The Logistics of the New Kingdom Egyptian Military in the Levant

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy by:

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Warfare in the New Kingdom has been described as a revolution in military organisation. For the first time in Egyptian history, New Kingdom armies were composed of full-time soldiers that were coordinated on a state scale. The motivation for this change is thought to have originated in the wars with the Hyksos and maintained its momentum throughout the 19th and early 20th dynasties. Many scholars have argued that the introduction of the chariot, scale armour and composite bow (the 'tripartite association') enabled the Egyptians to transform themselves into a cohesive military power which held a tactical advantage over their Canaanite neighbours. As a result, previous studies have tended to focus on weaponry to explain how Egypt was able to conduct campaigns and maintain political control in the Levant.

This thesis illustrates that the logistical component of New Kingdom Egyptian military gave the Egyptians an advantage over their geographic northern neighbours; examining the constraints they faced in trying to meet their territorial goals. By utilising archaeological data from fortresses along the overland route to the Levant (the eastern Delta, north Sinai and southern Levant), it can be demonstrated that the military relied upon logistical support to expand Egyptian influence to its greatest extent. This strategy relied upon rapid deployment, communications and the acquisition of supplies from either vassals or Egyptian-held centres in the Levant. By utilising modern medical and veterinarian data, it investigates how physical limitations would have impacted the Egyptian military's capabilities. Furthermore, this study refutes the idea that the New Kingdom Egyptians held a technological advantage over their Levantine vassals. It can be demonstrated there was an 'internationalism of arms' during the New Kingdom/Late Bronze Age (LBA) throughout the Near East. In order to explain why the New Kingdom Egyptians became a dominant political power, this research considers numerous factors in addition to military equipment.

This thesis is dedicated to my parents, Joan and Edward Wernick. Without their financial and emotional support, it would not have come to fruition and a dream would not have been realised.

Also to my wife, Doreen, whose patience on this long road is truly a testament to love and commitment.

And to the memory of Steven Larkman, whose life was cut too short for us to finish our debates about ancient Egyptian warfare.

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Abbreviations

Chronology Abbreviations

FIP	First Intermediate Period
IA	Iron Age
LBA	Late Bronze Age
MBA	Middle Bronze Age
SIP	Second Intermediate Period
TIP	Third Intermediate Period

Bibliographic Abbreviations

AEL	Ancient Egyptian Literature, 3 Volumes. M. Lichtheim (Berkley, 1973-80)
AJA	American Journal of Archaeology
Amer. Sci.	American Scientist
ASAE	Annales du Service des Antiquités de l'Égypte
Atlas	Atlas zur altaegyptischen Kulturgeschichte, 5 Volumes. W. Wreszinski (Leipzig, 1914)
BAR	Ancient Records of Egypt, 5 Volumes. J. Breasted (Chicago, 1906-07)
BASOR	Bulletin of the American Schools of Oriental Research
BH	Beni Hasan Tomb #
Bib. Arc.	The Biblical Archaeologist
Bildatlas	Bildatlas Zum Sport Im Alten Ägypten, 2 Volumes. Herb & Decker (Leiden, 1994)
BM	British Museum
BMRTB	British Museum Technical Research Bulletin
BMMA	Bulletin of the Metropolitan Museum of Art
BPT	Bulletin of Primitive Technology

CA	Classical Antiquity
CAD	The Assyrian Dictionary of the Oriental Institute, University of Chicago
CANE	Civilizations of the Ancient Near East, 4 Volumes. J. Sasson (ed.) (New York, 1995)
CdE	Chronique d'Egypte
CRIPEL	Cahiers de recherches de l'Institut de Papyrologie et d'Egyptologie de Lille
DE	Discussions in Egyptology
EgA	Egyptian Archaeology: The Bulletin of the Egypt Exploration Society
EA #	Amarna Letter (Translated by Moran 1992)
EL	Egypt and the Levant - Ägypten und Levante (Ä&L): internationale Zeitschrift für ägyptische Archäologie und deren Nachbargebiete
Feldzug	Die Feldzugsdarstellungen des Neuen Reiches: eine Bildanalyse. S. Heinz (Wein, 2004)
GM	Göttinger Miszellen
IEJ	Israel Exploration Journal
Iraq	Iraq: Publication of the British School of Archaeology in Iraq
JACF	Journal of the Ancient Chronology Forum
JAOS	Journal of the American Oriental Society
JARCE	Journal of the American Research Center in Egypt
JAS	Journal of Archaeological Science
JE	Journal d'Entrée, Cairo Museum
JEA	Journal of Egyptian Archaeology
JESHO	Journal of the Economic and Social History of the Orient
JMH	Journal of Military History
JNES	Journal of Near Eastern Studies
JSSEA	Journal of the Society of the Study of Egyptian Antiquities
KBo	Kleischifttext aus Boghazköi

KRI	Ramesside Inscriptions, Historical and Biographical, 7 Volumes. K. Kitchen (Oxford, 1969-1990)
Levant	Levant: Journal of the British School of Archaeology in Jerusalem
LdÄ	Lexikon der Ägyptologie, 7 Volumes. W. Helck, E. Otto, W. Westendorf (Wiesbaden, 1972 – 1992).
MDAIK	Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo
MFA	Museum of Fine Arts, Boston
MMA	Metropolitan Museum of Art, New York
NEAEHL	New Encyclopedia of Archaeological Excavations in the Holy Land, 4 Volumes. E. Stern (ed.) (New York, 1993).
OJA	Oxford Journal of Archaeology
OxEn	The Oxford Encyclopedia of Ancient Egypt, 3 Volumes. D. Redford (ed.) (Oxford, 2001).
Pap.	Papyrus
RdE	Revue d'Égyptologie
RS	Ras Shamra (ancient Ugarit) Text Number
SAK	Studien zur Altägyptischen Kultur
TA	Tel Aviv: The Journal of the Institute of Archaeology
TT	Theban Tomb #
UC#	Petrie Museum Catalogue Number
UCLA-Encyc	UCLA Encyclopedia of Egyptology, URL: http://www.uee.ucla.edu/index.htm
Urk	Urkunden des ägyptischen Altertums, 8 Volumes. K. Sethe, H. W. Helck, H. Schäfer, H. Grapow, O. Firchow (eds.) (Leipzig/Berlin, 1903-1957)
WA	World Archaeology
Wb.	Wörterbuch der ägyptische Sprache, 9 Volumes. A. Erman & W. Grapow (Leipzig/Berlin, 1926-1955).
ZÄS	Zeitschrift für ägyptische Sprache und Altertumskunde
ZDPV	Zeitschrift des Deutschen Palästina-Vereins

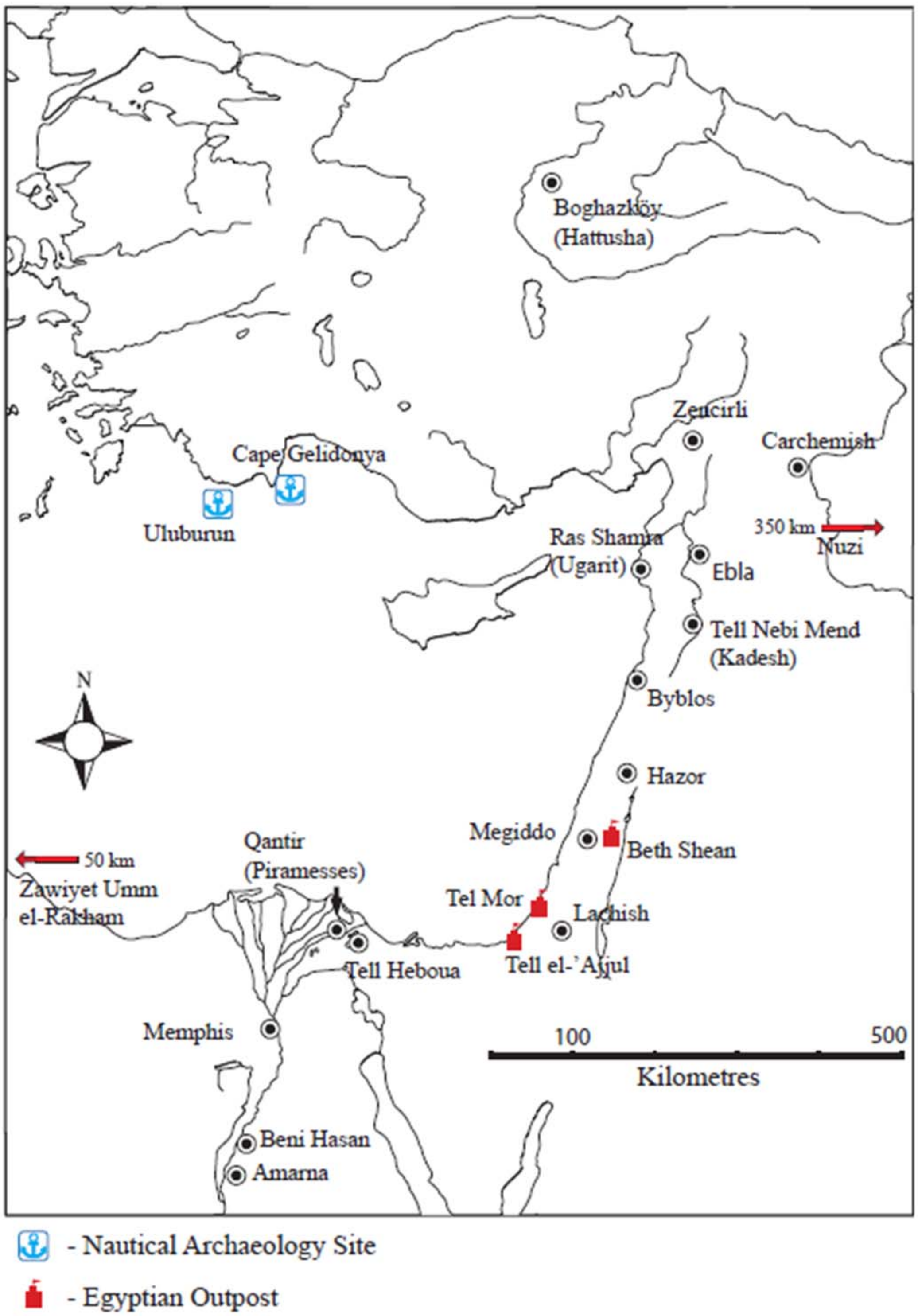

Figure 1 - Map of the eastern Mediterranean during the Late Bronze Age.

Chapter 1: Introduction

1.1 Introduction

In many ways, archaeology is an imperfect tool to examine ancient warfare as the remnants of battle are difficult to detect in material remains.[1] By examining data from various sources, we can reconstruct aspects of how ancient military campaigns were conducted. Warfare is a remarkable activity which can impact on every level and facet of a society, and has the potential to be a valuable means of observing human behaviour.[2] Keeley noted:

> "It is the riskiest field on which to match wits and luck; no peaceful endeavour can equal its penalties for failure, and few can exceed its rewards for success. It remains the most theatrical of human activities, combining tragedy, high drama, melodrama, spectacle, action, farce, and even low comedy. War displays the human condition in extremes."[3]

Most studies of ancient Egyptian warfare tend to focus chronologically on the New Kingdom, since this is the period from which the richest sources of data survive.[4] Usually, most analyses focus upon the introduction of new weaponry to explain the socio-political change took place during this time.[5]

Warfare in the New Kingdom has been described as nothing short of a revolution.[6] For the first time in Egyptian history, New Kingdom armies were composed of full-time soldiers that were organised on a state scale. The motivation for this change is thought to have originated in the wars with the Hyksos and maintained its momentum throughout the 19th and early 20th dynasties. Yadin argued that the introduction of the chariot, scale armour and composite bow enabled the Egyptians to transform themselves into a cohesive military power, hence, they held a tactical advantage over their Canaanite neighbours.[7] The Egyptians were able to subdue ancient Canaan for their imperial designs with subsequent campaigns. Thus, Yadin's study firmly rooted the seeds of 'technological determinism', this imperial venture in the technological aspects of ancient Egyptian warfare.

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[1] Shaw 1996, 239; Vencl 1984, 123
[2] Warburton 2001, 170 – 171
[3] Keeley 1996, 3
[4] Spalinger 2013b, 393; 2005
[5] Spalinger 2013b, 436 – 441; Darnell & Manassa 2007; Spalinger 2005; Martínez Babón 2004-2005; McDermott 2004; Drews 1993; Healy 1992; Humble 1980, 42 – 48; Yadin 1963
[6] Faulkner 1953, 41
[7] Yadin 1963, 58, 86 – 90

Technological determinism's perspective on warfare suggests that all aspects of a society are militarily based. By utilising superior technology, an expansionist group might encapsulate more and more territory. This results in the view that all decisions made, take military considerations as paramount in policy formation. Furthermore, it would suggest that all socio-political change during a timespan can be attributed to military technology alone, such as the change in arsenic copper to tin-alloyed copper. This philosophy appears to have influenced many scholars of Egyptian warfare and imperialism during the New Kingdom as these notions can be found in Spalinger's analysis of New Kingdom warfare.[8]

Spalinger argued that warfare in the New Kingdom changed dramatically from previous periods in that the army shifted from being primarily foot-archers that transported themselves via ships on the Nile to a land-based military that focused on shock weaponry.[9] The chariot, he argued, would not have been readily adopted by the Egyptians if it were not for the development of the composite bow.[10] The composite bow could fire arrows at higher concussive force and at a greater range than the previous period's self-bow. It is thought to have been the stimulus for the development of scaled armour throughout the ancient Near East. Spalinger claimed that with these new technological developments, the Egyptians were able to annex a wide area of the Levant and create an empire.

By taking each weapon's processes of technical manufacture into account and attempting to correlate their use with textual analyses of Egyptian military positions, researchers attempted to concentrate studies on a particular weaponry type and tried to envision how the ancient Egyptian military conducted its campaigns.[11] However, such analyses tend to underestimate the importance of logistical supply in the conduct of military campaigns. This thesis will demonstrate that examinations of weaponry alone cannot lead to a comprehensive theory of how warfare was conducted in the Levant and, by extension, how coercive power was employed by the Egyptians to achieve their political aspirations. By utilising archaeological data from fortresses along the overland route to the Levant (the eastern Delta, north Sinai and southern Levant), it can be demonstrated the military relied upon logistical support to expand Egyptian influence to its greatest extent. This strategy appears to have relied more upon the rapid deployment of military forces, supplied by strategically-located outposts, to extend the New Kingdom pharaohs' influence beyond Egypt proper. Therefore, this thesis provides additional insight into the 'human face' of ancient Egyptian military operations. By utilising

[8] Spalinger 2013b, 403, 425; 2005
[9] Spalinger 2005, 6
[10] Spalinger 2005, 15
[11] Spalinger 2013b, 401

modern medical and veterinarian data, it will also investigate how the physical limitations would have impacted the Egyptian military's capabilities. Furthermore, this study refutes the idea that the New Kingdom Egyptians held a technological advantage over their Levantine vassals. It will be demonstrated there was an 'internationalism of arms' during the New Kingdom/Late Bronze Age (LBA) throughout the Near East. In order to explain why the New Kingdom Egyptians became a dominant political power, this research considers numerous factors in addition to military equipment.

1.2 Aims of this Thesis

This thesis aims to illustrate that the logistical component of New Kingdom Egyptian military gave the Egyptians an advantage over their geographic northern neighbours; examining the constraints they faced in trying to meet their territorial goals. Consequently, this thesis explores the ways in which the Egyptian army operated in the LBA Levant, using data from fortification sites in the Levant, along with its military equipment and logistical considerations. Specifically, this thesis seeks to answer the following question:

- How did aspects of logistics impact the capabilities and infrastructure of the New Kingdom Egyptian military in the Levant?

Since 'logistics', or the study of how to supply one's forces while on campaign, is a broad term in itself, this thesis has to undertake an interdisciplinary approach to illuminate how the aspects of logistical planning would have affected the New Kingdom Egyptian military. The facets of logistics are complex as they can affect a variety of archaeological remains. Due to space constraints, this thesis has selected the following categories of archaeological information as they were seen to provide the most information on logistical aspects:

- Egyptian-held fortifications in the north Sinai and in the Levant
- Physical parameters upon a campaign force
- Military technology exchange and siege tactics

Therefore, in each category there are secondary questions that can be advanced:

- To what extent do the archaeological sites, along the route into Canaan, reflect aspects of Egyptian military logistics in the LBA? Do the remains of these sites differ from the Egyptian-held sites in the Levant and if so, what are the implications?

- What would have been the physical constraints on an Egyptian campaign force in the Levant? How did the Egyptian military approach questions of supply while on campaign?
- How did the New Kingdom Egyptians attribute their success in military campaigns? Did they attribute their success to technological developments in weaponry and military equipment? To what extent are the tactics in sieges an indication of the importance of logistics?

These questions will be answered via an interdisciplinary approach because the various aspects of ancient New Kingdom warfare cannot be studied in isolation to formulate a comprehensive theory of how logistics would have factored in the Egyptian military's campaigns in the Levant.[12] From the most cursory study of previous scholarship on ancient Egyptian warfare, we are essentially dealing with technological developments that took place during New Kingdom. Technological developments by themselves, however, cannot inform us about the ways that the Egyptians operated in the Levant and how long distance supply would have impacted their fighting capacity. This thesis seeks to avoid such a monocausal approach by examining various archaeological and textual data. Archaeological data relating with warfare is mainly composed of four types of material remains, such as armaments (weaponry and military equipment), skeletal trauma, fortified architecture and iconographic representations. In relevance to the Egyptian New Kingdom, we can also consult a fifth type; the textual record. Note that this thesis consults the textual and iconographic data relating with warfare to better shed light on aspects of military campaigns in the New Kingdom when the archaeological data is scarce. However, the main source of empirical data about the ancient world is material culture and it is how researchers can reconstruct the actions of ancient peoples.[13] The intangible aspects of military campaigns, such as the motivations for warfare, do not preserve in the archaeological record and therefore the utility of iconographic and textual data becomes apparent.[14] By focusing on the archaeological remains for New Kingdom warfare, this thesis bridges the gap between material remains of the ancient Egyptian military with representational and textual evidence.

1.3 Thesis Outline

Chapter 2 looks at definitions and possible motivations for warfare. It includes a literature review that examines the various ways in which ancient Egyptian warfare has been analysed.

[12] Raffield 2009, 38; Carman 1997b, 224
[13] Vandkilde 2006b, 483
[14] Vencl 1984, 129 – 130

It will also provide historical context and background necessary to evaluate the archaeological and textual data studied. Chapter 3 discusses the methodology of this thesis; primarily focusing on the archaeological remains as well as noting the shortfalls within the selected data sets. Chapter 4 is the first part of this thesis to deal with data; focusing on the archaeological sites of northern Egypt and the Levant. By analysing sites in these areas, we will understand the archaeological remains and the character of these sites. Chapter 5 discusses a different form of data to explore how physical limitations would have affected military campaigns. This chapter will investigate travel rates, provisions a campaign force would need and the likely method for the New Kingdom Egyptian administration to move materiel to and from the Levant. Chapter 6 presents a third form of data: the exchange of LBA military equipment and weaponry in the ancient Near East. This chapter will also discuss how LBA rulers attributed victory in battle. In addition, tactics in siege warfare will be discussed as they directly relate with the topic of Egyptian political control in the Levant. Finally, Chapter 7 draws together conclusions from the data chapters. It answers how logistics would have impacted the fighting capacity of the ancient Egyptian military during the New Kingdom.

Chapter 2: The Background to Ancient Egyptian Warfare

"Between two groups of people who want to make inconsistent kinds of worlds, I see no remedy but force."

-Oliver Wendell Holmes

2.1 A Definition of Warfare

By using data from fortification sites to explore the ways that the Egyptian army operated in the LBA Levant, we will first discuss definitions of the term 'warfare'. Anthropologists have been proposing theoretical frameworks for warfare and its manifestations for decades, while archaeology in the ancient Near East is just beginning to address the topic.[15] Vandkilde concluded that anthropological theory of warfare can be applied to archaeology as discussions about warfare were not commonplace before 1995: "(C)ompared to the general implementation of anthropological and sociological theories in archaeology (late 1960s and 1970s), war studies thus arrive on the scene much delayed".[16]

Note that anthropology often employs a different methodology to archaeological studies since assumptions are based upon direct observations of preliterate people.[17] Anthropological discussions have been centred on warfare and its connection with more complex social development.[18] Although this topic has value in Egyptology, it should be discussed primarily within the context of the Predynastic and the Early Dynastic periods.[19] However, the connection between warfare and the rise of the state in Egypt is irrelevant for the LBA as this period already has stratified societies that appreciate the implications of territorial domains and external threats. Cultures in this part of the world had been engaged in warfare for thousands of years by this time.

Lawrence Keeley's *War Before Civilization: The Myth of the Peaceful Savage* is often invoked in archaeological research on warfare.[20] Although Vandkilde credited Keeley's

[15] Carman & Harding 1999b, 3; Vencl 1984, 131
[16] Vandkilde 2006a, 57, 68 – 69
[17] Haas 1999, 12 – 13
[18] Otterbein 2011; 1999
[19] For a discussion of warfare and the development of the Egyptian state, see Gilbert 2004, 25 – 32; Bard & Carneiro 1989; Carneiro 1970. In contrast, that warfare was not the cause of the Egyptian state, review Warburton 2001, 244 – 245; Eyre 1997. See also, Claessen 2006 and Pitman 2011 for a general theoretical framework.
[20] Carman & Harding 1999b, 6 – 7; Keeley 1996

book with being one that sparked resurgence in warfare in anthropology, Keeley's argument did not provide much benefit to an archaeologist.[21] Keeley's volume was helpful for anthropologists as it pointed out that ethnographic data for warfare had been neglected and studies could be supplemented through archaeological finds. Yet, Keeley applied little archaeological evidence to support his claim that prehistory was violent and brutal.[22] Not every ancient Near Eastern scholar is interested in the topic of conquest and warfare, but no one would claim that it was a pacified time during the New Kingdom.[23] Thus, archaeologists are not involved in the debate of Keeley which is essentially a 'call to arms' for the field of anthropology. Hence, we should be wary of applying an anthropological methodology for analysing warfare in the archaeological record.

For this thesis, warfare is defined as the institutionalised use of violence by one group over another due to the perception of one group being different than another in aspects of culture or beliefs. This view is different from that of Warburton who claimed that warfare is a political action generated by two states; that warfare could not have achieved its level of organisation without social complexity.[24] Warburton also added that warfare has clearly set out delineated goals for which the parties can achieve a measure of success.[25]

Warburton's definition of warfare is restrictive and did not consider historical developments in the eastern Mediterranean during the LBA. The definition of a 'state' implies a territorial hegemon that controls several satellite centres. This is not applicable in comparison to the violent interactions of migratory peoples during the LBA (the Shasu, the Libyans, the Habiru and the Sea Peoples) who all appeared to have a very loose social organisation. When these groups launched a 'war' effort on sedentary groups, their attacks were neither limited, nor 'primitive' as their devastation was comparable to that wreaked by imperial civilisations (such as the Egyptians, the Hittites or the Assyrians).

Otterbein's definition of warfare is much more practical as he described it as a planned and armed dispute between political units.[26] The usefulness of the Otterbein's definition is that it is not contingent on either faction having the characteristics of states.[27] Likewise, De Souza's definition stated that groups engaged in warfare do not need to be delineated by

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[21] Harding 2006, 511; Vandkilde 2006a, 64 – 65; Carman & Harding 1999b, 6 – 7; Carman 1997b, 229. For a critique of Keeley's arguments, see Otterbein 1999, 795 – 797.
[22] Carman & Harding 1999b, 6
[23] See also Hamblin 2005, 14 – 34; Haas 1999, 11; Carman 1997b, 236; Vencl 1984
[24] Warburton 2006, 52 – 53
[25] Warburton 2006, 52
[26] Otterbein 1989, 3
[27] Otto 2006, 23 see also Bossen 2006, 97; Keegan 1993, 3 – 6

political terminology: "…(warfare is) any form of violence waged between two opposing groups that have been armed and organised for that purpose".[28] In order to avoid the restrictive language of Warburton in relation of the 'state', we should instead use the term 'polities'. 'Polities' is a useful term referring to socially uniform groups of peoples bound by common political goals (i.e. the organisation of making war against their enemies).[29] Although the definition of warfare used in this thesis might appear nebulous, it has to be broad enough to encompass the many permutations of violence within the archaeological record.[30]

2.1.1 Possible Motivations for Warfare in the New Kingdom

There has been a tendency to view the main motivation for engaging in warfare as a means to gain political and economic dominance over another group.[31] In this 'materialistic' view, war is an action to secure the wealth and resources of one group to enhance the stability and prestige of elite echelons of another. However, warfare should be perceived to be a culmination of various factors which might not be obvious at first glance.[32]

The 'ideological dimension' of engaging in warfare was underestimated in analyses of LBA period. Morris characterised the Egyptians as solely engaging in warfare and imperialism for economic reasons.[33] She argued that fortified architecture is often located along trade routes in Nubia and the ancient Near East. However, she neglected to factor in the evidence that suggested that Egyptian rulers took great pride in demonstrating that they had the right to rule through victories they had secured. We should consider that warfare became an expression of royal power and a foundation for authority. Similar to the 'Mandate of Heaven' in ancient China, the divine right to rule through victory in battle is a cornerstone of authoritarian power in ancient Egypt.[34]

Shaw argued that warfare is an essential element in the concept of Egyptian kingship since the Protodynastic period.[35] The argument is presented that the king, or representatives of the king, have a monopoly on the use of violence to exert their authority. Using violence for regular trials is avoided since it is perceived to be disruptive to civil order. It is no mistake

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[28] De Souza 2008, 7
[29] Cohen 1985, 276 – 277
[30] Carman 1997b, 223, 230; Vandkilde 2006b; Vencl 1984
[31] Keeley 1996, 15, 113; Yadin 1963, 1
[32] Keeley 1996, 114 see also Gat 2006, 233 – 236
[33] Morris 2005, 14, 810 – 812. See also, Gnirs 1999, 84 – 85
[34] Glanville 2010
[35] Shaw 1991, 9

that the use of violence becomes a prerogative of Egyptian kingship.[36] In order to support this ideology, warfare becomes indistinguishably combined with the concept of cosmic order or *ma'at*.[37] This religious paradigm, common across the LBA Near East, asserts that the legitimate authorities are sanctioned to resort to violence to counter groups who threaten the harmony of society.[38] Hence, the king becomes both a symbol for social order and an emblem of the divine investiture in ancient Egypt.[39] Due to the fact the king is supposedly responsible for the use of all violent force, opposing groups are typical portrayed as 'rebellious' since they are engaging in an unlawful action. Although the use of force in the ancient world often lead to material gains for the victorious party, ideological objectives should be taken into consideration in our analysis for the motivations for warfare. Liverani pointed out that all international relationships in the LBA utilise warfare as a prelude to political alliances and agreements: "Peace cannot be made without conflict… Good relations will not come without a fight."[40]

The debate between materialist and ideological motivations for imperialism and conflict can be seen in the debate between Stuart Smith and Barry Kemp.[41] Smith asserted that the material rewards from conquest were the main motivation for the ancient Egyptians establishing frontier bases at Nubian sites. He presented a view of Egyptian expansionism that was calculated with clear economic goals, such as the access to Nubian gold mines:

> "Nubia in the New Kingdom was made over into an image of Egypt itself, not to serve some ideological need to replicate Egypt abroad, but rather as the most efficient means of exploiting the dramatic changes in the infrastructure which occurred during the Second Intermediate Period…(using) ideology on the one hand and socio-economic systems on the other, they created the world's earliest and most successful expressions of imperialism, using their Nubian colony to create prosperity at home, and reinforce the position of the state both at home and abroad."[42]

Although Smith mentioned that the Egyptians employed ideology to justify their occupation of Nubia, Kemp found that Smith's focus on economic gain was too simplistic to satisfactorily explain cultural interactions of Egypt and Nubia during the New Kingdom.

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[36] Muhlestein 2011b; Keegan 1993, 4 – 5
[37] Liverani 2001, 108 – 115. See also, Shaw 1998, 256 – 257
[38] Gnirs 2013, 639; Bahrani 2008, 210; Darnell & Manassa 2007, 190; Bryce 2002, 100 – 101; Liverani 2001, 86 – 96; Gnirs 1999, 73; Houwink ten Cate 1984, 72; Korošec 1963, 163
[39] Gnirs 2013, 639.
[40] Liverani 2001, 123 citing Foster 1993, Vol. 1, 218
[41] Smith 1995; Kemp 1997
[42] Smith 1995, 188. See also Gnirs 2013, 715 – 717; Smith 2003, 73; Trigger 1982

"…(Smith) develops an argument which is consistent with his findings from Askut and turns several centuries of Egyptian rule into a clever piece of economic manipulation by Egyptian kings and their servants".[43] Besides pointing out that Smith portrayed imperial policy as constant and unchanging in the New Kingdom, Kemp argued that the ideological aspects of the Egyptian kingship was the principal motivation for the occupation of Lower Nubia, namely the assimilation of Nubian groups into Egyptian culture.[44] Furthermore, Kemp questioned the Egyptians' reasons for establishing large temples in Lower Nubia if they were seeking only economic gains from the area.[45] In response to Kemp's reservations, Smith countered that ideological considerations, although important, are often bombastic in some claims; the veil of hyperbole in royal Egyptian records clouds the matter on motivations for imperial rationales.[46] Furthermore, Smith added that the process of cultural assimilation claimed by Kemp is not uniform in Lower Nubia as Egyptian settlement is concentrated near raw resources and disperses in an outward, uneven pattern.[47]

Nicholas Postgate also commented on Smith's volume, giving sober advice when comparing the factors of economic and ideological motivations for empire (and by extension, warfare):

> "No-one is likely to deny that there are strong economic motives built into most imperial episodes, but it is not very productive to have a quantitative tug-of-war with economics at one end of the rope vs. ideology at the other… A change of approach might help. Rather than view them as competitors, is it not more constructive to explore the interaction between them? We need to ask ourselves on the one hand, how economic motives are reflected in the ideological statements visible to us, and on the other, whether choices in the economic sphere are skewed or determined by ideological considerations."[48]

Ultimately, although Kemp and Smith both portrayed Egyptian hegemony as having two main motivations, they appear to approve a multi-facetted approach to view motivations as an interplay between ideology and economics.[49]

[43] Kemp 1997, 125
[44] Kemp 1997, 128
[45] Kemp 1997, 129 – 130
[46] Smith 1997, 301 – 302
[47] Smith 2003, 86 – 96
[48] Postgate 1997, 135
[49] Smith 2003, 186 – 187; Kemp 1997, 127

As we will see, the shifting strategy of the New Kingdom Egyptians in the Levant was motivated by several factors. Aspects of ethnicity, population pressure and the perceived threat of an area's inhabitants seem to be some motivations that could give rise to confrontations. These intangible motivations for warfare are very difficult to quantify from the archaeological record.[50] Also, we must consider that prestige may be a factor in warfare; that the institutionalised use of violence leading to victory and supremacy could enhance the worthiness and suitability of those in the highest strata of society (similar to the Roman concept of *dignitas*).[51] Obviously, the prevalence of economic gains are much better attested in the archaeological record but we should not see this as the prime mover for all violent interaction.

For the complexities of warfare and its motivations, Claus Bossen proposed a theoretical framework based on the writings of Michael Mann.[52] Following Mann's claims, Bossen stressed that military institutions are just one of four aspects of social power.[53] The other spheres (politics, economics and ideology) are thought to interact with one another to various degrees and in relation to different stimuli. Warfare and its manifestations are expressions of legitimacy which are articulated in cultural paradigms on the societal use of violence.[54] The 'justification for warfare' has a direct link with the concept of the legitimate use of force.[55] The strength of Bossen's theory is that it emphasised the complexity of military power with other aspects of cultural development, concluding that researchers should not seek simplistic definitions of warfare for its use in the archaeological record. Thus, as Postgate argued, the motivations for ancient military campaigns should be addressed on a case-by-case basis and researchers should consider the many facets involved.

2.2 The Historical Context of New Kingdom Egyptian Warfare

Contacts with the Levant were very much a part of Egyptian trade as far back as the Predynastic Period (5500–3100 BCE), however, foreign interaction and influence changed considerably in the New Kingdom.[56] The New Kingdom in Egypt is a period of exceptional expansion over Canaan and south Syria. It is the best documented phase of pharaonic history

[50] Vencl 1984, 119
[51] Keeley 1996, 116
[52] Bossen 2006
[53] Bossen 2006, 94 – 96
[54] Bossen 2006, 92
[55] Warburton 2006, 45 – 46
[56] Ward 1971, 1 – 57; Wright 1988, 143 – 161; Oren 1993, 1387 – 1388; Moreno Garcia 2010

and this has led to a perception that bureaucratic power was strongly centralised and that Egypt became much more integrated with other powers of the ancient Near East. Egypt sought foreign territories to expand its influence and exact tribute from vassals. It is this involvement on the Near Eastern 'international' stage that leads one to argue that scholars cannot just look at Egyptian history in isolation but as an integral member of ancient Near Eastern 'superpowers'.[57]

The onset of the New Kingdom must be first understood against the political developments that took place during the Second Intermediate Period (SIP) (*c*.1650–1550 BCE). From the Kamose stele, the Thebans perceived themselves to be between two hostile forces of the Asiatic 'Hyksos' in the north and the Nubian Kerma-culture in the south.[58] Manetho described that the Hyksos established themselves through violent conquest.[59] However, others presented evdience to indicate that the Hyksos slowly settled in the Delta during the late Middle Kingdom.[60] However, the skeletal trauma on the body of Seqenenre Tao (*c*.1560 BCE) demonstrated the relationship between the Thebans and the Hyksos was aggressive near the close of the SIP.[61] The evidence for the Kerman polity annexing up to the first cataract fortresses is slight, but it is assumed that their campaigns took on the guise of military conquest.[62]

The subsequent battles of Kamose (1555–1550 BCE) and Ahmose (1550–1525 BCE), demonstrated the Thebans first dealt with the rulers of Kerma and then moved north to face the Hyksos.[63] The Egyptian military is seen as slowly gaining experience with each battle and transforming itself into a military force that was able to embark on large scale military manoeuvres unlike the previous campaigns of the Middle Kingdom.[64] After a three-year

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57 Hamblin 2005, 307; Shaw 1991, 13
58 Luxor Museum no.# J.43 (American Research Center in Egypt 1979, 36 – 37); Habachi 1972
59 Manetho's account as quoted in Josephus, *Against Apion* (CA), I.73 "The kings of Thebes and the other parts of Egypt rose against the shepherds (Hyksos), and a long and terrible war was fought between them". Healy 1992, 7; Maspero 1903
60 Bietak & Forstner-Müller 2011, 28; Booth 2005, 9 – 11; Warburton 2001, 39; Bietak 1996, 10 – 21
61 Shaw 2009, 159 – 176; Booth 2005, 47; Warburton 2001, 40
62 Stela of Sepedhor (no.# 18, Sudan National Museum, Khartoum), stela of Sobekemheb (no.# 5320, Sudan National Museum, Khartoum) and representation of a figure (presumably a Kerman king, no.# 62/8/17 Sudan National Museum, Khartoum). Smith 1976, 73 – 74, 80 – 85
63 Habachi 1972
64 Spalinger 2013b, 423

siege of Sharuhen, the Hyksos were defeated and Egypt became a force to be reckoned with.[65]

Although the next stages of the early 18th Dynasty are unclear in the textual record, it appears the Egyptian military embarked on a series of campaigns designed to weaken Canaan and eliminate any foreign threat. The perceived threat from Canaan is mentioned by modern authors as being the justification for seasonal campaigns that were not focused on 'empire building' but to devastate the Canaanite countryside and their capacity to launch another 'invasion' of Egypt. The Hyksos were invoked as a reason to campaign in southern Canaan in the early 18th Dynasty after they ceased to be a threat to Egypt. This can be seen in the inscription of Hatshepsut at Speos Artemidorus, which appears to ascribe the expulsion of the Hyksos to Hatshepsut, 75 years after the actual event occurred.[66]

The MBA to LBA transition (the SIP to New Kingdom, c.1550) is marked archaeologically by a series of destructions at urban centres and the abandonment of entire regions in Canaan. Not all scholars are convinced the Egyptian military was responsible for the significant decrease in population and a restructuring of settlement habitation.[67] Regardless of who destroyed Canaanite centres, we should acknowledge Canaan was radically transformed from a flourishing civilisation in the MBA to a relatively impoverished, sparsely populated area in the early 18th Dynasty.[68]

The shift of Egyptian international policy to a more imperialistic one occurred during the reign of Thutmose III (1479–1425 BCE).[69] Thutmose faced a Levantine coalition of city-states at the Battle of Megiddo (c.1479 BCE). The details of this engagement are not clear in the textual record as they only relay information that the Canaanites were routed and took refuge in the fortified city of Megiddo. The ill-discipline of the military is blamed for the resulting 7-month siege, as the Egyptian soldiers opted to plunder the Canaanite encampment rather than pursue the opposition. After the capitulation of Megiddo, members of the Canaanite coalition were made to swear an oath of loyalty to Egyptian authority. After fealty

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65 Redford (1992, 138 – 139) claimed that the length of this siege demonstrates the relative lack of experience of the Egyptian military in besieging cities (this will be discussed in Section 6.2). There is no doubt that the siege would have been arduous for either party.

66 Shaw & Nicholson 2003, 276

67 Finkelstein & Singer-Avitz 2004, 122 – 135; Hoffmeier 2004a; Knapp 1992; Redford 1992, 138 – 139; Dever 1990; Hoffmeier 1990; Bienkowski 1989; Hoffmeier 1989; Weinstein 1992; Rainey 1987; Weinstein 1981. For a good summation on the debate of early 18th Dynasty military actions, see Morris 2005, 35 ft. 40 – 45

68 Jasmin 2006, 163, 178 – 185; Redford 1992, 138; Weinstein 1992; Dever 1990; Mazar 1992, 232; Broshi & Gophna 1986; Gonen 1984; Weinstein 1981

69 Healy 1992, 15

had been declared, Thutmose appears to have established coastal bases that would have collected tribute of supplies for additional Levantine campaigns.[70] Although Amunhotep II (1427–1400 BCE) introduced a policy of indoctrinating foreign rulers' children by bringing them to Egypt and raising them in Egyptian customs and language, Thutmose appears to have done this to a wider extent.[71] His administration would install client kings in their respective cities when the former ruler died. In this way, Egypt was able to exercise authority over their Levantine vassals and ensure they would remain receptive to their wishes.[72] Thutmose campaigned frequently in the Levant and Nubia; there are currently 17 campaigns attributed to his reign.

The later 18th Dynasty is characterised by international diplomacy. It is thought the policies and military expeditions of Thutmose III were so successful that armed incursions into the Levant were no longer needed or were greatly curtailed during this time.[73] This impression has been significantly influenced by the discovery and translation of the Amarna Letters, a cache of tablets to the Egyptian royal court written during the time of Amunhotep III (1390–1352 BCE) to the beginning of the reign of Tutankhamun (1336–1327 BCE).[74] In the archive, vassals inform the Egyptian king of movements in the Levantine sphere of influence (such as who was breaking their word to the pharaoh, requests for Egyptian troops to secure areas, etc.). At a higher level, Egypt is contacted by Near Eastern powers such as the Mitanni, the Hittites, the Assyrians and the Babylonians. It is revealed that economic interdependence was indeed practiced at this time and there was a trade in military equipment and raw materials.

The 'Amarna Interlude' has been characterised by truncated military actions by the Egyptian state.[75] Egypt was not seen as a power that continued seasonal campaigns. This has often been based on speculation that Amunhotep IV/Akhenaten (1352–1336 BCE) was a pacifist because of his devotion to his new religion based on the worship of the Aten or sun-disc. The view that Egypt's power in the Levant was diminishing during the Amarna Interlude has been directly influenced by the Amarna Letters.[76] In these texts, vassals frequently request Egyptian troops to be stationed at their cities to respond to threats posed by other Canaanite polities which were urbanised centres or non-sedentary groups. The Apiru, in particular,

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70 Hoffmeier 2004a, 133 – 134, 141 see also Liverani 2001, 79 – 85
71 Stela of Usersatet (Boston MFA 25.632a-b); Gnirs 2013, 681 ft. 174; Urk. IV, 137 – 141; Spalinger 2013b, 440; Shaw & Boatright 2008, 32; Bietak 2007, 434; Bryan 2000, 236, 245
72 Smith 2003, 94
73 Morris 2005, 133
74 Shaw 1991, 49
75 Moreno Garcia 2013, 6
76 Warburton 2001, 71 – 73

appear to have been a disruptive element at this time in the Levant. Based in the area of Amurru, the Apiru are reported in the Amarna Letters to have upset trade networks, agricultural activities and even taken the Egyptian coastal garrison at Sumer. In addition, the Mitannian Empire, which had made peace and formed an alliance with Egypt since the time of Thutmose IV (1400–1390 BCE), fell to Hittite aggression without Egypt's aid.[77] This suggests that Egyptian authority as inept at maintaining its Levantine holdings. However, recent interpretations have re-evaluated Akhenaten's policies. Schulman argued that Egypt engaged in military campaigns against both the Hittites and the Apiru, bringing both to heel at this time.[78] Rather than see the requests of vassals as evidence of Egyptian ineffectiveness, Schulman surmised that Akhenaten used a strategic Machiavellian policy, based on the manipulation of vassals and external great powers to maintain the status quo rather than costly military engagements. A similar military re-evaluation of Tutankhamun's reign has also taken place.[79]

The 19th Dynasty is characterised by many scholars as being the most militaristic period in Egyptian history.[80] This perception is greatly influenced by the presence of artistic scenes of battle preserved on the exterior of temple walls. Although military scenes were a part of the 18th Dynasty representational repertoire, martial scenes of the 19th Dynasty are narrative depictions recording events in history.[81] The shift to narrative compositions, as argued by Gaballa, lies in the artistic works of the Amarna period.[82] He pointed out that Amarna art includes definitive spatial and temporal elements; this increased narrative compositions that followed the king's campaigns in the 19th Dynasty. The kings of the 19th Dynasty, not being directly related with the 18th Dynasty Thutmosids, had to show they had the right to rule as they would ensure victory and hold back the forces of chaos (*isft*) from reaching Egypt proper.[83] Interestingly, there appears to be a strange inverse situation of the 18th and 19th dynasties; material remains of weaponry are much more common in the 18th Dynasty with very few representations of military engagements, while in the 19th Dynasty, we find the opposite.[84] Furthermore, the founding of a new capital city in the Delta, at Piramesse, is

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[77] Bryan 2000, 257; Van Dijk 2000, 291; Shaw 1991, 52
[78] Brewer & Teeter 2007, 54
[79] Darnell & Manassa 2007
[80] Spalinger 2013b, 413; Humble 1980, 48
[81] Martínez Babón 2004-2005, 36; Gaballa 1967, 314 – 315
[82] Shaw 1996, 247; Gaballa 1967, 313 – 316
[83] *Contra* Gnirs (2013, 642) who also applied this theory of "qualification" to the 18th Dynasty.
[84] Martínez Babón 2004-2005, 36

taken as evidence of the 19th Dynasty Egyptian kings wishing to be closer to Canaan to launch campaigns with greater frequency.[85]

Horemheb (1323 – 1295 BCE), the former military advisor to Tutankhamun and first ruler of the 19th Dynasty, is credited with the militarisation of the Egyptian state which minimised abuses of the elite classes of Egyptian society.[86] Horemheb did not have any sons and so 'adopted' a trusted general to take the throne after his passing, Ramesses I (1295 – 1294 BCE). Ramesses I's reign was relatively short and his successor, Sety I (1294 – 1279 BCE), embarked on a series of campaigns to re-establish military control of Canaan and south Syria. Sety I is attributed with the establishment and embellishment of a series of military supply depots across the north Sinai to facilitate his Levantine military campaigns.[87] Murnane characterises Sety I's campaigns as being overly aggressive and hostile to Egypt's new rival in the Syria, the Hittites.[88]

Sety I's successor, Ramesses II (1279 – 1213 BCE), engaged the Hittite forces in the Battle of Kadesh during his fifth year (c. 1274 BCE).[89] Since there are 13 Egyptian versions, in various mediums and compositions, Egyptologists are relatively confident on the course of the battle.[90] The Hittites had mustered a force of 47,500 troops and awaited the Egyptian host of 20,000. The Egyptian army was lured into a false sense of security by the deceptions of captured Bedouin in the area. While the Egyptian camp was being constructed in the vanguard, the Hittite king, Muwatallis II (c. 1295 – 1272 BCE), ordered a contingent of 2,500 chariots to cross the Orontes and engage the second marching column of the Egyptians. Caught off guard, the Egyptian division broke ranks and fled toward the Egyptian camp with the Hittite chariot force in pursuit. However, when the Hittite force approached the Egyptian camp, discipline broke down and the Hittite army resorted to plundering the camp. Despite being caught unawares by a force of Hittite chariotry, Ramesses II was able to rally his forces and defend the Egyptian encampment with the timely arrival of additional troops (the Ne'arn). Although some authors claimed Ramesses II engaged the Hittite forces the following day, Goedicke illustrated there is evidence suggesting that Ramesses II punished his troops for their cowardice in the face of the Hittite

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[85] Gnirs 2013, 658; Brewer & Teeter 2007, 55
[86] Van Dijk 2000, 293
[87] Gilmour & Kitchen 2012, 13; Warburton 2001, 81 – 86
[88] Murnane 1990, 91 – 100; Van Dijk 2000, 294 – 295
[89] KRI II, 2 – 147
[90] Shaw 1991, 52 – 53

chariotry.[91] Nevertheless, it is clear is that the Egyptian forces made a strategic withdrawal from the field and Kadesh continued to remain a Hittite vassal.

Ramesses II's subsequent campaigns focused on Egyptian holdings in Canaan. Although it appears formerly loyal Egyptian vassals saw an opportunity to throw off the Egyptian yoke, Ramesses II was successful in maintaining Egyptian dominance.[92] In year 21 (c. 1258 BCE), through strategic manoeuvring and a crisis at the Hittite court, the first recorded peace treaty and mutual defence pact was established with the Hittites.[93]

During the course of the 19th Dynasty, Canaan had an influx of Egyptian influences.[94] Artefacts of Egyptian origin occur in much greater numbers in Canaan than they had in the previous 18th Dynasty. In addition, textual references to the bureaucratic administration of the Levantine holdings become much more numerous at this time.[95] From the material remains, it appears Egypt held sway over much of Canaan through the use of Egyptian functionaries, stationed at 'governor's residences'.[96] These residences are sometimes referred to as 'fortresses' by their respective excavators but there is little evidence to suggest that the architectural remains were capable of withstanding a hostile force. It is more likely they were storehouses holding tribute exacted from vassals which would supply Egyptian military forces.

The shift to the 20th Dynasty appears to have been detrimental to Egypt's 'empire' in Canaan. Specifically, a wave of marauding forces from various groups in the Mediterranean, known as the 'Sea Peoples', seem to have left a path of destruction in the eastern Mediterranean c.1200 BCE. Some scholars credited the Sea Peoples with the destruction of the Hittite empire and the sacking of numerous locations in the Levant, including the Syrian metropolis of Ugarit.[97] Although Ramesses III successfully repelled the Sea Peoples' incursion in the Delta and engaged them in Syria-Palestine, he also had to contend with two invasions of Libyans trying to force their way into Egypt (in Years 5 and 11, c.1179 and 1173 BCE respectively).[98] Due to these events, the 20th Dynasty is one in which Egypt was constantly

[91] Warburton 2001, 89 – 90; Shaw & Boatright 2008, 35;Shaw 1991, 57; Goedicke 1985
[92] Lundh 2002, 178
[93] Brewer & Teeter 2007, 54 – 55; Van Dijk 2000, 298
[94] Spalinger 2013b, 413
[95] Spalinger 2013b, 413
[96] Morris 2005, 386 – 391; Singer 1988; Oren 1984
[97] Van Dijk 2000, 305; Warburton 2001, 95;Shaw 2000, 328 – 329; Singer 1988, 3
[98] Van Dijk 2000, 304. Noted that these 'Libyan incursions' has been disputed (Smith 2003, 171 citing Lesko 1980).

having to defend itself from military threats closer to home.[99] This, along with internal strife, led to the demise of the Egyptians' influence over Canaan.[100]

In material culture, Egypt's Canaanite holdings appear to have declined during the 20th Dynasty. Although there was an influx of Egyptian pottery at some of the sites that possessed 'governor's residences', the material culture does not exhibit the same sense of control that the 19th Dynasty possessed. In particular, some sites in southern Canaan display a new type of pottery associated with Aegean cultural traditions.[101] The presence of this pottery is thought to be evidence of Ramesses III's policy of settling the Sea Peoples to act as mercenaries for the Egyptian administration.[102] It seems the destructive effect of the Sea Peoples disrupted trade and agricultural activities in the Levant to the extent that Egyptian power in Canaan could no longer operate.[103] This factor, when added to lower levels of Nilotic flooding and thus decreasing agricultural production in Egypt, signalled the end of the New Kingdom.[104] At numerous sites with 'governor's residences', there is evidence of destruction suggesting an uprising against Egyptian power. Ramesses VI is the last attested Egyptian king in Canaan and represents an erosion of Egyptian dominance from the reign of Ramesses III.[105] The IA was a new political landscape with the emergence of dynamic cultural groups within Canaan. Although Egypt would still have influence and the ability to engage in military actions in the Levant in consequent periods, it never approached the level of control it previously held in the 19th Dynasty.

In short, the discernible stages of Egyptian imperialism follow an accepted pattern with most Near Eastern researchers. In the first stage, before the Battle of Megiddo, Egypt is seen as a belligerent power, one that participated in the destruction and abandonment of well-established settlements in Canaan. There was no Egyptian attempt to control the Canaanite countryside. This changed after the conquests of Thutmose III. Although previous pharaohs had campaigned across vast distances in the Levant before the Battle of Megiddo, Thutmose III's changes in 'foreign policy' transformed Canaan into a formal Egyptian holding. Military campaigns were conducted on a regular basis to solidify power in contested regions. With the installation of client kings and carefully selected coastal bases at strategic locations, Thutmose was able to tighten his grip on Canaan and rely upon tribute to supply the military

[99] Spalinger 2013b, 419 – 420
[100] Dodson 2012, 8 – 38; Brewer & Teeter 2007, 56; Van Dijk 2000, 306 – 309
[101] Singer 1988, 6
[102] Bietak 1993, 292 – 294
[103] Heagren 2007, 156
[104] Drake 2012; Butzer 2012; Kaniewski et al. 2010; Antoine 2009, 5 – 7; Butzer 1984; Weiss 1982
[105] Killebrew 2005, 82 – 83; Singer 1988, 7

while on campaign. Thus, the conquest of Canaan gave economic benefits to New Kingdom Egypt.

In the next stage, the Amarna Interlude was a period of diplomacy rather than warfare in the Levant. This is primarily seen from the Amarna Letters illustrating a complex network of political relationships. Usually, the Egyptian royal court seems to have been weak during this time. Examples include the delayed reactions of Akhenaten to the destruction of the Egyptian coastal base of Sumer, the destruction of the Mitannian Empire and the repeated petitions of vassals' request for Egyptian reinforcements.

The 19th Dynasty represents a renewed dynamism and vitality for the conquest of Canaan and south Syria. Unlike the late 18th Dynasty kings, the pharaohs of the 19th Dynasty appear to have pursued an aggressive policy in which warfare played a major component. Along with their conquests came economic benefits whereby they established a complex series of administrators in Canaan to oversee Egyptian interests.[106]

The 20th Dynasty, in the last stage of the New Kingdom, transient groups disrupted Near Eastern political relations. Although, it is unclear why these groups congregated at this time, it is evident that the established sedentary centres had reasons to fear their actions. Within a short time, many established hegemonies and metropolises fell to their assaults. The early 20th Dynasty pharaohs were able to secure Egypt from invasion but the political order that had existed before was a thing of the past. The result was Egypt could no longer maintain a sphere of influence in the Levant.

2.3 Previous Publications and Research on Ancient Egyptian Warfare

This section will present the various ways in which Egyptologists have looked at warfare. To develop a comprehensive view of conflict in the New Kingdom, we will consult research based on Levantine materials and sites. A discussion of previous scholarship in ancient Egyptian warfare can be problematic; some researchers recommend particular publications that have been dismissed as uninformative by others.   For instance, Drews claimed Stillman

[106] Gnirs 2013, 641

and Tallis' volume is useful for academic research even though the volume is largely unreferenced and ignores critical data in the assessment of ancient Near Eastern conflict.[107]

Other than burial practices and agricultural activities, warfare is a topic for which we have a considerable amount of information from the ancient past.[108] With its ancillary facets, warfare affects many institutions and social hierarchies in the ancient world; it can lead to the formation of new societies, new governments and new areas of influence.[109] It is unwise to ignore its importance as a catalyst of change.[110] However, there has only been cursory warfare studies conducted in Egyptology. The topic of the ancient Egyptian military has not received proper attention as a research topic until recently and, even though there are several important studies published, the topic is marginalised by modern authors. For instance, Mieroop's analysis of the political dynamics and warfare in the 19th Dynasty discussed warfare for only 3.5 pages as opposed to a lengthy discussion of inter-politity correspondence.[111] Hackett claimed the Assyrians were the first group to have an empire with the military as a major component, even though he was well aware of the military activities of the pharaonic Egyptians.[112] Barbra Mertz expressed the traditional view of the topic of ancient Egyptian warfare:

> "One gets the impression that the Egyptians were never keen on fighting. 'The army', if one can give that name to a big disorganized militia, was not only called up for military campaigns. Under regular military commanders it was also employed for state work projects...For the Egyptians, there was no such thing as military science. You just got your men out to where the enemy soldiers were standing, and then shot arrows at one another and whacked one another with clubs and axes until one side got tired of it all and ran away. Some famous battles of the later period (Megiddo and Kadesh), when standing armies were the rule and kings prided themselves on their role as warriors, indicate a degree of ineptness and lack of common sense – let alone military strategy – that is astounding."[113]

From Mertz's statement, Egyptian warfare was portrayed by some Egyptologists as a series of simple acts of aggression perpetrated by one party over another. There are no nuances of

[107] Drews 1993, 101; Stillman & Tallis 1984
[108] Warburton 2001, 148 – 151; Eph'al 2009, 3; Moorey 2001, 4
[109] Keeley 1996
[110] Bossen 2006, 89
[111] Mieroop 2007, 100 – 133. See also Bryan 1996.
[112] Hackett 1990, 8
[113] Mertz 1966, 152 – 153.

social or strategic implications, nor is there a consideration of the institutions facilitating the logistics of campaigns. However, researchers should not underestimate ancient warfare's devastating effects. Keeley noted the study of ancient conflict has a bias against it in the social sciences:

> "Perhaps no aspect of prestate societies has been treated with more condescension by civilized observers than the way such groups conducted their wars…(the tactics and weaponry) supposedly bear only a resemblance to the complex, deadly military science of civilized warfare."[114]

2.3.1 Textual Data Taken as Primary Evidence for Ancient Egyptian Warfare

Studies in the 1900s on ancient Egyptian warfare mainly focused on textual analysis to illustrate conflict during the LBA. Often, the archaeological data is either missing from most analyses or only superficially incorporated. For example, Clarke's analyses of Nubian fortresses illustrated how the Middle Kingdom pharaohs established Nubian fortresses and emphasised their economic importance to the Egyptian authority in relation with Nubia's large gold deposits.[115] Although Clarke's study is informative in an architectural analysis, he did not venture any speculations on how these fortresses would operate during an assault scenario. Gardiner published an article that related the fortresses of Nubia to a papyrus from a late Middle Kingdom tomb.[116] Although useful for linking how textual data relates to archaeological sites, the article only illustrated the ancient names of modern Nubian fortress locations and did not discuss ways in which ancient Egyptian warfare took place. This can also be seen in Gardiner's later 1920 publication which demonstrated the route of the northern Sinai's 'fortresses' could be equated with Pap. Anastasi I and the battle scenes of Sety I at Karnak.[117]

The primacy of textual analysis over archaeological information can also be seen in more recent publications on the pharaonic military. There are many ancient textual accounts regarding the battles of Megiddo (*c*.1476 BCE) and Kadesh (*c*.1274 BCE) which have been extensively examined by Wilson, Faulkner and Gardiner.[118] Although, these analyses are

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[114] Keeley 1996, 3 – 24, 41 *contra* Warburton 2001, 149
[115] Clarke 1916
[116] Gardiner 1916, 184
[117] Gardiner 1920
[118] Wilson 1927; Faulkner 1942; 1958; Gardiner 1960

useful discussions of the textual record of each of these battles, discussion on the political ramifications of the outcomes of these battles and the tactics employed are insubstantial. Furthermore, these studies generally fail to take into account any archaeological material. Neglecting to incorporate archaeological evidence with textual analysis also arises in the case of more recent studies in the 1980s, such as Spalinger's *Aspects of the Military Documents of the Ancient Egyptians*, Pierre-Marie Chevereau's *Prosographie des cadres militaires Egyptiens du Nouvel Empire*, and Andrea Gnirs' *Militar und Gesellschaft: Ein Beitrag zur Sozialgeschichte des Neuen Reiches*.[119] Like earlier publications, these analyses have value; they compiled and analysed the use of military titles in the New Kingdom to determine duties of personnel within the armed forces. Regardless, such investigations fail to connect the archaeological material of military equipment or fortifications with the textual record.

For a scholarly publication concerning the ways the Egyptian army may have operated, we can to refer to Raymond Faulkner's "Egyptian Military Organisation".[120] Unlike previous authors, Faulkner made educated inferences as to how Egyptian warfare was conducted. His article established a baseline for further study into aspects of military campaigns. However, like previous authors, Faulkner relied heavily on textual data to explain the composition of the Egyptian military but did not attempt to incorporate archaeological data. Furthermore, Faulkner did not utilise any other sources from outside Egypt in his analysis.

2.3.2 Study of Egyptian Warfare in an Ancient Near Eastern Context

Perhaps the biggest step forward for bringing together the archaeological and textual data for ancient Near Eastern warfare is Yigael Yadin's *The Art of Warfare in Biblical Lands in the Light of Archaeological Study*.[121] Yadin's book is frequently regarded as the first attempt to incorporate warfare studies across the ancient Near East as a whole. We should praise his dedication to wading through such large quantities of data and his ability to present this material coherently, using language that is not couched in: "…nearly impenetrable technical jargon and abbreviations and a bewildering array of unpronounceable transcriptions of ancient words".[122] Furthermore, Yadin is right to advise that warfare is an intercultural activity and one cannot study a particular civilisation in isolation to evaluate how it operated in the ancient Near East:

[119] Spalinger 1982; Chevereau 1985; Gnirs 1996 (see also Gnirs 2013)
[120] Faulkner 1953
[121] Yadin 1963
[122] Hamblin 2005, 1

> “As an object of military study, a single land or nation is too limiting and confining and can be misleading. The smallest unit of such a study is a region or a group of peoples who battled each other at some period or another in their history. One must examine the reciprocal effects of such encounters, which enabled each side to gain knowledge of the weapons and fortifications of the other, to copy them and improve upon them.”[123]

Yadin’s analysis is highly reliant on assumptions about the archaeological material of military equipment and the art-historical record.[124] Although Yadin’s analysis is useful as an introduction to Near Eastern warfare, he overemphasised military technology in socio-political change, perceiving there was an ‘arms race’ between cultural groups throughout the Bronze and Iron Ages.[125]

Michael Hasel’s *Domination and Resistance: Egyptian Military Activity in the Southern Levant, ca. 1300-1185 B.C.* presented a very structured view in an attempt to unify the archaeological data with the textual record for Egyptian military operations in the Levant during the LBA.[126] Hasel examined textual instances of the Egyptian military and presented a statistical model showing the frequency with which the Egyptian military resorted to specific tactics while on campaign (e.g. How often did the New Kingdom Egyptian military claim to ‘destroy’ (*sksk*) a settlement or landscape?). In addition, Hasel examined city place-names in the Egyptian records and attempted to equate them with known LBA archaeological sites.[127] However, it might be argued that the major shortcoming in Hasel’s work lies in his conclusions on the ways the ancient Egyptian military operated. In his chapter on the military paradigm of the 19th Dynasty, Hasel only allocated 16 out of 271 pages to the study of Egyptian military operations in the Levant.[128] Most of his analyses did not speculate beyond the general tactics discussed by others. Although Hasel attempted to correlate archaeological sites with textual records, he did not refer to surviving examples of military equipment to support his conclusions. Furthermore, his analysis only equated archaeological sites with specific textual instances.

[123] Yadin 1963, 1
[124] Barron 2010, 5 – 6; Yadin 1963, 228 – 229
[125] Rey 2010, 46
[126] Hasel 1998
[127] Hasel 1998, 118 – 193
[128] Hasel 1998, 240 – 256

2.3.3 General Synthetic Works on Egyptian Warfare over the Last Two Decades

The overall trend in the 2000s is a renewed interest in the history of warfare studies of ancient Egypt and the Near East.[129] Hamblin suggested the 9/11 attacks on the World Trade Center brought ancient Near Eastern warfare studies back to scholarly and public interest.[130] Although this is debatable, these new studies can be contrasted against previous textual-approaches in that they usually are more reliant upon archaeological remains of military equipment.[131] The wave of new studies was first introduced by Ian Shaw's *Egyptian Warfare and Weapons*.[132] This was an attempt to popularise and synthesise a basic interpretation of how the ancient Egyptians conducted warfare. Shaw discussed Nubian fortifications and the development of ancient Egyptian weaponry. However, it was a non-academic volume without incorporating new data on the subject.[133] Robert Partridge's *Fighting Pharaohs: Weapons and Warfare in Ancient Egypt* attempted to describe the materials and technologies of weaponry and military equipment, while placing the artefacts into historical context.[134] Although this volume has numerous shortcomings, it demonstrated scholarly research into the topic was still relatively confused as no synthesis of this material had been attempted.[135] The first recent attempt at an academic discussion of ancient Egyptian warfare was Anthony Spalinger's *War in Ancient Egypt: The New Kingdom*.[136] This volume revitalised the field of ancient Egyptian warfare in a scholarly context. Although Spalinger admirably presented the historical context of Egyptian military campaigns in the New Kingdom, he did not present evidence to suggest how warfare was conducted, nor consulted archaeological data on LBA fortifications to support some of his claims. Mostly, these studies demonstrated how ancient Egypt was left to evaluation and summation on its own. Few attempts were made to focus on the ancient Near East as a whole and interconnect archaeological evidence of Egyptian military equipment and fortifications.

[129] Morkot 2007, 169 ft. 2
[130] Hamblin 2005, 12
[131] Humble 1980, 45 – 47, 53; Faulkner 1953; Säve-Söderbergh 1946
[132] Shaw 1991
[133] Shaw's later articles on ancient Egyptian warfare (2012; 2010; 2001; 1996) are directed towards an academic audience.
[134] Partridge 2002
[135] None of the claims in the volume are referenced, Partridge claimed that Ramesses III used Medinet Habu as a fortified refuge against Libyan incursions (2002, 136).
[136] Spalinger 2005

2.3.4 The Philosophy of Technological Determinism

With the resurgence of interest in aspects of the ancient Near Eastern armies, recent attempts were made to examine a category of military equipment to explain why the Egyptian military or another Near Eastern power was successful in extending its influence. For ancient Near Eastern studies, this appears to have been established by Yadin's previously mentioned volume. Throughout his work, Yadin overemphasised military technology as being *the* mechanism in socio-political change, thus implying there was a military technology competition between cultural groups throughout the Bronze and Iron Ages.[137] According to this view, the success or failure depended on a cultural group's access to advanced military technology. This view seems to be too simplistic as there are many reasons why a culture would dominate another cultural group. However, Yadin's underlying view has continued in other authors' work regarding ancient Near Eastern military equipment.

For example, in Robert Drews' *The End of the Bronze Age: Changes in Warfare and the Catastrophe ca. 1200 B.C.,* he suggested the introduction and deployment of the chariot dictated which army was successful in battle during the LBA.[138] In explaining the transition to the Iron Age (IA), Drews relied upon the introduction of new weaponry (cut-and-thrust swords) and tactics (massed javelin attacks directed at chariotry) to explain why the political system of the LBA collapsed.[139] Although his study is very useful on aspects of ancient Near Eastern warfare (in weaponry and deployment theories), his analysis placed too much emphasis on military technology to explain the transition to the IA. Much like Yadin, Drews did not include a single mention of logistical constraints placed on ancient Near Eastern armies. He presented military technology as a catalyst for socio-political change in the ancient world, arguing new tactics and technologies govern which military would be successful.

In this vein, Egyptologists seem to take the introduction of new weaponry to explain why the military character of the New Kingdom in Egypt was so decidedly different from previous periods. Spalinger placed emphasis on the introduction of the chariot but included the adoption of the composite bow and body armour (the 'tripartite association').[140] Spalinger's emphasis on these technologies to explain the establishment of the Egyptian New Kingdom hegemony in the Levant is not particularly distinctive, as many other authors have similar

[137] Yadin 1963; Rey 2010, 46
[138] Drews 1993, 104 – 134
[139] Drews 1993, 180 – 208
[140] Spalinger 2005, 1 – 24; Hulit 2002, 16

trains of thought.[141] Such analyses tend to examine a type of military equipment, create a typological analysis and then use it to explain political developments in the New Kingdom. Furthermore, there is a lack of strategic considerations in terms of this equipment was deployed. These previous studies asserted that the weaponry and military equipment of the New Kingdom Egyptian army led to a significant tactical advantage over other groups in the Near East. Thus, some scholars assumed the establishment of an imperial hegemony was based purely on a technological advantage, without taking other factors into account (such as logistical infrastructure). This generalisation of a weaponry-advantage turned into political power is labelled as 'technological determinism' in theoretical approaches in the study of history.[142]

Technological determinism suggests that technological development should take precedence in an analysis of ancient warfare as technology was a driving force of development and change. Fernando Rey illustrated that technological determinism has three main facets of explanation. The first facet is the 'battlefield' idea. Weaponry dictates which tactics are employed in battle and the ensuing victory must be credited to the use of superior technology. This helps explain the diffusion of new types of weaponry replacing older artefacts. The second facet of technological determinism is its affects at the political level. All decisions in political policy become reliant upon the technological 'strength' of the military and their capacity to wage war.[143] The third and final facet of technological determinism is that military technology alone provides an explanation of socio-political change. However, we should consider that the main factor in winning ancient battles certainly relied upon the fighting capacity of the ancient soldier:

> "…human factors cancel out technological potentialities, and human responses can be at variance with engineering expectations…(technological) determinism aims to eliminate the human factor, irrational and unpredictable as it is, from the clean equation of history…"[144]

More recent warfare researchers have emphasised that technological developments are complex in that they can possess psychological, social and political contexts that must be factored into an analysis or an artefact type.[145] It should also be recognised that

[141] Hamblin 2005, 463; Beal 1995; Healy 1992; Shaw 1991; Watkins 1989, 28 – 29; Humble 1980; Schulman 1963; Faulkner 1953
[142] Winner 2004, 107
[143] Rey 2010, 22. See also, Harding 2006, 511; Raudzens 1990, 417
[144] Rey 2010, 45, 55 citing Prichett 1985; Winner 2004, 107; Bossen 2006, 93; Carman 1997a, 16;
[145] Winner 2004, 112; Hacker 1990; Vencl 1984

technological advantages can be very important in battle but weapons by themselves cannot determine which party will be the victor.[146]

One of the crucial elements of this thesis is the question of whether the philosophy of technological determinism can explain the establishment and operation of the Levantine hegemony. Interestingly, ancient Egyptian textual records do not emphasise weaponry as being far superior to that of their neighbours.[147] The New Kingdom textual record of battle often ascribed victory to the moral character of the cause. The Egyptian king was bound to succeed over his enemies because that had been predetermined by the gods.[148] As we will discuss in Sections 6.1.1 – 6.1.2, there are reasons to revaluate the philosophy of technological determinism in relation with the LBA Near East.

2.3.5 Scholarly Neglect of Ancient Egyptian Military Logistics

Ancient military logistics has not been investigated thoroughly in Egyptological studies and surveys of ancient warfare. This might be the result of the plethora of data that researchers have to contend with when considering issues of supplying an ancient campaign force in foreign territories. The problem is compounded by very little textual evidence for the ways that the ancient Egyptian military maintained food and equipment. Faulkner, in his 1953 article, mentioned the logistical system that would be needed to support the ancient Egyptian military but this only accounted for one paragraph of his entire article.[149] The study of the logistical system seems to have been neglected by many in the field. Schulman, for instance, claimed that the Egyptian military did not possess a logistical system and solely relied upon "living off the land".[150] Thompson, in his historical overview of ancient military logistics, ignored pharaonic Egypt altogether and began his discussion with the Assyrian military.[151] Obviously, logistical aspects need to be investigated further. To establish a baseline for logistical studies, we must consider publications outside the field of Egyptology for comparative evidence.

Donald Engel's *Alexander the Great and the Logistics of the Macedonian Army* (1978) established a point of reference in logistical studies for the ancient world. Here, he

[146] Raudzens 1990, 432
[147] Lundh 2002, 174 – 176
[148] Gnirs 1999, 73
[149] Faulkner 1953, 46 – 47
[150] Schulman 1995, 297 – 298. Indeed, Engels (1978, 1) noted a similar sentiment was evident in Hellenistic studies.
[151] Thompson 1991, 10 – 12

conducted the first concerted attempt to establish calorific and hydration needs of soldiers to keep them in fighting strength. In addition, other factors such as rates of travel and the transport capacity of campaign forces were discussed.[152] This work has largely been superseded by Jonathan Roth's *The Logistics of the Roman Army at War (264 B.C. - A.D. 235)* (1999).[153] Roth refined and corrected various aspects of Engels' work in calorific needs, requirements of pack animals, and gave 'hard numbers' for logistical calculations.

Aspects of logistics have crept into several publications in Egyptological volumes in recent years. However, to date, there is no volume solely dedicated to ancient Egyptian military logistics. Donald Redford, in the appendices of his research concerning the campaigns of Thutmose III, made suggestions about the transport capacity of 18th Dynasty ships, an Egyptian army's travel speed and its size based on the amount of booty captured at the Battle of Megiddo.[154] Similarly, Spalinger did not ignore the topic of the physical constraints on an Egyptian solider in his analysis of warfare, and devoted an entire chapter to the topic.[155] Although these two authors highlight the importance of logistics while on campaign, their comparative data for the New Kingdom is erroneous or their calculations are faulty. For instance, Redford's claim that seagoing ships are 35 – 70 metres long is based on the Egyptian text, the Shipwrecked Sailor.[156] In consultation with the archaeological material from the eastern Mediterranean, ships at this time had a maximum length of 20 metres.[157] Similarly, Spalinger's 'feeling' that calorific values required by an ancient Egyptian soldier were 3000 kcal./day did not consult with modern medical data nor ancient documentation.[158]

There was no attempt to incorporate the statements of Engels and Roth into Egyptological studies. More recently, Brett Heagren's analysis of the logistical system of the Egyptian military was promising but it was primarily concerned with theoretical aspects of a site's function and does not refer to the archaeological remains.[159] The logistical system of the ancient Egyptian military requires evaluation with the current archaeological evidence to establish a baseline for future work. Given the administrative considerations that were

[152] Engels 1978
[153] Roth 1999
[154] Redford 2003, 195 – 205
[155] Spalinger 2005, 32 – 45
[156] Redford 2003, 205
[157] Monroe 2007, 2 see also Section 5.5.3
[158] Spalinger 2005, 40
[159] Heagren 2007

needed to mobilise an impressive workforce to complete their architectural goals, the same considerations would be required to support their military objectives.[160]

2.4 Conclusion

This chapter provided the reader with a necessary background to examine ancient Egyptian military logistics. ‘Warfare’, in this thesis, is defined as the institutionalised use of violence by one group over another due to perceived differences in culture or beliefs. The motivations for warfare can be complex. Although the economic benefits of expansionism can be detected archaeologically, some causes of warfare do not leave a trace in the material record. Therefore, when discussing the causes for warfare, we should consider that there may have been many factors that led to military action.

A historical review of the New Kingdom was also conducted to illustrate that Egyptian expansion in the New Kingdom had fluctuations in objectives particular to dynasties and reigns. Lastly, we evaluated previous publications on ancient Egyptian warfare. Although contributions from previous authors should not be overlooked or undervalued, there are areas of neglect and omission that this thesis will thoroughly examine concerning the New Kingdom Egyptian military in the Levant. The outcomes of which will be discussed in the next chapter.

[160] Moreno Garcia 2013, 12; Lehner 2002

Chapter 3: Methodology

3.1 Introduction

In archaeological material, warfare can be examined through its corollary attributes in physical remains. When considering the physical manifestation of warfare in the archaeological record, examinations usually involve working with four sets of data: artefacts of military equipment (either defensive or offensive), skeletal trauma (wounds from violent encounters), fortified settlements and, to some extent, iconographic representations.[161] In the study of the eastern Mediterranean during the LBA, textual data can be added to this list. However, its main function in this thesis is to supplement the archaeological remains and illustrate the non-tangibles of ancient warfare. As mentioned, although textual examinations are a useful avenue of inquiry, investigations of this type have been performed numerous times without direct consultation with the archaeological material.

This thesis serves to fill an important gap in research by bridging the divide between the textual data and the archaeological record. Note that a similar methodology is adopted in regard to iconographic representations of New Kingdom Egyptian warfare.[162] Although representational data can assist in the study of ancient Egyptian warfare, its main benefit is to complement the physical remains of material culture and their interpretation.[163] Bear in mind, textual and representational data is selectively recreated, not objectively captured.

In many ways, the approach to examining the relationship between logistics and New Kingdom Egyptian warfare involves a great quantity of data as the material culture of ancient warfare has so many permutations. By utilising a wide variety of data, this will provide the basis for a comprehensive theory of how ancient combat was conducted. A more precise nomenclature is employed in this thesis to facilitate the discussion.[164]

The main purpose of this thesis serves to illustrate the logistical system of the New Kingdom Egyptian military in relation with its interactions in the Levant. To analyse the topic, the examination is broken down into three main fields of inquiry; infrastructure, physical constraints (the maintenance and movement of military forces), and tactical considerations

[161] Vandkilde 2006b, 484 – 488
[162] For an examination of artistic representations of Egyptian warfare, see Heinz 2001; University of Chicago 1986; Gaballa 1967 (esp. 317 – 350; Plates 51 – 81)
[163] Carman 1997a, 2, 6
[164] The glossary in this thesis should be consulted to avoid confusion over how terms are employed.

(technology exchange and siege strategies). Each set of data can be shown to be directly related with the topic of military logistics. It is an important field of inquiry in that logistical factors would have affected the Egyptian military in how their campaigns were conducted and what their fighting capacity would have been. In addition, this topic can also present how the logistical network of military bases facilitated campaigns along the Sinaitic route and in the Levant.

Logistical analysis distances itself from explanatory models that solely focus on the technological side of ancient weaponry and military equipment. Administratively, the ancient Egyptians had a long history of massive building projects and mining campaigns.[165] Aspects of planning to supply a force of soldiers on campaign were derived from these previous efforts. The explanatory model proposed in this thesis, of how the Egyptian hegemony developed in the Levant during the LBA, is that it was the result of rapid deployment, superior numbers and ensuring that the campaign force was supplied appropriately. The implications of this conclusion could be applied to many other cultures of the ancient world. Thus, we might find that we have broken the bounds of technological determinism and such rationalisations that technology alone created hegemonial dominance and spheres of influence.

3.1.1 Logistics in Infrastructure

From the material remains of fortified architecture and storage facilities that would have supplied military personnel, it is possible to assess the material remains to investigate how the logistical system impacted infrastructure. In addition to architectural remains, the ceramic repertoire is consulted to establish when these sites were active and if any dynastic policy changes can be identified. An examination of pottery also has the potential to indicate how bases were supplied.

Critical in our analysis is in an examination of architectural features constructed of mudbricks. This thesis points out the varying brick sizes in relation to architectural features. Brick sizes are important as they allow for the sequential dating of architectural features at a site. For instance, if the establishment of a site utilised the same bricks in the foundation of its main architectural features and then later additions were constructed in bricks of different dimensions, this would allow a researcher to determine which features at the site developed later and speculate why these developments took place. Although this sequential dating is

[165] Moreno Garcia 2013; Shaw 1998

possible, it is impossible to attribute a brick size to a particular pharaoh.[166] Similarly, the dating of an architectural feature cannot be ascribed to a specific dynasty based on brick size alone since there is no noticeable difference between brick sizes between the 18th and 20th dynasties. Brick dimensions only allow for a general comparison of architecture built during the New Kingdom (see Section 4.2.4.4.2). Additionally, the bonding techniques in pharaonic architecture also signify that stacking methods were varied in New Kingdom Egypt, thus, they cannot be used for dating criteria either (Figure 2).[167]

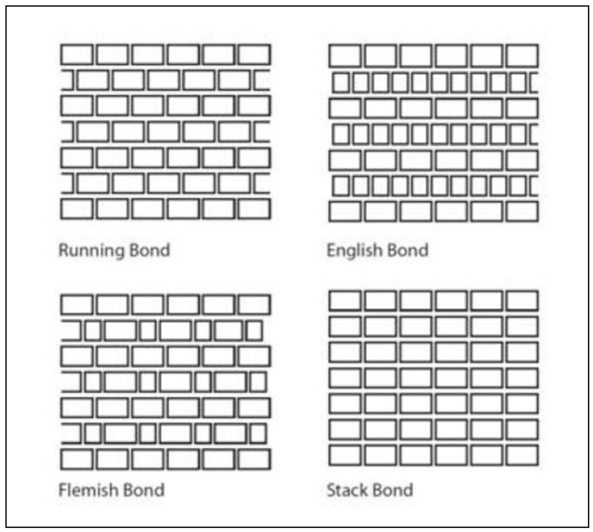

Figure 2 - Brick bonding patterns (Emery 2011, fig. 1).

The sites that are most relevant to our investigations about Levantine campaigns and logistical supply are located at the edge of the eastern Delta and the north Sinai. The purpose of our examination is to study each site in detail to determine the nature of the settlement and how it could have contributed to hegemonic control of southern Canaan. These sites are incorporated into previous studies on ancient Near Eastern architecture during the LBA.[168] However, there is a shortcoming in most analyses of each site. Often, a site's military value is only considered against the back-drop of the literary record. Although the textual record should be analysed to glean some information about a region or site, very rarely is the archaeological material addressed to achieve a comprehensive analysis of how settlement patterns at 'fortresses' manifested in the archaeological remains.

[166] Spencer 1979, pl. 41 c*ontra* Oren 1987, 87
[167] Spencer 1979, pl. 14
[168] Morris 2005; Hasel 1998; Oren 1987

One of the difficulties of examining these sites is that some of their archaeological remains have not been fully published. In most cases, the architectural features of sites have been described in detail while other aspects of the archaeological remains (e.g. burials, pottery, seal impressions, etc.) are insufficiently described to form a satisfactory analysis within their respective subsection. Nevertheless, an excavator's passing comments in publications about a site's material remains are often enough to form the 'broad strokes' of how a site contributed to the logistical network of the New Kingdom. Thus, there is a discrepancy in the type of detail presented for some topics in the discussion of features of archaeological sites. The publication of this 'new' material will have to be integrated in future analyses. Similarly, all of the sites examined have experienced significant disturbance by human activity or natural erosion.

The sites in this thesis are selective. There are many sites that could be added to this discussion to illustrate Egyptian hegemonic control of the eastern Delta to the southern Levant, such as Tell el-Retabeh, Deir el Balah, Beth Shean, Tell Farah (south), Gaza, etc. However, due to thesis space constraints and the fact that these sites have been recently discussed by Morris, a protracted analysis of these additional sites is not necessary to illustrate the character of an Egyptian 'outpost'.[169] Therefore, the sites examined in this thesis were chosen as they are located along the direct overland route into Canaan through the northern Sinai. The implications of this analysis for additional Egyptian-held sites in the eastern Delta to the Levant are discussed in the conclusion of Chapter 4.

Tel Mor, situated along the coast of the southern Levant, might appear out of place in the analysis of military sites. The inclusion of this site is to not only add commentary to this recently published material but to illustrate the dimensions and archaeological remains from an Egyptian-held site in Canaan. The archaeological strata of the site correlate with the traditional interpretation of the Egyptian hegemony in the Levant as proposed by Weinstein.[170] The site's coastal location will also be discussed in relation to maritime traffic as Chapter 5 includes a discussion of how shipping would have contributed to the maintenance of the Egyptian hegemony. Using an analysis of Tel Mor as a source for Egyptian-held sites in Canaan, we can then analyse how the logistical network manifested itself in architectural remains throughout the Levant. Tel Mor represents a vital site for the study into topics of imperialism, cultural interaction and architectural remains during the LBA.

[169] Morris 2005
[170] Weinstein 1992; 1981

3.1.2 Movement and Maintenance of a Campaign Force

In the investigation of the Levantine logistical network that supported the Egyptian army, there is a need to assess the physical constraints on campaign forces. The maintenance of personnel is an important factor to consider in relation to their fighting capacity. To establish what the nutritional requirements would have been for a soldier or pack animal, the primary method employed is to compare the archaeological remains with modern medical and veterinarian data. From this, we can evaluate how much provisions would have been required for a campaign force. Central to this analysis is the textual data as it can record aspects of logistics that would not leave a mark in the archaeological record (e.g. what were soldiers given for military rations?). The interdisciplinary approach is employed to evaluate the transport capacity of military forces, travel speeds and time of year when campaigns would take place. These investigations of the maintenance and movement of New Kingdom military forces will allow us to see how logistical constraints affected ancient armies. This section of the thesis represents an original contribution to Egyptological research as it advances previous work in the field.

3.1.3 Military Technology Exchange and Siege Tactics in LBA Warfare

Another aim of this thesis is to explore how the philosophy of technological determinism is inadequate to explain how the New Kingdom Egyptians came to dominate southern Canaan. During the discussion, this thesis will illustrate how Egyptian pharaohs (and other cultures in the ancient Near East) attributed their triumph in warfare. It is important to evaluate if the rulers of the LBA Near East assumed that new military technologies were a key element in achieving victory. Technological determinism argues that the dominant group should prevent competitors from acquiring new military technologies. To refute this claim, this thesis will also examine the exchange of military technologies in the LBA. This discussion examines textual evidence, representations and the physical remains of military equipment to illustrate the system of international exchange during the New Kingdom.

This thesis will also present how siege tactics are a reflection of the logistics in New Kingdom warfare. The capitulation of settlements to Egyptian authority was central to the operation of the hegemony in Canaan; it allowed the Egyptian king to extend his dominion and increase the logistical network's complexity. Considering the implications of the tactical options available to LBA besieging armies, it is surprising that few scholars speculated how warfare was conducted. To investigate the tactical aspects of New Kingdom sieges, the examination of textual material and archaeological remains are consulted.

3.1.4 Defining 'Hegemony'

In examining the data of fortified installations in the Levant (Chapter 4), it is unlikely that the term 'empire' can be applied without a preconceived notion or bias.[171] Often, when 'empire' is used to describe Egyptian influence during this time, we tend to think of a directly controlled area with outposts and an active policy of colonisation. However, there is little information to suggest that Egypt had an interest in inhabiting the area and replacing the culture with their own, thereby suppressing native customs that had a long history and development in the MBA.[172] Consequently, the need to refer to this cultural interaction more accurately, the term 'hegemony' should be utilised. Agnew stated,

> "Typically it (a hegemony) involves more than simple-military and economic coercion and relies on active assent and cooperation. Common 'rules', institutions and values form the core of the hegemony, backed up by the superior economic, cultural, and military position occupied by the state or social group exercising hegemony. The word 'hegemony' is thus also a purported solution to the dilemma of either singular economic or cultural determination by positing an integral form of class rule which exists not only in political and economic institutions and relationships but also in active forms of experience and consciousness."[173]

The utility in this definition is that it does not solely rely upon the use of military force or economic means to explain socio-political change in a central authority's relationship with dominated groups; it illustrates the various dimensions of interaction. When one examines the logistical network of the New Kingdom Egyptian military, vassals actively contributed in intelligence gathering and supplying the troops while on campaign (Section 5.4.4). Exchanges between Egypt and the Levant were highly complex as they possess cultural dimensions alongside aspects of economics and military power.[174] Therefore, to describe the variation of exchange between Egypt and the Levant during the New Kingdom, it is unlikely that the term 'empire' can adequately describe the relationship.

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[171] Healy 1992, 16
[172] Müller 2011, 238 – 239
[173] Agnew 2005, 20
[174] Bossen 2006, 94 – 96; Higginbotham 2000, 136 – 137

Higginbotham examined the archaeological and textual data to determine if the Egyptian administration was dominating Canaan through directly controlled military bases (the 'Direct Rule' model) or through the cooperation of Canaanite vassals who used Egyptian customs and artistic styles to convey power to their subjects (the 'Elite Emulation' model).[175] Some scholars have criticised Higginbotham's analysis, stating that she concluded that *all* interaction in Canaan was a result of elite emulation.[176] However, Higginbotham claimed no such thing:

> "A complete analysis of both the archaeological and textual evidence suggests, then, *the existence of a mixed system of administration involving elements from both the Elite Emulation and Direct Rule models*. Egypt maintained a limited presence in the form of imperial centers staffed by small numbers of soldiers and administrators. Alongside these centers were the city-states ruled by vassals princes who Egyptianized themselves to varying degrees".[177]

Correspondingly, Jasmin's analyses concluded similar results in that LBA IIB Canaanite centres had some autonomy, but they were ultimately subjugated to the Egyptian administration.[178] The sites examined in this thesis are indicative of the 'Direct Rule' model. However, the material remains from other sites in Canaan indicate that there was no sole imperial paradigm during the New Kingdom.

3.2 Problems with Data Sets

No examination of warfare in the ancient world is without its problems, but by employing an interdisciplinary approach and incorporating a wide variety of data in this thesis, the impact of these difficulties can be moderated. Based on the previously examined publications on ancient Egyptian warfare, the following assertions dictate the methodology in this thesis:

1. **Scholars should not regard one type of data as the ultimate source on the subject of ancient Egyptian military.** There was a tendency to rely largely on textual records to understand the ways that the ancient Egyptian army operated in the Levant. Obviously, we should incorporate finds of military equipment and archaeological sites to construct a paradigm that would incorporate all relevant fields of data. This position can also be applied to representations of ancient warfare. The various fields of archaeological,

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175 Higginbotham 2000, 10 – 16
176 Burke & Lords 2010, 28; Martin & Barako 2007, 152; Killebrew 2005, 54 – 55; Morris 2005, 9
177 Higginbotham 2000, 136
178 Jasmin 2006, 177

representational and textual data should be utilised to fill in the historical gaps to construct how ancient Egyptian warfare was conducted and the logistical system that would have made it possible. A holistic methodology is more informative about ancient Egyptian campaign tactics that were employed to extend their influence beyond Egypt proper.

2. **The study of ancient Egyptian warfare should not be considered in isolation.** There is a lot of evidence from ancient Near Eastern studies that can be used to supplement Egyptian data concerning warfare. By incorporating this type of data in direct association with the Egyptological evidence, we can potentially construct robust theories about the ancient logistical system that would have supported the Egyptian military while on campaign. Since detailed mentions of battles and logistics are rare in the LBA, contemporary sources and data from periods outside the immediate field of study should be consulted.

3. **Logistical analysis of the ancient Egyptian military has only been examined in a cursory manner.** Aspects of ancient military logistics have only been examined and related to Egyptian data by a few authors but these discussions are not done in consultation with archaeological data. Given that the logistics of a military force can determine the success or failure of a campaign, there is considerable utility in establishing the logistical capacities of the ancient Egyptian military. By comparing the capabilities of ancient Near Eastern armies and examining the Egyptian evidence, we can establish a foundation for future research.

3.2.1 The Pitfalls of Textual Records and Military Scenes as a Source for Information on Military Activities

There are few excavated battlefields for the ancient Near East. Researchers largely rely upon the textual record and artistic depictions of battles to establish how campaigns were conducted in the Levant. Since ancient Egyptian royal art and textual compositions have religious undertones, we should recognise that these sources have an intrinsic partiality. The record of battle will undoubtedly show the pharaoh and his accompanying forces in a very specific light, involving the dispatching of enemies with relative ease, aided by the apparent support of the divine sphere.[179]

[179] Liverani 2001, 79 – 96; Shaw 1998, 255 – 256

Due to this sort of portrayal, the Egyptian army appears never to have lost battles nor encountered any hardship in their campaigns.[180] However, the reality (and common sense) would tell us that marching on campaigns and engaging in battles would have been very stressful and dangerous. Textual and artistic sources can be consulted to suggest activities that cannot be captured in the archaeological record but, they must be viewed with scepticism. Therefore, when incorporating battle scenes and textual data of the New Kingdom Egyptian military, we must consider these sources informative but also idealised.[181] More specifically, Hamblin noted several aspects that we should be conscious of when employing artistic scenes of military engagements to form conclusions.[182] Hamblin's reservations can also be applied to the textual record:

Idealisation: Warfare had a deeply ceremonial and religious component in the ancient Near East and the artists and scribes reflect this in their compositions. These pictures of battle omit critical details and may not reflect the reality of battle in the ancient Near East.

Conceptualisation: Trying to determine the underlying reality that the scenes or texts may be attempting to record is a continuing problem for researchers. For instance, in Egyptian depictions of besieging fortified centres in the Levant, the predominant motif is that of an escalade assault. However, as will be demonstrated (Section 6.2), the most common siege tactic of the Egyptian military was victory over a settlement by attrition; cutting off supply lines and starving the inhabitants. Although the tactic of using a blockade to achieve military goals was certainly appropriate in the field, the artistic display of a heroic assault may have been considered to be more suitable for the exterior of a temple wall. Therefore, we must consider that textual and artistic data may be communicating something that researchers may misinterpret.

Anachronism: The influence of tradition may mislead researchers in their analysis of warfare in textual or artistic recordings. A good example would be the heraldic image of the pharaoh smiting his enemy with a mace. We must consider that the Egyptian ruler, if he did engage in battle, may have been armed with a variety of weapons and used weaponry and military

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[180] Boatright 2008, 13 – 23; Vandkilde 2006b, 488

[181] Spalinger 1982, 238 – 241

[182] Hamblin 2005, 10 – 11

equipment that may be more technologically advanced than those documented in a text or artistic scene.[183]

The civilisations of the ancient Near East had completely different motives for recording their battles and the events that surrounded them. Often the details of armed conflict are obscured in Near Eastern mythology and artistic military scenes that: "…can rarely be relied upon to give anything more than incidental indications of the motivation and nature of Egyptian warfare".[184] Similarly, Spalinger noted that the textual evidence referring to military campaigns is: "…entirely part and parcel of the religious sphere".[185] Therefore, an examination of the material evidence for warfare is taken as paramount verification for arguments in this thesis as it directly relates to human activities.[186] Although motivations are discussed in this thesis, a more comprehensive analysis will have to take place in the future if nothing else but for space limitations.

3.2.2 The Shortcomings of Architectural Remains

In relation to ancient warfare, the study of ancient fortifications is necessary to assess the abilities of ancient Near Eastern armies when engaging in siege warfare. Vencl argued that:

> "Fortifications are above all the materialised expression of the human fear of being attacked, and of losing life, freedom or property, which, in conditions of settled life and of accumulation of property, led to the development of defensive fighting tactics."[187]

Researchers rely heavily on artistic depictions and textual material to determine how the New Kingdom military engaged fortified settlements. Yet, the presence or absence of defenders changes the strategic value of these defences.[188] Through an archaeological analysis we can evaluate how these sites contributed in the logistical network and, by extension, how the Egyptian administration dealt with provisions to facilitate campaigns.

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[183] Peatfield 1999, 72. For suppositions that pharaonic rulers did not directly engage in combat, see Shaw 2008, 115
[184] Shaw 1996, 247
[185] Spalinger 1982, 238
[186] Carman & Harding 1999b, 3
[187] Vencl 1999, 67
[188] Vencl 1999, 68

The necessity to pick a particular point of time when studying ancient fortifications is clear. It is difficult to survey an aspect of ancient architecture from any other period than when it was the most widely used. Thus, for the purposes of this thesis, we shall focus on the New Kingdom in ancient Egypt while comparing the corresponding material in the Levant during the MBA IIB – C to the LBA (1750 – 1200 BCE). The reason for using a larger span of time for the Levantine sites is necessary because this area reused many aspects of fortifications well into the LBA.[189] The architectural remains reveal that there was a distinctive policy in dealing with the Levant as opposed to Nubia in the New Kingdom. However, the examination of fortress architecture is not without difficulties. Wright noted that there are specific challenges with researching ancient architecture in the Near East.[190] The challenges in this thesis include:

The lack of architecture preserved to its original height: This presents problems in assessing the reconstruction of fortification walls and their dimensions. However, by carefully incorporating data from various archaeological sites (that have better preserved architectural features) and consulting artistic compositions, we will be able to postulate the dimensions and appearance of ancient fortification systems.

Disturbed Stratification: Due to most Levantine sites being continually occupied, lower (earlier) levels have frequent intrusions from later times. In addition, the scavenging of architectural elements has disturbed the stratigraphy to the extent that archaeological remains may be found out of their original context. In regards to the eastern Delta it was observed that the area's inhabitants tended to appropriate architectural building materials (such as stone) for subsequent constructions.[191] In the north Sinai, there is little or stratigraphy due to wind-erosion (Section 4.3.1).

Inconsistent Evidence from Excavation: Not every archaeologist has an interest in ancient fortifications or topics of Egyptian imperialism. This is reflected in how the field director chose to excavate materials with finite resources. This is especially important to consider when we incorporate material from Egyptian-held sites in the Levant into our analysis as some sites' architecture have only received cursory attention while others have received a great deal. Therefore, we have a variable presentation of the architecture from sites in the Levant for comparative material.

[189] Wright 1985, Vol. 1, 187
[190] Wright 1985, Vol. 1, 1 – 4
[191] Bietak & Forstner-Müller 2011, 29

3.2.3 Weaponry and Logistics

This thesis also considers the physical remains of weaponry and military equipment artefacts. Undoubtedly, the nature of the evidence for this topic has its own limitations.[192] Most of the examples of military equipment come from burials and many of the artefacts show no signs of wear. This leads to a discussion of whether or not we should consider them as 'real' weapons or as symbolic tomb equipment.[193] A researcher must consider that that these 'ceremonial' weapons are constructed with the optimum materials and produced in such a way that displays conspicuous consumption and thus, having more social materiality (attesting to the deceased's attainment in life).[194] Caution should be stressed when using these artefacts in our review on the nature of LBA technology exchange. However, considering the value they possess to illustrate technological developments, they should be included in our investigation but they must be examined cautiously. Although weaponry and military equipment must be considered according to the contexts in which it is found, we must consider two factors in our study. One, the item itself represents the martial character of a weapon with the implication that it was designed to kill. Two, the item might have a long usage before it was deposited into a burial.[195]

Even though there are many of artefacts that could be classified as weaponry and military equipment, there were few studies regarding how individual weapons were used in armed conflict.[196] The world of the LBA was impacted by the new developments in warfare, but how these developments manifested themselves on the battlefield and in sieges is a matter of speculation. However, the field of study of ancient armed conflict will not advance unless one is willing to make an informed guess regarding its operation. Due to space constraints, this thesis will not address all possible deployment methods in LBA warfare but examines tactics in sieges as they directly relate with military logistics.

3.2.4 Routes in the LBA

The exact route that ancient Egyptian military forces took while on campaign is very difficult to determine due to the changing nature of the geomorphology of the eastern Mediterranean. With factors of erosion along the coastal margin, shifting dunal sands and the practical eradication of natural forests in Israel, the examination of routes is difficult to determine as

[192] Drews 1993, 97 – 98; Engels 1978, 25
[193] Philip 1989, Vol. 1, 149 – 155
[194] Vandkilde 2006b, 485; Vencl 1999, 65
[195] Caple 2006, 60 – 61
[196] Drews 1993, 99

ancient barriers and landscapes have changed considerably (Sections 4.2.2.2, 4.3.1, 4.4.2). One cannot simply examine the present landscape and identify the exact course of the Egyptian military based on modern contour maps. Although the general corridors of travel can be assessed with the archaeological information we have, a detailed discussion of routes is problematic. Future research would hopefully address this issue by assessing the capacity of the ancient environmental landscape through geomorphology and botanical studies to determine what would have been the natural obstacles in the Levant and by extension, what routes would have been available to the New Kingdom Egyptian military.

3.2.5 Personnel and Storage Capacity Estimates

As it will be discussed in detail, the sites examined in this thesis are problematic. All of the sites have experienced some level of disturbance resulting in the destruction of sizeable areas. In addition, most of the sites (which the exception of Tel Mor) have not been published in final form. It would be ideal if each site was preserved and all the architectural features were discussed at length. However, the reality is that the preservation and publication of the sites is sporadic and irregular. Therefore, some aspects of these sites cannot be postulated with any academic basis.

Critical to our examination of ancient logistics is the storage capacity of the site and how many personnel were stationed there in antiquity. For population estimates, one cannot take the area of an Egyptian centre and suggest its population density. For instance, the rough size of Tell Heboua 1's curtain walls is known but excavations have uncovered a large temple in the middle of the fortress (Figure 23). Surely, this area was not used for housing personnel. Similar statements could be raised over the existence of gardens, granaries, magazine complexes and how many storeys the barrack-housing reached. Estimating storage capacity at the sites is also fraught with difficulties. Although we can analyse some aspects of silo-storage at Tell Heboua 1 and Bir el-'Abd, we cannot suggest what the storage capacity was at other sites as these features did not survive in the archaeological record. Simply put, although there is enough evidence to examine how these Egyptian centres contributed to the logistical network, we cannot examine all aspects of storage and personnel at each site.

3.3 Naming Conventions

In this thesis the terminology in Table 1 is used to refer to geographical areas in the ancient Near East to identify the majority of people living in that area as a specific cultural group:

Table 1 - Naming Conventions of Geographic Areas

Name	Geographic (Modern) Region
Anatolia	Modern-day Turkey
Canaan	Modern-day Israel, Palestine and Jordan
Syria	Modern-day area of Lebanon and Syria
Levant	The combined area of Syria and Canaan
Egypt	Area of the Delta and the Nile Valley to the First Cataract
Libya	Desert area west of the western Delta
Mesopotamia	Area along the Tigris and Euphrates river systems, modern-day Iraq and eastern Syria
Nubia	Area south of the first cataract

This list is not exhaustive. For example, Mazar pointed out that ancient Canaan has a variety of environs which may have led to vast cultural differences.[197] For this thesis, it will be noted when a significant environmental difference existed between regions and if this may have affected the prosperity of the area and by extension, the architecture and material culture therein. However, all areas, outlined above, have many divisions by specialists in their respective fields.

3.4 Chronological Notations

The chronological sequence for the Levant is a matter of much scholarly debate and is outside the scope of this thesis.[198] Burke has noted that, in many cases with Levantine materials, cultural phases are artificially defined by excavators at particular sites and often there is no clear break in cultural assemblages from one phase to the next.[199] Therefore, for the sake of intelligibility and comprehension, this thesis has opted for the use of the Middle Chronology as applied by Mazar when dealing with Levantine material.[200] For Egyptian material, this thesis uses the chronology presented in *The British Museum Dictionary of Ancient Egypt* and the *Oxford Encyclopaedia of Ancient Egypt* for the rendering of ruler's names.[201] It should also be noted that this thesis has selected to abbreviate the terms relating with chronological periods (i.e. 'Middle Bronze Age' = MBA, 'Late Bronze Age' = LBA,

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197 Mazar 1992, 1 – 9
198 Dever 1992
199 Burke 2009, 31
200 Mazar 1992
201 Shaw & Nicholson 1995, 310 – 312; Redford 2001, Vol. 3, 551 – 552

etc.).[202] In addition, the chronological terms of the 'LBA' and the 'New Kingdom' are used interchangeably unless the material discussed is dealing with chronological implications.

[202] For a full list of these abbreviations, see page 17.

Chapter 4: Analysis of Archaeological Sites

4.1 Introduction

Weinstein argued that hegemonic control of the southern Levant was created in the wake of the campaigns of Thutmose III.[203] There certainly was a different policy for exerting royal control of the Levant as opposed to Nubia. The latter was characterised by the establishment of large fortified centres, whereas the Levant features much smaller Egyptian outposts for the collection of tribute in the New Kingdom. This implies that through logistical management and overseeing a largely settled native population, the Egyptians were able to launch campaigns into the area and exert royal authority without the need for a large permanent force in Canaan.

The analysis of archaeological sites presented in this chapter aims to provide material evidence, which illustrates the nature of Egyptian relations with the Levant (Figure 3). Complemented by textual references, this chapter examines the exceptionally large-sized Tell Heboua, then the more diminutive sites of the north Sinai and southern Levant. Throughout the following discussion of the archaeological remains, reference is made to the logistical concerns and mechanisms of the Egyptian military to determine the strategic importance of the fortification sites in this area.

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[203] Weinstein 1981, 10 – 12

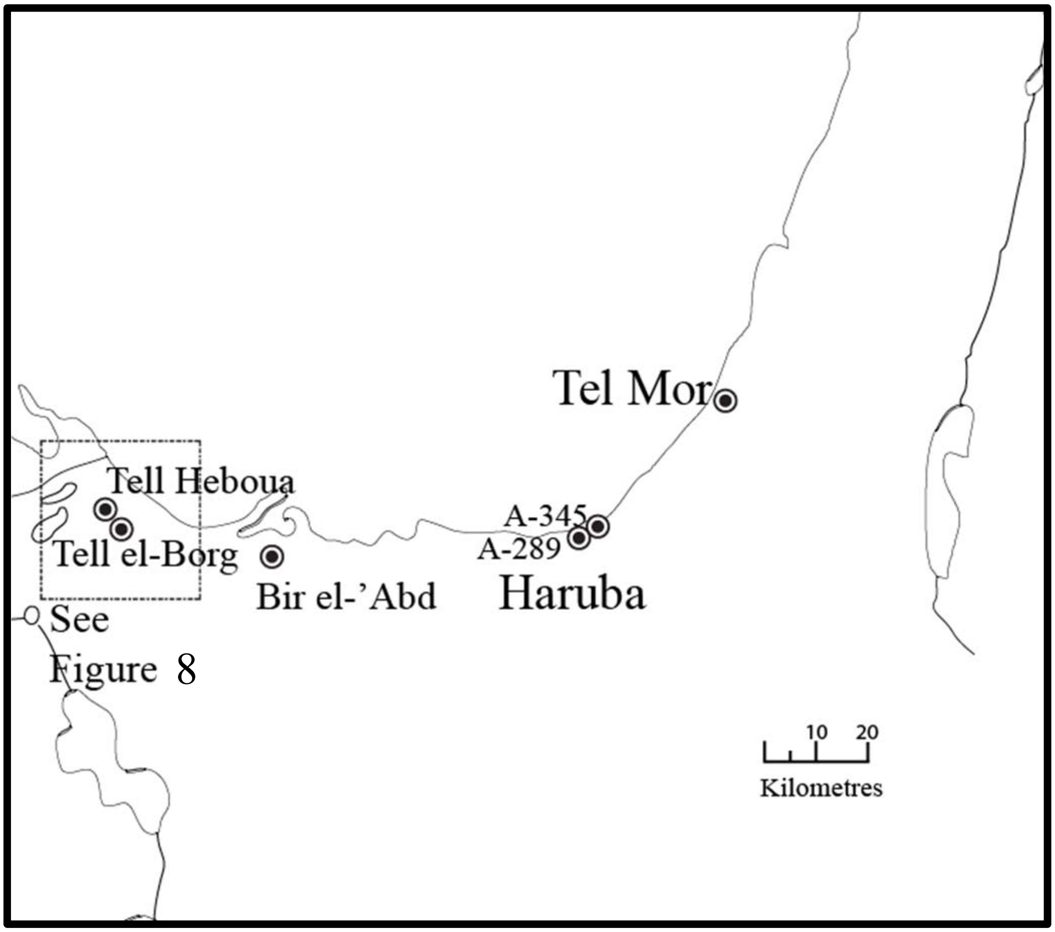


Figure 3 - Sites discussed.

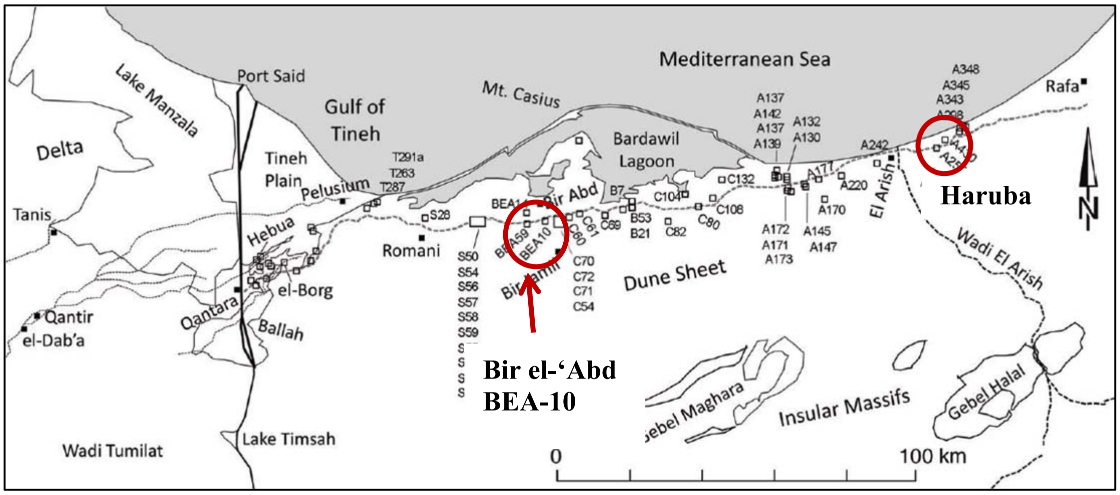


Figure 4 - The modern northern Sinai with Oren's survey points of archaeological sites (adapted from Hoffmeier 2013, fig. 2).

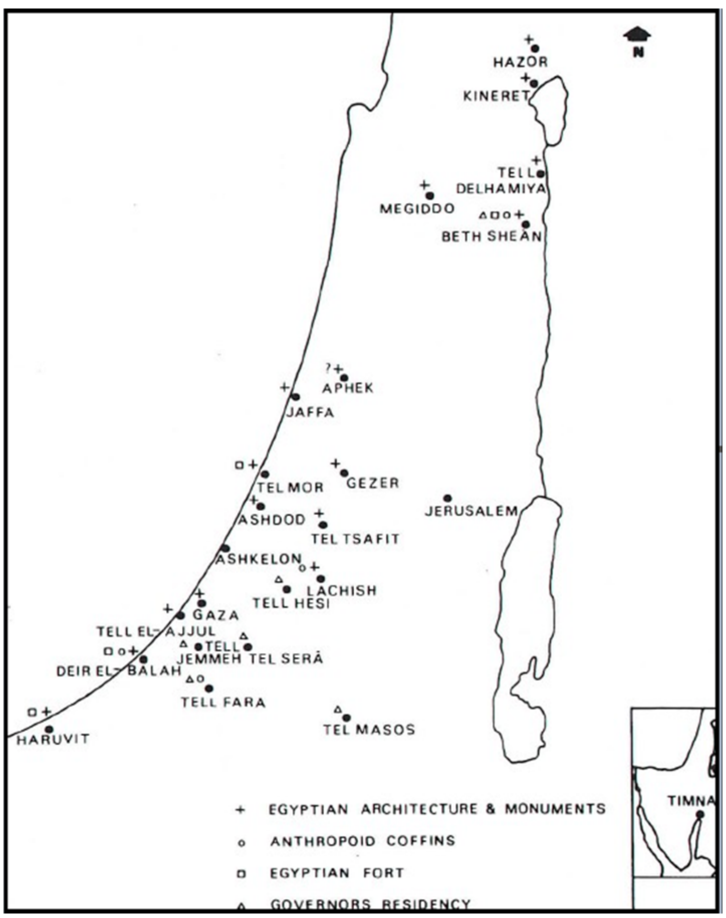


Figure 5 - Sites in southern Canaan with LBA Egyptian remains (Oren 1984, fig. 1).

4.2 Sites in the Eastern Delta

4.2.1 Introduction

Bergoffen noted that the sites of the eastern Delta and north Sinai are impoverished in their material culture when compared to sites along the Nile Valley.[204] The archaeological remains imply that this was not a desirable place to inhabit, especially when this was an area where criminals were sent, as stated in the 'Edict of Horemheb' (Table 4 nos. 16a – b).[205]

Unlike rock-cut tombs in the Nile Valley, the archaeological sites in the eastern Delta are notoriously difficult to interpret as the remains of these settlements lie just below the modern surface; in some cases excavations only are 5 cm deep to encounter LBA material. Furthermore, building materials in this area were (and are) pilfered and extracted for use in more recent building projects as some materials, e.g. stone, were at a premium.[206] Therefore, the disturbance of archaeological strata is very high and the physical remains might not have been deposited in such locales in antiquity. For instance, Smithsonian core S-44 found diagnostic pottery dating to the Late Period at a geological depth corresponding to 2,470 BCE and a New Kingdom sherd at a geological depth of 5,300 BCE.[207] Furthermore, Stralen and de Wit found fired brick and wheel made pottery 25 – 30 metres (c. 12,000 BP) below the current surface level.[208] Being conscious of this drawback in this region, we cannot place too much emphasis on the provenance of some features or artefacts.

Another aspect that must be considered when examining the archaeological sites in the eastern Delta is the disturbance from modern military operations. Attesting to the area's strategic importance, both the Israeli and Egyptian militaries in the 1960s through 1980s drove armoured personnel carriers through these areas. They also created bunkers, fox-holes and latrines which may have disturbed LBA strata. Especially in the case of the eastern portion of Tell Heboua, large sections of the archaeological sites have been destroyed. In more recent times, archaeological sites of the eastern Delta have been damaged and destroyed by reclamation projects for agricultural land (Figure 6).

[204] Bergoffen 1991, 63
[205] Decree of Horemheb, lines 16 – 17 and 21 – 22, Cairo Museum no.# CG34162 (Pflüger 1946, 260 - 276); Morris 2005, 286
[206] Bietak & Forstner-Müller 2011, 29; van den Brink 1986, 16
[207] Butzer 2002, 91 citing Stanley et al. 1992b
[208] Butzer 2002, 92;

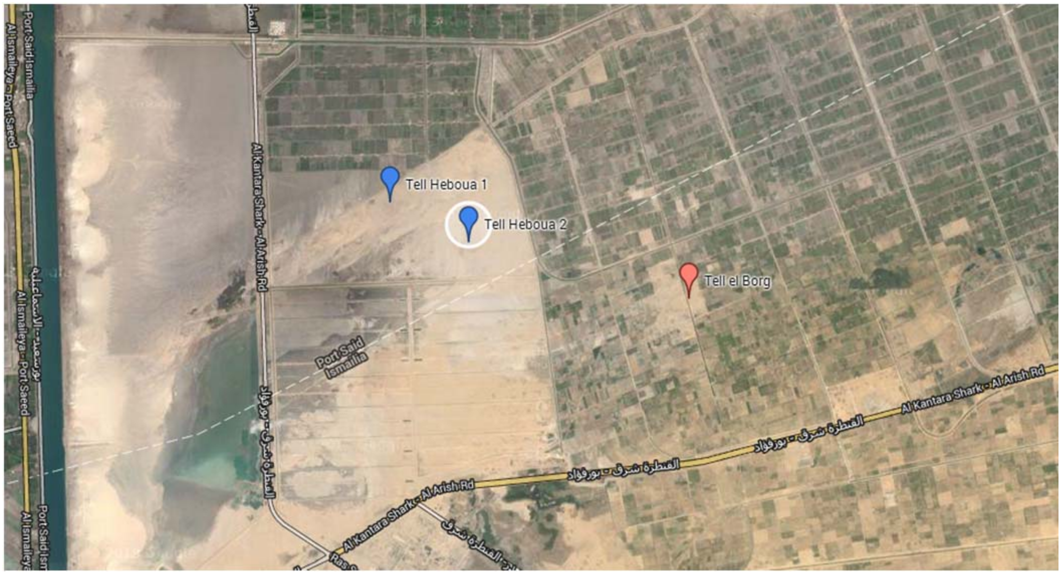


Figure 6 - Satellite image of examined sites of the eastern Delta (Google Maps, accessed November 2013).

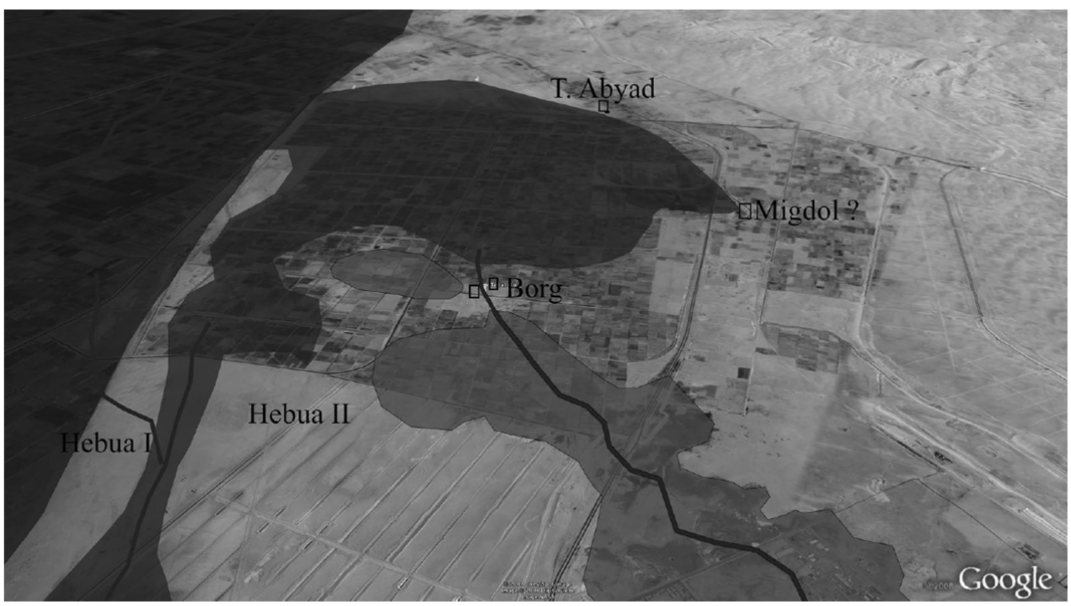
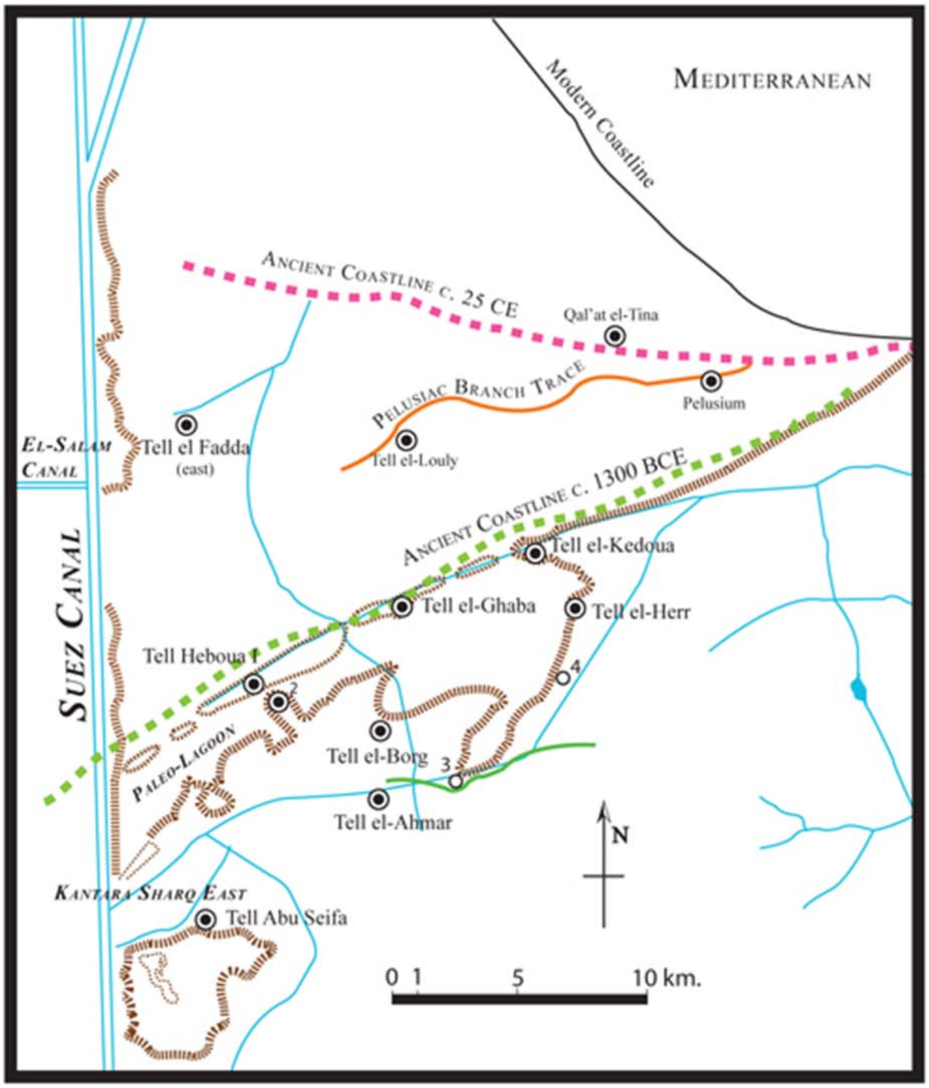


Figure 7 - Sites of the eastern Delta, Modern Satellite Image with an overlay of the proposed New Kingdom eastern Delta palaeo-lagoon's extent and the Mediterranean coast (Hoffmeier 2013, fig. 20).



2 - Tell Heboua II
3 - T78 - Migdol of Sety I (?), Hoffmeier ASAE 80 (2006)
4 - Ebedah - Edjo of Sety I (?), Hoffmeier ASAE 80 (2006)

◉ - Confirmed Archaeological Sites
○ - Suspected Sites
| - Ancient Canal Trace
▮ - Depression (denoting high/low ground)

Figure 8 - Sites of the eastern Delta (adpated from Valbelle et al. (1992) and integrated with Hoffmeier (2006)).

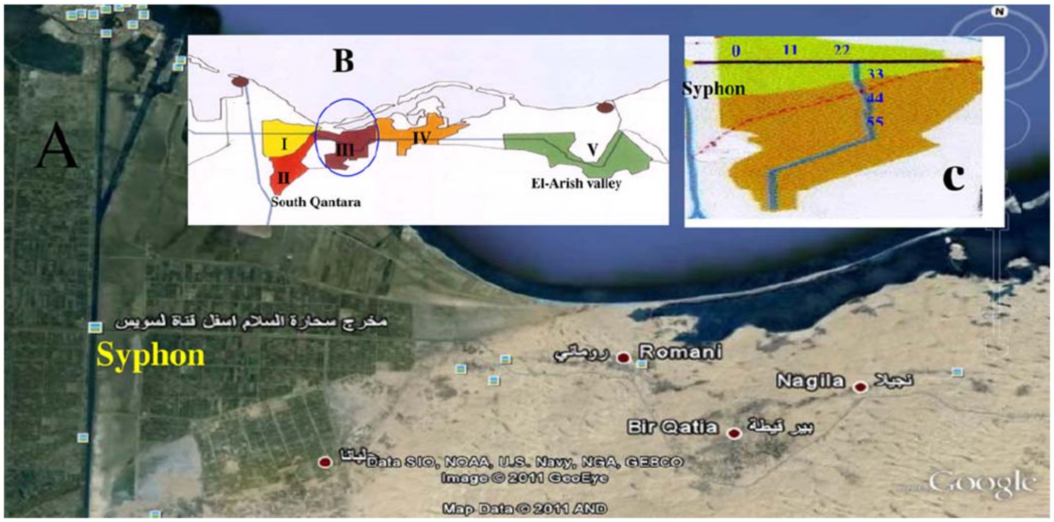


Figure 9 - The el-Salam Canal Project (Othman et al. 2012, fig. 1).

The el-Salam Canal or 'Peace Canal' is an attempt at a massive irrigation project by the Egyptian government to establish an estimated 248,000 hectares of agricultural land with 150,000 hectares in the north Sinai.[209] The fresh water for this project is obtained via the Nile and treated agricultural sewage. A reservoir, under the Suez Canal, will provide the basin for the reclamation project to continue eastwards.[210] Currently, the cultivated fields include about 607,028 m^2 west of the Canal and 1,064,323 m^2 in the north Sinai.[211] At its final stage, the canal will extend across the north Sinai for 175 km, connecting in the northern section of the Wadi el-Arish (Figure 9).[212] To date, there has been considerable transformation of the north-eastern Delta.[213] The establishment of this project represents a critical time for archaeological remains in the area as the reclamation process will undoubtedly disturb and destroy the shallow archaeological strata. Therefore, the excavation and publication of these archaeological sites is of great importance as it is the only record that future researchers will possess to interpret the remains.

[209] Abdel-Galil 2012, 153; Othman et al. 2012, 100; Hafez 2005, 953
[210] Greenwood 1997, 120, fig. 7.2
[211] State Information Service, accessed August 2013 (URL: http://www.sis.gov.eg/En/Templates/Articles/tmpArticles.aspx?ArtID=835)
[212] Othman et al. 2012, 100; Stanley & Warne 1998, fig.20
[213] Kaiser 2009, pl. 1, fig. 3

4.2.2 Geography and Environment

4.2.2.1 Geographic Data of Regions Studied

We must examine geographical data of the region to gain a clear picture of how these archaeological sites were situated in the ancient landscape. It must be stressed that this analysis is not meant to be exhaustive and obviously more work will have to be done in this field. As Bietak noted with his own study of the eastern Delta's geoarchaeology, the range of information from a variety of several specialist fields can be staggering.[214] Some aspects of landscape archaeology must incorporate data from the fields of geology, metrology, archaeobotany, etc. Although, this thesis can incorporate information from these fields, an interdisciplinary research project would yield more concise answers. Thus, as it is, geographic and environmental sections will only represent an outline of the general aspects of the areas where examined sites are located. Further investigation is warranted as it is critical to record this information before the el-Salam Canal Project continues forth and destroys this archaeological data forever.

4.2.2.2 A Geographic View of the Egyptian Delta

Although the Egyptian Delta was viewed as important to the development of pharaonic civilisation, archaeological investigations here have not been as intensive as the Nile Valley. Therefore, the history of pharaonic Egypt is largely based on Upper Egyptian remains rather than a comprehensive view incorporating the Nile Valley and Delta together. Butzer noted there were many explanations for this lack of archaeological information from the Delta by early Egyptologists: [215]

- Sparse settlement during the pharaonic period
- Sites are poorly preserved
- Deposition of sites is too deep for surface detection
- Difficulties in site identification

However, since the announcement of the land reclamation in the area, archaeological investigations have taken place to record material and sites before they are irreparably damaged. Current excavations have thus rewritten the history of the Delta.

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[214] Bietak 1975, 11
[215] Butzer 2002, 83

The Nile, at the latitude of 30°15', reaches level country and divides into a number of branches. Herodotus, in his examination of Egypt, named the area due to its similarity, albeit upside down, with the Greek character *delta* (Δ) (Figure 10).[216] The Delta is roughly 22,000 square kilometres of fertile floodplain land (about 58% of all cultivatable land in all of Egypt) with a Mediterranean coastline that stretches 225 km long.[217] The area of the Delta was formed over a process of deposition of new alluvial materials through the seasonal flooding of the Nile. Although it has a symmetrical pattern today, in antiquity, the western portion was established early on with the eastern coast's Gulf of Tineh located 50 km inland (Figure 11).[218] Summerhayes et al. suggested that the western branches of the Nile did not advance as far into the Mediterranean due to more suspended sediment in the branches resulting in less fluvial energy.[219] The eastern Delta's branches appear to have possessed mid to high fluvial energy as indicated by deposition of heavy mineral concentrations.[220] Furthermore, the Mediterranean's counter-clockwise current, up to 2 knots, actively eroded the western coastline and transposed sediments to the eastern portion of the Delta, in the Gulf of Tineh (Figure 12).[221] The gradual beach accretion of the Gulf of Tineh occurred after the New Kingdom with the eastern Deltas' branches shifting to the Tanitic and Mendesian branches (Figure 11).[222] Lake Manzala, located in the north-eastern Delta today, was only formed about 1,000 years ago (c. 961 CE).[223]

[216] Redmount 2001, 305
[217] Stanley & Warne 1998, 802. Butzer (2002, 84; 1975, 1043) estimated the area of the Delta slightly smaller at 17,000 square kilometres.
[218] Butzer 2002, 88; Stanley 2002, 104 fig. 5.5; Sneh et al. 1975, 543
[219] Summerhayes et al. 1978, 58
[220] Butzer 2002, 89 *contra* Butzer 1975, 1046
[221] Stanley 2002, 104; Summerhayes et al. 1978, 47
[222] Marcolongo 1992, 24
[223] Coutellier & Stanley 1987, 265, 269; Goedicke 1988, 165; Bietak 1975, 47

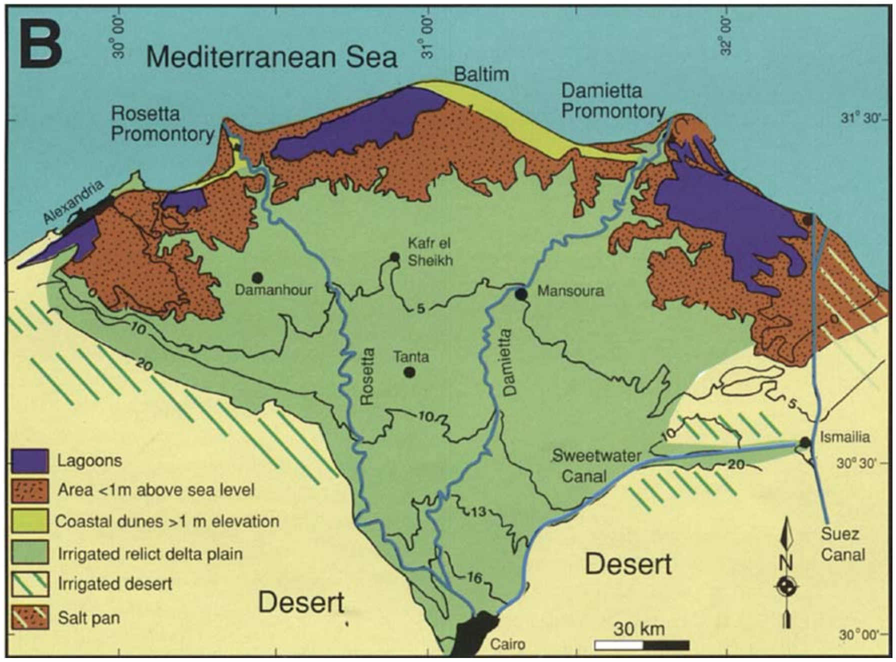

Figure 10 - The Modern Nile Delta (Stanley & Warne 1998, fig. 1 - B).

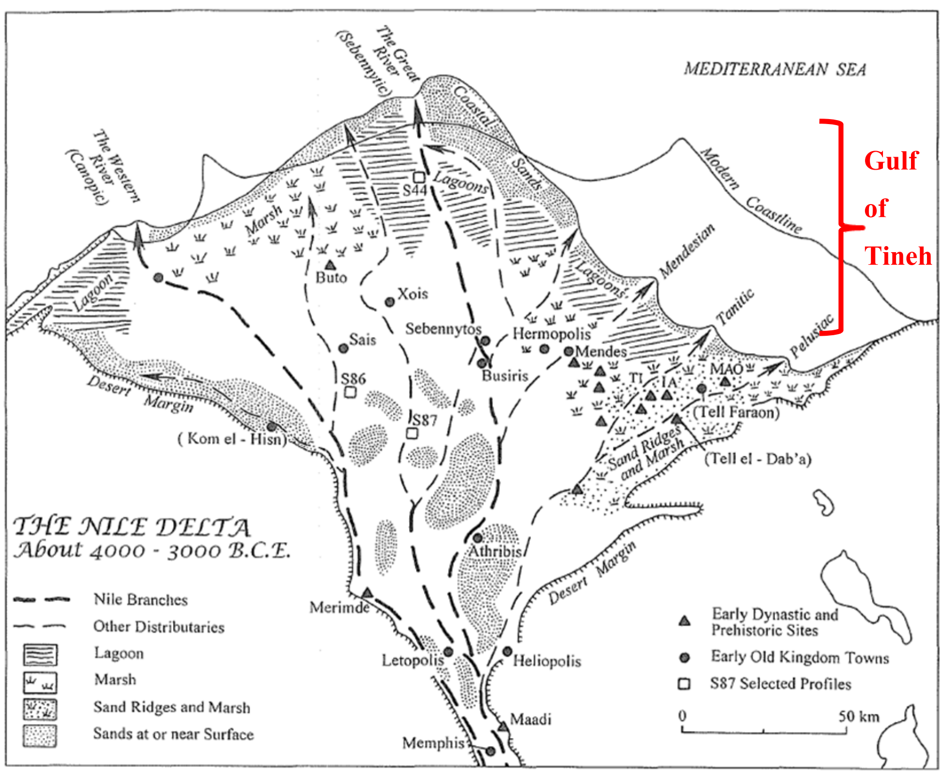

Figure 11 - Nile Delta, 4,000 - 3,000 BCE (adapted from Butzer 2002, fig. 4.5).

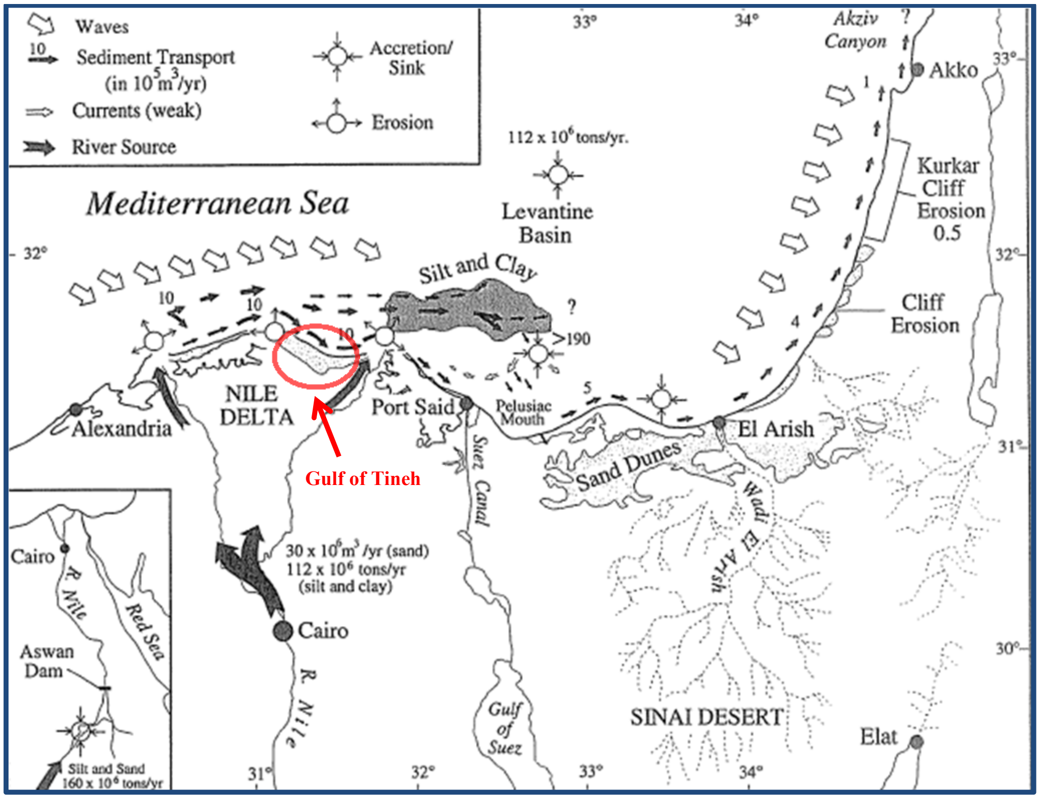

Figure 12 - Coastal flow direction and erosion points along the modern coastline (adapted from Stanley 2002, fig. 5.4).

The Nile Delta is not a static geological formation but is in a constant state of change.[224] During the transition to the Holocene (12,000 – 8,000 BP), the Mediterranean Sea was as much as 50 kilometres inland.[225] After this time, the rise in sea levels subsided and the Nile was able to halt this ingress of the Mediterranean Sea by expelling Delta silt and mud into the shallow waters. This process of coastal growth or 'progradation' continued as new sediments were laid down in each subsequent flooding with promontories forming at the end of river mouths.[226] During periods of low fluvial volume, the coast of Deltine area is eroded by the coastal tidal processes (Figure 12).[227] Before the building of the Aswan Dams, it is estimated that 1,000 billion m^3 of water discharged through the Delta Nile-Branch system (depositing 50 to 300 x 10^6 metric tons of sediment), resulting in as much as 10 metres of coastal progradation per year with 80% of the sediment discharge being lain down in the

[224] Bietak 1975, 59
[225] Butzer 2002, 86
[226] Stanley & Warne 1998, 794; Frihy & Khafagy 1991, 209
[227] Stanley & Warne 1998, 805

seasonal inundation.[228] Thus, the ancient sites that once where situated along the Mediterranean coast are now located inland. However, with sediment deposition effectively cut-off by the Aswan Dams in modern times, the coast is currently eroding ('retrogradation').[229] This coastal erosion process is exacerbated with a 16 cm rise in sea level since the dams were installed.[230]

The northern area of the Delta was laid down during the Holocene with sediments ranging 10 – 50 metres deep and increasing as one gets closer to the Mediterranean coast.[231] The Egyptian Delta has been characterised as being relatively flat.[232] The elevation from Cairo to the Mediterranean coast is minimal, about 18 metres without significant mounds or mountain ranges.[233] The area closest to the Mediterranean coast, rising within 1 metre above sea level, was primarily composed of marshland which formed the western Delta in c. 6,825 BCE.[234] The eastern Delta's humic clays levels in the Tineh Plain, indicate that this area was also an extensive marshland.[235]

The pollen profiles of Tell Ibrahim Awad and cores south of Lake Manzala indicate that this area was composed of papyrus (*Cyperus*) and wetland grasses (*Scipus, Riccia, Typha*).[236] Species of algae indicate a depth of 50 – 100 cm for standing-water lagoons before desiccation and becoming salt plains (*sabkhas*).[237] Timber would have been very sparse in these areas but would have consisted of salt cedar (*Tamarix*) and acacia.[238] Stone is also a scarce resource in this area. The practice of recycling stone from earlier sites and incorporating them into new constructions has led to a very complex archaeological record at many sites in the Delta, such as the New Kingdom building remains from Qantir (Piramesses) being reincorporated in buildings that date to the Third Intermediate Period (TIP, 1069 – 747 BCE) at San el-Hagar (Tanis).[239]

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[228] Stanley 2002, 103, fig. 5.4; Stanley & Warne 1998, 794, 803, 815; Coutellier & Stanley 1987, 257, 272; Summerhayes et al. 1978, 47
[229] Greenwood 1997, 24; Frihy & Khafagy 1991, 197; Summerhayes et al. 1978, 44
[230] Kaiser 2009, 280, 287 the sea-level is expected to rise 60 cm by 2100.
[231] Stanley & Warne 1998, 799
[232] Marcolongo 1992, 23
[233] Wilson 2007, 17; Redmount 2001, 306; Stanley & Warne 1998, 806
[234] Butzer 2002, 89; Coutellier & Stanley 1987, 265; Butzer 1976, 25; Butzer 1975, 1049
[235] Butzer 2002, 89; Yekutieli 2002, 422; Coutellier & Stanley 1987, 272
[236] Butzer 2002, 92; Butzer 1976, 25; Butzer 1975, 1048
[237] Coutellier & Stanley 1987, 265
[238] Butzer 2002, 92
[239] Dodson 2012, 59; Shaw & Nicolson 2008, 320; Graham 2001, 348

The courses of the Deltine branches have changed over time. During the inundation, sediments would be deposited along the course of the river banks and gradually, natural levees would form that were higher than the surrounding landscape. In the case of higher-volume floods, this would result in the levees breaking and a new waterway being formed. During times of low inundations, the deposition of sediments would increase over time and waterways would silt up, resulting in a new course and the abandonment of settlements located on the former branch's path.[240] Thus, the Deltine branches are more akin to a 'roaming river' than a perpetual geographic feature. In addition, the remains of ancient settlements usually signify a fairly focused time period in which they were situated near an active branch.[241]

The Rosetta and Damietta branches are the only major, active branches today. During the Ramesside period, there were 5 major Deltine branches, from west to east; (1) the River of the west (Canopic), (2) the Water of Ptah (Bolbinitic), (3) the Great River (Sebennytic), (4) the Water of Amun (Phatemic) and (5) the Water of Re (Pelusiac).[242] Although the most important branch for our discussion, the Pelusiac, can be traced to the eponymous Greco-Roman site of Pelusium, this branch's existence in the New Kingdom was disputed.[243] The designation of this branch, called the 'Water of Re', comes from the flow of this branch near Heliopolis which was important for the cult of Re in the pharaonic period.[244]

[240] Said 1993
[241] van den Brink 1986, 9, 12
[242] Redmount 2001, 307; Stanley & Warne 1998, 800; Butzer 1976, 25; Bietak 1975, 119-120, figs. 22 and 23
[243] Stanley 2002, 105 fig. 5.6; Bietak 1975, 87; Sneh et al. 1975; Sneh & Weissbrod 1973
[244] Bietak 1975, 118, 125, fig. 23. For further discussion of the ancient names of the Delta branches, see Bietak 1975, 117-139

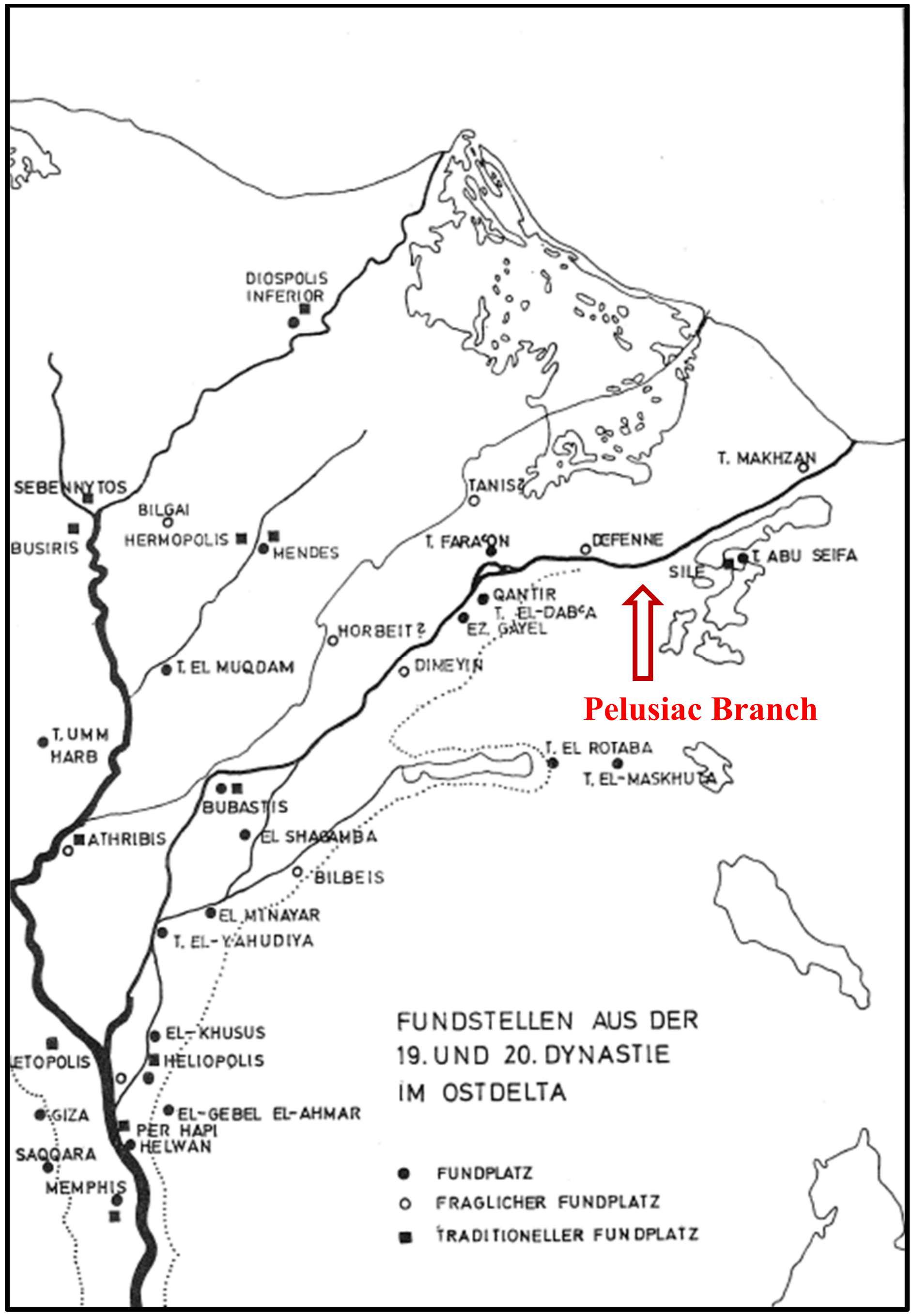

Figure 13 - Bietak's 1975 reconstruction of the Pelusiac and Tanitic branches of the Nile in the eastern Delta (adpated from Bietak 1975, 108 fig. 17).

Bietak's examination of the eastern Delta's geomorphology and hydrology is unsurpassed.[245] Produced in consultation with specialists of geology, Bietak attempted to trace the branches

[245] Bietak 1975

of the Nile in the eastern Delta based on the contour of the landscape. However, Bietak admits that the geomorphology of the area is complex and not fully understood; he recommended further investigation.[246] The Pelusiac arm of the Nile is the most important branch for our study as it was the easternmost branch flowing in antiquity. Reconstruction efforts to define the contour of this branch during the New Kingdom are fraught with difficulties. As mentioned, the beach accretion in this part of the Delta means that this Late Period plateau did not exist in the New Kingdom.

Bietak traced the course of Pelusiac branch back to the city of Heliopolis and has roughly laid out the branch's course by numerous sites in the eastern Delta.[247] As one gets closer to the terminus of the branch to the LBA coastline, the traces of the Pelusiac are harder to follow as the contours of the area become less pronounced.[248] However, Bietak argued that the fortress of Tjaru could not have supported a garrison if it did not have a supply of fresh water.[249] In 1975, Bietak equated Kantara Sharq with ancient 'Sile' or 'Tjaru', which is not a valid candidate for the ancient fortress (Section 4.2.4.2.1).[250] There is some evidence that the Tanitic Deltine branch may have flowed into the Pelusiac and vice versa, just north of Bubastis.[251]

In his 1975 publication, Bietak ascribed the New Kingdom Pelusiac's course to 'Variant (Variante) 1' in his reconstruction while 'Variant 5' represents the later course that flowed in the TIP and Late Period (Figure 13).[252] The course laid out would have placed the exit-point of the Pelusiac north of the palaeo-lagoon of Kantara Sharq. In Bietak's 2009 publications, he revised the course of the Pelusiac to empty into a depression near Tell Heboua and Tell el-Borg that formed a mooring lagoon (Figure 14).[253] In Bietak's interpretation, to the east of Tell Heboua, the Pelusiac flowed just to the north of Tell el-Dab'a and Qantir, forming access points to a series of harbours.[254] Most scholars accept Bietak's trace of the Pelusiac

[246] Bietak 1975, 71, 140
[247] Bietak 1975, 77-78, 139
[248] Bietak 1975, 82, 84
[249] Bietak 1975, 83
[250] Bietak 1975, 131, 133
[251] Bietak 1975, 91, 100 fig. 12
[252] Bietak 1975, 87, 134
[253] Bietak 2009b, 15; 1975, 139
[254] Bietak 2009a; 2009b

and Tanitic branches of the Nile.[255] However, an Isareli geological team disagreed that the Pelusiac flowed this far eastward at this time.[256]

Sneh et al. proposed that an artificial canal, called the 'Eastern Canal', was *the* major waterway in the eastern Delta during the New Kingdom. Working in the late 1960s – early 1970s, the team was surprised when they examined satellite photographs of the eastern Delta and discovered a feature that had a smooth linearity without natural tributaries.[257] Investigating this feature, they found a 70 metre wide formation that appeared to be man-made as it lacked aeolian cross-bedding, common with natural formations.[258] In their interpretation, Sneh et al. proposed to reconstruct this feature as a man-made canal extending to the Wadi Tumilat. The evidence for this canal, other than the satellite images that Sneh et al. has provided, is unfortunately destroyed today to the reclamation projects in the area. Redmount possibly found an adjoining canal in the Wadi Tumilat but the presence of the 'Eastern Canal' is far from certain.[259] Sneh et al. claimed that the Pelusiac did not flow this far eastwards in antiquity. However, current evidence shows that this branch extended to the region during the New Kingdom.

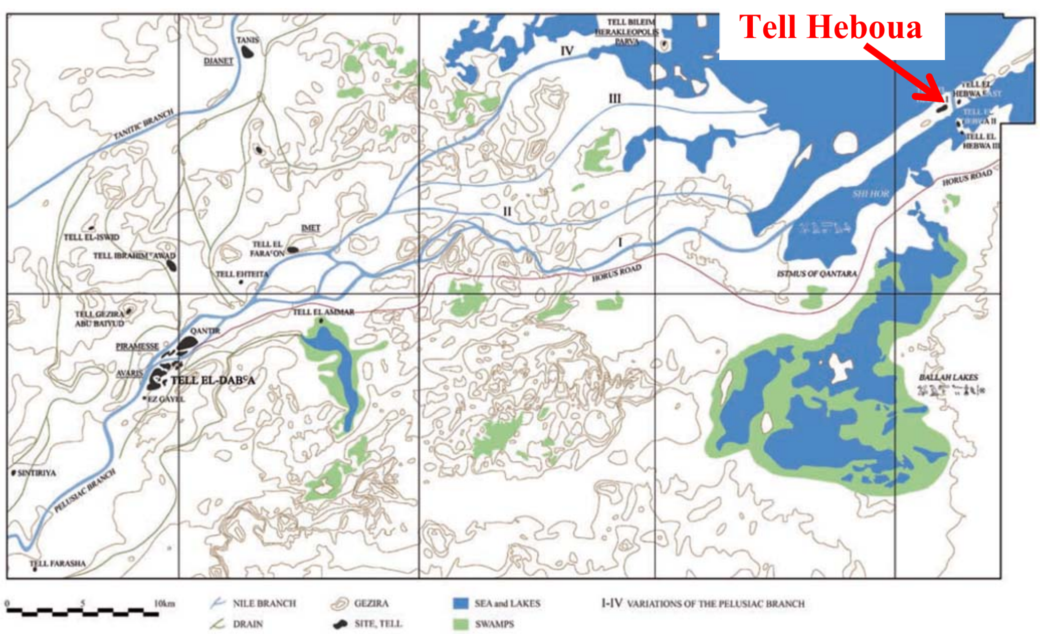

Figure 14 - Bietak's 2009 reconstruction of the eastern Delta during the Ramesside Period (adpated from Bietak 2009b, 15).

[255] Hoffmeier 2013; Brewer & Teeter 2007; Valbelle et al. 1992
[256] Sneh & Weissbrod 1973; Sneh et al. 1975
[257] Sneh et al. 1975, 542
[258] Sneh et al. 1975, 542
[259] Redmount 1995

Marcolongo, investigating the eastern Delta in late 1980s and early 1990s, suggested that the Pelusiac arm of the Nile Delta was indeed concurrent with the New Kingdom and that it past between Tell Heboua 1 and 2, forming an inlet to the Mediterranean.[260] Following Bietak's suggestion of the Pelusiac Branch, Marcolongo reconstructed the Pelusiac waterway. He asserted that the Pelusiac arm passed through the sites of Tell el-Dab'a and Qantir before making an eastward turn towards Tell Heboua. However, Marcolongo's work was largely based on the landscape-contour approach that Bietak had employed in the 1970s. The debate over if the Pelusiac flowed this far eastward during the pharaonic period was finally settled in the work of Stanley.

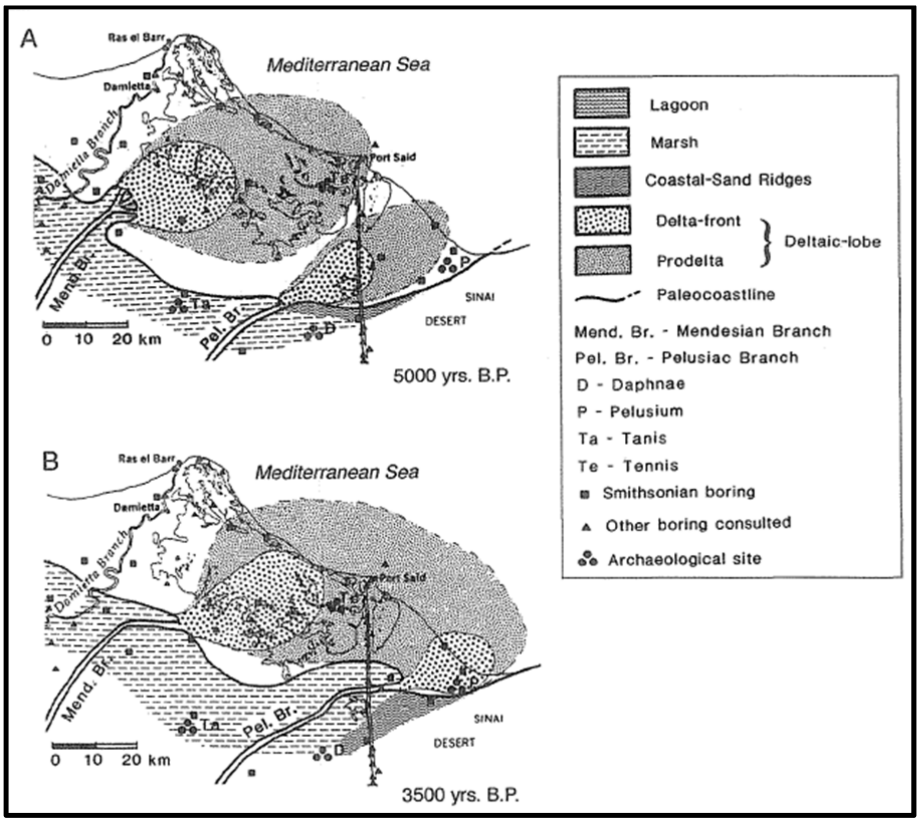

Figure 15 - Eastern Deltine Nile plumes (Stanley 2002, fig. 5.7).

Stanley presented drilling cores from the area around Tell Heboua and confirmed that there were discharge cones or 'Nile Plumes' present in the north-eastern Delta (Figure 15).[261] Although the presence of Nile Plumes in the north-eastern Delta did not solve the eastern Canal-Pelusiac branch debate in itself (as the discharge to create a Nile Plume could have

[260] Marcolongo 1992, 23-31
[261] Hoffmeier & Moshier 2006, 166; Stanley 2002, 106 fig. 5.7; Coutellier & Stanley 1987, fig. 6, 270-271; Summerhayes et al. 1978, 60

come from a man-made waterway), it would appear that the dredging involved to clear up the deposited Nile silt would have been a monumental task.[262] Stanley concluded that the Pelusiac did flow in the region of Tell Heboua in antiquity. This claim appears to have been accepted in geoarchaeological studies as Butzer reconstructed the Deltine branches to include the Pelusiac branch dating back to 4,000 BCE.[263] Furthermore, Butzer noted that Tell el-Dab'a and Qantir served as major harbour-ports for sea-going vessels and riverine traffic and inferred the Pelusiac was not only present at this time but also that this branch was large and reliable. Therefore, it should be concluded that the Pelusiac flowed in the New Kingdom and emptied into a lagoon in the region of Tell Heboua.

The Pelusiac branch was a critical tributary of the landscape during the New Kingdom. The relocation of the state capital to Qantir in the 19th Dynasty appears to have influenced the founding of many sites in this area. This is shown in the more recent surveys of Bietak and van den Brink which have noted that only 8 sites could be located in this area dating to the Middle Kingdom.[264] By the New Kingdom, the number had increased to 28. The New Kingdom sites do not appear to have been founded earlier, arguing that these sites were established with the Royal Court's move to Qantir.[265] The Pelusiac flowed for most of the 19th Dynasty until c. 1100 BCE, when many sites were abandoned, presumably, when the course of the Pelusiac altered due to environmental fluctuations.[266] As noted, the course of the Deltine branches silted up in antiquity and sites had to adapt to this changing riverine system. Butzer argued that increased sedimentation caused this branch's course to change during the late 20th Dynasty to the TIP; forcing relocation from Qantir to San el-Hagar.[267] It seems likely that the sustainability of this area was no longer viable as evidence indicates a fluctuating Nile during the 20th Dynasty.[268]

The water in the eastern Delta has a high level of salinity due to several factors; (1) salt leeching from the geological soils under the alluvial plain, (2) a mixing of salts from sea water in the high water table and (3) the increased evaporation factor from high winds in the area (3.6 kmph).[269] The high salinity concentration of eastern waterways would have curtailed the growth of bacteria and viruses, such as malaria.[270] Coastal lagoons in the area

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[262] Bietak 1975, 83
[263] Butzer 2002, fig. 4.5
[264] Butzer 2002, 91; van den Brink 1986, 17
[265] van den Brink 1986, 19
[266] Butzer 2002, 94
[267] Butzer 2002, 90; Coutellier & Stanley 1987, 268; Butzer 1976, 29; Bietak 1975, 80
[268] Welc & Marks 2013; Butzer 2012; Drake 2012; Kaniewski et al. 2010; Butzer 1984; Weiss 1982
[269] Hafez 2005, 961; Stanley 2002, 101; Stanley & Warne 1998, 805; Zohar et al. 1971, 323
[270] Nunn & Tapp 2000, 151-152

never extended southward past the 2 metre elevation range.[271] The Ballah Lakes, just south of Tell Heboua and Tell el-Borg, were not a deep barrier to transit but the quality of the water was too saline to drink.[272] As Bietak noted, it was possible for groups to try to bypass the fortresses of the eastern Delta, but it presented a large problem from a logistical vantage-point; the groups would have to travel through the waterless section of the Sinai.[273] The Ballah Lakes are non-existent today because of the building of the Suez Canal and their ancient extent is difficult to identify because of reclamation.[274]

The fringe of the eastern Delta had abundant wildlife in extensive marshes; the area became a popular place for hunting and fishing activities.[275] Images of cattle figure prominently in the western Deltine provinces' (nomes') standards has been taken as evidence that these areas of the Delta were responsible for cattle rearing.[276] The finds from Kom el-Hisn confirm this in its archaeological remains.[277] Textual records from the eastern Delta indicate that this area focused on viticulture and fishing (see below).[278] The dried and salted fish of the eastern Delta would have provided a supply of protein to the area's inhabitants.

At first glance, the Delta appears to be archaeologically impoverished as it has no standing ancient architecture. However, the small rises in the landscape have areas of urban settlement and cemeteries that yielded important information about pharaonic settlement in the Delta.[279] In most cases, settlements were founded on *geziras*, small Pleistocene hills (1-12 metres high), composed primarily of sand and formed through the continual process of inundation waters depositing material.[280] By situating on these raised areas, the settlements would be out of the fluvial plain and avoided damage during the inundation season. However, van den Brink noted that the sites from the Delta probably were located on the lower areas but over time, these settlements have been destroyed. Thus, it might be that the archaeology of the area is a matter of differential deposition.[281]

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[271] Redmount 2001, 306
[272] Bietak 1975, 135 – 136
[273] Bietak 1975, 135, 217
[274] Hoffmeier 1997, 211
[275] Stanley & Warne 1998, 805; Bietak 1975, 55
[276] Moens & Wetterstrom 1988, 159; Butzer 1975, 1049
[277] Wilson 2007, 19; Moens & Wetterstrom 1988
[278] Redmount 2001, 308; Eyre 1994, 71
[279] Wilson 2007, 15
[280] Brewer & Teeter 2007, 18-19; Butzer 2002, 83, 87; Redmount 2001, 306; van den Brink 1986, 9; Butzer 1976, 25; Bietak 1975, 49; Butzer 1975, 1044, 1049
[281] van den Brink 1986, 12

The Delta was attractive for agriculture as the fields of this area are sufficiently flat and can be flooded fully during the inundation season (*3ḫt*). Lower areas of the Delta were uninhabitable because large portions were inundated for 3 months of the year (August – October).[282] The best agricultural fields for growing crops in the Delta are situated in the southern area of the Delta. Irrigation water would have been cached in natural basins that used gravitational watering during the inundation season and manual watering for the rest of the year.[283] The management of such irrigation systems was done on a local level rather than a reliance on the royal administration.[284] The area under investigation in the eastern Delta was not able to support irrigated crops.[285] This area's 'build-up' during the New Kingdom was due to its strategic importance for maritime trade by the newly founded capital of the 19th Dynasty (Qantir) and controlling the entrance point to the Sinai's overland route.

Many archaeological analyses of this region refer to these raised sandy areas in the Delta as 'tells'.[286] This nomenclature for these geographic features is not consistent with anyone familiar with Levantine archaeology. In Levantine archaeology, the definition of a 'tell' is an artificially raised mound on the landscape through the deposition of mudbrick architectural remains.[287] Since mudbrick architecture dilapidates through time, people of the Levant would systematically destroy these architectural units by collapsing the walls of the structure and/or filling the space in with dirt and build a new structure above.[288] After the course of a few generations, a raised area is a mound made up of layers of stratified cultural material with each stratum representing an occupation level at the site. In some cases, the tells of the Levant can reach 20 – 50 metres in height and encompass an area of 20 hectares.[289] Although Deltine sites have some elevation in the deposition of cultural layers, they are not as high as Levantine tells. Tell Heboua, for instance, is situated on a raised area of the landscape, rising 1-3 metres in height, and it is clear that this site's 'tell' is a naturally forming hill on the landscape; it was not formed or developed through continual levels of occupation.[290] This is pointed out so those with a familiarity with Levantine archaeology do not think that term is used in the same sense in the field of Egyptology. Perhaps the *kom* ('hill') is more appropriate in this case to denote an area that was only occupied for one or a

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282 Stanley 2002, 103; Redmount 2001, 306; Stanley & Warne 1998, 802; Butzer 1975, 1047
283 Eyre 1994, 79; Bietak 1975, 54
284 Eyre 1994, 77-78
285 Bietak 1975, 83 "Bewässerungswirtschaft lag in diesem Gebiet nicht vor".
286 van den Brink 1986, 7
287 Wright 1985, 155
288 Akkermans & Schwartz 2003, 7; Mazar 1992, 9
289 Akkermans & Schwartz 2003, 7; Wright 1985, 155
290 Kaiser 2009, 282

few periods of time.[291] However, the term 'tell' is firmly entrenched and there is no effort to revise this term in Egyptology, despite its archaeological inaccuracy.

For the ambient temperature of the eastern Mediterranean during the New Kingdom, there have been no major long-term climatic changes that have occurred in the last 7,000 years.[292] Therefore, modern data of temperatures can be applied to the ancient world.[293] The modern temperature data, gained from stations at Kantara Sharq from 1997-2002, display that the area of the eastern Delta has an average high temperature of 35.5°C in July and an average low temperature of 19.3°C in February.

The rainfall isohyet drops dramatically in the Delta with 200 mm in the coast of the Delta to 30 mm near Cairo.[294] In the eastern Delta, February has the most amount of rain with 11.3 mm/month.[295] Due to this increased rainfall, the humidity of these eastern coastal areas can reach as high as 73%.[296]

4.2.3 Textual and Artistic Evidence

4.2.3.1 A Brief Analysis of Textual Attestations

The textual evidence indicates how the pharaonic Egyptians viewed the eastern Delta.[297] This has been dubbed in scholarly literature as the 'Ways of Horus' ( *w3t- ḥr*; Wb. 1: 248). Much like the textual attestations of Tjaru (discussed below), the recorded ancient references to the 'Ways of Horus' are relatively few and usually lacking detail. The term is first attested on the 5th Dynasty limestone sarcophagus of Henmu in the title: "Overseer of the Ways of Horus". However, since this individual held many titles (Table 2 no. 1), it is unlikely that one could deduce what functions Henmu would have served in this role.[298] A similar argument can be made for the term in the Pyramid Texts of Teti (Table 2 no. 2) as the passage does not convey any more information than the term itself.

The next two instances of the 'Ways of Horus' come from literary texts: the Instructions of Merikare and the Story of Sinuhe. They are a rare glimpse on what the term 'Ways of Horus'

[291] Mazar 1992, 9
[292] Marcus 2002, 403 *contra* Issar 2010, 290
[293] Hafez 2005, 960
[294] Butzer 2002, 84; Stanley & Warne 1998, 802; Butzer 1980, 456. See also Enzel et al. 2008, fig. 1
[295] Hafez 2005, 960
[296] Hafez 2005, 960
[297] Vabelle 1994, 384
[298] Hassan 1953, 49-52, pl. XXVIII-B

represents. However, these texts should be treated with caution as both are literary in nature and incorporate fictional elements.[299] 'Ways of Horus' appears to have been used to refer to the easternmost part of the Delta. In the Instructions for Merikare, the former ruler, Kebkaure Khety, advised the future king, Merikare Khety, to strengthen his borders against Asiatic incursions. Since it is unlikely that this text is referring to Asiatics coming from sea, the area of the eastern Delta is deduced. In the case of Sinuhe, his flight from Egypt to Canaan is inferred in his overland route.[300] Although these texts may relate to events that might not have taken place, the geographic position of the 'Ways of Horus' should not be discarded out of hand. Both compositions do not appear to manipulate other geographic locales for the sake of creating a pseudo-world in which the audience could not relate. Therefore, these records indicate that the 'Ways of Horus' refer to the eastern Delta.

In the speech of Hathor at Hatshepsut's mortuary temple at Deir el Bahri (Table 2 no. 6) and the Theban tomb inscription of Senefer (Table 2 no. 7), there is a strong possibility that the 'Ways of Horus' was located within a low-lying area that was waterlogged. This may relate with the representation of the *t3-dnit* of the Sety I reliefs (see below) depicting reeds and fresh-water crocodiles (Figure 18). As mentioned, there is corroborating geoarchaeological evidence to suggest that this area was a marshland and characterised the landscape of the eastern Delta.

On the western wall of the 18th Dynasty Theban tomb of Puyemre, it displays the "tribute of the north" and included a depiction of offerings from the 'Ways of Horus'. The textual instance details Puyemre receiving tribute from Retenu along with the northern and southern oases. This would suggest that 'Ways of Hours' was a fringe zone in the ancient Egyptian perspective; its inclusion in a tribute scene would have added to the tomb owner's prestige and proof of his ability in office. Davies suggested that the 'Ways of Horus' from this tomb indicated an area from the eastern end of the Wadi Tumilat to the fortress of Tjaru in the north.[301] Davies also argued that this area was vunerable to raiding parties of Bedouin from the Sinai.[302] This would indicate that roadways do not imply a solid border but a "frontier zone" with dubious security.[303] The inclusion of the 'Ways of Horus' in a tribute scene along with offerings from Retenu, implies that full imperial control of the area was in a state of

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[299] Parkinson 1997, 21-22, 203; Bietak 1980, 62
[300] Bietak 1980, Goedicke 1957, 77-85
[301] Davies 1923, 81.
[302] Davies 1923, 81-82
[303] Quirke 1989, 266

flux at this time.[304] Puyemre also mentioned that he held the title of "the overseer of the vineyards of the glebe-lands of Amun", suggesting that this was a wine-producing area.[305] Since there is evidence of wine production from Tjaru, it is acceptable to place the 'Ways of Horus' in a region that could support viticulture.[306]

[304] However, it should be remembered that amongst the 'Nine Bows' of Egypt, nos. 1 and 2 are actually listed as 'Upper Egypt' and 'Lower Egypt'.
[305] Eyre 1994, 73; Davies 1923, 82.
[306] Valbelle 1994, 384

Table 2 - Instances of the 'Ways of Horus' in Texts.

No. #	Text Name	Dated to	Instance of 'WoH'	Medium	Type	Reference	Notes
1	Sarcophagus of Hekni-Henmu	5th Dynasty (2494 - 2345 BCE)	Right Flank: The district chief of the desert, overseer of the desert, overseer of the hunters, director of the Mitr, king's acquintance, overseer of the Way of Horus, greatest of the ten of Upper Egypt (regiment of archers), captain of the crew, overseer of the army, judge and nome administrator, chamberlain, staff of the people, Iwn-Knm.wt, priest, overseer of the Great Court, director of all scribes, Hkni-Hnmw	Stone	Autobiographical	Hassan 1953, 49 - 52, figs. 40 and 42	Limestone sarcophagus, 2.7 X 1.2 X 1 m.
2	Pyramid Text of Teti	Reign of Teti (2345 - 2323 BCE)	O, Way of Horus, make ready your tent for Teti	Stone	Royal Inscription	Maspero 1883, 24	
3	Instructions of Merikare	10th Dynasty (c. 2160 - 2025 BCE)	Behold, I drove in my … mooring-post in the region (?) that I made (?) on the east. From the boundaries of Hebenu to the Way of Horus, equipped with cities, filled with people of the best of the entire land, so as to repel their attacks.	Papyrus	Literary Text	AEL 1, 103 Lines 85 - 90	Attested in versions from later periods: Pap. Lennigrad 1116A (2nd half of 18th Dynasty); Pap. Moscow 4658 (late 18th Dynasty); Pap. Carlsberg 6 (late 18th Dynasty).
4	Story of Sinuhe	12th Dynasty (1985 - 1795 BCE)	I halted at the Ways of Horus; the commander there, who was in charge of the frontier patrol, sent a message to the palace to let it be known. His majesty caused an efficient overseer of field workers of the palace to come, ships were loaded behind him with presents of the royal bounty for the Asiatics, who accompanied me to the Ways of Horus.	Papyrus	Literary Text	AEL 1, 231 Lines 240 - 245 Parkinson 1997, 39 Lines 240 - 245	Multiple instances in this text but should be seen as in the context of a pedagogical text and not necessarily relating to reality (if there was such a feature as a canal). Interesting that if we are to presume that Sinuhe is reaching the Eastern Delta, that ships could reach him and his accompanying Asiatics.
5	Stela found in the temple of Ptah in Memphis	Reign of Senrusret III (1874 - 1855 BCE)	Temple of the king of Upper and Lower Egypt, Kakheperra, which is in the town of Senwosret on the Way of Horus.	Stone	Royal Inscription	Posener 1982, 7 - 8.	Pink granite block, 2 X 2.5 m.
6	Speech of Hathor, Deir el Bahri	Reign of Hatshepsut (1473 - 1458 BCE)	I have come from Pe, I have marched through Dep, I have travelled through the marshes and the lands of the Ways of Horus	Stone	Royal Inscription	Naville 1901, 87 - 94	

Table 2 - Instances of the 'Ways of Horus' in Texts.

No. #	Text Name	Dated to	Instance of 'WoH'	Medium	Type	Reference	Notes
7	Inscription of Senefer, Theban Tomb - TT 96	New Kingdom (1550 - 1069 BCE)	Beholding the meadows and traversing the marshes and making arrangements at the Way of Horus by the mayor of the southern cuty, Senefer, the justified	Stone	Autobiographical	Sharpe 1837, 55 Urk. IV 1421; 9-11	
8	Senefer Statue, British Museum	New Kingdom (1550 - 1069 BCE)	Overseer of the place of in the Way of Horus	Stone	Autobiographical	Urk IV, 547:4 Edwards 1939, Prt. VIII, Pl. 5	Mention of Senefer's father having a WoH title
9a	Tomb of Puyemre, Theban Tomb - TT 39	18th Dynasty (1550 - 1295 BCE)	Reception of Tribute: Receiving the tribute of the products of the northern lands and the Way of Horus, together with the gifts of the Southern and Northern Oases, by the prince and mayor, royal chancellor, sole campanion rich in love, chief lector-priest, [second] priest [of Amun], Puyemre, true of voice, which (my) lord had assigned to the temple of Amun	Stone	Autobiographical	Davies 1923, 80 - 82, pl. XXXI	Viewing the "Ways of Horus" as being lumped in with fringe zones of Egyptian control.
9b	Tomb of Puyemre, Theban Tomb - TT 40	18th Dynasty (1550 - 1295 BCE)	Wine jar identification: Wine of the vineyards of the Way of Horus	Stone	Autobiographical	Davies 1923, pl. XII	
10	Pap. Anastasi I, Lines 27: 1 - 5	19th Dynasty (1295 - 1186 BCE)	…[I will describe to] thee the [lands] of the extremity of the land of Canaan… turn thy face towards the fortress of the "Ways of Horus". I begin for thee with the "House of Sese". Thou hast never trodden it; thou hast not eaten the fish of (the waters of) ... thou hast not bathed in them.	Papyrus	Literary Text	Gardiner 1911, 28 - 29	Pedogogical text in which a scribe insults the geographical knowledge of the recipient. The mention of the fish could relate with the bulti fish mentioned in other textual instances of Tjaru.

4.2.3.2 Divergence of Definitions of the 'Ways of Horus'

Since the textual evidence indicates that the 'Ways of Horus' was a region in the eastern Delta, it is perplexing its use in scholarly literature is synonymous to the Sinaitic overland route (approximately 183 km long), connecting Egypt's Delta to southern Canaan.[307] In 1920, Gardiner asserted that the term, the 'Ways of Horus', could be equated with the fortress of Tjaru (Thel), based on a clause in Pap. Anastasi I.[308] However, this definition of the ''Ways of Horus'' has recently evolved to denote a different geographic area.

The change in meaning of the 'Ways of Horus' first appeared in Kees' *Ancient Egypt: A Cultural Topography*. Kees stated:

> "The Ways of Horus, the royal road from Sile (Kantara Sharq) by way of el-Arish to Gaza in southern Palestine, played an important role as a military highway… it was doubtlessly the route by which all Egyptians armies marched in to Asia, and which was utilised by all Asiatic conquerors."[309]

Kees also claimed that this view was based on the conclusions of Gardiner, although Gardiner made no such claim.[310] Kees' definition was adopted by Shea.[311] This new usage, where the 'Ways of Horus' referred to a road across the north Sinai was reinforced in Oren's publications.[312]

When the Sinai Peninsula was under Israel's control in the 1970s, archaeologists surveyed the north Sinai and located many sites from a range of time periods. The sites that are most relevant to our discussion are those of Bir el-'Abd and Haruvit which date to the New Kingdom (discussed below). From the start of the publication of these sites, Oren titled the survey's results of the pharaonic remains to be along the 'Ways of Horus'; seeing the *w3t- ḥr* as a stretch of road from the eastern Delta to southern Canaan. Whether Oren was directly influenced by Kees or Shea is uncertain. In Oren's view, this highway was punctuated by sites that could be classified as outposts or fortresses that could have served to resupply military units making the trek to Gaza in southern Canaan.[313] Later authors employed the

307 *Contra* the 220 km claimed by Morris (2005, 384).
308 Gardiner 1920, 113; 1911, 28 – 29 lines 27.1 – 27.5 "The fortress of the 'Way of Horus'"
309 Kees 1961, 116
310 Kees 1961, 191, ft. 1. Valbelle 1994, 379 "Nulle part cependant, dans cette étude, Gardiner n'écrit que le toponyme désigne la route elle-même ou l'ensemble des fortifications de cette route."
311 Shea 1977
312 Oren 1987, 69-119
313 Oren 2006, 279; 1987, 70; 1979, 181;

term 'Ways of Horus' to mean a military highway route in their own treatments of the north Sinai.[314]

The crux of the argument against the 'Ways of Horus' being equated with a military road is that the term appears never to have been employed as such. In the tomb of Puyemre, the offerings of wine and pomegranates indicate fresh water irrigation. As will be discussed (Section 4.3.1 and Chapter 5), the north Sinai lacked access to fresh water. Therefore, it could not have yielded such produce. Valbelle examined the use of the 'Ways of Horus' and concluded that it was used to refer to a region in the eastern Delta.[315]

Despite Valbelle's acute observations, Hoffmeier opted to employ the term to mean both a region of the eastern Delta while, at the same time, referring to the Sinaitic route.[316] Hoffmeier's 'middle-ground' was based on a misinterpretation of Pap. Anastasi I as the word only says 'fortress', not 'fortresses' or 'highway' (Table 2 no. 10). Thus, it still refers to the 'Ways of Horus' as a term equivalent with Tjaru in the 19th Dynasty. Morris also opted to use the 'Ways of Horus' as both a region and as an overland route.[317] Future publications of the northern Sinaitic material from the pharaonic age should avoid using the term to refer to a military route and confine it to its original meaning, a region of the eastern Delta.

4.2.3.3 The Battle Scenes of Sety I

Fortunately, we have an artistic representation of the eastern Delta and the north Sinai.[318] The depiction dates to the reign of Sety I and is located on the northern exterior wall of the Hypostyle Hall at Karnak Temple. The scenes are of historical importance as they portray Sety's campaigns in 6 horizontal registers with each register encapsulating a separate campaign. The artistic pattern of the scenes is laid out with a central doorway dividing the registers. The doorway symbolically represents Egypt while the far ends depict foreign localities, the 'distance-to-doorway' principle (Figure 16).[319] As one follows Sety's depiction from the central doorway towards the end of the register, one can follow the campaign's progress.

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[314] Hoffmeier 2013; Al-Ayedi 2006, 39; Hoffmeier 2006a, 1; Cavillier 1998, 10; Hasel 1998, 96-99; Redford 1992, 80; Maksoud 1989, 181; 1987, 13-16.
[315] Valbelle 1994, 382 "Il paraît clair, d'après cet extrait, que les «Routes-d'Horus» - c'est la plus ancienne mention connue de la forme pluriel - sont un lieu situé sur la branche pélusiaque, placé sous la responsabilité d'un officier de patrouille, servant de poste frontière entre l'Asie et l'Égypte", which is more in-keeping with the statements of Davies that this refers to a region.
[316] Hoffmeier 2013, 164; 2006a, 10
[317] Morris 2005, 38-39
[318] Bietak 1980, 63
[319] Wernick 2011

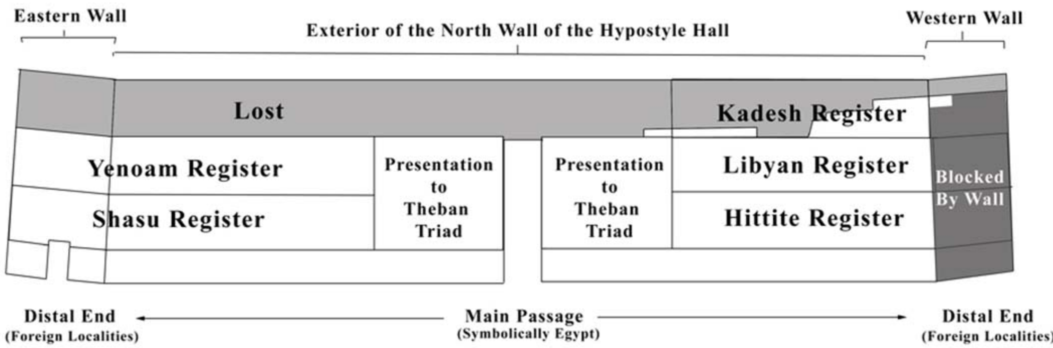


Figure 16 - Schematic layout of the Sety I battle scenes at Karnak Temple (Wernick 2011, fig. 1).

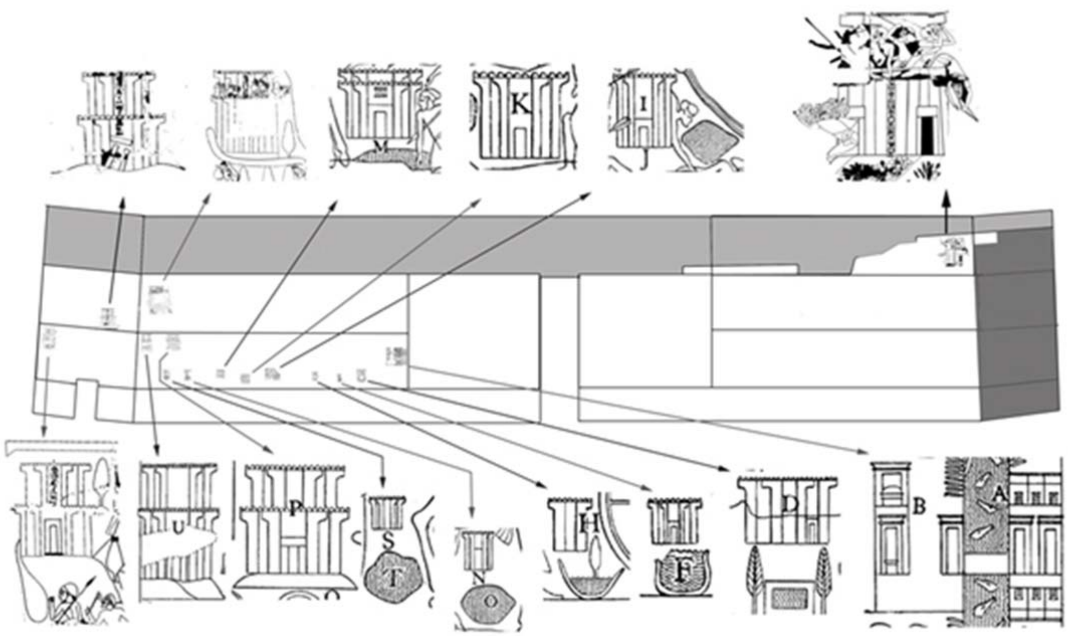


Figure 17 - Images of fortifications within the Sety I battle scenes (adapted from Wernick 2011, fig. 2).

The depiction of Sety's first campaign into the north Sinai and southern Levant is located on the bottom register on the eastern side. The route across the north Sinai was an artery for trade goods and armies in the ancient world and represented a strategic area to control. Amongst the representations of Sety’s encounters with Bedouin and Shasu tribes, the register is punctuated by a series of fortresses thought to represent a series of Egyptian-held sites that would supply Egyptian armies and control traffic on the road. At first glance, these small fortresses appear to be a copy of one another but that is an over-simplification; each fort has a different composition and different proportions (Figure 17).

Gardiner discovered that the names of the fortresses can be compared to a passage in Pap. Anastasi I.[320] In this section of the papyrus, various locations are sequentially laid out in topographical order. This section lists 12 outposts along the Sinaitic route. On the Karnak relief, there are twenty names describing bodies of water or a fortified outpost (Table 3). Starting at the 'Ways of Horus' fortress, the nearest fort located in the Delta, the papyrus proceeds to list fortresses along the Sinaitic route as far as Gaza, marking the start of Canaan.[321]

In the Shasu register of Sety I, the fortress closest to Egypt is indicated by its placement near the doorway of the Hypostyle Hall. In this scene, Sety returns from his campaign leading three lines of prisoners, who are identified as Retenu in the presentation scene (Figure 18).[322] The fortress depicts a structure with a water canal dividing it. The inscription reads “the (boundary) Canal” (, *t3-dni.t*; Wb. 5, 465.5).[323] However, there are some more liberal translations such as Nibbi’s “The Dividing Water” or “The Land which Divides”.[324] On either side of the water channel there are two fortresses, each with two gates (making four in all) and are connected by a pontoon bridge or causeway.[325] The gateways of the fortress have a gate with a rectangular aperture and a defined cornice. The Sinai-facing gateway has second storey which has a cornice on it and a single merlon in its opening. The position indicates that this was a tower above the doorway. These heavy-corniced gateways are similar to gateways of the Amarna period.[326] The identifying inscription of the fortress is located on the left side and reads, ‘The Fortress of Tjaru’ (, *p3 ḫtm n ṯ3rw*; Wb. 5, 355.14; Figure 18 B). This structure is depicted differently than other fortresses in the Sety I battle scenes. Given that supply lines will always be stronger at the source, it may be a fortified enclosure of a settled population rather than a representation of a frontier fortress.

[320] Cavillier 2001a, 23; Gardiner 1920
[321] Gardiner 1920, 103
[322] Gaballa 1967, 321
[323] KRI 1, 9: 15
[324] Nibbi 1989, 73 presumably Nibbi misread ‘*t3*’ to mean ‘land’ instead of the article ‘the’.
[325] Chicago Ep. S. 1986, 26
[326] Kemp 2012, 159 fig. 5.5, 293 fig. 8.17

Moving eastwards, we encounter the next fortress. The identity of this fortress is written as 'The Dwelling of the [Lion]' (, *t3 't p3* [*m3i*]; KRI 1, 10: 1; Figure 18 D) (Section 4.2.5.2). The image of this fortress is stout with the top border capped by semi-circular merlons. There are four vertical sections that have their top portions flare out at right angles. These vertical sections appear as an upside-down 'L' shape (referred to as 'tower piers'). This shape suggests that they represent an overhang that allowed the defenders to rain arrows and stones upon attackers (functioning as *machicouli*).[327] The Egyptian artist used these tower piers to represent the four corners of the square installation to be shown all at once, as if the fortress were unfolded. The rectangular gateway is positioned off to the western side between two piers. Reconstructed from previous drawings, a manicured rectangular pool is shown outside the fort, flanked on either side by trees. The overall image of the fortress and the pool is that this was an area still relatively close to Egypt and that the garrison could experience some benefits of civilisation. Furthermore, as we progress in the Shasu Register, the shapes of these external pools, associated with fortresses, become more rugged and wild.

The rest of the Egyptian fortresses in this register are similar but differ from one another in their details. The next fortress is located between the back hooves of the horses of Sety's chariot (Figure 18 E) but it is totally lost now so Gardiner's reconstruction has to be relied upon.[328] The fortress had the four tower piers but the rectangular gate is positioned in the middle. A water body lies outside this fortress, shaped in a steep 'U', and represents a profile-view of the pool/cistern. Curiously, this water body shape stands in contrast to the previous pool's 'bird's eye view'. The merlons of this fortress are semi-circular. The next fort is located between the chariot's wheel and the attendant following the king (Figure 18 G). The merlons are clearly rounded but there are only two tower piers with no gate displayed. The associated pool of water is a similar 'U' shape to that of the previous fort, being in 'profile view', but the sides do not curve up as sharply and there is a tree growing out of the middle of the pool. It is interesting that the bodies of water from this point on in the relief appear less formed and more natural, communicating a sense of ruggedness and the wildness of the terrain. Perhaps this tacitly indicated the level of control, as we started with a rectangular pool at the "Dwelling of the Lion" and gradually become less manicured.

[327] Wright 1985, i, 177; Yadin 1963, 20
[328] Gardiner 1920, pl.XI

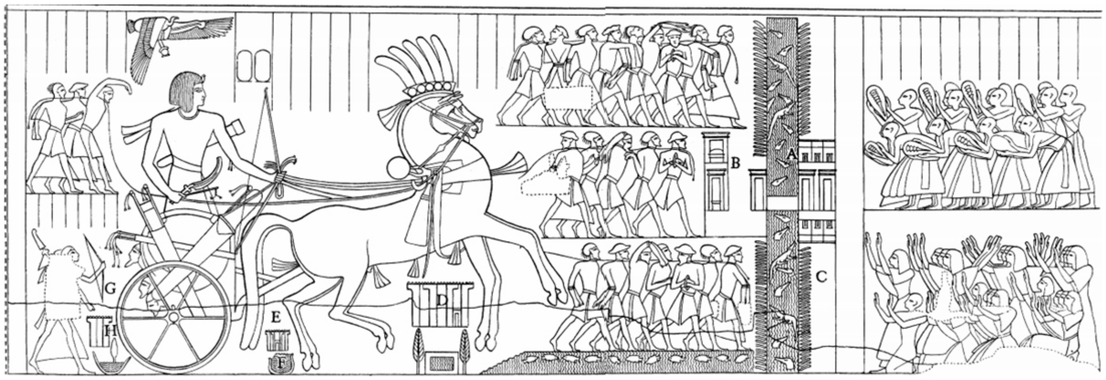


Figure 18 - Sety returning with captives past the fortresses of Tjaru (B), the ‘Dwelling’ of the Lion (D) (Gardiner 1920, pl. XI).

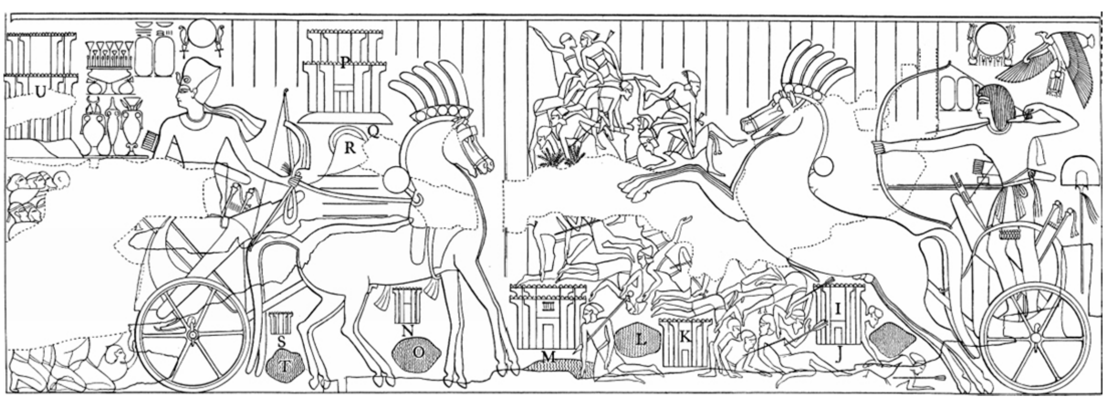
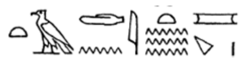
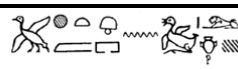
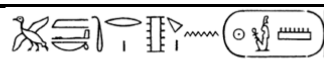
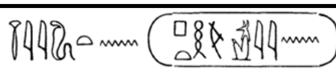
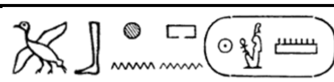
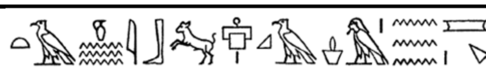
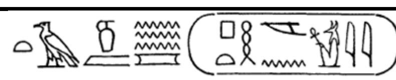
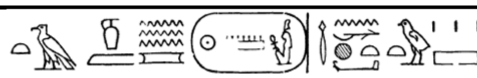
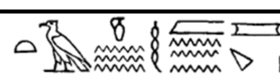
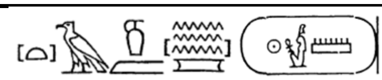
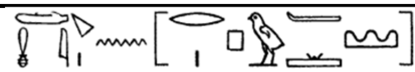


Figure 19 - The fealty of the chiefs of Retenu (left) alongside the Bedouin Battle scene (right) (Gardiner 1920, pl. XII).

Table 3 - Fortress and Water Feature Names in the Sety I Battle Scenes at Karnak

Designation (see figs. 16 and 17)	**Hieroglyphic Inscription** (Gardiner 1920)	**Translation** (Gardiner 1920; KRI I, §6 – 11; University of Chicago (Epigraphic Survey) 1986)
A		The (boundary) Canal (*t3-dni.t* (Wb. 5: 465.5))
B		The fortress (*ḫtm)* of Tjaru
D		Dwelling of the Lion
E		The *mktr* of Menmaatra
F		The well (*ḫnmt*) of Hepen / Hatjan (*ḥpn* / *ḫtn*)
G		The wadjet (*w3ḏyt*) of Sety Merenptah
H		The well of the district of Imy-‘a (?)
I		The fort (*bḫn*) of Menmaatra
J		The stronghold (*nḫtw*) of Sety-Merenptah
K		The town (*dmi*) which his majesty built (a)new
L		The well of Ibseqeb (*ib-s-ḳ-b*)
M		The well of Sety Menmaatra
N		The well Menmaatra, great of victories
O		The well called sweet water
P		Town which His Majesty built anew at the well Hu[.]ututi (*ḥ-[.]wtwti*)
R		Wide pool (*[y]m rbt* (KRI I, § 8.3); *?-b(?)-r-b t* (Gardiner 1920, 112))

Designation (see figs. 16 and 17)	**Hieroglyphic Inscription** (Gardiner 1920)	**Translation** (Gardiner 1920; KRI I, §6 – 11; University of Chicago (Epigraphic Survey) 1986)
S		The well of Menmaatra
T		*nḫs* of the Chief / Prince (KRI I, § 8.4 / Gardiner 1920, 113)
U		The town of [Rafah]

The next 3 fortresses encountered are amongst a battle scene in which Sety triumphs over a Bedouin host (Figure 19 I, K and M). Gardiner suggested that this battle scene is evidence that the area around the fortresses, and maybe even the forts themselves, were dominated by Bedouin tribes during the Amarna period. Therefore, Sety had to secure this area before he could campaign into Syria and Palestine.[329] Interestingly, none of Sety's opponents have any weapons or armour. These three fortresses have the 'typical features'; a rectangular gateway, four tower piers, rounded merlons and an exterior water source. However, the easternmost fortress in this 'Bedouin battle' has two additional features (Figure 19 M). There is a second tier of defences that may suggest a fortified enclosure on the inside of this fortress. The fortress's position, located further away from Egypt, may have required increased defences. Above the gateway, there is a window with wooden hoarding across it. The remaining two fortresses, located in the next scene (the 'Tribute Scene'), are positioned below Sety's horses and have the 'typical' fortress features.

4.2.4 Tell Heboua

4.2.4.1 Introduction

As mentioned, archaeological excavations in the eastern Delta and north Sinai are underdeveloped due to modern political and military disputes. Jean Clédat's survey of sites in the eastern Delta between 1904 and 1914 noted Tell Heboua but it was not seen as a candidate for the fortress of Tjaru until recently. In 1985, the Supreme Council of Antiquities (SCA) and the University Charles de Gaulle-Lille jointly began their study of the

[329] Gardiner 1920, 100

north Sinai to record archaeological sites before they were destroyed.[330] Tell Heboua was rediscovered in 1989 by the north Sinai Department of the SCA and a subsequent survey of the area was conducted by the Franco-Egyptian mission.[331] Since then, excavations have been conducted by the SCA under the direction of Mohamed Abd el-Maksoud.[332]

Tell Heboua is the largest site in the area and has remains from the SIP to the New Kingdom (Figure 20).[333] The site is strategically located along the New Kingdom coastline bordering the Tineh Plain to monitor traffic and house a garrison to defend the border. It is composed of four distinct centres identified in the excavations with numeric values 1 – 4. Tell Heboua 1 is the largest of the cluster and is the focus of publications to date.

Tell Heboua 2, located 1 km south-east from Tell Heboua 1, was excavated in the summer of 1999 (Figure 20). These excavations were conducted by Abd El Rahman Al-Ayedi who was undertaking his Master's degree in Egyptology from the Department of Near & Middle Eastern Civilisations at the University of Toronto, later publishing the results.[334] However, new excavations in 2007 showed inconsistencies with Al-Ayedi's earlier findings.[335] Unfortunately, Tell Heboua 2's architecture has not been discussed other than its general features. Therefore, this thesis will only present the general architectural features of Tell Heboua 2. The remaining sites (Tell Heboua 3 and 4) have not been published and so they are not presented in this thesis. Recognisably, the results of these new excavations will have to be integrated as more data becomes available.

[330] Maksoud 1998a, 7; 1987, 14
[331] Al-Ayedi 2006, 35
[332] Al-Ayedi 2000, 98.
[333] Emery 2011, 3; Maksoud 1989, fig. 3; 1987, 14;
[334] Al-Ayedi 2006; 2000
[335] Maksoud & Valbelle 2011; Hoffmeier 2008, 8 – 9

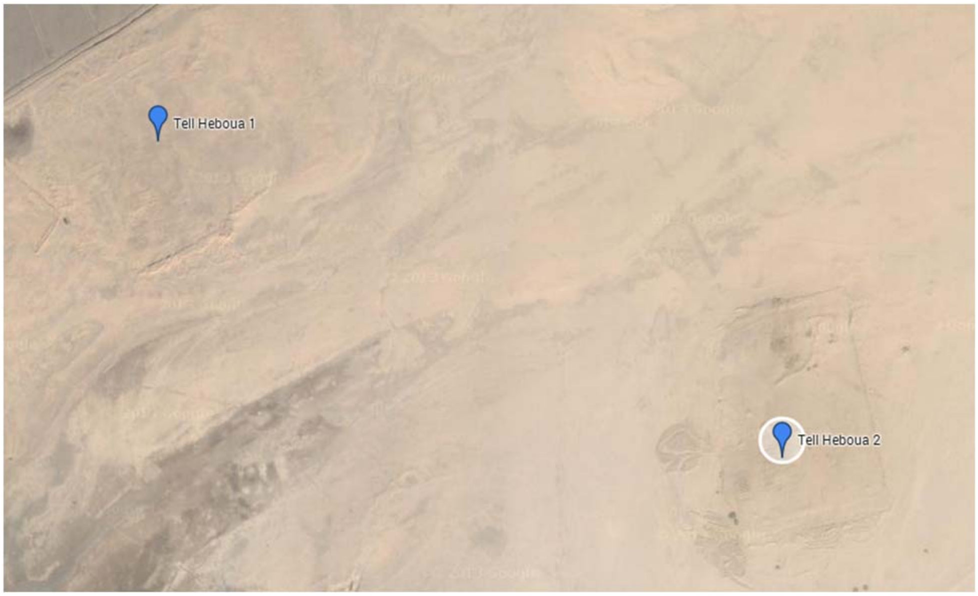


Figure 20 - Satellite View of Tell Heboua 1 and 2 (Google Maps, accessed Nov 2013).

4.2.4.2 Textual and Artistic Evidence

4.2.4.2.1 Site Identification

Tjaru has often been equated with the ancient Greek site of 'Sile', named so after the discovery of an inscribed paving stone from the Roman period that dates to the joint reign of Diocletian and Maximian.[336] However, the equation of Tjaru with Sile, other than being both located in the eastern Delta, is unfounded and represents speculations of previous authors that do not take into account geoarcheological processes.[337] In the past, a number of sites had been suggested for the location of Tjaru (Tanis, Ismailiya, an area south-west of Bubastis, Kantara Sharq, and an area somewhere along the Pelusiac branch between Piramesses and Heliopolis).[338] Before the 1990s, authors concluded that Tell Abu Seifa (Sefah) was the most probable candidate without excavations conducted.[339]

Tell Abu Seifa was accepted as the location for Tjaru because the site is in Kantara East which would have been a good candidate for the ancient Egyptians to monitor traffic on the

[336] Al-Ayedi 2000, 63; Cavillier 1998, 11; Nibbi 1989, 71 Albright 1924, 6 – 8
[337] Nibbi 1989, 72 followed by Maksoud & Valbelle 2005, 22 and Vandersleyen 1993, 85 – 86.
[338] Nibbi 1989, 71, 76
[339] Morris 2005, 45 ft. 63; Cavillier 1998, 17

Sinaitic route (Figure 8).[340] Kuthman originally claimed this and Gardiner followed.[341] Between 1993 and 1999, the SCA conducted excavations at Tell Abu Seifa for the 'Ways of Horus Project' and the earliest ceramics dated no earlier than the Ptolemaic period (332 – 30 BCE).[342] While Tell Abu Seifa can no longer be dated to the New Kingdom, the large fortified structures, the Ptolemaic fortress (400 x 200 m) and a smaller Roman fortress, make it a perfect candidate for Sile.[343]

Maksoud first designated Tell Heboua as a possible location for the second fortress depicted in the Sety I reliefs, the 'Dwelling of the Lion' (Figure 18 D).[344] During Maksoud's presentation of finds from Tell Heboua 1 at Wadham College (1988), a member of the audience suggested that the site could be equated with Sile.[345] However, Maksoud was careful not to equate Tell Heboua 1 with Tjaru until he had epigraphic evidence to confirm this assertion.[346] In his 2005 publication, there was finally a statue that listed the name of the site.[347] The stelaphorous statue, 28.5 X 14.2 X 21.2 cm, was carved from pink quartzite and was dedicated to Horus of Mesen, the area's local deity.[348] Although the statue was badly damaged, the dedicatory inscription was still intact. It reads, "an offering which the king gives to Horus, lord of Tjaru, he gives" (*ḥtp di [nsw] ḥr ṯ3rw di=f*) which confirmed that Tell Heboua is Tjaru (Figure 21).[349]

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340 Cavillier 2001b, 39 – 42; Nibbi 1999, 79-89
341 Nibbi 1989, 69
342 Hoffmeier 1997, 183, 197 ft. 76; Maksoud et al. 1997, 221 – 226; Al-Ayedi 2000, 66.
343 Morris 2005, 46
344 Maksoud 1989, 175, 184; 1987, 15;
345 Maksoud 1989, 188 It is unknown which scholar made the suggestion.
346 Maksoud 1998a
347 Maksoud & Valbelle 2005, 18 – 21
348 Maksoud & Valbelle 2005, 18
349 Maksoud & Valbelle 2005, 20

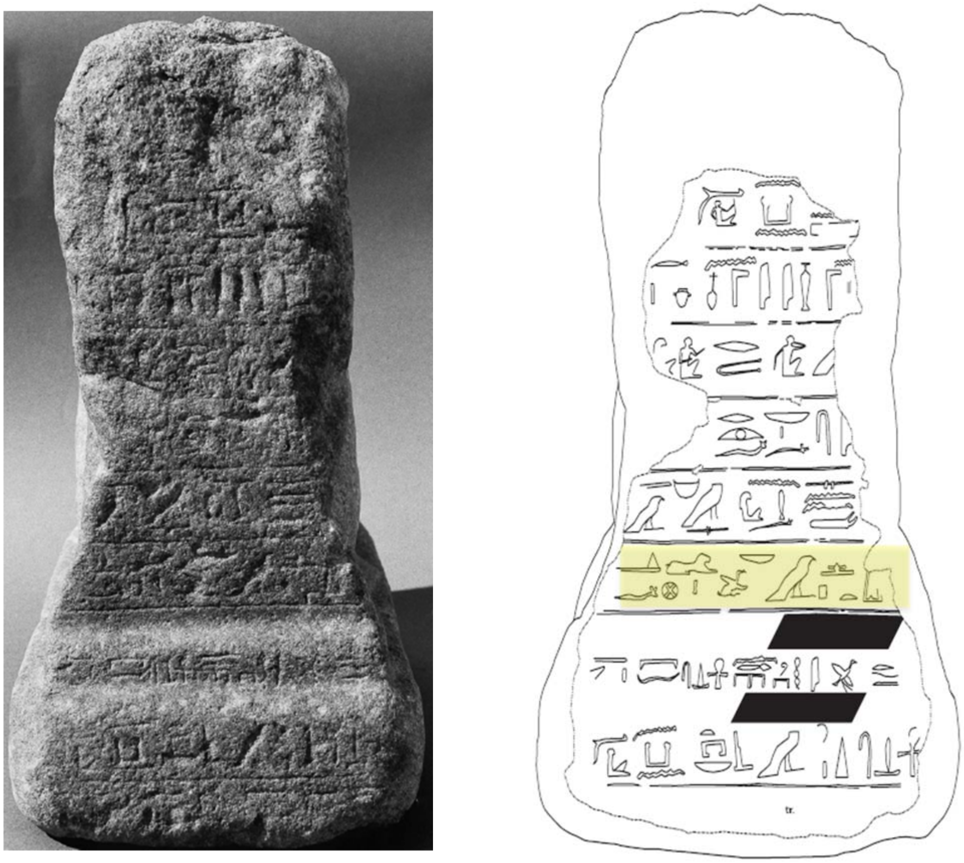

Figure 21 - The stelaphorous statue that refers to Tjaru (adapted from Maksoud & Valbelle 2005, pl. 10, fig. 13).

4.2.4.2.2 Textual instances of Tjaru

Textual documentation mentioning Tjaru provides additional information about its location and operation in the New Kingdom. The textual attestations convey that it was a settlement on the easternmost fringes of Egyptian administrative control and operated as a muster-spot for the armies of the pharaoh.[350] The royal texts of Thutmose III, Sety I, and Ramesses II note when the army departed from Egypt to go on military campaigns, they did so from Tjaru (Table 4 nos. 2, 17, 19).[351] Since the site was the last significant depot for an Egyptian campaign, we would expect to find evidence of storage areas at the site.[352]

[350] Table 4 no. 9a - b. See also EA 288 (Moran 1992, 330 – 331; Albright 1924, 6 – 8).
[351] Hayes 1951, 159 – 160
[352] Morris 2005, 38 – 39

As mentioned, the pharaonic Egyptians often equated Tjaru with the fortress of the 'Ways of Horus' and used the two terms interchangeably.[353] Interestingly, the two terms do not occur in the same text. In contrast to the 'Ways of Horus' usage, 'Tjaru' is referred to in texts to indicate a specific location. The fortress was accessible by water (Table 4 no. 25) and in one text, an administrator of the site was responsible for a canal, presumably in the vicinity (Table 4 no. 6b). The site also has a close association with the god, 'Horus of Mesen' and it is likely that the large temple excavated within Tell Heboua 1 is connected to the worship of this deity (Figure 23, Table 4 nos. 9, 12 and 29).[354] For local resources, the site had access to vineyards and fish (Table 4 nos. 12, 24, 28).

The Edict of Horemheb noted that corrupt officials were sent to Tjaru for punishment (Table 4 nos. 16a and 16b).[355] Being posted to this location was not desirable as this site's location did not provide the benefits of Egypt's position as a dominant Near Eastern power to the personnel stationed in it. However, it is unknown why any king or general would post criminals to man such a barrier against an attacking force. Burke noted that garrison duty in fringe areas often had sub-standard troops because of the tedious role of observing the surrounding countryside and that these soldiers were not assigned to military action on a large scale.[356]

[353] Morris 2005, 146 – 147
[354] Maksoud & Vabelle 2005, 2 fig. 1, 3; Bietak 1980, 62
[355] Morris 2005, 286
[356] Burke 2008, 109

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
1	Rhind Mathematical Papyrus (Pap. BM 10057-8)	15th Dynasty, Year 33 of Auserre (Apophis), (c. 1555 BCE)	Regnal year 11, second month of Shemu, Aon (Heliopolis) entered. First Month of Akhet, day 23, this southern prince (Ahmose) broke into Tjaru. Day 2[5], it was heard that Tjaru had been entered. Regnal year 11, first month of Akhet, the birthday of Seth, a roar was emitted by the majesty of this god.	Papyrus	Scribal Text	Peet 1923, 129, pl. 21	It appears that this passage was copied from the texts of Amenemhat III. Text continues with entries on the verso in the early 18th Dynasty. Refers to Amose possibly cutting off the supply from Tjaru to Hyksos rulers - the rage expressed is that of the Hyksos ruler.
2	Annals of Thutmose III	Year 22 of Thutmose III (1479 - 1425 BCE)	Year 22, fourth month of the second season, day 25, his majesty was in (passed) the fortress of Tjaru on the first campaign of victory, (made) to extend the frontiers of Egypt	Stone	Royal Decree/Carving	AEL 2, 30 Lines 5 - 10	Evidence of last major settlement before leaving Egypt and considered on a campaign.
3	Stelephorus statue	18th Dynasty (1550 - 1295 BCE)	…for the ka of the general… favoured of the gods, the prisoners… listener of people…his master did/made…chariot warrior of his majesty Nehemsouher*…An offering the king gives to Horus, lord of Tjaru, he gives… Life, Prosperity, Health in any place for the ka of the general...	Stone	Autobiographical	Maksoud & Valbelle 2005, 1 - 22, pl. X - XI.	Badly eroded and difficult to read, thus the text is broken. Perdu suggests that the name, Nehemsouher, is for a diety attested later (Maksoud & Valbelle, 2005; 20).
4	Stele of Amenmose, British Museum	Reign of Thutmose IV (1400 - 1390 BCE)	Titles (in front of Amenmose figure): Chief of Dues of Pharaoh in Memphis, Mayor of Tjaru	Stone	Autobiographical	BM 1843 Collection Database	Quartzite round-topped stela, 39 X 24 X 11 cm. Stele depicts Thutmose IV offering to Amun-Ra in upper portion while a kneeling image of Amenmose is shown in the lower portion. Purchased from A Chenevix-Trench in 1970.
5	Stele of Neby	Year 4 of Thutmose IV (1400 - 1390 BCE)	(over Neby's head) - The royal messenger in all foreign lands, steward of the Harem of the royal wife, mayor of Tjaru, child of the nursery, Neby	Stone	Autobiographical	Gardiner & Peet 1952, pl. 20 stele no.58. Björkman 1974, 34 - 51	Autobiographical stele that lists Neby's titles. It appears that he was the 'Mayor of Tjaru'. The stele depicts Thutmose IV offering to Hathor while Neby is offering behind him. Found at Serabit el Khadim in the Sinai.

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
6a	Stele of Neby - top register, Leiden V43	Thutmose IV (1400 - 1390 BCE)	Giving praise [to Osiris] and kissing the ground before Wennefer by the chief of police and troop captain of Tjaru, Neby. His sister, the lady of the house, his dearly beloved, Tauswert. The troop captain and mayor of Tjaru, Neby.	Stone	Autobiographical	Helck & Cumming 1984, Vol. 2, 319 - 320 no. 548	Text is in the top register of this stela. Second register also repeats his title of being troop captain and mayor of Tjaru as well. His son is Haremheb and has led to speculation of this being Horemheb of the 19th Dynasty. However, this is presumptuous based on one stela.
6b	Stele of Neby - main text, Leiden V43	Thutmose IV (1400 - 1390 BCE)	…an important man in his office and magnate in the palace, chief of police, overseer of the fortress of the land of Wawat, troop captain of Tjaru, overseer of the fortress, superintendent of the canal and mayor of Tjaru, Neby	Stone	Autobiographical	Helck & Cumming 1984, Vol. 2, 319 - 320 no. 548	This text might contain a direct reference to the administration of Sneh's Eastern Canal
7	Canopic Jar of Neby, No. 1, Ronneby College, Sweden	Thutmose IV (1400 - 1390 BCE)	To be recited: Isis, put your arms around what is inside you, protect Imsety who is inside you, the mayor of Tjaru, Neby, the justified	Travertine	Autobiographical	Björkman 1974, 34 - 51	Human headed canopic jar, 34 cm high.
8	Canopic Jar of Neby, No. 327, Municipal Museum at Sens, France	Thutmose IV (1400 - 1390 BCE)	To be recited: Nephthys, hide what is inside (you), protect Hepy [Hapi], the mayor Neby, the justified	Travertine	Autobiographical	Björkman 1974, 34 - 51	Baboon-headed canopic jar, 40 cm high
9a	Block Statue Fragment of Hatre, Louvre E.25550	Reign of Amunhotep II (1427 - 1400 BCE)	Dorsal Pillar: …I am a competent artisan for Upper and Lower Egypt, the work of my arms reached Elephantine and Tjaru to the north in the monuments which his majesty made for Amun in this place, for Horus, lord of heaven, lord of Mesen, for the goddess Wadjet of Imet.	Quartzite	Autobiographical	De Cénival 1965, 15 - 20	Head and parts of feet missing. 47 cm high and made from quatrzite. Artist is refering to the entirety of Egypt - showing that Tjaru is within this sphere as a border. A cartouche of Amunhotep II is on the right arm and dates the statue.
9b	Block Statue Fragment of Hatre, Louvre E.25551	Reign of Amunhotep II (1427 - 1400 BCE)	Right Flank: The divine father of Heliopolis, Hatre, the justified, he said: I did work in this temple… in the temple of Horus, lord of Mesen. I was praised, I was rewarded for this work by the good god. I've received numerous royal rewards in the form of gold, silver textiles and beautiful things of the royal palace.	Quartzite	Autobiographical	De Cénival 1965, 15 - 20	Horus, lord of Mesen' is a frequently mentioned diety in the Eastern Delta.

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
10	Talatat block, TBO 714, doorjamb	Reign of Amunhotep II (1427 - 1400 BCE)	Bodily son of Re whom he loves, [Amun]hotep, divine ruler of Heliopolis, beloved of Amen-Re who is in Tjaru	Limestone	Royal Decree/Carving	Hoffmeier & Bull 2005, 79 - 86, pl. XV.	1.03 m long.
11	Talatat block, TBO 726, doorjamb	Reign of Amunhotep II (1427 - 1400 BCE)	Bodily son of Re, [Amunho]tep, divine ruler of Heliopolis, beloved of Nut, the great one, foremost of Tjaru forever	Limestone	Royal Decree/Carving	Hoffmeier & Bull 2005, 79 - 86, pl. XIV.	
12	Wine jar sealings, Malkata, Western Thebes	Reign of Amunhotep III (1390 - 1352 BCE)	Leahy, no . XII, XIII: Wine of Tjaru Leahy, no XIV: Wine of the fortress Hayes, no. DD: Honey of the fortress Hayes, no. TT: Horus, lord of Mesen Hayes, no. UU: Bulti-fish of Lower Egypt	Pottery	Commodity Inventory	Leahy 1978, 30 - 31, pl. 15 - 16 Hayes 1951, 156 - 183	Wine sealings do not give a lot of information but they do appear to be products at least manufactured in the Eastern Delta and administered by the fortress's administration. Bulti-fish are mentioned as a product of Tjaru administration in Pap. Anast IV, 15,7 (see below)
13	Shabti of Menna, 18th Dynasty	18th Dynasty (1550 - 1295 BCE)	Given as praise from the king, for the praised one, one who is greatly trusted by the lord of the two lands, child of the nursery, commander of the troops of Tjaru, overseer of horses, Menna	Faience (?)	Autobiographical	Petrie 1935, 49 notes 29 and 47, pl. VIII	
14	Armarna Letter, EA 288, lines 41-47 , Letter of 'Abdi-Khepa to Akhenaten	Reign of Amunhotep IV (1352 - 1336 BCE)	(5-10)...Behold, I am not a mayor; I am a soldier of the king, my lord… (23-28) May the king give thought to his land; the land of the king is lost. All of it has attacked me… (41-47) Behold, Turbazu was slain in the city gate of Silu (Tjaru). The king did nothing. Behold, servants who were joined to the 'Api[r]u smote Zimredda of Lakisu and Yaptikh-Hadda was slain in the city gate of Silu. The king did nothing. [Wh]y has he not called them to account?	Clay Tablet	Royal Decree/Carving	Moran 1992, 330 - 332 Albright 1924, 6 - 8	Extracts from previous lines done for contextual meaning. The passage refers to an 'Apiru-inspired revolt. Albright noted that the passage of the Egyptian-backed governors being slain at the gates of Tjaru is hyberboyle and meant to give the passage urgency for the king to act. However, very good instance that Tjaru is known to be 'doorway' of Egypt in transit to Syria-Palestine.
15	Wine jar sealing, tomb of Tutankhamun, no. C411	Reign of Tutankhamun (1336 - 1327 BCE)	Year 5. Sweet wine of the House from Aton [from] Tjaru. Chief vinter Penamun	Pottery	Commodity Inventory	Černý 1965, 2 no. 8, 22 no. 8, pl. 2 no. 8	Neck and stopper missing

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
16a	Decree of Horemheb, lines 16 - 17, Cairo Museum, CG34162	Reign of Horemheb (1323 - 1295 BCE)	[and there is anyone who interferes](17) and he takes away the craft of any military man (or) of any (other) [per]son in any part of the country, the law shall be applied against him by cutting off his nose, he being sent to Tjaru	Stone	Royal Decree/Carving	Pflüger 1946, 260 - 276	This text is directed at those who would comandeer ships for personal use.
16b	Decree of Horemheb, lines 21 - 22, Cairo Museum, CG34163	Reign of Horemheb (1323 - 1295 BCE)	…and those who are supplying the harim as well as the offerings of all (kinds of) gods in that they deliver dues on behalf of the two deputies of the army, a[nd he]…(22) the law shall be] applied against him by cutting off his nose, he being sent to Tjaru likewise.	Stone	Royal Decree/Carving	Pflüger 1946, 260 - 276	This text is directed at those who would comandeer commodities bound for temples.
17	Tjaru representation on the northern exterior of the Hypostyle Hall at Karnak, Sety I war scenes.	Reign of Sety I (1294 - 1279 BCE)	Plate 3 - Pakanaan siege: Regnal year one (of the King of Upper and Lower Egypt, Menmaatre: the devas[tation] which the energetic forearm of Pharaoh - Life prosperity, health - made (of) [the] Shasu enemies, from the fortress of Tjaru to the Canaan. Over the fortress-image: The For[tress of Tjaru]	Stone	Royal Decree/Carving	University of Chicago (Epigraphic Survey) 1986, 5 - 8, 16 - 22	Royal text that informs the reader of leaving Tjaru for military campiagn.
18	400 Year Stele, Cairo Museum, CG60539	Reign of Ramesses II (1279 - 1213 BCE)	...May you (Seth) give a happy lifetime in following your will for the spirit of the hereditary noble, city governor and vizier, royal scribe, master of the horse, overseer of desert lands, commander of the fortress of Tjaru, Sety, the justified…Now there came the hereditary prince; the mayor of the city and vizier, fan-bearer on the right hand of the king, troop captian, overseer of foriegn countries, overseer of the fortress of Tjaru, chief of police, royal scribe, master of the horse, conductor of the feast of the Ram-the-Lord-of-Mendes, the high-priest of Wadjet, she-who-opens the two lands, and overseer of the prophets of all gods, Sety, the justified. Over another figure: Son of the hereditary noble, city governor and vizier, troop captain, overseer of the desert, fortress commander of Tjaru, royal scribe, master of the horse, Pramesses, the justified, born of the lady of the house, chantress of Pre, Tiu, the justified.	Stone	Autobiographical	Montet 1933, 191 - 215 Goedicke 1966, 23 - 39.	Seth receiving homage from an officer named Sety who stands behind Ramesses II (this officer is not to be confused with the 19th Dynasty king). There is debate over what the '400 years' signifies. It has traditionally been attributed to the explusion of the Hyksos. However, Goedicke argued that '400' commemorates the establishment of a prominent temple of Seth in the Delta. The stele does mention two commanders of Tjaru, Sety and Pramesses, but it is unclear if the role was hereditary.

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
19	Battle of Kadesh - Poem version P29 - 32	Reign of Ramesses II (1279- 1213 BCE)	Now then, his majesty had prepared (8) his infantry, his chariotry, and the sherden of his majesty's capturing, whom he had carried off by the victories of his arm, equipped with all their weapons, to whom the orders of combat had been given. His majesty journeyed northward, his infantry and chariotry with him. He began to march on the good way in Year 5, second month of the third season, day 9, (when) his majesty passed the fortress of Tjaru.	Stone	Royal Decree/Carving	AEL 2, 11 - 12 Gardiner 1960, 7 - 8	Poem version that demonstrates that Tjaru is the end of Egypt proper and the entry/exit of the country. Interestingly, the previous statements allude to the king and his troops as having been already equipped (or that he had captured the sherden previously with all their weapons intact).
20	Golanischeff Scarab, Moscow	Reign of Ramesses II (1279 - 1213 BCE)	Usermaatre Setepenre Ramesses (II) Mery-Amun, who provides for Tjaru, and (is) given life like Re forever.	Stone	Royal Decree/Carving	KRI I, 781 no. 282	This epithet is alluding to Ramessses II's skill in supplying the inhabitants of Tjaru. Due to the low agricultural yields in the vicinity, it is unlikely that Tjaru could have operated without the central administration.
21	Stela of Huy, Berlin Egyptian Museum, no. 17332	19th Dynasty (1295 - 1186 BCE)	…the troop captain, the overseer of horses, the deputy of his majesty in the chariotry, the troop captain of Tjaru, the royal messenger to every foreign land, the one who comes from Khatti, who brings its great one; a person who can report where it (Khatti) is, has never existed, the royal scribe, Huy.	Stone	Autobiographical	Habachi 1961, 221	80 cm high, 65 cm wide. Provenance of this stela is not known but Habachi assumes it came from northern Nubia. Habachi argued that Huy escorted the Hittite princess, Mahornefrure, to the Egyptian royal capital at Piramesses.
22	Pap. Anastasi III, Lines 1.9 - 1.11	Reign of Merenptah (1213 - 1203 BCE)	Fan-bearer on the right of the king, first charioteer of his majesty, liutenant-commander of the chariotry, king's envoy to (1,10) the princes of the foreign lands of Khor starting from Tjaru to Iupa…to the princes of the Asiatics, (1,11) Amenemope.	Papyrus	Scribal Text	Caminos 1954, 69.	Epithets and titles of a scribe's master.
23	Pap. Anastasi III, Line 6.5	Year 3 of Merenptah (1213 - 1203 BCE)	...Arrival effected by the captains of troops of the wells of Merenptah-hotphima'e, life, prosperity, health, which are in the hills, in order to investigate (matters) in the fortress which is at Tjaru.	Papyrus	Scribal Text	Caminos 1954, 108	Extracts from a journal of a border official.

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
24	Pap. Anastasi IV, Line 15.7	Reign of Sety II (1200 - 1194 BCE)	...and buri-fish of She, shena-fish of Mi-wer, gutted bulti-fish of Tjaru.	Papyrus	Scribal Text	Caminos 1954, 200	Command to make preparations of the pharaoh's arrival.
25	Pap. Anastasi V, Lines 24.6 - 25.2	Reign of Sety II (1200 - 1194 BCE)	…Look, we (24.7) passed the fortress of Ramesses-Meryamun, Life, Prosperity, Health, which is at Tjaru in regnal-year 33, second month of (24.8) Shemu, day 23, and we shall go to empty the ships at The-Dwelling-of-Ramesses-Meryamun, Life, Prosperity, Health; reach him yourselves. Let (25.2) the butler of Pharaoh, Life, Prosperity, Health, write to us about all that we are to do.	Papyrus	Scribal Text	Caminos 1954, 266	Transport of 3 stelae to northern Sinai, possibly Tell el-Borg (see Section 4.2.5.2).
26	Pap. Lansing, Lines 9.9 - 9.10	20th Dynasty (1186 - 1069 BCE)	He recieves the corn-ration when he is released from duty, but it is not pleasant when it is ground. He is called up to Khor, and he does not spare (9.10) himself (?). There are no clothes and no sandals, and the weapons of warfare are assembled at the fortress of Tjaru.	Papyrus	Scribal Text	Caminos 1954, 401	Lament of the life of a soldier (genre text).
27	Onomasticon of Amenope, Col. 419	20th Dynasty (1186 - 1069 BCE)				Gardiner 1947, 202	
28	Hieratic Ostraca on Wine Jars		no. 163: overseer of the estate of Amun in Tjaru no. 189: life, prosperity, health - overseer of the estate of Amun in Tjaru no. 203: ...Tjaru ka… no. 211: Year 7…in Tjaru…	Pottery		Spiegelberg 1898, pls. XXI no. 163, XXIV no. 189, XXV no.203 and 211	Spiegelberg thought that these fragments, found in the brick chambers around three sides of the Ramesseum, housed a scribal school
29	Inscription from the temple of Dendera	Roman Period (30 BCE - 395 CE)	The foremost (lit. 'first') secret image of the Ba of Horus, lord of Mesen and lord of Tjaru has come before you, oh Osiris; it defends Egypt, it protects (its) monuments and it throws Seth out of Baqet (Egypt).	Stone	Royal Decree/Carving	Cauville 1997, 89, 160, 190, 288, 337	Text displays association of 'Horus ofMesen' with Tjaru. Seth in the Greco-Roman periods was demonized and percieved as a diety of malevolence, thus he is referred to being 'thrown out' of Egypt.

Table 4 - Instances of 'Tjaru' in Texts.

No.#	Text Name	Dated to	Instance of Tjaru	Medium	Type	Reference	Notes
30	Sarcophagus of Padiamenemope, El Kantarah	Roman Period (30 BCE - 395 CE)		Stone	Autobiographical	Chaban 1912, 69 - 75	Sarcophagus has titles of the owner being a "prince of Tjaru"
31	Sarcophagus of Henti, El Kantarah	Roman Period (30 BCE - 395 CE)		Stone	Autobiographical	Chaban 1912, 69 - 75	Sarcophagus has titles of the owner being a "prince of Tjaru" and also refers to Horus, lord of Mesen in being in close association with it.

4.2.4.2.3 The image of Tjaru in the Battles Scene of Sety I

An image of this fortress was rendered in the Sety I battle scenes (Figures 17 to 18 and 22).[357] It is depicted differently than other fortresses in the reliefs. As mentioned, the fortress is divided by a fresh-water stream or canal (as evidenced by the inclusion of crocodiles) and the two sides are connected by a causeway or bridge. The doorways of the fortress are depicted with Amarna 'Window-of-Appearance' traits, possibly alluding that this fortress, being located on Egyptian soil, might have been an administrative centre rather than a 'frontier outpost'.[358] Furthermore, along the bottom-end border of the register of the Sety I scene, is a corresponding water body filled with saltwater fish, suggesting that the site was located close to the Mediterranean Sea.

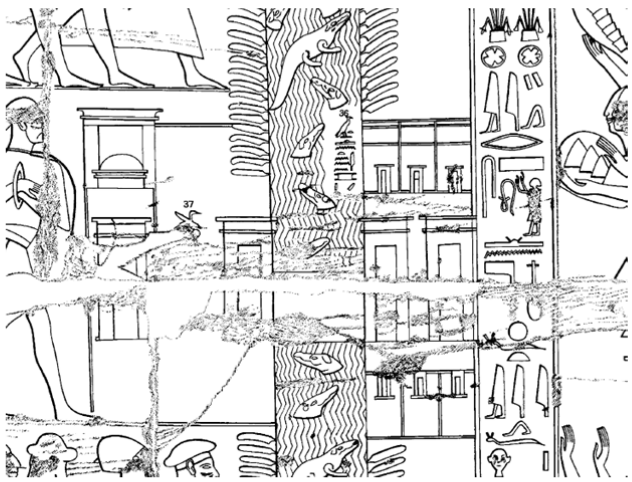

Figure 22- The image of Tjaru and the *t3-dnit* in the Shasu Register (University of Chicago (Epigraphic Survey) 1986, pl. 6).

4.2.4.3 Physical Location

Tell Heboua is located 4 km north-west of Kantara Sharq and was asserted by Hoffmeier and Maksoud to be the ancient site of Tjaru.[359] Along with this information from the Sety I scenes, a few authors claimed that there is a similarity with the archaeological site of Tell Heboua.[360] As mentioned, the site is a cluster of archaeological sites (Tell Heboua 1 – 4) around a depression to the south, the now-dried-up lagoon (Figure 7). Maksoud agreed with

[357] Chicago Ep. S. 1989, pl. 6
[358] Wernick 2011, 160
[359] Hoffmeier 2004b, 85 – 86; Al-Ayedi 2000, 95; Maksoud 1998b, 61
[360] Bull & Hoffmeier 2005, 83; Maksoud & Valbelle 2005; Maksoud 1989, 184

the suggestion that the Pelusiac did flow this far east during the New Kingdom.[361] Therefore, when the site operated in antiquity, it would have served as a mooring area for water traffic and possible traders from the Near East.[362] The remains of a crocodile found in the depression confirmed that it was a lagoon in antiquity.[363] Secondly, the main centre of the site, Tell Heboua 1, appears to have a sister-site across the depression to the south, Tell Heboua 2. However, to date, no evidence of a harbour, a bridge or a bridge-like construction was found in the depression between the two sites. The physical similarities of this site with the image of Tjaru in the Sety scenes seem compelling. The 'tell' of the site is not high, rising 1 to 3 metres above sea level.[364]

4.2.4.4 Phases and Dates

4.2.4.4.1 Epigraphic Remains from Tell Heboua and the Surrounding Area

Tell Heboua 1 exhibits remains from the Middle Kingdom to the end of the New Kingdom. The majority of the dating is based on the epigraphic remains discovered at the site which have not been published in their final form. The New Kingdom material has been well published while the remains from the late Middle Kingdom and the SIP have not been thoroughly presented. The Middle Kingdom remains at Tell Heboua have only shown a vase fragment with the name of Senrusret I and a cylinder seal dating to Senrusret II.[365]

Although Tell Heboua has levels dating to the SIP, they have not been presented in detail. Maksoud and Valbelle described two limestone stelae that were found inscribed with the name Aasehere Nehesy, a possible royal personage from the 14th or 15th Dynasty.[366] In addition, the remains of equids, structures and tombs have been dated to the SIP but were only briefly noted.[367]

The remains from the storage areas in the north of Tell Heboua 1 attest to the presence of some activity of 18th Dynasty pharaohs. The storage magazines' jars had royal seals of Thutmose I, Hatshepsut and Thutmose III.[368] A limestone stela uncovered during excavation

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[361] Maksoud 1998a, 121; 1989, 186, ft. 17
[362] Björkman 1974, 49
[363] Al-Ayedi 2000, 95, pl. XII; Maksoud 1998a, 28; Marcolongo 1992, 23 – 31.
[364] Maksoud 1998a, 23; 1987, 15.
[365] Maksoud & Valbelle 2005, 4
[366] Maksoud & Valbelle 2005, 4 – 11 it is unclear to which dynasty this individual should be attributed.
[367] Maksoud & Valbelle 2005, 3
[368] Maksoud & Valbelle 2005, 11

was inscribed with the name of Thutmose I. Door jambs, dating to the reign of Amunhotep II, were found at Tell el-Borg and refers to Tjaru.[369] Neby (reign of Thutmose IV, Table 4 no. 5 – 8), Paramesses and Sety (reign of Ramesses II, Table 4 no. 18) served during the New Kingdom and possessed titles that indicate that Tjaru was a base of their administration.

A limestone stela has the epithet, *nṯr nfr wḫ3 n* [...] "The perfect god, column of the [sky...]", indicating a 19th Dynasty date.[370] Sety I is the most frequently attested royal name at the site. A cartouche of Sety was found on a door jamb in the southern part of the site in association with a large building (BAT II, see below).[371] Attesting to the scarcity of stone in the area, an inscribed column drum of Sety I was found at Tell el-Herr where it was reused as a millstone. Maksoud and Valbelle noted that the drum had been re-inscribed with the name of Sety I from a previous king, however, the degraded inscription made it impossible to ascertain which ruler.[372] In addition, the central part of a limestone lintel was found in the excavations of Tell Heboua 2 bearing the name of Sety I which Maksoud and Valbelle dated to Year 2 of his reign when the first 19th Dynasty 'renovation' of the site took place.[373]

4.2.4.4.2 Brick Sizes

There are two major brick sizes at Tell Heboua which represent at least two major building phases. The initial fortification was constructed of bricks measuring 35 x 17.5 x 8.5 cm while the later constructions used bricks of larger dimensions of 40 x 19 x 10 cm.[374] Both sizes correlate with the brick sizes found in the architecture of Bir el-'Abd (44 x 22 x12 cm) in the Sinai and Tell el Dab'a (37.5-39 x 17.5-18 x 10 cm) in the eastern Delta.[375] In the southern Levant, the initial phase of Deir el Balah's bricks measure 40 x 20 x 12 cm.[376] Brick sizes from Egypt also show similar dimensions. Bricks dating to Amunhotep II at the Temple of Amun at Karnak measure 39 x 18.5 x 12 cm.[377] Bricks found in the initial surveys at Qantir measure 37 x 17 x 10 – 12 cm and the two types that occur at Medinet Habu (20th Dynasty) measure 37 x 18 x 11 cm and 43 x 21 x 12 cm.[378]

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369 Bull & Hoffmeier 2005, 80
370 Maksoud & Valbelle 2005, 14
371 Maksoud & Valbelle 2005, 15 – 16
372 Maksoud & Valbelle 2005, 16
373 Al-Ayedi 2006, 35; Maksoud & Valbelle 2005, 16
374 Maksoud 1998a, 110. The brick sizes of Tell Heboua 2 are 38 x 18 x 8 cm (Al-Ayedi 2006, 36).
375 Oren 1973a, 112; Bietak 1991, 39, 42
376 Brandl 2010, 251
377 Hayes 1951, 164
378 Brandl 2010a, 251; Bietak 1975, 39; Hölscher 1951, 14, 18

The bricks of Tell Heboua are brittle and present challenges to archaeologists. The smaller bricks of the first phase utilised a low quantity of straw temper. Since the area had a lower agricultural productivity in the eastern Delta than the western Delta, if stocks of straw were imported, they would have been seen as a valuable commodity for feeding livestock.[379] The naturally occurring shells in the local mud served as an alternative brick-aggregate for sites in this region.[380] Sand would have also assisted mudbrick composition for load-bearing walls.[381] As a possible source for this sand, Maksoud pointed out evidence of 'mining' depressions south of the tell of Tell Heboua 1. He deduced this activity from the large square hole at Deir el Balah as it was a source for materials for constructions in the Amarna Period.[382] Much like Tell el-Dab'a, the brick colour varies between a yellow to a dark grey based on the sand to mud ratio.[383]

4.2.4.4.3 Overall Phases at Tell Heboua

Maksoud presented the major levels of Tell Heboua 1 as follows:[384]

Level 1: Greco-Roman period, the site was used as a burial ground

Level 2: Rebuilding of the wall in the north-western sector of the site along with the establishment of magazines in Zone B. Maksoud attributed the building activity to the reign of Sety I based on epigraphic evidence and the Karnak battle scenes suggesting that this king revitalised the site for future campaigns into the Levant.

Level 3: The fortification of the Tell Heboua 1. Maksoud observed that this took place during the 18th Dynasty. However, the pharaoh involved in this construction project was unknown. It was likely Thutmose III because of his nearly seasonal campaigns into the Levant. The large buildings are laid out on orthogonal plan and suggest an expansion onto 'virgin' soil.

Level 4a: Transitional phase between the late SIP and the 18th Dynasty. The houses constructed during the SIP were spaced haphazardly. Maksoud claimed that there is similarity to Tell el Dab'a's Level D/2 (MBA IIC). There is no evidence of a destruction

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[379] Maksoud 1998a, 110
[380] Emery 2011, 1; Maksoud 1998a, 31, 109 ft. 64
[381] Maksoud 1998a, 109 – citing Spencer 1979, 3
[382] Issar 2010, 289 – 290; Killebrew et al. 2006, 97 – 119; Maksoud 1998a, 47
[383] Bietak 1991, 32
[384] Maksoud 1998a, 35 – 40

level at the site but was possibly abandoned in the wake Ahmose's campaigns as recorded in the verso of the Rhind Mathematical Papyrus (Table 4 no. 1).

Level 4b – c: Hyksos occupation indicated primarily by the presence of 'warrior burials' under the 18th Dynasty curtain wall. The individuals were interred with weaponry, a common practice for Levantine cultures during the MBA IIB-C Period.[385] Fragments of classic Kerman ware were found in the burials that Maksoud interpreted as evidence of a communication link between the Kerman peoples of Nubia and the Hyksos.

Level 5: Initial Hyksos occupation of the site's eastern portion.

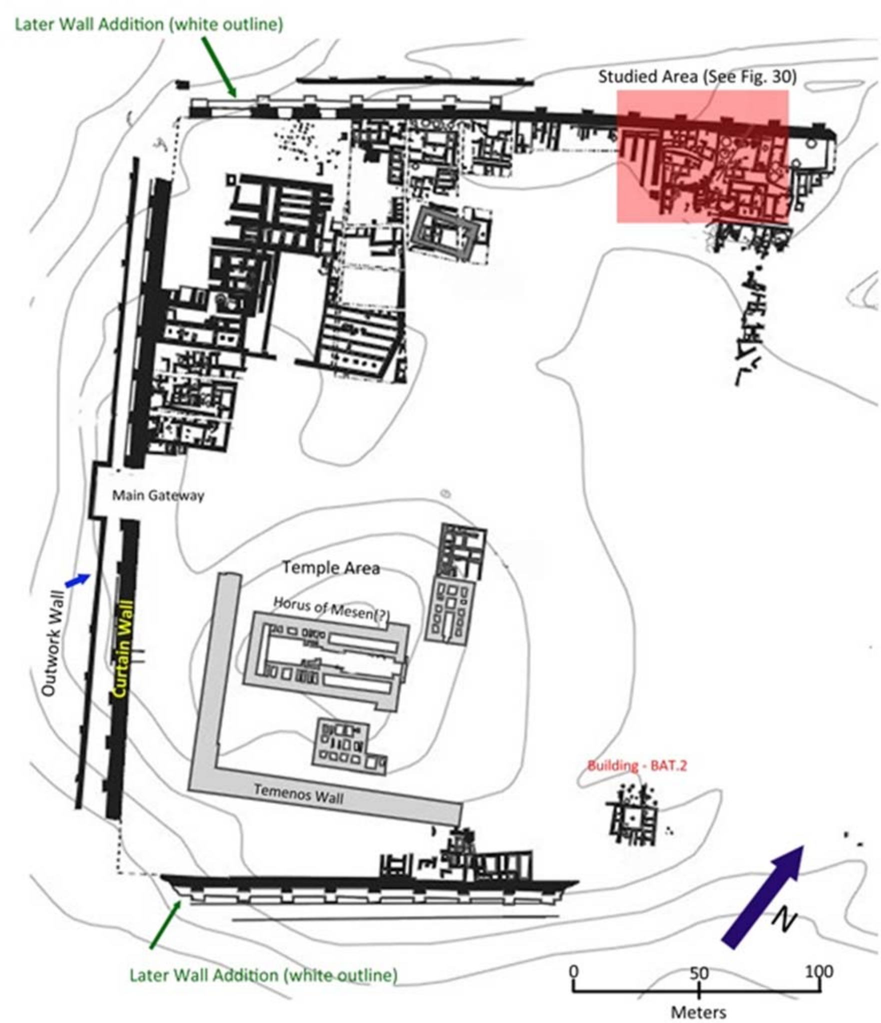

Figure 23 - Tell Heboua 1 (adapted after Maksoud & Valbelle 2005, fig. 1).

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[385] Bietak 1991, 33, 39; Philip 1989, Vol. 1, 149 – 161

4.2.4.5 Architectural Features

4.2.4.5.1 Fortifications

As discussed above, parts of Tell Heboua 1 are completely destroyed (Figure 23). The destruction of the eastern side was caused by human activity while the western corners did not preserve due to erosion. Therefore, we can only assume how it was laid out in antiquity.[386] A further blow to the site was the enlargement of the Suez Canal in 1976-1979 and illicit digging.[387] However, given that Haruba, Deir el Balah, and Bir el-'Abd all exhibit a rectilinear plan, Maksoud's reconstruction of a roughly square-shape has some supporting evidence.[388] The overall layout of Tell Heboua 1 is similar to Vogel's classification of a 'river shore fortification' which is used in installations that secure an area of the Nile that could monitor traffic and hold a strategic location.[389]

The fortifications of Tell Heboua 1 are notable for its multiple trace system of defence. The two enclosure walls at Tell Heboua are a unique feature in fortifications of the eastern Delta and north Sinai.[390] The walls were built entirely of mudbricks measuring 40 x 20 x 10 cm and 35 x 17.5 x 5 cm and they vary in their preservation height from 10 cm in one area, up to 170 cm in another.[391] The two sets of walls were confirmed in the northern section for a stretch of 400 metres but it may be twice that length.[392] The western wall segment was cleared for 300 metres. Maksoud noted that it was difficult to determine the exact boundaries of the fortress as there were no corner-areas preserved. However, it is clear that Tell Heboua 1 was the largest fortified site in the eastern Delta.[393]

The northern wall is punctuated by ten rectangular buttresses at an interval of 14.9 metres.[394] These buttresses measure 4.45 m wide and 2.2 metres along their flanks.[395] The foundation of the wall was built upon a layer of sand.[396] There is a divergent opinion on how high these buttresses reached because the parapet of the wall has not been preserved.

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[386] Maksoud 1998a, 45
[387] Maksoud 1998a, 30 – 31; 1989, 177; 1987, 15
[388] Maksoud 1998a, 45
[389] Vogel 2004, 148
[390] Maksoud 1998a, 112
[391] Vogel 2004, 119; Maksoud 1998a, 45
[392] Maksoud 1998a, 111
[393] Maksoud 1998a, 111
[394] Maksoud 1998a, 45 – 46
[395] Al-Ayedi 2000, 114.
[396] Al- Ayedi 2000, 114

Emery's reconstructions of the fortress of Buhen in Nubia extended the buttresses to the parapet of the wall, making an archers' platform.[397] In contrast, Vogel pointed out that the buttresses should not be seen as archers' platforms due to their small size and contemporary evidence suggesting that buttresses in fortresses did not reach the top of the parapet. Vogel argued that a fortification scene dating to Montuhotep II shows that the external buttresses tapering towards the parapet.[398] In addition, Vogel pointed out that the siege-scenes from Beni Hassan do not display external buttresses in profile but only timber balconies and a slanted talus (Figure 24). The buttresses, presumably reaching up to the top of the wall, would have represented a material and labour intensive practice that could only provide a platform large enough for two archers. In Vogel's view, therefore, it is unlikely that buttresses would have reached the parapet. Structural stability for a fortification wall can be achieved with buttresses only tapering to two-thirds of the wall's total height.[399]

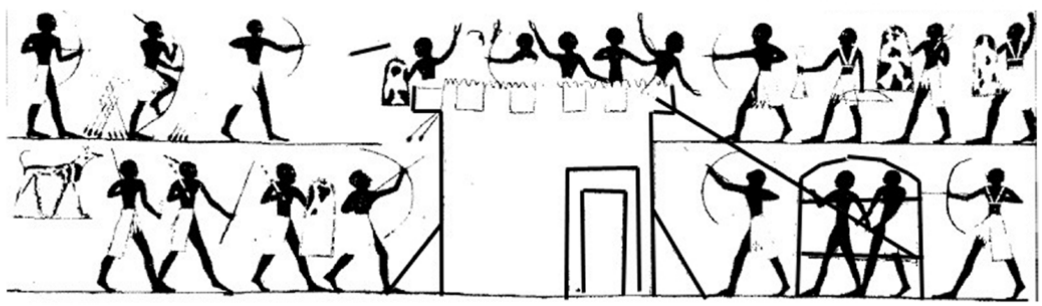

Figure 24 – Fortress with a sloping talus, tomb of Khety (BHT 17), 12th Dynasty (Newberry 1893, Part 2, pl. 15).

We should examine both the evidence from Nubia and artistic examples to reconstruct the parapet of Tjaru. Buhen's external buttresses are the same height as the remaining 11 metre-high curtain walls; they do not taper off sharply as Vogel has suggested in her reconstruction drawings.[400] Comparable Nubian New Kingdom levels at fortified sites (Semna, Kumma, Uronarti, and Shalfak) display external buttresses in a similar manner.[401] This, when taken with the artistic depictions of a model of an orchard with an exterior, crenellated wall (Figure 25), a model of an exterior wall of the Temple of Ptah at Memphis (Figure 26) and a depiction of a temple wall from the Temple of Khonsu at Karnak, all seem to indicate that Vogel's postulation is erroneous.[402] Therefore, the matter should not be considered resolved

[397] Emery et al. 1979, pl. 11; Emery 1960, pl. 2
[398] Vogel 2004, 121
[399] Vogel 2004, 122.
[400] Vogel 2010a, 24; Emery et al. 1979, pls. 84 E, 85 A, 86 E, 89 C – F
[401] Dunham & Janssen 1960, pls. 4 – C, 43 – B; Dunham 1967, pls. 6 – A, 53 – A
[402] Kemp 2006, 253 fig. 92; Eyre 1994, 66, pl. 8; Chicago Ep. S. 1979, pl. 53; Jacquet & Wall-Gordon 1958, 164;

until more evidence comes to light. The top of the wall presumably was crowned with semi-circular, mudbrick merlons to provide cover for the defenders on the wall-walk.[403]

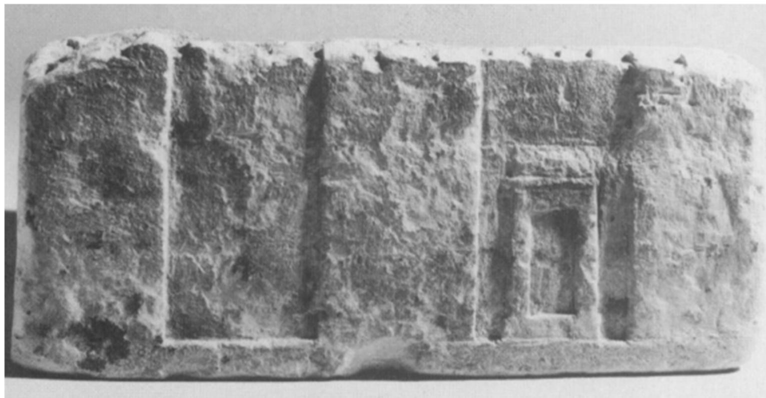

Figure 25 - Crenelated wall of a model orchard, BM EA36903 (Eyre 1994, pl. 8).

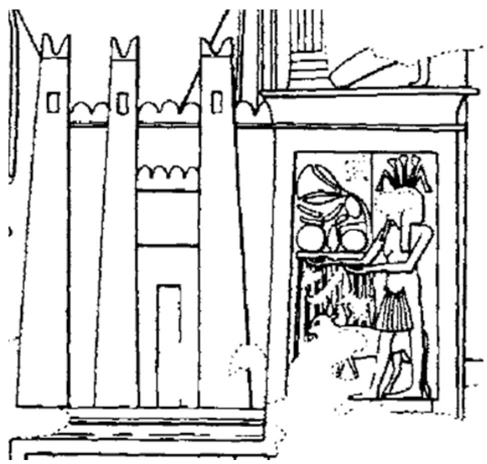

Figure 26 - Depiction of the exterior of the Temple of Ptah at Memphis, Reign of Herihor (The University of Chicago (Epigraphic Survey) 1979, pl. 53).

The timber struts as seen in Nubia fortification walls were thought to have been a stabilizing feature.[404] Interestingly, the fortified walls of Tell Heboua 1 lack them, possibly due to the area's scarcity of lumber resources. The thickness of the main curtain wall varies in the northern section. The north-east span is 4 metres thick while the north-western span is 7 metres with an additional stabilizing wall. It appears the addition to the main curtain wall was not uniform around the site as these walls are only detected along the north and south stretches of the curtain wall. The 'new' buttresses had the same dimensions as the original

[403] Golvin & Hegazy 1993, pl. 3
[404] Emery et al. 1979, 22; Dunham 1967, 21, pl. 52 – B; Dunham & Janssen 1960, 114, pl. 4 – B

ones. This additional wall was added as a preventative measure against collapse because of the irregularity of the northern terrain; it should not be seen as a feature that had to be expanded to the rest of the curtain wall.[405] This section extends for 90 metres with 5 buttresses where it abruptly ends due to modern disturbance.[406]

Burke noted that in fortification walls, it has generally been assumed that the curtain walls stood at a height of two storeys because of window depictions that are on some representations (Figures 17 and 44 – II).[407] Looking at other walled sites in Egypt, the Inner Fortification Wall at Buhen was preserved to a height of 11 m with a basal width of 5 m, but the original top of the parapet was denuded.[408] The wall at Medinet Habu is preserved to 15.2 m (presumed to be 18.4 m in antiquity) with a basal width of 6 m and a parapet wall-walk width of 2 metres.[409] Outside Egypt, Shechem's 'City Wall A' had a preserved height of 10 metres and the walls of Nineveh were 12 metres high.[410] The walls of Tell Heboua 1's main curtain wall can be seen to fall within this 10 – 15 metre range based on the wall's thickness. However, we should not place too much stock in this estimate as ethnographic studies in Yemen's Wadi Hadramut have shown that some mudbrick apartments can reach a height of 30 metres with walls that only have a base less than 1 metre thick.[411]

The outer wall was built parallel to the curtain wall and can be classified as an 'outwork wall'. This exterior wall, measured at 1.20 metres thick and preserved up to 80 cm high, is not as massive but still would be a considerable obstacle for an attacking force to overcome. The mudbricks used in this wall were from the first major construction phase and it also had buttresses.[412] As indicated in the north-eastern portaion, the distance between this wall and the curtain was 7 metres. With the addition of the stabilizing wall of the later phase, this distance was decreased to 4.5 metres. There is no evidence of any structure between the two walls.[413] Perhaps this area was kept clear as an *intervallum* or walkway so defenders could respond and move if they were under attack.[414] Maksoud claimed that Tell Heboua, having double-walls, is representative of art styles displaying fortifications of the 19th Dynasty.[415] However, Maksoud presented locations that are all Levantine locales and ignored the fact

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405 Maksoud 1998a, 45 – 46; 1989, 179
406 Maksoud 1998a, 46; 1989, 179
407 Burke 2008, 60
408 Emery et al. 1979, 4, pl. 89 C – F
409 Cavallier 2008, 39 – 51; Seguin 2007, 109 – 111; Hölscher 1951, 1
410 Wright 2002, 94 – 95; Stronach 1997, 310
411 Burke 2008, 61 citing Damluji 1992. See also, Vogel 2010b, 422
412 Maksoud 1998a, 46
413 Maksoud 1989, 179
414 Hölscher 1951,14
415 Maksoud 1998a, 112

that the Sety I battle scenes display Tjaru as distinctly different in its elements.[416] We should refer to the 'distance-to-doorway' principle for an explanation on why Sety I's artistic depiction of Tjaru appears so different from other sites in the northern Sinai.[417]

The outworked wall at Tell Heboua presents an initial barrier to an attacking force. Maksoud argued against Clarke's claim that walls of this type usually employed a fosse behind them to put the enemy in an 'awkward position' in attacking the main curtain wall.[418] However, Clarke was making reference to Nubian fortifications that had been excavated thus far and was not inferring that this is a general rule that should be applied to all fortresses.[419] For architectural parallels of this outworked wall, Maksoud cited Abydos and Hierakonpolis which have a double-enclosure wall.[420] At both sites though, the enclosures are constructed of an undulating wall which Spencer has shown was only used in temple architecture and does not typically represent construction in military architecture.[421]

It is doubtful that a fosse would have been a viable option for defence in this area because the terrain of Tell Heboua was not much above sea-level and the walls were constructed of mudbricks. It would likely have led to further damage to the walls and compromised their integrity.[422] Instead, we should consider that the interior buildings (at least along the north section in Zone B) were built right up against the main curtain wall. Therefore, it is more likely that the interim space between the main curtain wall and the outworked wall acted as an *intervallum* or a space that could facilitate travel of defenders.

On the western side of the site, the pattern of the two nearly parallel walls continued. The bricks in these walls have a similar divergence, showing two phases of building.[423] The main wall maintains its original thickness of 4 metres and is preserved to a height of 1.5 metres. There are 6 buttresses on either side of the main gateway (in the western wall). The outworked wall has a thickness of 1.2 metres and it was built directly on sand. Its preserved height varies between 60 and 90 cm.[424]

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416 Maksoud 1998a, 112, ft. 73
417 Wernick 2011, 157, fig. 1 & 2
418 Maksoud 1998a, 112, ft. 79
419 Clarke 1916, 159 – 160
420 Maksoud 1998a, 112, ft. 778
421 Spencer 1979, 114 – 116; Dunham & Janssen 1960, pls. 4 c, 41 a
422 Maksoud 1998a, 113
423 Maksoud 1998a, 46
424 Maksoud 1998a, 46

In the southern section, Maksoud was only able to identify a small section of the main curtain wall, with a buttress for the 1998 publication.[425] This publication confirmed that the wall was 4 m thick, like the rest of the main curtain wall in other areas. In the 2005 publication with Valbelle, Maksoud presented this area as possessing a fortified wall over 100 metres long which exhibited a similar initial construction followed by a reinforcing wall that had a mirror-image of the external buttresses.[426] Unfortunately, the publication concentrated on the epigraphic finds from Tell Heboua and no further details were given.

The main gateway of Tell Heboua was located on the western wall of the site, facing the interior of the Delta. One could argue that the gateway, being the weak point of a fortification, would naturally stand at the back of a fortress if one was to charge the city from the Sinai-side. However, Burke pointed out that the placement of gateways is not significant in a defensive system's layout.[427] Similarly, Vogel noted that gateways were the most vulnerable point of any fortification system but their elaboration (with flanking towers or *ressaults* and possible inner chambers) made up for this deficiency.[428] There is the possibility that Tell Heboua 1 had multiple gateways (especially with such a large site) which have not preserved. Considering Burke's and Vogel's comments though, one cannot make assumptions that the direction of the gateway had tactical considerations.

The main gateway's entrance was 12 metres wide and was located in the centre of the western wall.[429] The passageway between the curtain wall was slightly elevated and paved with mudbricks. The bricks were of the later phase; it is probable that the initial entrance experienced wear from traffic and this paving was to prevent a 'passage furrow'.[430] The brick flooring was extended on both sides of the passage. The walls of the gateway are assumed to have had limestone veneers as they are more durable to prevent wear.[431] A large piece of limestone veneer, measuring 130 x 48 x 16 cm, was found not in situ but 15 metres north-east of the entrance. Maksoud asserted that limestone found in this area of the western gateway was probably used for foundations, floors and the sides of the doorway.[432] Like the

[425] Maksoud 1998a, 47
[426] Maksoud & Valbelle 2005, fig. 1
[427] Burke 2008, 67 *contra* Maksoud 1998a, 113; 1989, 181
[428] Vogel 2004, 124
[429] Maksoud 1998a, 113
[430] Maksoud 1989, 181
[431] Emery 2011, 3; Maksoud 1998a, 110
[432] Maksoud 1998a, 48 "Des pierres en calcaire ont été retrouvées à l'entrée ouest de la forteresse; elles servaient probablement de fondations, de pavements, et de seuil de la porte, ou encore comme support."

curtain walls, timber was not used in thresholds and corners as the Egyptians employed at Nubian fortresses.[433]

On the eastern edge of the site, a formation of clay was found. It was 2 metres high and thought by Maksoud to be a 'glacis'.[434] However, this feature did not have a 'sandwich' construction that is seen at Levantine sites but was a solid block of clay directly built upon a sand foundation.[435] Similarly, Zawiyet Umm el-Rakham has this feature on the north-eastern corner of the main curtain wall.[436] Rather than functioning as a part of the fortifications, this feature likely was constructed as a preventative measure against erosion since it is located near the depression.[437]

As mentioned, a re-examination of Tell Heboua 2 took place in 2007. Maksoud's team found that Al-Ayedi's analysis was faulty in that they uncovered more extensive fortifications than was originally reported (Figures 27 to 29). Although a specific publication has not discussed the architectural remains, it clear that there is a central square structure with magazine-halls along the main curtain wall (to the east and west). The entire complex covers 110,000 m^2.[438] The curtain wall was 13 – 14 metres thick and had a series of buttresses on its façade.[439]

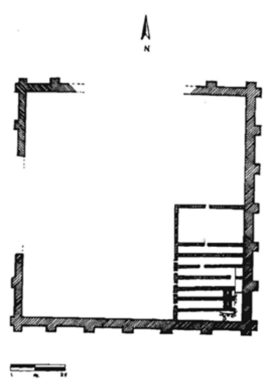

Figure 27 – Al-Ayedi's depiction of the fortified remains of Tell Heboua 2 from the 1999 excavation (Al-Ayedi 2006, fig. 2).

433 Dunham 1967, 21
434 Maksoud 1998a, 47
435 Kempinski 1992a, 71 – 72, 316 *contra* Vogel, 2004, 127
436 Snape, personal communication, Sept. 2009
437 Burke 2008
438 Maksoud & Valbelle 2011, 1
439 Maksoud & Valbelle 2011, 1; Hoffmeier 2008, 9

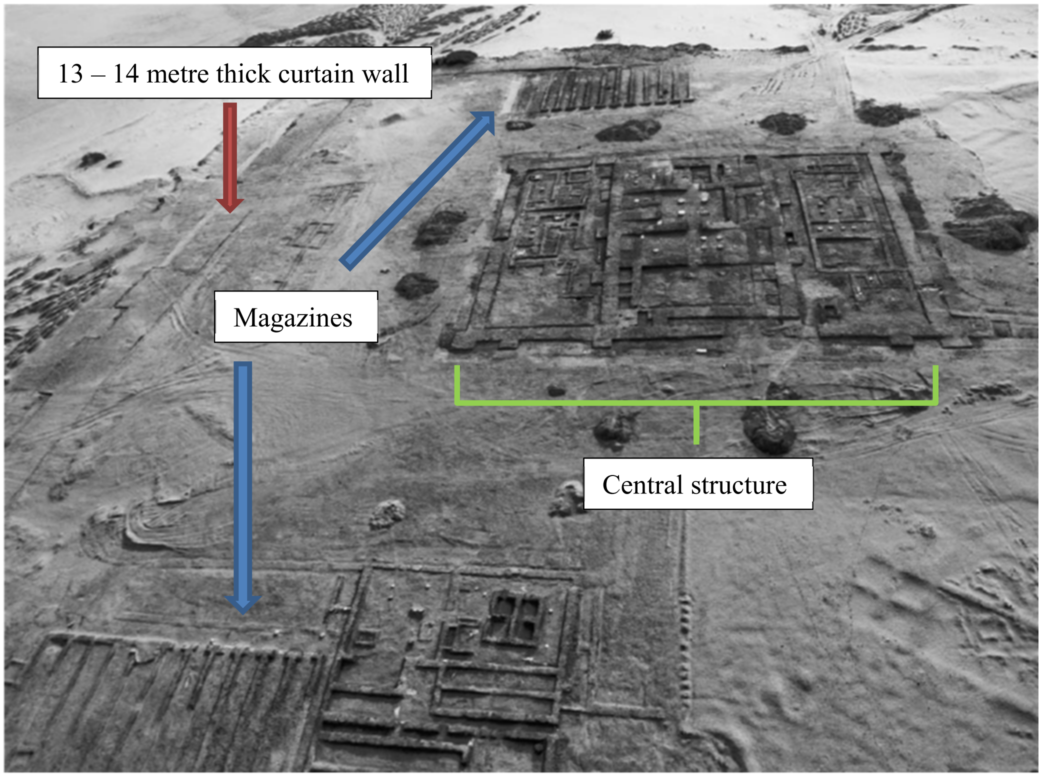

Figure 28 - Aerial view of Tell Heboua 2 (looking east), post-2009 excavations (adapted from Maksoud & Valbelle 2011, pl. 1).

Figure 29 - Satellite Image of Tell Heboua 2 (Google Maps, accessed November 2013).

4.2.4.5.2 Large Buildings

The large structures at Tell Heboua 1 are indicative of administrative buildings. For logistical management, it is highly probable that the function of personnel in these buildings would have been to manage the granaries and supplies in the storage magazines. At Tell Heboua 1's Zone B there are two large buildings (BAT.I and BAT.IV) (Figure 30). Their position is away from the wall and Vogel's criteria of these being a 'commander's house' does not apply.[440] The walls of these buildings are very thick in comparison to the housing structures, being, on average, 20 cm thicker in BAT.I (one brick-length) and 40 cm thicker in BAT.IV. Due to the thickness of the walls, an upper-storey was assumed but there is no evidence of stairwells in either building.[441] Both buildings are close to the granary areas of Zone B and may have been responsible for administrating granary stock.[442] Maksoud further argued that these buildings' orthogonal layout is an example of the administrative importance of Tell Heboua.[443]

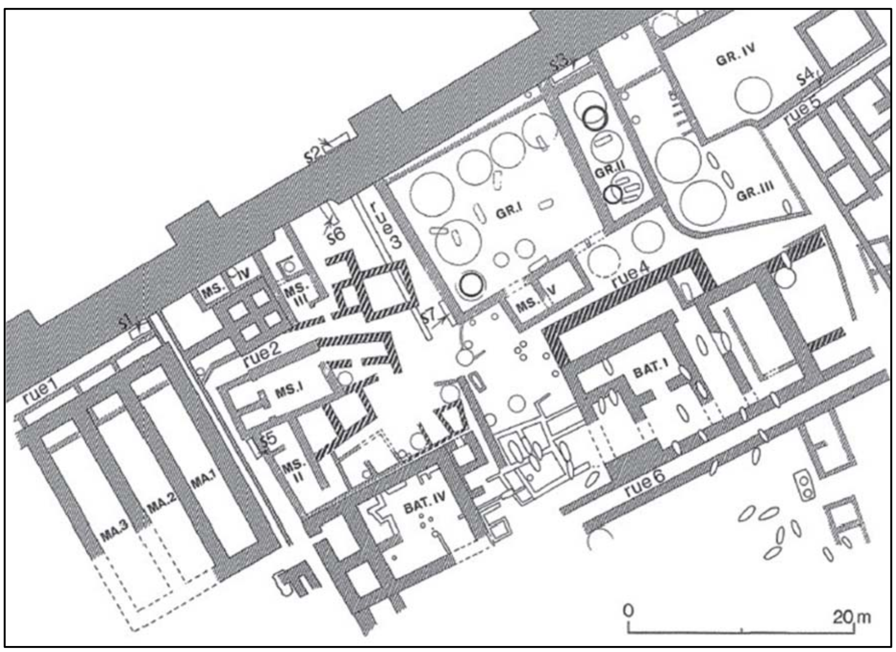

Figure 30 - Tell Heboua 1 - Zone B. MS - House, MA - Magazine, BAT - Large Building, GR - Granary Area, dark cross-hatching - later phase of building (based on larger brick size) (Maksoud 1998a, 198 fig. 2).

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440 Vogel 2010a, 42; 2010b, 423; 2004, 128

441 Maksoud 1998a, 68

442 Maksoud 1998a, 119

443 Maksoud 1998a, 119, "...Elle est très géométrique et montre l'importance des bâtiments administratifs dans la ville."

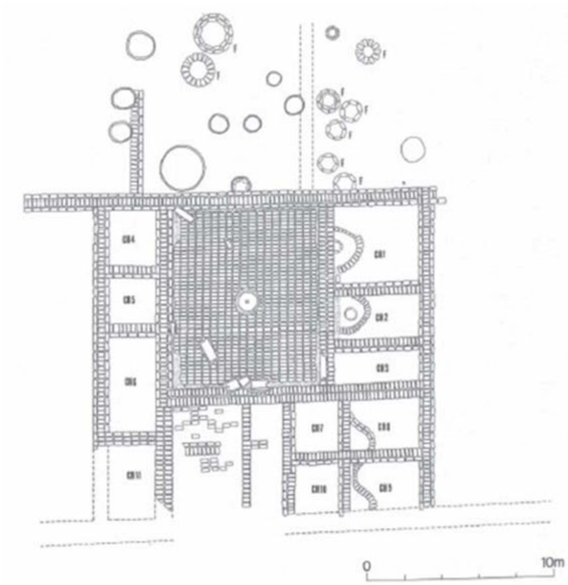

Figure 31 - Tell Heboua 1, Large building in Zone C (BAT. II) (Maksoud 1998a, fig. 20).

In the south of the site, a large building (BAT.II) is laid out in a noticeably different way (Figure 31). It appears to be a centre-hall house with many smaller rooms around it.[444] The building appears to have been a later addition to the site because it had the later-phased bricks in its construction.

4.2.4.5.3 Granaries

It is important to understand the role of fortified bases for supplies and defence. Therefore, we should focus on the granaries at Tell Heboua 1. Tell Heboua 1 has more structures identified as 'granaries' than any other frontier site in the eastern Delta. Its granaries were constructed in a square or rectangular pattern with circular silos within their compounds which differs radically from Nubian fortresses' rectangular areas without silos (Figure 30).[445] Maksoud argued that Zone B's granaries were laid out according to accessibility.[446] However, the granaries discussed were located over 100 metres from the main gateway. Therefore, the position of the granaries reflects concerns of security by limiting access.[447] Maksoud, quite rightly, noted that because the site is on the fringes of Egypt, its granaries might have been served as reserves for a military campaign force rather than fora domestic

[444] Maksoud 1998a, 80; 1987, 15
[445] Vogel 2010b, 425; 2004, 132; Kemp 1986, 123 – 130
[446] Maksoud 1998a, 114
[447] Maksoud 1998a, 114; Kemp 1986, 133

populace.[448] The existence of ovens in the immediately vicinity of the granaries also demonstrate that processing grain into consumable products was important at the site.[449]

Maksoud estimated the storage capacity of Zone B but there are fundamental problems in his analysis.[450] Maksoud did not reference Kemp's work in Nubia which examined the grain storage at a frontier, fortified site.[451] His statement that a silo with 1 metre diameter corresponds to 2.5 tonnes of grain is an oversimplification.[452] Maksoud assumed this was based on a statement from Oren's analysis of the granary complex at Bir el-'Abd (see Section 4.3.3.4.2).[453] However, Oren's estimate was based on 1 m^3 as the equivalent of 1,000 litres.[454] The problem with this assumption is that it only accounts for grain products stored *en masse*. We cannot be certain if grain was stored in sacks or some other compartments within the silos that would have reduced their storage capacity. Furthermore, it is unknown if the grain was stored in winnowed form or if the chaff was intact (being fodder for animals). It is too presumptuous that the silos were solely dedicated to the storage of grain, as the silos could have stored additional food items and/or supplies.[455] In short, the volume of a silo cannot indicate weight of the goods stored therein as densities of provisions can vary widely.

Secondly, the superstructure has to be reconstructed to properly estimate the storage capacity of each silo. Although bee-hive silos are known from the pharaonic period in Egypt and the Levant, the physical parameters of these structures have to assume that silos had the shape of a conical frustum or a cylinder with a dome.[456] Either assumption can impact calculations of storage capacity.

Lastly, the tally from the table does not account for silos built in subsequent phases. This is shown in granary GR.II, as Maksoud noted that SI.7 and SI.8 belong to the first phase of this structure.[457] In the subsequent phase, the construction of three new silos (SI.16, SI.17, and SI.18) was built over the earlier ones. However, this is not accounted for in the table's

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[448] Maksoud 1998a, 114; 1989, 183
[449] Maksoud 1998a, 115, 121
[450] It appears this table was derived from Al-Ayedi's thesis (2000, 161 Table 1).
[451] Kemp 1986
[452] Maksoud 1998a, 127 Table 2
[453] Maksoud 1998a, 114, 127 Table 2 Maksoud claimed that this equation is based on the work of Oren (Oren 1987, 79 – 83). However, Oren does not state this in the cited article.
[454] Oren (1987, 80) incorrectly assumes that 1,000 litres = 1 ton.
[455] Vogel 2010b, 427
[456] Currid 1986
[457] Maksoud 1998a, 62-63

calculation. The capacity of all 5 silos is added together into the final total.[458] Therefore, Maksoud's Table 2 should be disregarded in light of these objections as the data is misleading and not presented in a clear context.

Before we attempt a calculation of Tell Heboua 1's storage capacity, it must be stressed that Zone B represents a small portion of the site. In light that large areas are destroyed at Tell Heboua 1, it is unlikely that the storage capacity for the entire site can be determined. For the sake of this exercise, the silos in Zone B are estimated to have filled to the 2.5 metre-mark (see Section 4.3.3.4.2). However, this thesis acknowledges that the smaller silos may have been much shorter than larger examples. Thus, calculations utilise a 2.5 metre-mark of a cylindrical shape but this is highly speculative. The walls of the silos are taken into account and subtracted from the external diameter to obtain the internal diameter. Volume of each silo is calculated through the formula:

$$V = \pi\ (radius\ of\ the\ silo)^2 \times 2.5\ metres\ (grain\ storage\ height)$$

Assuming that Maksoud's illustrations of the site and brick sizes are accurate, we calculate the capacity of Zone B (Table 5). Thus, the speculative storage capacity of Tell Heboua 1's Zone B is 193,900 litres in the earlier phase and 227,900 litres in the latter phase. Although one could point out that the calculations in this thesis are based on a number of assumptions, the numbers appear plausible and are quite modest by Kemp's estimates of Nubian storage facilities.[459] If more granaries are uncovered in future excavations, the estimated storage capacity will increase.

[458] Maksoud 1998a, 141, fig. 16
[459] Kemp 1986, 131 Table 1

Table 5 - Tell Heboua 1's storage capacity in Zone B[460]

Granary	Silo	Internal Diameter (m)	Theoretical Capacity (m^3)
GR.I			
	SI.1	2.12	8.8
	SI.2	4.12	33.3
	SI.3	3.74	27.5
	SI.4	2.82	15.6
	SI.5	2.82	15.6
	SI.6	2.82	15.6
		GR.I Capacity	**116.4**
GR.II			
	SI.7 – phase 1	1.2	2.8
	SI.8 – phase 1	1.12	2.5
	SI.16 – phase 2	2.2	9.5
	SI.17 – phase 2	2.7	14.3
	SI.18 – phase 2	2.85	16.0
		GR.II, Phase 1 Capacity	**5.3**
		GR.II, Phase 2 Capacity	**39.8**
GR.III			
	SI.9	2.7	14.3
	SI.10	2.7	14.3
		GR.III Capacity	**28**
GR.IV			
	SI.11*	1.4	3.8
	SI.12*	1.4	3.8
	SI.13*	1.4	3.8
	SI.14	2.6	13.3
	SI.15	3.1	18.9
		GR.IV Capacity	**43.6**
		Total Capacity for Zone B, Phase 1	**193.9**
		Total Capacity for Zone B, Phase 2	**227.9**
* - These silos are noted by Maksoud to have been virtually destroyed. The walls of these silos are estimated to be 40 cm based on GR.IV's SI.14 and SI.15			

4.2.4.5.4 Magazines

The rectangular storage magazines at Tell Heboua 1 and 2 also emphasise the importance of storage capacity to facilitate campaigns that would have crossed the overland Sinaitic route into Canaan. There are a series of 3 magazines at Tell Heboua 1's Zone B that are rectangular in shape (MA.1, MA.2, MA.3) (Figure 30). Each hall measure 25 metres long and 3.5 metres wide.[461] The blackish bricks of these magazines are from the second phase of

[460] Maksoud 1998, 59 – 66
[461] Maksoud 1998a, 51

construction. The walls' thickness is 1.2 metres. The floor of the magazines had a coating of sand 5-6 cm with another layer of beaten clay, 10 cm thick, beneath it. The significant find was a flint arrowhead (item #464) in MA.3 and it is tempting to consider that if there was ample storage for grain products at the site, these storerooms might have been utilised as an armoury. If these magazines stored weapons, one could imagine that the central administration would oversee their distribution.[462] However, this is speculation and should only be considered with a great deal of caution as the number of weapons found at Tell Heboua 1 is minimal compared to Mirgissa.[463] The surface of the walls was covered by a layer of plaster, 3-4 cm thick. Due to poor preservation, it cannot be confirmed what sort of roof covered these magazines. However, it is likely that the roofs were vaulted when we compare evidence of barrel vaulting from the magazines from the Ramesseum, Sety I's mortuary temple on the west bank of Luxor, Medinet Habu, Buhen and the central bakeries of the House of the Aten at Amarna.[464]

4.2.4.6 Material Culture

4.2.4.6.1 Pottery

The evidence of Cypriot vessels, dating from the SIP and the early 18th Dynasty, indicate commercial activity occurred at Tell Heboua but the extent of the trade, and whether the site was a 'destination point' for LBA traders is open to debate. Based on the work of Marcolongo, Maksoud asserted that a branch of the Pelusiac emptied into the depression of the lagoon and claimed that sea-going trade was a function of the site. Levantine vessels were also found at the site and are largely confined to amphorae shapes.[465] Maksoud thought that the site's pottery assemblage argued for a trade-city in the time of the Hyksos. With the ousting of the Asiatics at the close of the SIP, Tell Heboua went into decline until Thutmose III rebuilt portions of the site. Under his reign, it became a sizeable fortress on the frontier that could provide supplies and arms to campaigning forces.[466] The ceramics are indicative of trade that came from both naval and overland traffic.

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[462] Vila 1970, 175
[463] Vila 1970
[464] Kemp 2012, 113 fig. 3.27; Emery 2011, 5; Vogel 2004, 134; Stadelmann 1991, 255; Hölscher 1951, 16
[465] Maksoud 1998a, 125; Aston 1996, 180
[466] Maksoud 1998a, 125, "À l'époque de Thoutmosis III, pendant sa campagne de l'année 30 contre le Mitanni, le trafic maritime a été rétabli" (citing Säve-Söderbergh 1946, 33). This reference is very much outdated and it has been shown that trade did not dwindle in the early 18th Dynasty but trade connections were maintained in this period except for the importation of Cypriot forms which do not occur before Thutmose III (Bergoffen 1991, 72).

4.2.4.7 Discussion

Tell Heboua 1 operated as an established fortified frontier site during the New Kingdom. Located at the junction between the eastern Delta and the north Sinai, it had a commanding view of the overland route and presumably, one of the main responsibilities of the garrison was monitoring traffic. Based on the textual and geographic data, the site was accessible to maritime traffic during the New Kingdom. The surrounding area was not suitable for large agricultural fields but the site maintained a trade in *bulti*-fish and viticulture for export to the Nile Valley. Hence, the site would have had a strong reliance on provisions delivered to the site for its inhabitants. The site has no significant remains dating to the TIP. The terminus for the site's occupation is not indicated in the material remains nor in the excavation report but there are no destruction levels suggesting a clash with the Sea Peoples. Presumably, when the flow of supplies to the site was disrupted, its inhabitants abandoned the site because they could no longer sustain themselves. Although we can roughly date the terminus to the 20th Dynasty, we cannot be more specific until new evidence comes to light.

It is difficult to attribute construction at the site to any particular pharaoh beyond the epigraphic evidence. The brick sizes fall within the dimension tolerance from contemporary sites. Similarly, the pottery forms used at the site had longevity during the New Kingdom, being used in the 18th to the 20th Dynasty. Diagnostic forms specific to a reign or dynasty are problematic given the modern disturbances at the site and the ancient Egyptian long curation cycle on pottery vessels. Therefore, to make the site's phases comprehensive, Maksoud has understandably consulted the textual record to date the site's initial fortification to Thutmose III and later embellished by Sety I.

The fortifications of the site indicate that it was unique in the eastern Delta. Although it lacks a fosse, the fortified walls are formidable. Standing at an estimated 10 – 15 metres, the curtain wall with its external buttresses would have dramatically casted impressive shadows on its façade. In combination with an outworked wall and a possible large garrison, the site would have represented a major obstacle to any force that wanted to enter the Delta. The *intervallum* between the two walls indicates the importance of moving defenders to specific positions on the outwork wall. The logistical factors in crossing the north Sinai would have likely multiplied this site's defences for those who wished to enter forcibly Egypt.

The Egyptian architects also created satellite centres that may have relied upon the larger site for provisions and operational support. The renewed excavations of Tell Heboua 2 indicate that it was also a large site and functioned along similar parameters to its sister-site. If the garrison had encountered a threatening force, they could have fallen back to, or relied upon support from, Tell Heboua 1.

The large magazines at both Tell Heboua 1 and 2 indicate that the sites' main role were in the supply or storage of commodities. Likely, the magazines were used to store goods derived from import taxes on trade caravans. The cultural remains from Tell Heboua 1 are mainly confined to utilitarian materials and are not extravagant; it is unlikely that the inhabitants saw the benefits of these trade items in their personal lives. In addition, the magazines could have functioned as storehouses for departing campaigns leaving Egypt and making the overland route into southern Canaan.

The granaries at Tell Heboua 1 indicate that the site was concerned with grain storage throughout its history. Presumably, the main function of this storage was to supply forces leaving Egypt and making their way into the Levantine theatre. However, considering the extensive damage at the site, it is unlikely that the excavation will be able to estimate the number of housing units and so a population estimate cannot be conducted. Maksoud's estimation of the grain capacity at Tell Heboua is not applicable due to a number of factors in its analysis. For instance, silos dated to different phases of the site are used to calculate total capacity. In conjunction with the preservation levels at the site, it is unlikely that a 'hard number' for total storage capacity can be obtained.

4.2.5 Tell el-Borg

4.2.5.1 Introduction

Tell el-Borg can be classified as a diminutive fortified outpost along the overland route to southern Canaan. Much like Tell Heboua, Tell el-Borg has a long history of disturbances that affected the deposition of its archaeological remains. James Hoffmeier, the site's excavator, mentioned that as much as 50% of the site had been 'obliterated' and the remaining structures and artefacts are in poor condition.[467]

Tell el-Borg was occupied by both Israeli and Egyptian forces during the 1960s and the 1980s. Eliezer Oren first noted the impact of the modern military when he surveyed Site T-

[467] Hoffmeier 2011, 209; 2004b, 85

108, Tell el-Borg, as it had areas altered for military camps.[468] Modern activity has undoubtedly impacted the site's LBA strata.[469]

More recent developments have also negatively impacted the site. A modern irrigation canal, 40 metre wide, bisects the Ramesside period fortress and as a result, the south-west and the north-east corners of the square fortress were completely destroyed (Figures 33 to 34).[470] In addition, a modern bridge was constructed and damaged much of the fosse in Field 4. Its construction involved not only deep excavation but also used concrete to secure its bulwarks.[471]

In antiquity, Tell el-Borg's architecture was pilfered for building materials in later periods. As we have seen in our geographic analysis (Section 4.2.2), stone and timber would have been at a premium on the fringes of the eastern Delta.[472] Hoffmeier noted how the theft of building materials at the site can be observed and associated with Greco-Roman sherds found in various areas.[473] Despite these disturbances, the site does have features that can be analysed in this thesis. However, note that Hoffmeier's site plans for Tell el-Borg do not designate specific features that he discussed.

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468 Hoffmeier & Maksoud 2003, 174
469 Hoffmeier 2004b, 86, 89; 2002, 18;
470 Hoffmeier & Maksoud 2003, 175; Hoffmeier 2004b, 96
471 Hoffmeier 2004b, 91; Hoffmeier & Maksoud 2003, 177
472 Wilson 2007, 26 – 27
473 Hoffmeier 2004b, 97

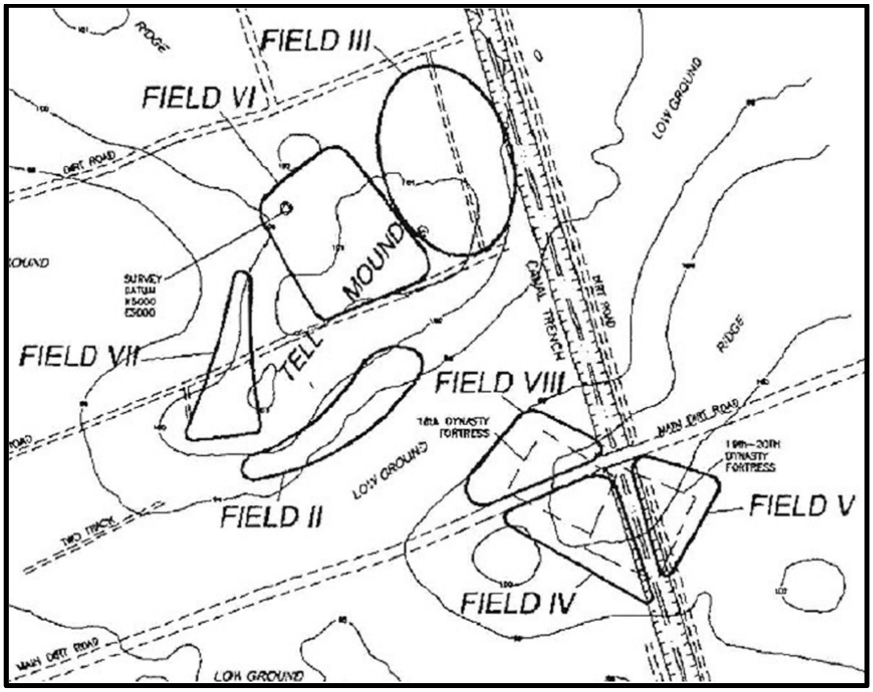


Figure 32 - Tell el-Borg's field excavation units (Hoffmeier 2006b, fig. 2).

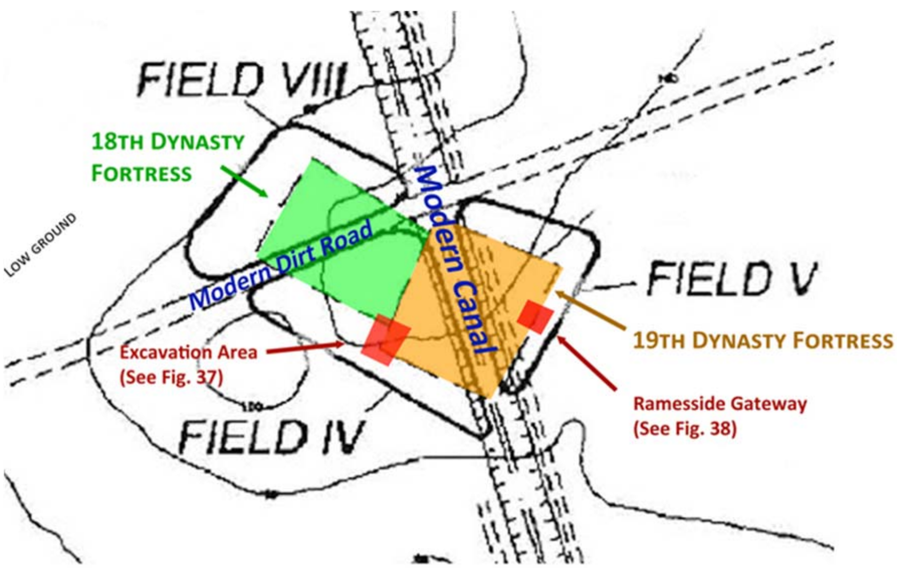


Figure 33 – Approximate positioning of the fortresses of Tell El-Borg (adapted from Hoffmeier 2006b, fig. 2).

Figure 34 - Satellite image of Tell el-Borg (Google Maps, accessed November 2013).

4.2.5.2 Textual and Artistic Evidence

Hoffmeier equated the Tell el-Borg with the 'Dwelling of the Lion' in the Sety I reliefs (henceforth, the 'Dwelling', Section 4.2.3.3), choosing to see the depiction of Tjaru as one fortress that covered both Tell Heboua 1 and 2 (Figure 22).[474] This is plausible given Tell Heboua 2's proximity to Tell Heboua 1 and the palaeo-lagoon depression acting as a channel for water, the *t3-dni.t*.

Hoffmeier's identification of Tell el-Borg with the 'Dwelling' is mainly inferred from the Sety I Shasu Register because it is the next fortress in the sequence; this identification is not based on direct epigraphic evidence (Figure 35). Morris, however, was uncomfortable with assigning Tell el-Borg with the 'Dwelling' based on its proximity to Tell Heboua. She operated under Gal's premise that fortified way-stations should be found within one day's

[474] Hoffmeier 2006b, 257, ft. 4; Hoffmeier 2004b, 85; Hoffmeier & Maksoud 2003, 196 – 197

march (15 – 20 km) from one another.[475] However, the archaeological and the textual evidence make Tell el-Borg a good candidate for the 'Dwelling'.

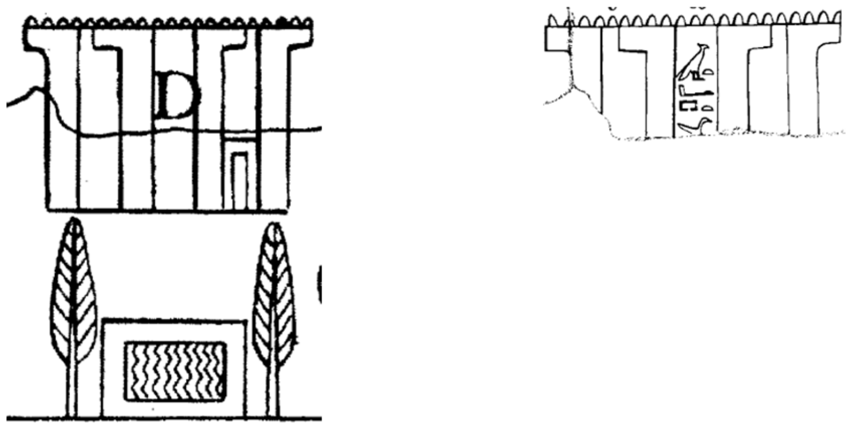


Figure 35 - The image of the 'Dwelling of the Lion' in the Shasu Register. Gardiner's reconstruction (left) compared to the depiction today (right) (Gardiner 1920, pl. 11; University of Chicago (Epigraphic Survey) 1986, pl. 6).

There are two mentions of the 'Dwelling' in textual records outside of the Sety I battle scenes. The written name for the site can be equated in Pap. Anastasi I, line 27, 1.

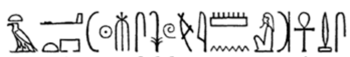
> "I begin for thee with the 'Dwelling of Sese'(). Thou hast never trodden it; thou hast not eaten the fish of (the waters of) […]; thou hast not bathed in them."[476]

The term 'Sese', Gardiner noted, is the shorthand name of Ramesses II.[477] In pharaonic Egypt, the imagery of large cats was associated with royal authority.[478] It would appear therefore that in the reign of Ramesses II, the 'Dwelling' changed its name to reflect the current ruler.

In the same section of Pap. Anastasi I, after mentioning Tjaru (the fortress of the 'Ways of Horus'), the author indicates that the next fortress was accessible by water and alludes to

[475] Morris 2005, 411. See also, ft. 484
[476] Pap. Anastasi I, Lines 27.1 – 27.5 (Gardiner 1911, 29).
[477] Gardiner 1920, 106. See also, Pap. Anastasi I, Lines 12.1 – 12.5 (Gardiner 1911, 14 – 15).
[478] Houlihan 2001, 513 – 516

fishing resources. Gardiner connected this with a possible mention of the 'Dwelling' in a 20th Dynasty text.[479] Pap. Anastasi V reads:

> "…Another topic: We set out from the place where the King is, bearing three stelae together with their *ispw* and their plinths.......... The King said to us: 'Go after the butler of Pharaoh (l.p.h.) in all possible haste with the stelae; reach him in all haste with them that you may hearken to all that he says so that he may set them up in their places forever. ' Thus spoke the King. Look, we passed the fortress of Ra-messe-miamun (l.p.h.) which is at Tjel (Tjaru) in reignal-year 33, second month of Shomu, day 23, and we shall go to empty the ships at The-Dwelling-of-Ra-messe-miamun (l.p.h.)
>
> (). And drag the monuments before the butler of Pharaoh (l.p.h.); reach him yourselves. Let the butler of Pharaoh (l.p.h.) write to us about all that we are to do."[480]

The text records the delivery of three stelae to this border site, reflecting the scarcity of stone. It is not clear from the texts if the stelae were funerary or if they were to celebrate the jubilees of the king. However, what is informative is that the Egyptians saw the utility in using naval transport to carry the stone monuments to the 'Dwelling' and then use brute force to drag the monuments to their respective erection locations.[481] This demonstrates not only that the 'Dwelling' could be reached by water but also that the Egyptians understood the utility of using water transport to heavy materials (Section 5.5.3).

The topography of Tell el-Borg, being on the higher ground next to the palaeo-lagoon, indicates that the site had access to water transport. If we accept that Tell Heboua 1 and 2 comprise the representation of Tjaru in the Sety I battle scenes, then equating Tell el-Borg with the 'Dwelling' seems a likely candidate as it is the only fortified installation in the immediate area.[482] Due to its proximity of the site to Tell Heboua 2 it is virtually certain that this site is the 'Dwelling' mentioned in the Sety I battle scenes.

[479] Gardiner 1920, 106
[480] Caminos 1954, 266
[481] Bietak 1975, 134. Caminos (1954, 268) noted that the *ipsw* in the text is referring to sledges to drag the stelae.
[482] Hoffmeier 2004b, 85 – 86; Hoffmeier & Maksoud 2003, 197

4.2.5.3 Physical Location

Tell el-Borg's forts are located on high ground, 2 kilometres away from the palaeo-lagoon depression.[483] The 'tell' rises 2 – 3 metres from the basal area, much like Tell Heboua 1. The site is located 5 km from Tell Heboua 2 and demonstrates this coastal route in antiquity had its outposts located in strategic locations rather than a standard one-day's march (c. 20 km).[484]

4.2.5.4 Phases and Dates

Hoffmeier proposed three main phases at Tell el-Borg:

Phase 1 – Establishment: In the first phase, a small, square fortress was founded which Hoffmeier attributed to the reign of Thutmose III.[485] The remains of the 18th Dynasty fortress were so damaged or reused in the 19th Dynasty fortress' construction that Hoffmeier could not comment on the 18th Dynasty fortress' features other than two fossae discovered.[486] Fosse A is dated roughly on the ceramic evidence along with the fosse being lined with Amarna *talatat* blocks, suggesting that it was constructed sometime late in the Amarna Period, after the death of Akhenaten, or as late as the reign of Horemheb or Sety I.[487] Similarly, Fosse D, was dated in connection with a later fortress wall and a stamped jar handle of Smenekhare found on the top-fill layer. Hoffmeier suggested that the action of filling in the fosse occurred during or after his reign (c. 1336 BCE). In Field 6, approximately 325 metres away from the presumed 18th Dynasty fortress, the remains of some burnt reed huts were uncovered and might represent a 'domestic area'.[488] In Field 3, a modest cemetery was uncovered.[489] The finds from this area, although disturbed, suggests usage during the 18th Dynasty.[490] Tomb 4 yielded a sherd fragment with the name of Amunhotep II (TBO 0071) and the surface area of Tomb 8 produced a faience ring of Queen Tiye.[491] There is the strong suggestion that this area was established in the 18th Dynasty but nothing substantial to attribute its establishment to one particular pharaoh.[492]

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[483] Hoffmeier 2006b, 257
[484] *Contra* Morris 2005, 384; Gal 1993, 80 – 81
[485] Hoffmeier & Maksoud 2003, 194 – 195
[486] Hoffmeier 2006b, 264; 2004b, 91
[487] Hoffmeier & Maksoud 2003, 190
[488] Hoffmeier 2006b, 261
[489] Hoffmeier 2004b, 103 – 110
[490] Hoffmeier 2004b, 104, fig. 24
[491] Hoffmeier 2004b, 108; Hoffmeier & Maksoud 2003, 188
[492] Hoffmeier & Maksoud 2003, 194

Phase 2 – Early 19th Dynasty: At some time during the late 18th or early 19th Dynasty, the 18th Dynasty fort was dismantled and a new fortress established on higher ground to the east. The two fossae of the 18th Dynasty were filled in at this time.[493] It would appear that the 19th Dynasty fortress was moved to higher ground to avoid a rising water-table.[494] Horemheb's name was found on two seal impressions which Hoffmeier used to date its construction.[495] The new fortress followed similar dimensions of the former and even incorporated a new fosse (Fosse 5) on its northern side.[496] Due to the poor state of preservation and modern damage, this fortress could only be excavated at two locations, the south-west corner and the eastern gateway (Figure 33).

In Field 6, the 'burial ground' of the 18th Dynasty, a disturbed limestone inscription was found and indicates the presence of a military unit:

> "The Great Company (of) Amun, Amun appears gloriously and victorious
> For Usermaatre Setepenre (Ramesses II), given life like Re forever
> Made by the weapons-bearer Kha."[497]

Given the overall size of the settlement and fortress at Tell el-Borg, it is likely that the 'Company of Amun' could not mean the full 5,000 men said to have accompanied Ramesses II to Kadesh (Section 5.3.2). From this evidence, it appears a small group of the division, such as those who might have accompanied the king on circuit-campaigns in southern Canaan, may have been stationed at Tell el-Borg.[498] This chance find remains the only piece of written evidence of a military presence at Tell el-Borg.

Phase 3 – 20th Dynasty: Tell el-Borg's later fortress was used in the 20th Dynasty until it was destroyed and abandoned.[499] No major buildings were erected during this time. The dating of this phase rests on an inscribed limestone fragment that has a partial name of Ramesses III.[500] Other than this inscription, pottery sherds from the 20th Dynasty are found

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[493] Hoffmeier 2004b, 91
[494] Hoffmeier 2006b, 262
[495] Hoffmeier 2006b, 262
[496] For unknown reasons, this fosse's designation is numeric rather than alphabetic.
[497] Hoffmeier & Maksoud 2003,pl. XII, ft. 2 and 189, ft. 44
[498] Heagren 2007, 142
[499] Hoffmeier & Maksoud 2003, 195
[500] Hoffmeier 2006b, 259

in disturbed contexts. Hoffmeier suggested that the fort was in operation till it was destroyed by the Sea Peoples during the course of the 'marine battle' as displayed at Medinet Habu.[501]

4.2.5.4.1 Brick Sizes

There are two predominant sizes for mudbricks at Tell el-Borg. The smaller bricks measure 36 – 38 x 18 x 9 cm which correspond to the ones used in Tell Heboua's construction and were used in the earlier fossae of Phase 1.[502] The larger bricks, 45 x 20 x 10 cm, are incorporated into the 19th Dynasty fortress. Although they are slightly larger than those used in the architecture of Tell Heboua's later phase, they do fall within the variance of New Kingdom brick sizes. The use of shells as aggregate materials is present in the later phase bricks at Tell el-Borg.

4.2.5.5 Architectural Features

4.2.5.5.1 Fosse or Pond?

Hoffmeier used the term 'moats' to define unique architectural features found at Tell el-Borg.[503] These constructions do not enfilade the site but are truncated and stop abruptly. Although Hoffmeier originally interpreted these depressions or fossae to have a defensive purpose, it is likely that they served a more utilitarian role.

The initial discovery of 'Wall A' was thought to be the foundation of a casemate building but, upon further clearance of the internal fill, it was discovered that the base tapered downwards to form a V-shape.[504] This feature was an intentional depression built in antiquity. Hoffmeier proposed that the feature was a dry-ditch or 'fosse' to impede traffic from reaching the curtain wall.[505] This is remarkable in that outside of Nubia, only Zawiyet Umm el-Rakham, far on the western Mediterranean coast, has shown an example of this type of feature in fortress architecture in northern Egypt.[506] Unfortunately, the top of the feature and its immediate area was damaged by earth-moving equipment so Fosse A's length could not be determined.[507] Fosse A runs in an east-west direction and Hoffmeier originally

[501] Hoffmeier 2006b, 259; Hoffmeier & Moshier 2006, 171 – 172; Heinz 2001, 307 I.18
[502] Hoffmeier 2004b, 89, 102; Hoffmeier & Maksoud 2003, 190
[503] Hoffmeier 2006b, 257 – 8; 2004b, 91
[504] Hoffmeier & Maksoud 2003, 189
[505] Hoffmeier 2002, 19
[506] S. Snape, personal communication, Sept. 2009
[507] Hoffmeier & Maksoud 2003, 190

suggested that it is associated with Wall C of the later phase fortress.[508] However, we should take into account that the remains of Fosse A were constructed of bricks measuring 36 – 38 x 18 – 19 x 8 – 9 cm, which suggests that the feature was constructed in an earlier phase.[509] Fosse A, on the basis of brick-size, should be associated with the earlier phase in Field 4. The fosse was constructed of stone and fired brick. Amarna *talatat* blocks (c. 50 – 52 cm) had been split lengthwise and were used to line the bottom of the fosse. Sherds of re-slipped, red-rimmed and red-burnished wares indicate that the fosse was constructed sometime late in the Amarna Period or early 19th Dynasty.[510]

Fosse A's walls were lined with a smooth mud plaster. When taken with the socle lined in stone, it is likely this depression was not a fosse but a pond which used the area's high water table. Hoffmeier's discussions of these depressions employed both terms of 'fosse' and 'moat' interchangeably despite their different meanings.[511] However, Hoffmeier did not investigate this idea further.

Based on contemporary evidence, it appears these were ponds for the fortress' inhabitants. Ponds are easier to manage than cisterns as they rely on the water from the area's water-table rather than a workforce to fill it. As Eyre explains, ponds that tap into the sub-soil for their water supply are more permanent and ensure a supply of water for most of the year whereas cisterns have to be continually monitored.[512] A pond would also have avoided the practice of sieving suspended sediment out of Deltine water during the inundation season.[513] The similarity of Tell el-Borg's Fosse A to the steep-sided pond found at the 18th Dynasty temple of Amunhotep son of Hapu's forecourt and the 20th Dynasty pool in the garden at Medinet Habu, is striking.[514] Both ponds had steep sides, plastered embankments and stone lining the bottom of the slopes. This construction was not a defensive fosse that enfiladed the fortification walls but was probably used for the water-needs of the fortress' inhabitants and livestock.

Fosse D, located on the southern side of 18th Dynasty fortress, appears to have a similarity with Fosse A in that it functioned as a watering area directly sunk into sub-soil. Fosse D was discovered while the archaeological team tried to excavate to the preserved depth of the later

[508] Hoffmeier & Maksoud 2003, 191
[509] *Contra* Hoffmeier & Maksoud 2003, 189; Maksoud 1998a, 56, 110
[510] Hoffmeier & Maksoud 2003, 190
[511] Hoffmeier 2006b, 257 – 8; Hoffmeier 2004b, 91; Hoffmeier & Maksoud 2003, 190
[512] Eyre 1994, 64
[513] Wilson 2007, 24
[514] Hölscher 1951, 20, figs. 22 – 23; Robichon & Varille 1936, 35, pls. III – V, X, XI, XX, XXI, XXVII, XXVIII. See also, Badawy 1956, 61 – 62

phase Wall D.[515] At the bottom of Wall D, the team noticed that a layer of hard-packed mud sloped down away from the wall. It was initially thought this might have been a type of mud-plaster 'glacis'.[516] Expanding the excavation square, it was soon clear that the alignment of this feature was not parallel with Wall D and therefore, probably not contemporary but originated from an earlier phase at the site.[517] The team discovered a similar fosse to Fosse A but it was built on a much larger scale.[518]

Courses of fired brick formed the base of the fosse and its measurements were consistent with an earlier phase of building at the site. The fosse, when originally constructed, was dug to a depth of 2 metres, 6 metres across at the top and tapering down to be 3 metres at the bottom.[519] However, unlike Fosse A, the bottom of the fosse did not have any evidence of a mud-plaster lining which suggests that the fired brick was sufficient to withstand water damage. In addition, the feature was truncated and did not continue around the presumed 18th Dynasty fortifications.[520] At Buhen, arguably possessing the best-preserved fosse in Middle Kingdom fortress architecture, it was designed to act as a physical void, not for holding water, as seen in the drainage channels at the fosse's foundation.[521] At a depth of 1.3 metres, sand and mud fill gave way to a concentration of limestone chips, 1.5 metres thick.[522] Fosse D was filled in the subsequent building of the 19th Dynasty fortress at the site. Based on a stamped jar handle of Smenekhare in the top-fill layer, Hoffmeier suggested that the blocking occurred during or after his reign (c. 1336 BCE).

Spencer noted that the large-scale use of fired brick in Egypt usually comes from the Roman period (32 BCE – 395 CE) onwards and its use is rare in the pharaonic period.[523] However, Spencer additionally mentioned that fired brick was utilised in areas that could experience high wear and erosion. Considering the similarities of the Amunhotep son of Hapu pond with Fosse A, it is likely that Fosse D was an additional pond for the fortress. When the construction of the 19th Dynasty fortress was built over this fosse, a small portion of it was included inside the new fortress' walls.

515 Hoffmeier & Maksoud 2003, 192
516 Burke 2008, 55 – 56; Pennels 1983, 57 – 61
517 Hoffmeier & Maksoud 2003, 192
518 Hoffmeier & Maksoud 2003, 192
519 Hoffmeier & Maksoud 2003, 193; Hoffmeier 2004b, 93, 95
520 Hoffmeier 2004b, 91; 2006b, 257
521 Emery et al. 1979, 5
522 Hoffmeier & Maksoud 2003, 193
523 Spencer 1979, 140

Hoffmeier communicated that Fosse D was no small construction, being 120 metres long by 80 metres wide.[524] However, when one examines the diagrams of the excavated site it is clear that this feature was not that large. It remains unclear how Hoffmeier ascertained this fosse's dimensions.

Figure 36 - The Field 5 fosse (Hoffmeier 2006b, fig. 17).

The tradition of constructing a fosse at Tell el-Borg also carried over to the 19th Dynasty fortress (Figure 36). Whatever function they served, whether as a pond or a defensive feature, the construction of a fosse was important enough to be included with the new fortress. The fosse in this area was orientated to the northern side of the square fortress. It is not preserved as well as Fossae A and D. This fosse was followed for 24 metres long and measured 6.4 metres wide at the top and was 2.5 deep.[525] Like the two previous fossae, this feature appears to have been limited and did not encompass the new fortress. Thus, given its sloping sides and general outline, it is likely that this represents a pond much like Fossae A and D. The overall quality of this feature, by Hoffmeier's assessment, was rather poor when compared to the 18th Dynasty fossae and it implies that Fosse 5 was built with expediency rather than craftsmanship.[526] The sides of this fosse utilised stone elements of buildings that had been dismantled. Exacavation found that a group of these stone panels had once been limestone doorjambs of a building attributed to Amunhotep II. Furthermore, two of the doorjambs had inscriptions mentioning Tjaru.[527] Hoffmeier dated the construction of this

524 Hoffmeier 2006b, 257
525 Hoffmeier & Kitchen 2007, 127; Hoffmeier 2006b, 260, 267, fig. 3. See also the fosse at Buhen (Emery et al. 1979, 5) and Levantine fossae (Burke 2008, 57 Table 6).
526 Hoffmeier 2006b, 260
527 Bull & Hoffmeier 2005, 79 – 94.

fosse to c. 1300 BCE.[528] Considering that its fosse's orientation is in parallel to the 19th Dynasty fortress' curtain wall, the relative date for this feature seems likely.

The remains of four equids were found in Fosse 5, indicating its abandonment.[529] Perhaps this is similar to the remains of the 'Buhen horse' that was interred near Buhen's fosse before the New Kingdom builders filled it in.[530] However, the reason why this feature was used as a dumping ground for equids and then filled in is not clear from the physical remains.

4.2.5.5.2 Fortresses

Hoffmeier argued that there were two subsequent fortresses at Tell el-Borg (Figure 33). The initial fortified compound may have been built during the reign of Thutmose III or Amunhotep II. For this explanation, Hoffmeier, quite reasonably, relied heavily on the historical record rather than on evidence from the site.[531] To date the first fortress, Hoffmeier used ceramic remains which cannot be taken as definitive evidence for architectural building. The 18th Dynasty fortress was so poorly preserved that there was nothing left to examine.[532] Only the fossae indicate the limits of a square outpost.[533]

During the transition from the 18th to the 19th Dynasty, a replacement fortress was needed and the ancient Egyptian architects created a similar-sized fortress beside the old one. Presumably, the 18th Dynasty fortress was pilfered for building materials. The reason for this new construction was to relocate the new fortress on slightly higher ground than its predecessor. Hoffmeier concluded this based on mudbricks that had evidence of water-erosion in Field 8, Area 2 of the earlier enclosure.[534] However, sand blowing against these bricks could have eroded them as this area is known for high winds. It is unclear if "adjacent Nile flooding" caused damage to the western part of the site.

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[528] Hoffmeier & Kitchen 2007, 130
[529] An osteological analysis of these remains has not been published.
[530] Dixon et al. 1979, 191
[531] Hoffmeier 2006b, 257; Hoffmeier & Maksoud 2003, 195 – 195
[532] Hoffmeier 2013, 173
[533] Hoffmeier 2006b, 264
[534] Hoffmeier 2006b, 262

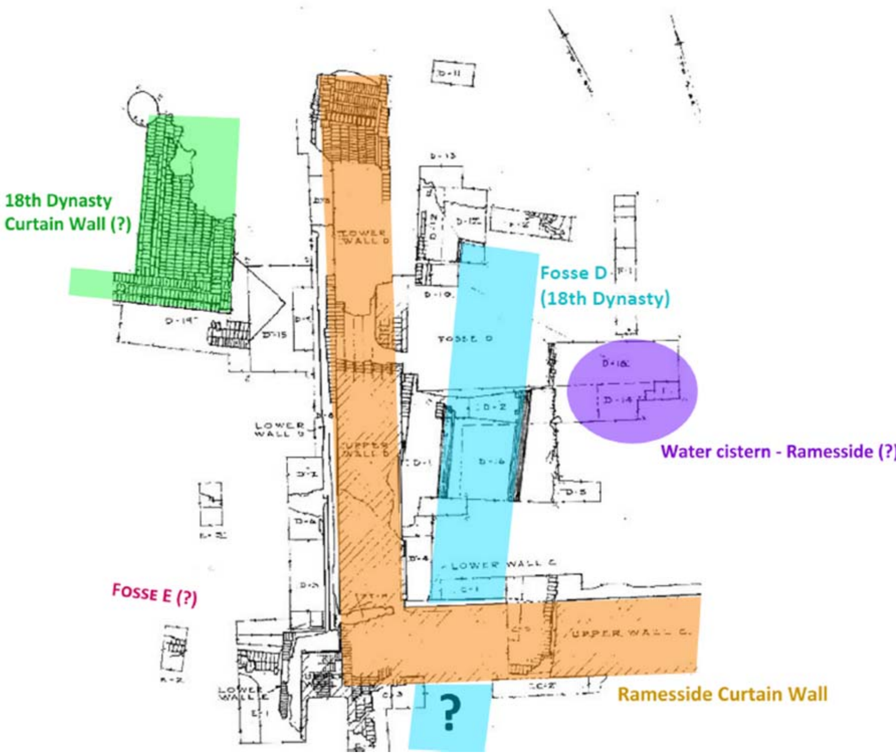

Figure 37 - Excavation plan of the south-west corner (adapted from Hoffmeier 2006a, fig. 3).

The south-western corner of the later fortress appears to have been built further eastwards than the earlier fortress (Figure 37).[535] Wall C was uncovered by an investigation of the archaeological team looking for further traces of Fosse A and still operating under the premise that Fosse A encompassed the 18th Dynasty compound. The team noticed that in Field 4, Area C and D, a large collection of shells were exposed by recent earth-moving for development at the site, possibly indicating the former presence of mudbricks that used shell aggregate.

Further investigation led to the discovery of Wall C which was attributed to the south-western corner of the square 19th Dynasty fortress. The bricks of this wall show a similarity with the later phase of Tell Heboua 1's construction that they measured 45 x 20 x 10 cm and included bivalve shells for aggregate.[536] The wall was uncovered for 30 metres and measured 3.8 metres wide. It did not show any evidence of buttressing, whether internal or external.[537] A similar wall, Wall D, turns to the north from the terminus of Wall C for about

[535] Hoffmeier's excavation drawing (2006a, fig. 3) oddly has two north indicators.
[536] Hoffmeier & Maksoud 2003, 190
[537] Hoffmeier & Maksoud 2003, 191, fig. 14

25 metres. These two walls were constructed over Fosse D and thus, represent a later phase of building at Tell el-Borg.[538]

The later phase fortress was also investigated in Field 5, the northern side of the 19th Dynasty compound. The team found a 3.4 – 3.6 metre-thick wall on the north-eastern side that could be traced for 50 metres.[539] The wall was preserved up to 4 courses of mudbricks that measure 38 x 18 x 9 cm which are markedly different from the ones used in Wall C. It is possible that these bricks might have been salvaged from the earlier fortress but there are no criteria for confirmation. This section of the wall also does not have external or internal buttresses. Possibly, the ancient Egyptian builders realised that whatever feature the buttressing was designed to serve at Tell Heboua 1 and 2 was not needed at this fortress. The punctuated buttressing found at Nubian fortress sites was a common architectural feature that was copied at Tell Heboua only to be phased out because it served no purpose in the relatively flat eastern Delta where stress and strain would have been considerably less. Postulating that this fortress was laid out on a square layout, the fortress measured 79 x79 metres, covering 6,241 m^2.[540]

Hoffmeier dated the establishment of the later fortress to the Ramesside period but this is mainly conjecture, basing this on Ramesses II's lengthy reign. Given that the stamped jar handle of Smenenkhare was found in the top levels of Fosse D in the south-western corner, we can assert that it was built post-Smenenkhare but we cannot associate the fortress's creation to a specific 19th Dynasty ruler.[541]

538 Hoffmeier 2002, 19
539 Hoffmeier 2004b, 104
540 Hoffmeier 2004b, 100
541 Hoffmeier & Maksoud 2003, 193 – 194

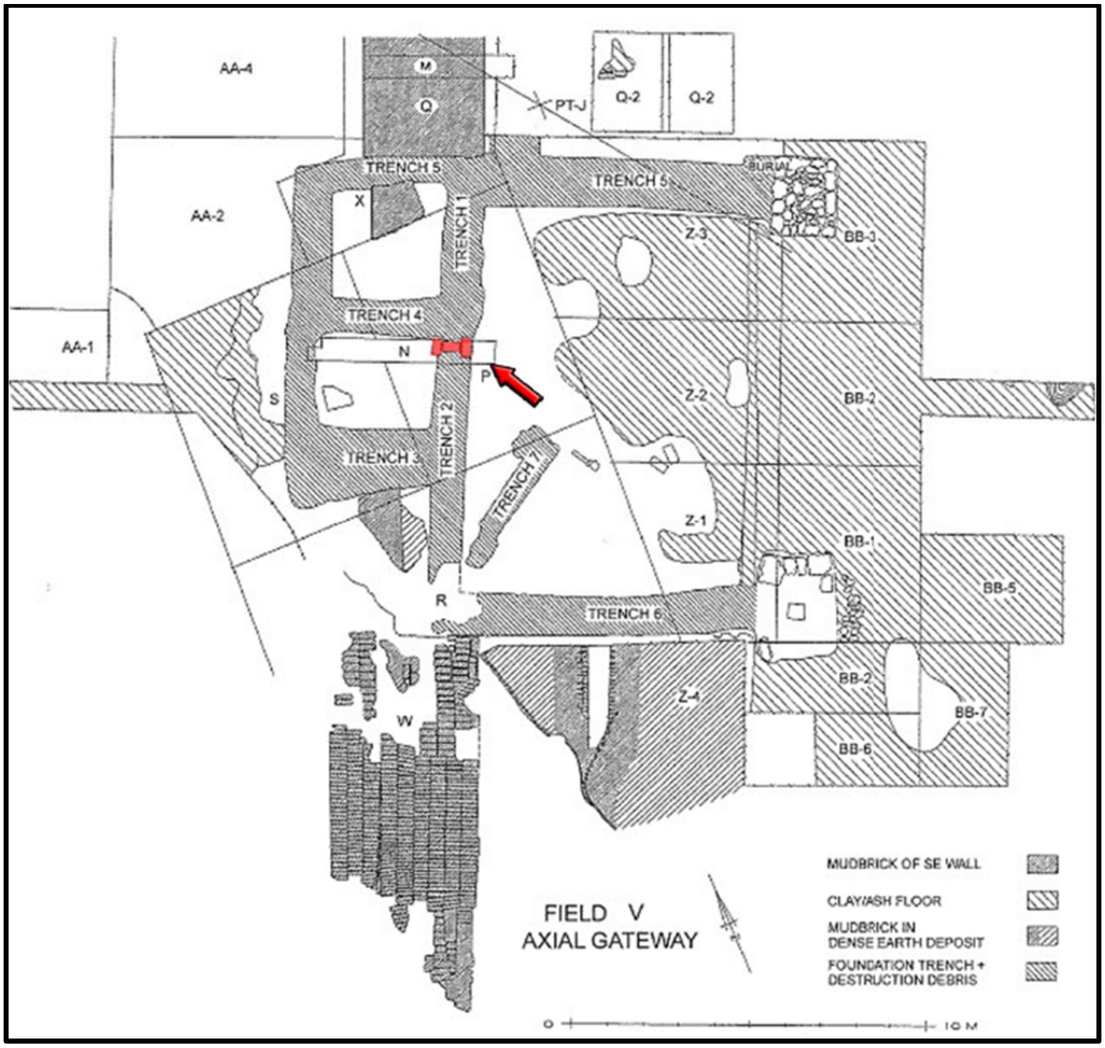

Figure 38 - Excavation plan of the Ramesside gateway. The three in situ *talatat* blocks are noted in red (adapted from Hoffmeier 2011, fig. 4).

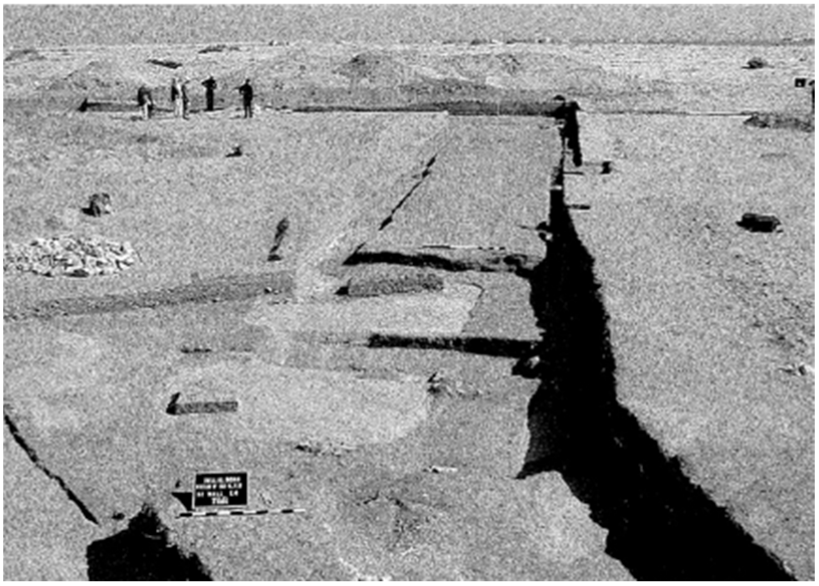

Figure 39 - Excavation photograph of the Ramesside gateway, illustrating the denuded remains (Hoffmeier 2011, fig. 2).

The gateway of the 19th Dynasty fortress is located on the eastern side. As stated, Hoffmeier estimated that the main curtain wall of the Ramesside fortress was between 3.4 – 3.6 metres thick.[542] From the easternmost corner, the curtain wall proceeds south for 33 metres and ends abruptly.[543] The gateway area is approximately 14 metres across and the southern part of the curtain wall is preserved for 11 metres.[544] The gateway area, like most features of the site, is very badly preserved (Figure 39). To assess the gateway area, the excavation team followed 'voids' (areas that had been filled in with "bricky soil, ash and limestone fragments") which contrasted against the natural ground in this area.[545] The gateway itself, engaged with the surface of the main curtain wall and extended backward toward the inner part of the fortified enclosure, is approximately 5 metres long.

As for the composition of the gateway, the team only found three *talatat* blocks in situ and laid out as if in a header-stretcher pattern (Figure 38). Hoffmeier, based on these three blocks and their layout, claimed the gateway's wall can be estimated to be 2 cubits (c. 1.04 metres) thick. In addition, he also asserted that the entire gateway had a limestone foundation based on a small piece found in Unit S. If we accept Hoffmeier's suggestion of the gateway's thickness and composition, it would indicate a similar layout to Tell Heboua 1's gateway with durable flooring to prevent against wear. Hoffmeier also claimed that there

[542] Hoffmeier 2011, 209
[543] Hoffmeier 2011, 210 fig. 2
[544] Hoffmeier 2011, 209
[545] Hoffmeier 2011, 209

were 3 compartments to the gateway but the physical evidence is minimal.[546] Following the assertions of Oren, he estimated that the middle compartment must have been the main passageway and that it was around 2.5 metres in antiquity so it could have accommodated chariot-traffic.[547]

At either side of the gateway, Trenches 5 and 6, had a similar "bricky soil" void that extended externally from the main curtain wall for 10 metres. At the end of these void-deposits, a broken stone foundation was a bit thicker than the void.[548] The rough stones of this foundation are composed of local caliche sandstone. The team did not find any evidence of a frontal gateway in the area between the two stone-foundation ends. Thus, the team concluded that there was no second door to this area and that this space acted as some sort of forecourt in front of the gateway that measured 10 x 10 metres.[549] Hoffmeier suggested that the "forecourt" operated as a wind-blow against the build-up of sand by heavy winds in front of the gateway.[550] However, we should consider that the ponds at the fortress would have been rendered useless if sand accumulation was a problem. Furthermore, considering that there is no precedent in military architecture for an "open gatehouse", the argument seems unlikely. A more reasonable assessment is that the gateway was so badly damaged that any evidence of a stone lintel or pivot for an exterior doorway was removed in antiquity by those scavenging for stone materials.

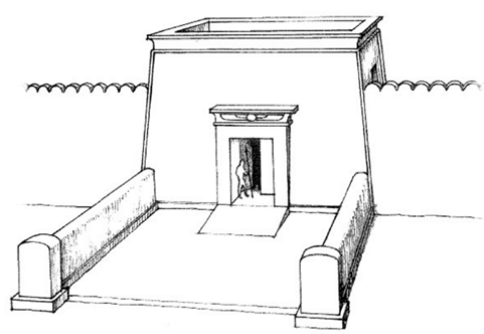

Figure 40 - Hoffmeier et al.'s Ramesside gateway reconstruction (Hoffmeier 2011, fig. 5).

[546] Hoffmeier 2011, 211
[547] Hoffmeier 2011, 211, ft. 20
[548] Hoffmeier 2011, 211
[549] Hoffmeier 2011, 211
[550] Hoffmeier 2006b, 258

The project's architect, J. E. Knudstad, collaborated with Hoffmeier, Mumford, Frey and Bull to produce a reconstruction of how the gateway would have looked in antiquity.[551] The drawing created looks more appropriate as a temple-pylon portal than for a fortress (Figure 40). There is no portal that has this layout at all in military architecture in the history of pharaonic Egypt and is surely conjecture on the excavator's part. The argument is stronger when we consider the fact that the area only had three blocks in place. In regard to the forecourt, the walls extended forward, about 2 metres high and ended with round-topped stelae at either side. This is yet another feature that is without parallel in military architecture.[552] The team's reasons for this reconstruction are not discussed and one can only assume that were based on the reconstruction of Medinet Habu or the stables at Qantir.[553] Indeed, one should ignore this reconstruction in the light of scant evidence.

Another curious aspect of the Ramesside gateway at Tell el-Borg is Hoffmeier's suggestion that the forecourt walls had a chariot warfare scene.[554] Hoffmeier pointed out that many stone fragments and crushed limestone were found in the gateway area and some pieces had the praenomen of Ramesses II. This remains his only proof for claiming that this gateway was constructed and in use during the latter part of the 19th Dynasty. Hoffmeier ignored the evidence of recarving over some of these fragments. Fragment TBO 0740 with the nomen of Ramesses II was partially carved over by a sun-disc and uraeus combination.[555] It is quite possible that the gateway functioned for a long time after Ramesses II's reign and had been reinscribed.

In 2000, the team discovered a group of blocks depicting a battle scene of a pharaonic ruler hunting down Shasu-bedouin.[556] The blocks were removed in antiquity and buried for possible reuse.[557] They were originally thought to be from a temple, given that most warfare compositions come from such contexts. However, Hoffmeier opted to view them as originating from the gateway area.[558] Ignoring the fact that Field 1 is approximately 350 metres from the Ramesside fortress' entrance, there is no direct correlation with these inscribed veneers to the gateway area.[559] The only known parallel to such a decorated

551 Hoffmeier 2011, 212 fig. 5
552 Hoffmeier 2011, 212 fig. 5
553 Cavillier 2008, 71; Pusch 1996b, 130 fig. 126
554 Hoffmeier 2011, 212
555 Hoffmeier 2011, 213, fig. 6
556 Hoffmeier & Pinch-Brock 2005, 82. See also, Chicago Ep. S. 1986, pl. 3 and Bietak 1997, 100 fig. 4.12 – 1.
557 Hoffmeier 2011, 212
558 Hoffmeier 2011, 213
559 Hoffmeier & Pinch-Brock 2005, 84; Hoffmeier & Maksoud 2003, 179

gateway is at Zawiyet Umm el-Rakham, located east of Mersa Martuh, approximately 550 kilometres from Tell el-Borg.[560] The fact that Hoffmeier left his reader with the impression that the partial chariot scene at Zawiyet Umm el-Rakham can be directly related with Tell el-Borg's Field 1's pit of inscribed panels is mostly conjecture. Zawiyet Umm el-Rakham has numerous features and architecture that are unique and it is not proper to present the two fortresses as being mirror-images of each other.

Hoffmeier was quite convinced that the gateway of the Ramesside fort shows evidence of being: "attacked militarily and burnt, and subsequently most of the limestone blocks were robbed out for reuse".[561] However, he has not presented any criteria on what an attacked gateway would look like in the archaeological record other than stating that the stone blocks of the gateway had not been split systematically.[562] For this, Hoffmeier claimed that the presence of limestone chips in the forecourt of the gateway displayed evidence of burning and being smashed. This does not seem to take into account that setting fire to stone to crack it might be an alternative theory on the large amount of limestone chips in this area. It is likely that the gateway was damaged to procure building materials when the fortress had gone out of use. It is unlikely that a hostile force would have devoted so much time to destroy Tell el-Borg's gateway with Tell Heboua being a bigger target only 5 kilometres away. As noted, at many sites in the Delta, building materials were at a premium and it is not rare to find stone materials used in one context and repurposed in another. The fact that inscribed panels were found 350 metres away from the immediate vicinity of the Ramesside gateway and were buried intentionally in a pit, should dissuade anyone from arguing against the ancient motivation to ransack ancient unused sites for building materials.[563]

Hoffmeier also made the suggestion that the only host that could have inflicted this kind of destruction on the Ramesside gateway was the Sea Peoples.[564] This explanation is obviously in error for a number of reasons. First, as we will see with our logistical analysis (Sections 4.3.1 and 5.4.1), it would be very difficult for marauding bands to cross the north Sinai as it presented a very harsh geographic boundary. Second, if the Sea Peoples did make their way to the eastern Delta, how likely is it that they would have engaged the soldiers of the diminutive fortress at Tell el-Borg to the extent where they could crush the gateway down to

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[560] Hoffmeier 2011, 216; Hoffmeier & Pinch-Brock 2005, 83, 85; Snape 2004, 149; 2003, 2 – 3
[561] Hoffmeier & Pinch-Brock 2005, 85
[562] Hoffmeier 2004b, 101
[563] Hoffmeier & Pinch-Brock 2005, 88, ft. 35
[564] Hoffmeier, personal communication – University of Liverpool 2009; Hoffmeier (2006b, 264; 2004b, 102 – 103). However, some publications (Ertman & Hoffmeier 2008, 296), seem more cautious.

fist-sized chunks of rubble? Thirdly, what evidence is there at Tell el-Borg for any type of Sea Peoples presence and/or military activity? The archaeological record is mute on a definitive answer to these questions. It is more likely that the inscribed scenes in Field 1 and crushed limestone in the forecourt of Field 5 suggests that stone 'recycling' took place in the gateway area. Considering that Tell Heboua 1's terminus did not yield a destruction layer, it is likely that Tell el-Borg was abandoned after the problems of provisioning supply had affected the fortress' inhabitants; they had to seek their livelihood elsewhere.

4.2.5.6 Material Culture

Several bronze items were discovered in the north-east corner of the fort, in Square Ua, including arrowheads and a spearhead.[565] There was also a pair of circular cheek pieces for horse-harnessing.[566] One measured 3.5 cm in diameter and had three pointed tips (to press into the horse's mouth/mandible).[567] Hoffmeier claimed that the horse imagery in the Astarte stela (that depicts the goddess on a horse), the equid remains from fosse in Field 5 and these cheek pieces suggests a stable in this fortress.[568] However, the postulation of a stable is presumptuous based on this material evidence. A physical structure or paddock would be a more convincing find to support this statement.

4.2.5.6.1 Pottery

Numerous sherds were found on top of Field 6 at Tell el-Borg but, like other parts of the site, the remains are very badly preserved due to modern activity.[569] The sherds date to the SIP through to the 19th Dynasty. Unfortunately, the irregular pattern of preservation made statistical analysis very problematic. The presence of a high concentration of bivalve shells indicates mudbrick architecture that once stood in the area, similar to constructions at Tell Heboua 1 in its later phases.

Hoffmeier noted that a "surprising number" of sherds came from foreign vessels in the backfill of Fosse D, such as types from Cyprus and Mycenae and he thought that they were representative of 'luxury items' for the fortress' inhabitants.[570] However, Bergoffen claimed that vessels from Cyprus do not appear to have been prized forms but occurred in 'non-elite'

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565 Hoffmeier 2006b, 261
566 Littauer & Crouwell 1979, 3 – 4, 5
567 Hoffmeier 2006b, 275, fig. 22
568 Hoffmeier & Kitchen 2007; Hoffmeier 2006b, 261; Cornelius 1993. See also, an Astarte figure sitting astride a horse from Buhen (Smith 1976, 110 no. 1112, pl. XX).
569 Hoffmeier 2004b, 89
570 Hoffmeier 2006b, 258

contexts during the LBA.[571] If Tell el-Borg did have a port for water transport, it might be reasoned that luxury vessels might have been quite common due to trade with Mediterranean merchants.[572]

4.2.5.7 Discussion

Although the damage to the archaeological remains is extensive, Tell el-Borg was a small fortified outpost along a strategic juncture around the New Kingdom lagoon in the eastern Delta. If we are to equate this site with the 'Dwelling', there are a number of claims that could be made.

If we accept Stanley's and Marcolongo's claims that a Pelusiac branch reached this area during the New Kingdom, Tell el-Borg could have benefited from the delivery of provisions and materiel by water transport. The site's location on the edge of the north Sinai's arid desert indicates that the site could not have supported itself without aid from the central Egyptian administration. Pap. Anastasi I indicates that it had access to fish, but whether that was via the lagoon or from a stock maintained in one of the fortress' ponds is unclear.

One of the notable architectural features of the site are the series of fossae. Referring back to the depiction of the external water body outside the 'Dwelling' fortress in the Sety I battle scenes, it is tempting to associate the depiction of the rectangular pool with the fossae found at the site (Figure 18). The manicured trees and rectangular layout of the pool bear a rough resemblance to what was found during the excavations. It is clear that their primary use was not for defence but for consumption. The purpose of having a pond outside the fortress' curtain wall might seem odd but this can be explained by the importance of this feature in logistical administration. By having a pond outside the fortress' curtain wall, it allowed more livestock and people to access the watering-hole more rapidly, avoiding a 'bottleneck effect'.[573] These external pools demonstrate the importance of logistical supply in the New Kingdom army and possibly this sites' main function along the Sinaitic route to Canaan.

The rough phases of the site are based more on the historical record than archaeological data, which seems warranted given the damages that were done to the site. Only the rough outline of the 18th Dynasty fortress could be determined from the locations of Fosse A and D. The re-establishing of the fortified enclosure in the 19th Dynasty is perplexing unless we are

[571] Bergoffen 1991, 64, 69
[572] Hoffmeier 2004b, 111
[573] Engels 1978, 57

willing to accept Hoffmeier's explanation that the move was the result of the water table being too close to the surface of the site, possibly damaging architectural features.

The scant architectural remains from the site indicate that external buttressing along the curtain wall was recognised by Egyptian builders to serve a minimal function. Thus, the external buttressed façade that we saw in the layouts of Tell Heboua 1 and 2 were phased out in the construction of the 19th Dynasty fortress.[574] The gateway of Tell el-Borg's 19th Dynasty fortress was located on the eastern side but, as we have seen, the attempt to reconstruct the gateway and its associated artistic war-scene are unconvincing. In addition, the claim that this fortress met its end at the hands of the Sea Peoples still needs verification archaeologically.

The importance and possible focus of Tell el-Borg and its association with ponds indicates that this site functioned as a critical place for the resupplying troops that were either leaving or coming to Egypt. Likely Tell el-Borg operated as a place where, on the return journey back to Egypt proper, the king and his forces could reinvigorate themselves before marching triumphantly into the major centre of Tell Heboua 1 or Qantir. Considering the small size of Tell el-Borg, it is unlikely that the site could have withstood an aggressive force if they chose to attack it. More likely, any hostile forces that reached the area could have easily by-passed the fortress on their way to Tjaru. Due to these factors, we can evaluate that the fortress of Tell el-Borg's importance lay in its ability to supply military forces and to monitor the overland Sinaitic route. If a threat had arrived at the edge of the eastern Delta, Tell el-Borg would have relied upon communication with Tell Heboua for reinforcement.

4.3 Sites in Northern Sinai

Most of the northern Sinai is characterised by shifting sand dunes with interdunal valleys (Figure 41).[575] The nature of the shifting sands of the north Sinai makes identification and excavation of archaeological sites very difficult.[576] Furthermore, the sites of the north Sinai have been noted to have very little (or no) stratigraphy; remains from different time periods are deposited right next to one another. This archaeological material was not deposited on the same stratum in antiquity, but through the process of high winds and the shifting sands of the north Sinai, the archaeological remains, being heavier, gradually became deposited on the

[574] It is unknown whether this was the same case with the 18th Dynasty fortified compound.
[575] Yekutieli 2002, 422
[576] Yekutieli 2002, 423

same plane over time.[577] Thus, the inference of a site's 'popularity' during a specific period is based on the frequency of diagnostic remains.

The Sinaitic route to Canaan was a conduit of trade and travel very early in pharaonic history. Protodynastic jars (c. 3200 BCE), composed of marl clay from the Nile Delta, were excavated from Sheikh Zuweid and indicate that long distance trade took place with southern Canaan using the overland route.[578] Oren noted that pottery remains imply occupation in the north Sinai as far back as the Predynastic Period (5500 – 3100 BCE).[579] In addition, Oren, Marcus and Gophna suggested that maritime traffic between Egypt and Canaan was active in the Early Bronze I.[580] Contact between Egypt and the Levant was maintained throughout the pharaonic period by trade and military expeditions that appear to have been more akin to raid-attacks than an attempt at establishing a permanent Egyptian presence.[581] During the New Kingdom, however, the archaeological evidence indicates that the establishment of permanent bases in the north Sinai was a new feature. No doubt, the formation of a series of bases in the barren landscape demonstrated how the Egyptian administration was perceptive of logistical constraints on their military.

There are a number of dangers today with archaeological investigations in the north Sinai. As some authors noted, the area has been somewhat volatile in modern times due to the smuggling of illegal narcotics.[582] In addition, during the course of the Egypt-Israeli conflict of the 1960s and 1970s, there are a number of areas considered to be unsafe due to unexploded ordnance.[583] Currently, the Egyptian government has imposed a travel-ban in the area that confines foreigners to the main road, the El Arish highway, as it is too dangerous to venture into the dunal landscape. Thus, archaeological investigations and geographic analysis have been done primarily by Eliezer Oren and Ned Greenwood. Therefore, the analysis of this area has to rely predominately on their work.

Oren led an archaeological team from Ben Gurion University and surveyed the north Sinai for ten years (1972 – 1982). The motivation for this investigation was to conduct archaeological work in an area that had been widely commented on in scholarly literature but

[577] Yekutieli 2002, 423; Butzer 1982, 52, 110
[578] van den Brink & Gophna 2004, 493
[579] Oren 1973b, 204
[580] Gophna 2002; Marcus 2002, 407; Oren 1973b, 204
[581] Spalinger 2013b, 428 – 429, 441; Moreno Garcia 2010; Grajetzki 2006, 135 – 136; Wright 1988
[582] C. Malleson, personal communication, August 2012; Garfunkel 1979, 43
[583] Greenwood 1997, 8, fig. 5.3

not investigated thoroughly.[584] Oren and his team surveyed the area by dividing it into 44, 10 x 10 km sections.[585] During the investigation, they managed to survey 3,000 km^2 and located nearly 230 settlement sites.[586] On the whole, the project did not allow for detailed investigations at every site encountered. Most of the archaeological sites recovered by Oren's team were only indicated by a concentration of pottery sherds, lithic tools and simple installations.[587] The survey found a regular arrangement in sites of the north Sinai in that, they were grouped in clusters; a central location encircled by smaller sites in a rough, radial pattern ('centralised pattern') (Figure 4).[588] These smaller sites took the form of temporary encampments that would have depended upon the central area for protection and/or supplies.[589] Oren noted that the expedition found this sort of spatial 'clustering' at ten different places.[590] Although the sites of Bir el-'Abd and Haruba appear to have architectural remains, the remains of fortified enclosures have not been reported at Rumani, Nagila, Madba'a, el-Mazar and el-'Arish.[591] To date, the results of the survey have not been published in final form. However, Oren published various articles relating to the north Sinai but focusing on Bir el-'Abd and Haruba.

In examining Bir el-'Abd and Haruba, we will obtain an understanding of the architectural remains and the material culture at these sites. To place them into their proper context, we must first examine the landscape of the northern Sinai. It is by this analysis that we can investigate the environmental conditions that led to the establishment of these bases and how they would have been integral to the logistical network to facilitate Egyptian military campaigns.

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[584] Yekutieli 2002; Oren 1987, 79
[585] Yekutieli 2002, 423
[586] Oren 2006, 280; Stanley 2002, 98
[587] Yekutieli 2002, 423
[588] Oren 1987, 77; 1993, 1389
[589] Oren 2006, 289
[590] Oren 2006, 280
[591] Morris 2005, 527

Figure 41 - Physical geography of the Sinai (Greenwood 1997, ix).

4.3.1 Geography and Environment

The Sinai Peninsula forms a natural land bridge between Egypt and the southern Levant (Figure 4). The rough dimensions of the peninsula are 200 km east – west and 380 km north

– south.[592] The pollen record indicates that the aridification of the Sinai was established to present-day conditions around 5,000 BCE.[593]

The Sinai, geologically, is primarily composed of two parts; the large Precambrian base which lies largely exposed in the hilly south while the north has sedimentary layers that are more recent as one move towards the Mediterranean coast.[594] Greenwood characterises the northern Sinai as a 'Dune Sheet' made up of undulating, aeolian sand dunes that can reach 50 metres in height that extend 50 km inland from the Mediterranean coast.[595] In the central Sinai, the Tih Plateau, the elevation rises with some areas reaching as high as 500 metres before dropping down to the Dividing Valleys before another higher elevation rise in the southernmost area of the Sinai, the Sinai Massif (elevation c. 1,600m).[596] For our examination, we will focus on the northern Sinai's geography as it would have mostly impacted overland travellers and campaigns in the New Kingdom.

The north Sinai is a very arid desert comprising of a sandy coastal plain backed by calcareous sandstone (*kurkar*) ridges and salt flats (*sabkhas*).[597] The offshore current of the north Sinai flows in a counter clockwise direction (Egypt→Sinai→southern Canaan) and this appears to have established itself as the predominant coastal flow about 5,000 BCE.[598] Some suspended sediment is deposited along the Sinai littoral but the coastal flow predominantly erodes the northern coast and deposits sediments as far as the northern coast of Israel. Today, a hyper-saline lake (60 – 80%) is present and dominates the northern coast, called the Bardawil Lagoon.[599]

The Bardawil Lagoon covers 67,000 hectares and is 1 to 3 metres deep.[600] Bardawil's formation differs from that of the saline wetlands of the Delta, in that the coastal currents formed this feature by depositing sediment by the 'longshore process'.[601] However, much

[592] Garfunkel 1979, 41
[593] Stanley 2002, 101; Redmount 2001, 306; Coutellier & Stanley 1987, 265 *contra* Issar 2010, 290
[594] Greenwood 1997, 19 – 20
[595] Greenwood 1997, 26, 29; Garfunkel 1979, 44
[596] Greenwood 1997, fig. 3.2; Garfunkel 1979, 41
[597] Karmon 1971, 14
[598] Stanley 2002, 100, fig. 5.2 before 5,000 BCE, the coastal flow was in the opposite (clockwise direction)
[599] Stanley 2002, 98
[600] Stanley 2002, 107 – 108
[601] Stanley 2002, 108

like the Nile's eastern Delta, the geography of the northern Sinai coast represents a geographic feature that has changed over time.

Oren noted that the survey did not find any installations along the Mediterranean coast and he took this to mean that sites were directly cut off from maritime traffic.[602] He elaborated that along the Mediterranean, the coast is very shallow and would not allow for vessels to directly take harbour. Instead, vessels had to rely on smaller craft, with a shallow draft to make any provisions available to overland travellers.[603] However, Stanley's work provided an answer to why these 'coastal sites' were not found during the course of the survey.

Stanley's investigations of the Mediterranean coastal flow of suspended sediment and erosion factors demonstrated the Bardawil Lagoon did not exist along the north Sinai coast during the New Kingdom (Figure 42). The northern coast of the Sinai had a land-mass projection in-line with the Pelusiac Fault of the eastern Delta and extended as much as 25 km into the Mediterranean during the Early Bronze Age. Although this feature would have been eroded over time in the New Kingdom, this headland still would have been present and would have been a natural mooring location for shipping traffic.[604]

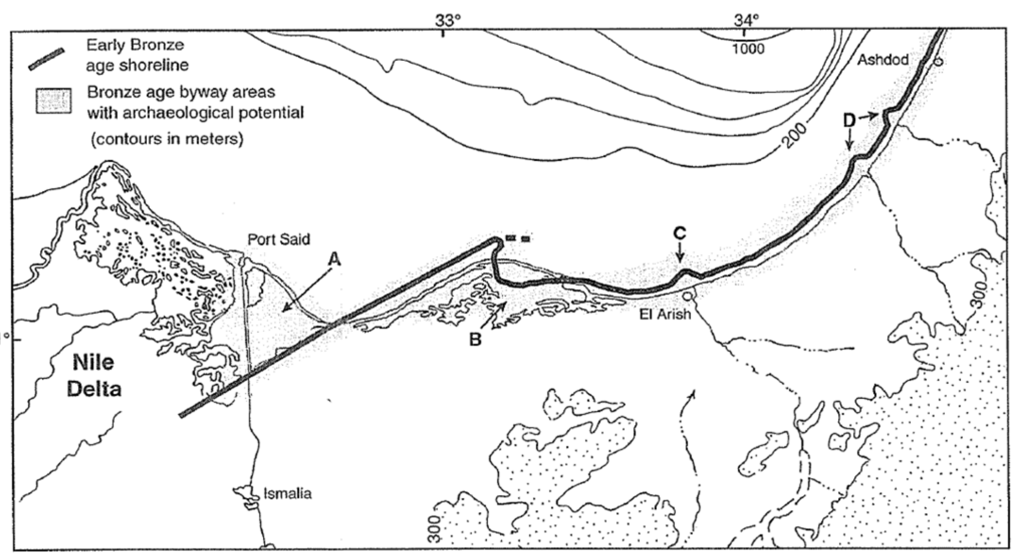

Figure 42 - Stanley's reconstruction of the Early Bronze Age coastline of the north Sinai (Stanley 2002, fig. 5.15).

[602] Oren 1993, 1389; 1987, 77; 1979, 190
[603] Oren 1987, 114, ft. 8
[604] Stanley 2002, 114

The implications of Stanley's research demonstrated the Mediterranean current makes the possibility of finding New Kingdom anchorages in the north Sinai very unlikely as the erosion process signifies any potential mooring-sites are now submerged beneath the Mediterranean.[605] In the New Kingdom, the coastline of the north Sinai would have been 500 metres north of its present location.

The solar radiation for the Sinai is very high. The average annual radiation is 500 cal/cm^2/day and 72% of daylight hours at el-Arish are cloud-free.[606] This results in a very high rate of water evaporation (evapo-transpiration) and would have an impact on any ancient cisterns.[607] The winds in the area are predominantly from the north-west/west direction and average 3.6km/hour.[608]

The Köppen Climatic Classification of this area assigns it as a Marine Desert ('BM') with a hot summer and a mild winter ('al').[609] The low specific heat capacity of the Sinai's north coast means that the seasonal temperatures in the northern Sinai are very warm in summer while it can be cold in winter. The average daytime temperature recorded at el-Arish in July is 25.5°C and in January, is 13.5°C.[610]

The mean annual rainfall decreases from east to west in the north Sinai. Rafah has an average rainfall (isohyet) of 120-200 mm per year while el-Arish has 97 mm per year.[611] However, the only precipitation that falls is in the Sinai occurs in winter (November to April, predominantly in December to February), so New Kingdom travellers would have to rely upon alternative water sources to satiate their thirst outside of the winter months.[612]

The shifting sand dunes of the north Sinai are in a constant state of change and so, established stable wadis are very rare in the Sinai's Dune Sheet.[613] Therefore, the area is largely devoid of surface water. The Wadi el-Arish, on the eastern side of the Sinai, is desert fluvial system which reaches far south for 250 km, to the Tih Plateau (Figure 41). The Wadi el-Arish is composed of three main wadis, Bruk, el-Arish and Aqaba, and accounts for 28%

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[605] Stanley 2002, 113 – 114, fig. 5.15
[606] Greenwood 1997, 51
[607] Garfunkel 1979, 42
[608] Stanley 2002, 101; Greenwood 1997, 56
[609] Peel et al. 2007; Greenwood 1997, 62, fig. 4.7
[610] Greenwood 1997, figs. 4.1 and 4.2
[611] Stanley 2002, 107; Greenwood 1997, 57; Zohar et al. 1971, 320
[612] Greenwood 1997, 59; Garfunkel 1979, 42
[613] Greenwood 1997, 48

of the Sinai's drainage, remaining the only stable wadi network in the northern Sinai.[614] Today, 40% of the modern population of the Sinai is located at el-Arish.[615] Due to the wadi network flowing northwards towards el-Arish, it remains the only area of the north Sinai that could have sustained agriculture on a small scale with the alluvial soil being of 'fair' quality.[616]

The natural vegetation of the area of the north Sinai coast is dominated by halophytes and succulents. Further inland, the plant remains slightly change to a steppe of *Artemisia monosperma* and annual grasses, the perennial grass *Stipagrostis scoparia* predominates.[617] The plant cover in the Dune Sheet is estimated to be about 5% today and this comparable to what it was in antiquity. The limited and scattered biomass of the north Sinai restricts the number of animals in the area, predominantly being smaller varieties of lizards, rodents and birds.[618] It is unlikely that pack animals travelling with an Egyptian campaign force could have foraged on the natural vegetation of the north Sinai's Dune Sheet.

Yekutieli's analysis investigated the area of the north Sinai to estimate the carrying capacity of the area.[619] To investigate this, he organised areas of the north Sinai into living condition-ratings based on their access to fresh water and scrub vegetation. Yekutieli determined that the north Sinai could have supported a maximum population of 5,500 inhabitants, 40,000 sheep and goats, 2,500 cows and 2,500 donkeys. However, he concluded that concentrations of 100 people were a 'large cluster' in his study.[620] Yekutieli's results imply that the inhabitants of the north Sinai could not have represented a threat to Egyptian bases in the area since logistical supply issues would have been a barrier to waging war on these centres. Interestingly, Yekutieli's regional analysis proposed that the only areas that were suitable for year-round occupation (on a pastoral nomad lifestyle) are the exact areas where Bir el-'Abd and Haruba are located.[621]

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[614] Greenwood 1997, 48
[615] Greenwood 1997, 122
[616] Stanley 2002, 111; Greenwood 1997, fig. 5.2
[617] Greenwood 1997, 90 – 94, 99; Zohar et al. 1971, 320
[618] Greenwood 1997, 104
[619] Yekutieli 2002
[620] Yekutieli 2002, 428
[621] Yekutieli 2002, 422-423, fig. 26.2

4.3.2 Pictorial Evidence from Egyptian Sources

As noted above (Section 4.2.3.3), the first register of the battle scenes of Sety I at Karnak have a clear line of what was considered Egypt proper and what lay outside of it (Figures 18 to 19, Table 3). In the Tjaru-scene, this is delineated by a vertical line representing a channel or possibly a canal that separates the fortress of Tjaru. For the most part, Tell el-Borg is one of the fortresses that followed in the subsequent scenes. However, as Oren noted: "The remaining stations that took the names or epithets of Sety I and Ramesses II and consequentially are impossible to identify with any specific site".[622] Brandl has made a similar claim about Deir el Balah in association with the Sety battle scenes.[623] As mentioned, the remaining representations of fortresses are characterised by having all four tower piers displayed to the viewer, a rectangular doorway and are associated with a water-body that is located outside the fortress' curtain wall (Figure 43).

I II III

Figure 43 – A selection of fortresses and water features in the Shasu Register (Gardiner 1920, pl. 12).

4.3.3 Bir el-'Abd

4.3.3.1 Introduction

Bir el-'Abd has not been fully published but Oren has commented enough on its features to gain a sense of how it functioned in the New Kingdom in the logistical network. Unfortunately, there is very little detail on the fortified enclosure itself. Instead, Oren has focused on the presentation of the granary complex and a depression that could have functioned as a cistern. This complex reveals interesting details about the site's function and its contribution to Egyptian logistical infrastructure in the north Sinai.

[622] Oren 1987, 73
[623] Brandl 2010b, 84

4.3.3.2 Physical Location

Bir el-'Abd is located in the Dune Sheet of the north Sinai, roughly 75 km from Tell Heboua 1.[624] The site displays the centralising pattern in that it consists of a central location (marked as BEA-10 in Oren's survey) and has about 30 smaller encampments within a 3 – 4 kilometre radius (Figure 4).[625] Bir el-'Abd's central site covers roughly 50,000 m^2 but the architectural remains do not cover an area larger than 4,046 m^2.[626] In antiquity, Bir el-'Abd would have been situated roughly 20 km from the New Kingdom coastline.

4.3.3.3 Phases and Dates

To date, Oren has not presented phases of the site. He only commented that it was occupied during the New Kingdom. The evidence indicates that the fort was built in the 14th century BCE and was occupied during the reign of Sety I.[627] The preserved sections of the fortress' pavement revealed numerous Egyptian vessels that were consistent with the New Kingdom. In general, there is an absence of pottery dating to the early 18th Dynasty throughout the north Sinai which led Oren to suggest that there was little or no trade between Egypt and Canaan during the LBA I.[628]

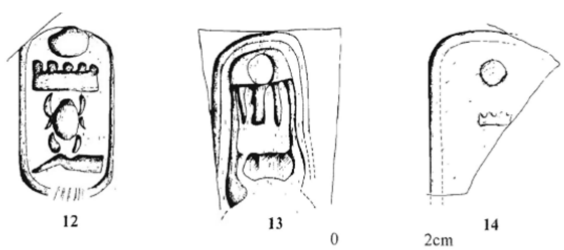

Figure 44 - Cartouche impressions of Thutmose III, Bir el-'Abd BEA-10 (Oren 2006, fig. 6).

The ceramic repertoire found in the north Sinai is composed of mid-18th Dynasty types either locally manufactured or imported. Egyptian ceramics become more prevalent as one approaches the eastern Delta.[629] The presence of red-slipped and splashed-decorated ware represents a diagnostic part of the ceramics found at the site as they became popular during

[624] Morris 2005, 295
[625] Oren 1993, 1389; 1987, 78; Morris 2005, 295
[626] Oren 1987, 78
[627] Oren 1973a, 113
[628] Oren 2006, 283
[629] Oren 2006, 286

the reign of Thutmose III and continued in use till the reign of Amunhotep II.[630] In addition, several stamped impressions of the cartouche of Thutmose III suggest that Bir el-‘Abd was founded during his reign, importing mainly closed containers for larger commodities (such as oil and wine) (Figure 44).[631]

Dating the early phases of the site come from the remains of Egyptian ‘flower pot’ vessels (Figure 54). The presence of these vessels indicate that the fortress was established at least in the mid-18th Dynasty, as it was conclusively shown that such vessels had already become quite rare in the reign of Amunhotep III and were nearly out of use during the Amarna Period.[632] Thus, much like the dating of Tell Heboua, we might speculate that the site was founded before the reign of Thutmose III as he was able to cross the Sinai in 10 days; a feat which could not have been performed without sufficient logistical infrastructure.[633]

Figure 45 - Jar handle with a cartouche of Sety I (Oren 1987, pl. C).

Perhaps one of the most important artefacts for dating the site in the 19th Dynasty comes from a jar handle that has an impression of a cartouche of Sety I (Figure 45).[634] Oren interpreted this as confirmation of Sety I’s reconquest of the Sinaitic route. Although there are some fragments dating to the 20th Dynasty, Oren found no evidence of pottery or material remains that suggest the site was still in operation during the TIP. Much like Tell Heboua, there are no destruction levels at the site at the close of the New Kingdom (c. 1069 BCE).

630 Aston 2006; Oren 2006, 286, fig. 5 no. 2 – 3
631 Oren 2006, 286, fig. 6 no. 12-14
632 Martin 2004, 268, Figure 3, no. 11, 270; Martin & Barako 2007, 148
633 Dothan 1987, 121 *contra* Oren 2006, 283
634 Oren 1979, 188; 1987, 84 – 85, pl. C

The granary complex was used as a refuse pit in its last phase implies intermittent habitation.[635]

4.3.3.3.1 Brick Sizes

All the structures at Bir el-‘Abd are composed of the same size of bricks, 44 x 22 x 12 cm, which are a bit larger than the later-phase buildings at Tell Heboua 1.[636] This size however, still falls within the New Kingdom size variance as proposed by Spencer.[637]

4.3.3.4 Architectural Features

4.3.3.4.1 Fortifications

In Area A at the site, a square structure was uncovered with 3 metre-thick walls. The walls of this structure were homogenously composed of mudbrick.[638] Morris commented that although the walls seem thinner than those from fortified sites in Nubia (suggesting a smaller height for the curtain wall, c. 6 metres high), they still would have represented a “formidable enough barrier” to a hostile force.[639] Although Oren did not describe the installation in detail, he claimed that it would have covered 1,600 m^2 or a square structure that was 40 x 40 metres.[640]

4.3.3.4.2 Granaries

Bir el-‘Abd’s logistical significance can be seen in the discovery of a granary complex. This would have served as an important feature in resupplying campaign forces and travellers. The four-silo granary complex is located 40 metres to the south of the fortified enclosure (Figures 46 to 47). The mudbrick walls of the silos were preserved up to a height of 2 metres to just below the base on the dome that originally covered the structure.[641] Thus, the silos had a cylindrical drum and around the 2 metre mark, began to have brick courses corbelled to

[635] Oren 1993, 1389; 1987, 80 *contra* Morris 2005, 300
[636] Morris 2005, 296
[637] Spencer 1979, pl. 41
[638] Oren 1993, 1389; 1987, 78
[639] Morris 2005, 296
[640] Morris 2005, 296; Oren 1993, 1389
[641] Oren 1979, 188

form a dome on top. Silo 4 was the best preserved of the group and remained the basis for a reconstruction estimate.[642]

In the excavations of this structure, it was found that initially the builders had cut a pit out of a sand dune.[643] Oren theorised that the granary complex was originally covered with sand and that this was to maintain an even temperature to preserve the grain inside. However, this seems contradictory to what Oren wrote later in that two of the silos had projecting ‘shelves’ one brick thick, which were just above the ground’s outside level which Oren stated: “marked the location of the opening”.[644] It is unclear whether Oren believes they were covered by sand or not while they were in operation. There is some benefit to think that the structure was covered so it would have been concealed in defending the outpost.

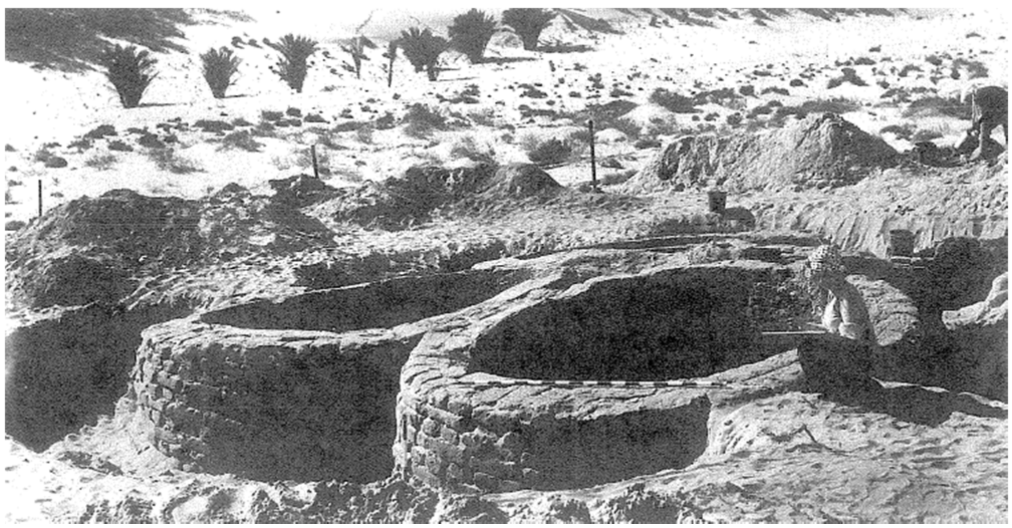

Figure 46 - Granary of Bir el-'Abd, located 40m south of the fortified enclosure (Oren 1993, 1389).

[642] Oren 1987, 80
[643] Oren 1979, 188; Oren 1973a, 113
[644] Oren 1993, 1389; 1987, 80

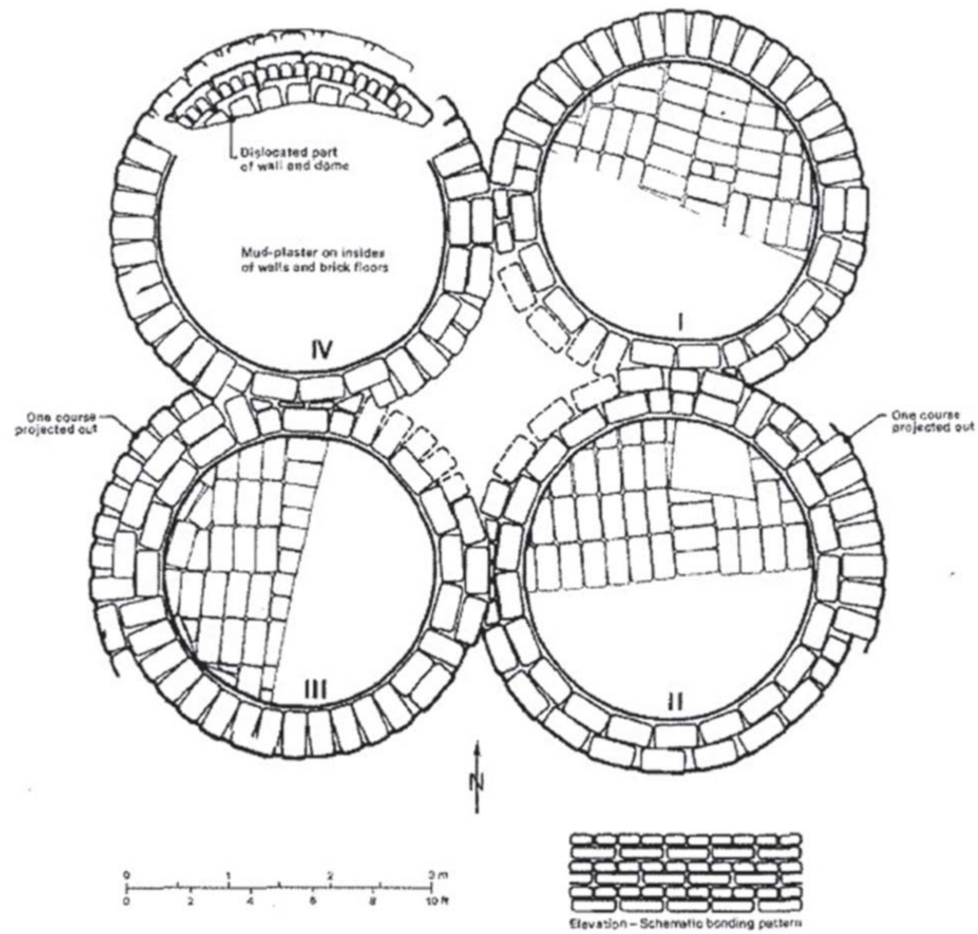

Figure 47 - The granary complex at Bir el-'Abd (Oren 1979, Fig. 39).

On the floors of the silos, Oren and his team found a layer of organic material but were unable to determine if it was grain or some other material. The domes of the silos collapsed in the site's last phase and the area was used as a refuse pit.[645] Thus, it is unlikely that further analysis will yield a satisfactorily explanation of this organic material.

In 1987, Oren described the dimensions of the silos of Area B: "…about 4 m in *circumference*, with walls approximately 50 cm. thick".[646] The measurements of the silos are misleading as his earlier publications stated that each silo had a 4 metre *diameter*.[647] Examining the illustration of the granary complex that accompanied his 1979 publication (with an included scale) it is clear that Oren referred to the diameter of the each silo's exterior.[648] This confusion over the circumference with diameter was corrected to read

[645] Oren 1993, 1389; 1987, 80;
[646] Oren 1987, 80
[647] Currid 1986, 21; 1979, 188; 1973a, 112
[648] Oren 1979, 189, fig. 39.

‘diameter’ in Oren’s 1993 publication.[649] The implications of these measurements are important when estimating the grain storage capacity.

Oren claimed that the silo complex could have held 44,600 litres or 40 tons of grain.[650] Although this figure was repeated by Maksoud and Morris, there are a number of issues with Oren’s calculations.[651] As discussed in Section 4.2.4.5.3, each silo has to be reconstructed to calculate its storage capacity and its fill-height has to be presumed. Kemp argued that the top-fill level of storage rooms in Nubia did not reach the top roof and thus, he estimated a 2.8 metre-mark.[652] However, Kemp noted that the granaries at Kahun were estimated to be filled to a height of 2.5 metres. Oren employed this ‘Kahun level’ when calculating the silos’ capacity at Bir el-‘Abd.

Taking Oren’s estimate of 44,600 litres as our base, we can divide this number by 4 to reach the estimated capacity for each silo at Bir el-‘Abd. Thus, we obtain a figure of 11,150 litres per silo. Upon further analysis, it is likely Oren was calculating the silos’ capacity by utilising the volume of a cylinder; he was not taking into account the area of the dome (if it was filled up to the aperture in antiquity). Accounting for an internal storage capacity of a 2.382 metre diameter, we arrive at Oren’s rough calculation:

$$V = \pi\,(1.191\,m)^2 \times 2.5\,metres\ (grain\ storage\ height)$$

If we compare this figure of the internal measurement based on the 1979 drawing of the silos, we find that this is an underestimate. If the drawing is to scale, the internal diameter of the silo is closer to 2.74 metres. This would adjust the calculation considerably:

$$V = \pi\,(1.37\,m)^2 \times 2.5\,metres\ (grain\ storage\ height)$$

The resulting calculation shows each silo had a capacity of 14.74 m^3 which would work out to the entire grain capacity of 58,974 litres. Furthermore, if we were to add a short dome, in the conical frustum shape, to the top of this structure and presume that it was filled up to the brim in antiquity, we could add more storage capacity.

[649] Oren 1993, 1389
[650] Oren 1993, 1389; 1987, 80
[651] Morris 2005, 298 ft. 301; Maksoud 1998a, 114 ft. 88
[652] Kemp 1986, 131

Kemp claimed that silos in ancient Egypt could reach a height of 3.24 – 3.44 metres.[653] Thus, employing Kemp's assumptions about the height of Egyptian silos, we use the low-estimate to reconstruct the height of a Bir el-'Abd silo to be around 3.24 m with a 1 metre aperture. This rough calculation reveals that we could add an additional 12 m^3 or 12,000 litres of storage capacity for the granary complex. Therefore, in estimating the storage capacity of the Bir el-'Abd granary complex, we should present the figure of 58,974 – 70,974 litres to demonstrate the low and high range. However, similar arguments can be made about the densities of provisions, what the silos held and if the silos were consistently filled up to the 2.5 metre-mark in antiquity (see Section 4.2.4.5.3).

4.3.3.4.3 The Cistern

About 200 metres north-west from the remains of the fortified installation, there is a rectangular depression.[654] This feature measured 10 x 15 metres and was bordered by an embankment of dark silt.[655] Investigation of the depression revealed that the bottom had been lined with a muddy silt or clay and had sherds of New Kingdom pottery.[656] The clay that lined the depression would have reduced the seepage of water into the ground.[657] Oren suggested that this depression could be equated with the Sety I battle scenes which depicts forts with external water sources and noted that northern Sinai Bedouin create similar depressions with clay-linings today, albeit on a much smaller scale.[658]

As mentioned in the discussion of Tell el-Borg, having a large pool outside the enclosure would ensure that if a campaigning body was seeking resupply, that the hard work needed for drawing up water from a well, the 'bottleneck effect' could be avoided. Oren, in a later publication, claimed that this depression was: "…designed to collect rainwater for the nearby fortress".[659] However, in comparison with rainfall isohyet data and the time of year when rain fell in the north Sinai (primarily in the winter months), this seems very unlikely. Thus, it could be postulated that there are undiscovered wells within the fortified enclosure at Bir el-'Abd, similar to those at Zawiyet Umm el-Rakham and Tell Abqa'in.[660] Alternatively, the cistern could have also been filled by water supplies from naval craft. However, calculations

[653] Kemp 1986, 124
[654] Oren 1993, 1389
[655] Oren 1987, 82 – 83
[656] Oren 1987, 83
[657] Oren 1987, 83
[658] Oren 1987, 83
[659] Oren 1993, 1389. Note that Pelusium does seem to have employed cisterns in the North Sinai (Snape 1994, 17).
[660] Thomas 2011, fig. 5; Snape 2003, 5 – 6; 1998, 1081 – 1084; Eyre 1995, 180

for this feature's tank capacity cannot be completed without the feature's depth, which has not been noted.[661]

The recent work done at Dier el-Balah, suggests that the Bir el-'Abd depression is indeed a cistern (Figure 5). The square depression at Dier el-Balah (measuring 20 x 20 x 5 m) was formed in the late 18th Dynasty as a quarry site for the manufacture of mudbricks.[662] A recent hydrological investigation found that in the subsequent phases of the site (Strata 9 – 7), the depression was artificially compacted to act as a reservoir.[663] The natural clay content of the soil would have acted as a barrier against seepage of water into the ground. Compaction of the ground in the depression would have reduced the level of seepage from 60 cm a day to 20 cm a day. Issar estimated that Deir el-Balah's cistern could have held water for up to a month and a half and this could be comparable to the cistern at Bir el-'Abd.[664] The implication is that this area may have been filled up periodically through human agency. Thus, while the depression is not completely water-tight, it could have been filled up intermittently when a campaign force approached Deir el-Balah.

If Bir el-'Abd's depression functioned as a container for water, then it must have relied upon water drawn from wells that presumably lay undiscovered within the fortified enclosure. Alternatively, water could have been transported by ship and offloaded to a coastal locale where it would have been transported to Bir el-'Abd. The high evapo-transipirational rate of the north Sinai indicates that the cistern could not be filled for a long period of time. Furthermore, if the depression was used as a container for water on a year-round basis, it would have been a breeding ground for insects and diseases, surely affecting the local garrison.[665] The evidence indicates that the depression acted as cistern that was filled when the site's personnel were advised of an approaching Egyptian army. If a hostile force approached Bir el-'Abd, they could not rely upon this cistern to meet their hydration requirements.

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661 If the cistern was at a hypothetical depth of 2 metres and was filled up to the top, it would have been 300 m^3 or capable of holding 300,000 litres.
662 Killebrew et al. 2006, 97 – 119; Dothan 1993, 343; 1987, 125
663 Dothan 2010, 309; Issar 2010, 289
664 Issar 2010, 290
665 Carson & Mumford 2010; World Health Organization's "Water Sanitation and Health (WSH)" bulletin, http://www.who.int/water_sanitation_health/hygiene/envsan/emergencies_qa10/en/index.html

4.3.3.4.4 Magazines

The logistical importance of Bir el-‘Abd can be seen in the presence of an exterior magazine complex, 20 metres away from the fortified enclosure.[666] Oren curiously, presented this structure’s orientation as being west of the enclosure in his 1987 publication, revising it in 1993 to be located in the south. The walls of this structure were composed of the same size bricks as the fortified structure and the granary installation.[667] The magazines were composed of elongated halls with open courtyards. One suspects that they formed a rough similarity to those found at Tell Heboua. Unfortunately, the dimensions of this magazine complex have not been published.

Morris claimed that the magazine complex was built in a later phase at Bir el-‘Abd; that it replaced the silo complex to the south.[668] The basis for her claim hinges on the assertion that the collapsed silo complex was used as a dump while the fortress was still active. As noted, Oren has not published the details about this magazine complex, so such a supposition cannot be verified. Considering that Tell Heboua utilised both magazine complexes and circular silos at the same time and that dilapidated centres in the north Sinai, were occupied by squatters (such as at Phase 1 at Haruba A-289, see below), it might be that the magazine complex was in operation at the same time as the granary structure.

4.3.3.5 Material Culture

4.3.3.5.1 Pottery

For the material culture found at Bir el-‘Abd, there was a “large store” of late 18th Dynasty pottery.[669] As mentioned, the absence of early 18th Dynasty pottery is common throughout the north Sinai.[670] The Egyptian ceramic corpus included bowls with string-cut bases, drop-shaped vases, storage jars and ring stands (Figure 48).[671] Oren suggested that the Egyptian drop-shaped forms were used specifically to transport wine and oil.[672] As mentioned, the jar handle with a cartouche of Sety I proved invaluable to demonstrate the site’s occupation during the 19th Dynasty (Figure 45).

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[666] Oren 1993, 1389; 1987, 80
[667] Oren 1993, 1389
[668] Morris 2005, 300
[669] Oren 1987, 83;
[670] Oren 2006, 283
[671] Oren 1973a, 113
[672] Oren 2006, fig. 5 no. 15 – 16; 1987, 83

Other vessels included 'flower pots'; open vessels with very thick, thumb-indented bases.[673] These ceramics indicate a foundation date likely before the Amarna period. In function, Morris suggested that flower pots were used for rations given to those manning Egyptian fortresses.[674] However, there is no evidence that this type of jars was standardised and further research into their type at a variety of sites, would have to be produced before such a statement could be substantiated.[675] A few examples of Canaanite vessels have also been found but are limited to cooking vessels and storage jars which appear to continue a tradition of exchange from the late MBA.[676]

Figure 48 - Drop-Shaped vessel, painted in 'Egyptian Blue', Amarna Period (Oren 1993, 1390).

Oren gave the rough ratio of 5 Egyptian to 1 Canaanite vessels in the Predynastic and Early Dynastic. Based on the publications to date, this ratio had been presumably maintained to a certain extent.[677] Morris claimed that this disproportion of Canaanite vessels at the site is significant.[678] She suggested that the personnel at the fortress might have employed local Bedouin to cook for the Egyptian garrison here. This is conjecture as the presence of pottery only suggests that something was traded, not that an ethnic people were involved in the day-to-day operation of the fortress.

[673] Oren 1987, 83; Morris 2005, 297
[674] Morris 2005, 297
[675] See Higginbotham (2000, 156 – 158) for a list of find-locations in Nubia and the Levant.
[676] Oren 1973b, 201
[677] Oren 1993, 1388; 1987, 84
[678] Morris 2005, 297

4.3.3.6 Discussion

Stanley demonstrated the coastline of the ancient northern Sinai was dramatically different than today. Bir el-‘Abd, situated 20 km away from the northern Sinai coastline and in close association with Stanley’s natural mooring location, seems to have served a dual-role. On one hand, it could provide logistical support for marine traffic roughly one day into their journey (if departing from Egypt). On the other hand, the site could have been supplied by water-transport and served as a critical location for overland travellers after 3 days of hard trekking across the Dune Sheet (Section 5.5.2). By being situated inland, Bir el-‘Abd’s garrison could have monitored the overland route along with satellite encampments. From the ceramic corpus, this fortress was reliant upon goods coming from the Egyptian administration for its provisional support.[679]

The small size of the fortified enclosure suggests that a small garrison was located at the site; Yekutieli‘s suggestion of a 100 people for the carrying capacity of this area is tempting to apply for the area of Bir el-‘Abd.[680] Despite the small number however, the walls of the site would have been sufficient enough to prevent raids by local Bedouin. No doubt, if a large hostile force from southern Canaan was making its way towards Egypt, this fortress was not designed to withstand a siege but to raise the alarm and possibly retreat to the Egyptian Delta. This is further suggested by the fact that the granary, magazines and the cistern lay outside of the fortress.[681] These features were likely not stored year-round but would have been filled in the event a campaign force travelling the Sinaitic route. Thus, communication with the central Egyptian administration factored into the operation of this fortress. Bir el-‘Abd, although small by comparisons to other Egyptian New Kingdom military installations, would have served a vital function in logistical supply for overland and maritime traffic in the north Sinai.

4.3.4 Haruba (Haruvit)

4.3.4.1 Introduction

Haruba is an archaeological cluster that was investigated during the course of Oren’s north Sinai survey.[682] There are two specific sites that demonstrate different compositions in their architectural remains. Site A-345, to the north, lacks fortifications and focused on

[679] Morris 2005, 298
[680] Yekutieli 2002, 422-423, fig. 26.2
[681] Morris 2005, 299
[682] Oren 2006; 1987

administrative storage. Site A-289, to the south-west, is represented by a fortified enclosure. The sites were not fully excavated during the survey. However, the partial excavations of the sites did suggest the changing course of the Egyptian hegemony in southern Canaan.

4.3.4.2 Physical Location

Excavated during 1980 – 1982, Haruba is located 12 km east of el-Arish, approximately 95 km east from Bir el-‘Abd’s BEA-10. Although the climate and geography is similar to the northern Sinai, there is an increase in yearly rainfall (within the 100mm isohyet). Within an area of 4 – 5 km^2, there are approximately 20 encampments sites clustered around A-345 and A-289.[683] A-345 covers an estimated area of 20,000 – 60,000 m^2 but Oren was only able to excavate 3 – 10% of the site (2,000 m^2).[684] Although Site A-345 is located 1km from the coastline today, in the New Kingdom it would have been located an additional 500 metres inland. Site A-289 is located approximately 400 metres to the southwest of Site A-345 and covers an area of 3,000 m^2.[685] Both sites are located within the shifting sands of the north Sinai and Oren has noted the difficulties of excavation.[686]

4.3.4.3 Phases and Dates

A-345 and A-289 are representative of two different sites in operation during the 18th and 19th dynasties. Site A-345 appears to have been founded during the reign of Thutmose III and operated until the close of the 18th Dynasty.[687]

Figure 49 - Cartouche impression of Thutmose III (Oren 2006, fig. 6 no. 15).

683 Morris 2005, 299; Oren 1987, 78
684 Oren 2006, 282; 1987, 98; 1979, 188
685 Oren 1987, 87
686 Oren 1987, 97 – 98
687 Oren 2006, 288

Similar to those found at Bir el-'Abd, this claim that Thutmose III founded the site is based primarily on a stamped cartouche impression discovered at Site A-345 (Figure 49).[688] As mentioned, Oren thinks that the early 18th Dynasty did not use the Sinaitic route: "…(it) was not traveled by organized military expeditions between the reign of Ahmose and the joint reign of Hatshepsut and Thutmose III".[689] Morris has speculated that the use of rectangular magazines indicate that Site A-345 was founded during the reign of Horemheb or Sety I.[690]

At Haruba A-289, there is evidence of four sequential phases. From Oren's multiple publications, he has presented the following phases (Table 6):

Table 6 - Phases of Haruba Site A-289

Phases of Haruba Site A-289			
Phase Name	**Occupation Type**	**Evidence for**	**Estimated Dynasty**
Phase 4	Seasonal Encampment	Very sparse. Burial of male under curtain wall.	Contemporary with Site A-345, in use during reign of Thutmose III
Phase 3	Fortified Way-Station	Establishment of fortress and gateway.	Reign of Sety I
Phase 2	Reduced military presence shifting to administrative function. Canaanite pottery forms predominate.	Gateway passage reduced. Taboons established along north curtain wall. Fortress structure in disrepair. Ends with 'destruction' of Building 500.	Reign of Sety II
Phase 1	Squatters' settlement	Sparse evidence archaeologically.	Iron I / late 20th Dynasty

The earliest phase at Site A-289 is a radial encampment site that operated in conjunction with Site A-345.[691] In the next phase (Phase 3), a sizable fortified enclosure was constructed in the 19th Dynasty.[692] This is inferred from the Shasu register of the Sety I battle scenes as the

[688] Oren 2006, fig. 6 no 15
[689] Oren 2006, 279, 283
[690] Morris 2005, 300
[691] Oren 1987, 94
[692] Oren 1993, 1390; 1987, 87

Egyptian king is depicted battling Bedouin near the northern Sinai fortresses. Since these fortresses are already established in this scene, it is possible that Horemheb might have founded them for logistical support along the Sinaitic route.

Phase 2 at Site A-289 witnessed the change of the fortress as a military installation to an administrative function.[693] Two large pithoi with cartouches of Sety II suggest that the fortress was being partially supported during the end of the 19th Dynasty (Figures 58 to 59).[694] Structures of the enclosure's western side were replaced by larger, administrative buildings. By the end of this level there is evidence of repair in sections of the curtain wall, while some sections had collapsed.[695] The burning of one of the enclosure's largest buildings, Building 500, in the mid 12th century (c. 1150 BCE) brought this phase to an end.

In Phase 1, there was evidence of a squatter occupation at the site. No major building projects were undertaken and only refuse pits were cut into the floors of Phase 2. The occupants used some Egyptian 20th Dynasty pottery.[696] Philistine wares and hand burnished pottery suggest a date for Phase 1 as being IA I (1050-1000 BCE) or near the end of the 20th Dynasty; these inhabitants might not have been of Egyptian origin.[697]

4.3.4.3.1 Brick Sizes

The buildings at Site A-345 and A-289 are homogenously comprised of mudbricks measuring 45 x 22 x 12 cm, similar in size to the bricks used at Bir el-'Abd.[698] The bonding pattern is characteristic of the New Kingdom and so dating cannot be performed on this basis.[699]

4.3.4.4 Architectural Features

4.3.4.4.1 Site A-345

At the centre of the excavated area, a central courtyard was found measuring 20 x 15 metres with buildings located on the north, east and southern sides (Figure 50).[700] The walls of this

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[693] Oren 1993, 1390
[694] Morris 2005, 382
[695] Oren 1987, 94
[696] Oren 1993, 1390
[697] Oren 1993, 1390
[698] Oren 1987, 87
[699] *Contra* Oren 2006, 282; 1987, 87. See also, Spencer 1979, pl. 14
[700] Oren 1987, 98

courtyard were very thin, only one brick thick (c. 45 cm). During the course of the excavations, Oren surveyed the surrounding area but found no evidence of any fortifications.

Along the courtyard's northern section, there is a 25 metre-long building with thin plastered walls. At the southern end of the complex, a group of three magazines were discovered that measured 10 metres by 3 metres wide with a 1 metre wide doorway.[701] The floors of the magazines had a thick layer of carbonised grain. Oren suggested that this was from occasional spills of stored supplies.[702] Oren posited that the grain supplies for Site A-345 may have come from Canaan but scientific testing was conducted without conclusive results.[703]

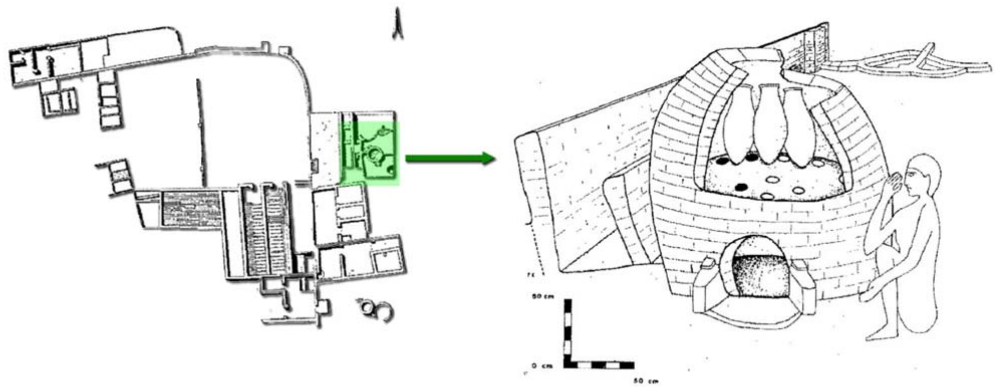

Figure 50 - Haruba Site A-345 with a reconstruction of the northern pottery kiln (adapted from Oren 1987, fig. 8 and 9).

Haruba Site A-345 has the addition of an 'industrial quarter'. Two kilns indicate pottery manufacturing in this 'fringe zone'.[704] An analysis of the charred wood found in association with the kilns indicated that it was of Kermes and Mt. Tabor oak which came exclusively

[701] Oren 2006, 282; 1993, 1390; 1987, 98
[702] Oren 2006, 289
[703] Oren 2006, 289
[704] Oren 1987, 99 – 100 the confusion with circumference and diameter is once again apparent as another publication of Haruba Site A-345 (Oren 2006, 282, Figure 2) displays that Oren was referring to the diameter of the main body of the kiln, not its circumference.

from the Palestinian area.[705] A comparison with the work of Ahuituv supports this claim as he noted that timber resources were a primary item of tribute-tax from the Canaanite area.[706]

4.3.4.4.2 Site A-289's Fortress

Site A-289 is a square fortified enclosure (Figure 51). Built on a consolidated sand dune, the structure is entirely made of mudbrick. Much like the fortified enclosure of Tell el-Borg and Bir el-'Abd, some sections of the fortress's curtain wall were not preserved. However, measurements indicated that the fortified enclosure covered 2,500 m^2 or 50 x 50 metres.[707] The curtain wall was preserved to 1 metre height and 4 metres thick. Oren estimated that this curtain wall would have reached 6 metres in height in antiquity.[708] However, as we have seen in the discussion of fortification walls' height from Egypt, this is a low approximation.

On the north side of the curtain wall and at the north-eastern corner, Oren claimed that his team uncovered "…huge buttresses, some 4 m wide, which may be the base of a watchtower".[709] However, from the plan of the fort, it is clear that these buttresses only project 0.6 – 1 metre from the wall.[710] It is unlikely that such a projection would have facilitated a parapet's balcony or hoarding that could have aided in defence.[711] These projecting external features were probably constructed to stabilise the walls on an *ad hoc* basis. The entire length of the south wall, the western wall and the southern part of the east wall did not possess these features. It is probable that buttresses were added to the curtain wall for structural stability.

[705] Oren 2006, 289, note 8;
[706] Ahuituv 1978, 100
[707] Oren 1993, 1390; 1987, 87
[708] Oren 1987, 87
[709] Oren 1987, 87
[710] Oren 1987, 88, fig. 6 this measurement, c. 110 cm, is extrapolated from the figure displaying that it has two rows of bricks with a stretcher facing (44 + 44 + 22 cm).
[711] Wright 1985, 178

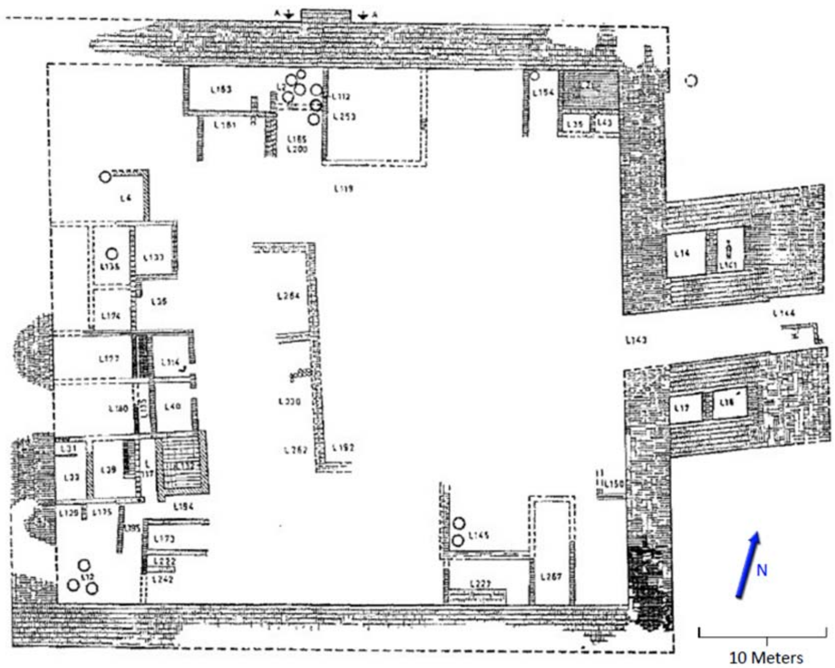

Figure 51 - Haruba Site A-289 - fortified enclosure (adapted from Oren 1987, fig.6).

Inside the fortress, the frontal third was devoid of any structures and Oren suggested that this space was for chariot and cart parking or additional room for people to pitch tents.[712] The interior of the fortified enclosure did not possess an *intervallum*; structures were built against the curtain wall.[713] These rooms were the living quarters for the fortress' inhabitants and/or storage space for provisions.

The gateway is composed of two large flanking buttresses or ressaults, each measuring 13 x 8 metres.[714] Each ressault contains two chambers, roughly 2 – 3 x 2 – 3 metres to a side. With the addition of the curtain wall's thickness, the entire passageway would have been 16 metres long and 3.7 metres wide.

The floor of the earlier phase of the gateway was composed of beaten earth and reinforced with brick material to create a narrow channel, 30 cm wide.[715] The presence of this channel can be related with the channels found at Buhen that allowed for drainage.[716] Sections (2.4 metres wide) of brick pavement were found at either end of the gateway and provided a solid

[712] Oren 1987, 89
[713] Oren 1993, 1390; 1987, 92
[714] Oren 1993, 1390; 1987, 87
[715] Oren 1987, 89
[716] Emery et al. 1979, 5, 8 pl. 14, 80 A – D

base for doors but there was no evidence of a door pivot.[717] Morris followed Oren in the speculation that there were two doors at either end of the passageway but there is no evidence to support this claim.[718] Oren suggested that the gatehouse had two doors at either end as is common with Levantine gateway systems.[719] Unfortunately, ancient Egyptian sites with fortified architecture in the eastern Delta and north Sinai cannot confirm whether two sets of doors were commonplace. There is evidence that, in a later phase (Phase 2) the passageway underwent a reduction of its original width by the construction of a brick partition wall on the gateway's external aperture.[720]

4.3.4.5 Material Culture

4.3.4.5.1 Ethnicity at Site A-289

Human remains from Site A-289 were recovered and were dated to Phase 2.[721] Oren claimed that they were representative of foreigners manning the Egyptian fortress at this time as an osteological analysis determined that the remains were ethnically representative of Sinaitic and southern Canaanite populations.[722] However, the skeletal analysis did not account for 'genetic drift' (intermixing of ethnic populations) during the LBA. Wide trade connections and contacts were a simple fact of life. It is unlikely that genetic markers could be detected during this time between Egyptian, northern Sinai and southern Canaanite populations.[723] Furthermore, it unlikely that so few bodies can indicate the entire composition of an entire garrison. However, the claim that Phase 2's garrison consisted of Canaanites has been repeated in the work of Morris without critical evaluation.[724] It was demonstrated at the fortresses of Zawiyet Umm el-Rakham and numerous Nubian fortified centres that Egyptian garrisons traded for goods with local populations. It is likely that one ethnicity manning a fortress cannot be detected archaeologically.[725] It should be noted that viewing an entire garrison as composed of one local population or ethnicity is erroneous as the idea of a pure 'ethnicity' did not exist in the LBA as much as it does today. Cultural aspects matter more

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[717] Oren 1987, 89
[718] Morris 2005, 513; Oren 1987, 89
[719] Wright 1985, 54 – 55
[720] Oren 1987, 89
[721] Oren 1987, 89
[722] Oren 1993, 1390; 1987, 94-95, 115 ft. 16
[723] Anne Katzenberg, University of Calgary – personal communication, October 2007; Andrew Shuttleworth, University of Liverpool, personal communication, October 2010.
[724] Morris 2005, 427
[725] Morris 2005, 814; Snape 2003, 6 – 7

and these are the very things that we can detect archaeologically, not racial aspects of variation within a small sample size.[726]

4.3.4.5.2 Pottery

For pottery analysis, sites A-345 and A-289 are still incomplete. Until the publication of Oren's 2006 article, the only pottery that had been described were pieces that possessed Egyptian royal cartouches to illustrate the phases of the site.[727] The focus of the 2006 article was not to present the corpus of ceramic material but to illustrate the founding of Site A-345 to the reign of Thutmose III. The discussion in this section is lacking in details about ceramic repertoire from the Ramesside period at A-289.

As one moves west towards Egypt, Egyptian locally-made wares become scarce and imported Nile and Marl wares increase in number. This suggests that way-stations closer to Egypt had a direct line of supply.[728] Oren implied that Site A-345's pottery production was indicative of a redistributive context. He noted that liquid goods (such as oil and wine) were exclusively imported from Egypt based on the lack of Canaanite liquid-containers at Site A-345.[729] The early ceramic repertoire has parallels with the reigns of Hatshepsut, Thutmose III and Amunhotep II.[730] Like Bir el-'Abd, the diagnostic red-rimmed and splash-decorated ware suggests a foundation of A-345 to be within the Thutmose III-Amenhtoep II range (Figure 55).[731]

The pottery at Haruba Site A-345 was predominantly produced locally based on petrographic analysis.[732] The pottery assemblage of Haruba Site A-345 is largely composed of Egyptian forms (Table 7). Vessels made from Delta silt indicate that A-345 was supplied from Egypt or that clay materials were traded to the site's potter. The potter became specialised in recreating Egyptian forms; examples of bowls, craters, drop-shaped vessels, and flower pots are represented (Figures 53 to 54). Canaanite vessels are present at the site but they were limited to storage jars.[733]

[726] Smith 2003, 33
[727] Higginbotham 2000, 103 ft. 7
[728] Oren 2006, 288
[729] Oren 2006, 289
[730] Oren 2006, 286
[731] Oren 2006, 286
[732] Oren 2006, 288
[733] Oren 1993, 1391

Fragments of Cypriot jars are also present at Site A-345.[734] Site A-345 yielded 52 vessels of Cypriot origin (Base-Ring I, Base Ring II, Monochrome, White-Shaved I –II, and White-Shaved II).[735] These types are contemporary with the mid 18th Dynasty (Thutmose III-Amunhotep II). Oren noted that there is debate on how these Cypriot vessels arrived at A-345, whether from Canaanite traders or if the Egyptian administration redistributed them. He suggested that Cypriot wares played a significant role in the trade system across the north Sinai between Canaan and Egypt. However, Gittlen and Bergoffen demonstrated Cypriot wares were localised to the north Sinai and southern Levant but they were minimal in Egypt during the New Kingdom.[736]

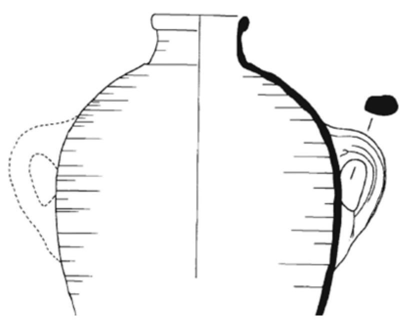

Figure 52 - Canaanite amphora, A-345 (Oren 2006, fig. 5 no. 14).

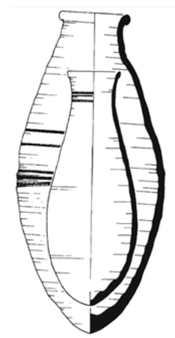

Figure 53 - Egyptian drop-shaped Vessels, A-345 (Oren 2006, fig. 5 no. 15 (centre) and 16).

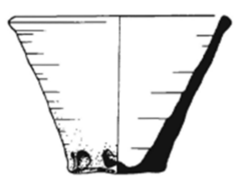

Figure 54 - Flower Pot vessel, A-345 (Oren 2006, fig. 5 no. 5).

Figure 55 - Red-rimmed bowls with splash decoration, A-345 (Oren 2006, fig. 5 no. 2 - 3).

The majority of Ramesside pottery found at Haruba were Canaanite forms contemporary with LBA IIB and are composed of carinated craters, flasks and storage jars (Figure 52).[737]

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[734] Oren 1987, 103
[735] Oren 2006, 288, fig. 6 no. 6 – 11
[736] Bergoffen 1991; Gittlen 1981
[737] Higginbotham 2000, 104

Oren noted that this increase in pottery suggests that the Egyptian administration employed Canaanites at sites in north Sinai.[738]

Figure 56 - Beer bottle with Neck (Oren 1993, 1390).

Figure 57 - Beer bottle without neck (Oren 1987, pl. D).

Figure 58 - Fragments of the incomplete Pithoi, incised with the cartouche of Sety II (Oren 1987, pl. F).

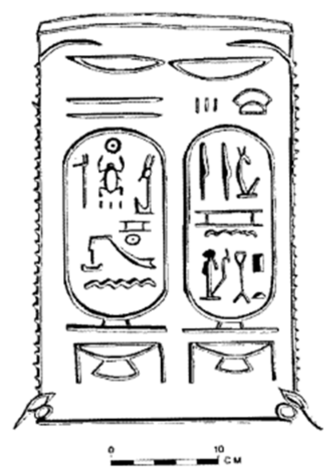

Figure 59 - Reconstructed cartouche of Sety II (Oren 1987, fig. 7).

The Ramesside Egyptian wares have not been fully published. There are a few examples from Haruba Site A-343 (located about halfway between A-345 and A 289, Figure 56 to Figure 57) of BB4 'beer bottles' with Sety I cartouche stamps.[739] In the north-eastern corner of the enclosure, two large pithoi were uncovered dating to Phase 3.[740] The pithoi were

[738] Oren 2006, fig. 5 no. 14
[739] Oren 1993, 1390 fig. top-right; 1987, pl. D
[740] Oren 1987, 90, pl. F, 92-93

incised with a cartouche of Sety II (1200-1194 BCE, Figure 58 to Figure 59).[741] Oren has indicated that the remainder of the Ramesside ceramics date to the 19th and 20th dynasties.[742]

Table 7 - Site A-345 Pottery assemblage totals[743]

Haruba Site A-345 Pottery Assemblage - 18th Dynasty		
Type of Vessels	% of total assemblage	Estimated Actual Number
Egyptian Wares	3.19	534
Egyptian locally-made wares	94.34	15,794
Canaanite Wares	2.19	367
Cypriot Wares	0.30	50
Total Analysed Pieces		**16,742**

4.3.4.6 Discussion

Site A-345 and A-289 appear to have followed a similar development sequence to Deir el-Balah in southern Canaan (Figure 5). Dothan and Brandl proposed that Deir el-Balah was founded in the Amarna period based on architectural forms and the high frequency of Amarna pottery types in Stratum IX.[744] The rectangular buildings in this stratum are noted for their lack of fortifications, their thin mudbrick walls and their general administrative character.[745] In Stratum VII, a large square fortress was founded in the early 19th Dynasty (Sety I). Although, it appears Deir el-Balah's fortress was never completed, the evidence from there strongly suggests that Haruba A-345 preceded site A-289.[746]

Resupply centres would have required a great deal of administrative work. Haruba A-345's ceramic evidence signifies that the garrison did not solely rely upon Canaanite sources for resupply. Larger commodities, shipped in Egyptian closed containers, denote that the inhabitants of Haruba A-345 relied on the Egyptian administration to supply some goods to

[741] Oren 1993, 1390
[742] Oren 1993, 1390
[743] Based on Oren 2006, 288. Note that the 'Estimated Actual Number' is based on the writer's calculations (based on the percentages and the total number of sherds analysed). However, it does allow the reader to see trends in ceramic manufacture and trade.
[744] Brandl 2010a, 251; Dothan 2010, 309, 311
[745] Brandl 2010b, 65 – 69, fig. 5.1 and 5.6
[746] Brandl 2010b, 84, 91; Dothan 2010, 314

the sites along the north Sinai.[747] Oren suggested that sites close to Canaan received their grain rations from Canaan as tribute-taxes but the evidence from Haruba is inconclusive.[748] Deir el-Balah's recent grain analysis supports Oren's postulation as the grains from this site all came from the Canaanite area.[749] The use of Kermes and Mount Tabor oak indicate that the fuel for the pottery kilns was supplied from a Canaanite source.[750] Exactly how this exchange took place, whether by trade, tribute or forcible requisition, cannot be determined. Similarly, the claim that the site had a 'Canaanite service population' to feed the Egyptian inhabitants cannot be substantiated.[751] Oren has illustrated that Egyptian forms at the site dominate the ceramic assemblage.

The pottery kilns indicate that Site A-345 acted as a rationing centre for the overland route as it supplied the military with pottery supplies as they made their trek into Canaan.[752] Morris did not state why pottery production would be important for this exchange as supplies from the overland route would have already been in easily transportable containers. It is likely that goods were received in bulk from shipping traffic and this would have required pottery production for distribution purposes.

Haruba's sites display the varying character of New Kingdom agendas in the establishment of fortified centres. Site A-345 operated as an administrative area during the 18th Dynasty. The architectural remains indicate that a primary function of the site was storage. In the 19th Dynasty, there is a discernible shift in the establishment of a fortified enclosure that has very little focus for surplus storage. It is likely the A-289 was established to facilitate the monitoring of the overland route. Perhaps the change was due to the site being superseded in its logistical duties. Site A-289 does not appear to have been a major centre for resupply of the New Kingdom hegemony. Site A-289 would not have been able to withstand a siege by a hostile force. Instead, its strategic position was conducive to keeping the central Egyptian administration appraised of potential threats. Both sites display the varying agendas and approaches of different dynasties to the maintenance of the Egyptian hegemony in Canaan. They demonstrate that logistical aspects of campaigns, such as the supply of provisions and communications, factored more in military campaigns than large established centres.

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[747] Oren 2006, 286, 289
[748] Oren 2006, 289
[749] Kislev 2010, 307 -308
[750] Oren 2006, 289 ft. 8
[751] Morris 2005, 819
[752] Morris 2005, 301

4.4 Tel Mor (Tel Kheidar)

4.4.1 Introduction

Tel Mor was excavated for two seasons in 1959-1960 by Moshe Dothan under the auspices of the Israel Department of Antiques and Museums.[753] For nearly 50 years researchers relied on Dothan's brief articles about Tel Mor.[754] The recent Israel Antiquities Authority (IAA) publication by Tristan Barako has produced the final report of the excavations. Tel Mor has often been cited as an exemplar of an Egyptian-held garrison town in Canaan. In examination, we can evaluate the similarities and the differences of a coastal site in southern Canaan.

The site must be placed in its geographical context first. To establish an understanding of the overland route between the northern Sinai and the southern Levant, data is incorporated to illustrate the Negev coast to the Judean coast. Although this examination is not extensive, it assists the reader in evaluating Tel Mor's operation. The next section will place the site in a historical context with a brief examination of textual references. In the remainder of the discussion of the site, the chronology of the phases, architectural features and material remains will be examined.

[753] Barako 2007; Dothan 1993, 1073. IDAM being a precursor to the IAA.
[754] Dothan 1993; 1973a; 1973b; 1960; 1959

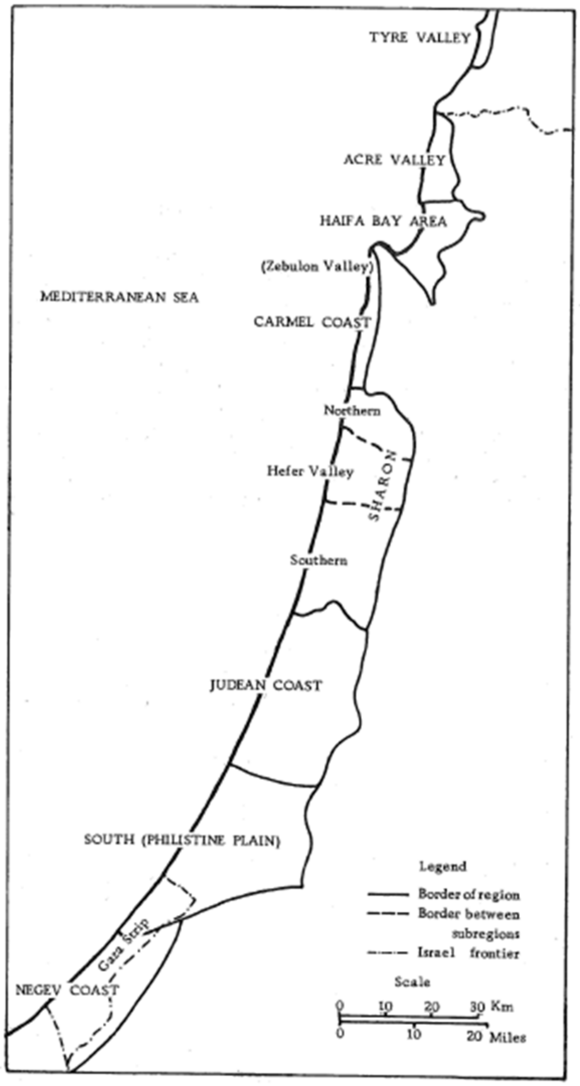

Figure 60 - The southern Levantine coast (Orni and Efrat 1964, fig. 20).

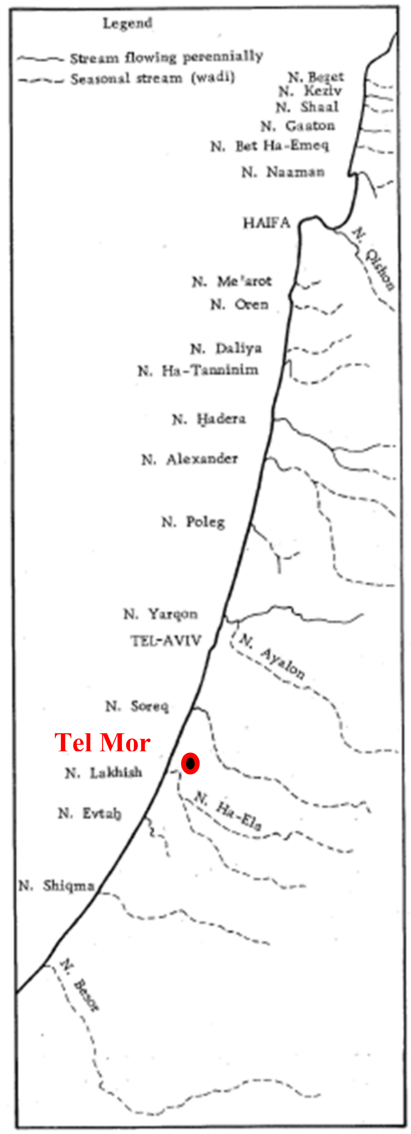

Figure 61 - Major rivers of the southern Levantine coast (adapted from Orni and Efrat 1964, fig. 23).

4.4.2 Geography of the Southern Levant

The coastal plain of the southern Levant is primarily composed of sand dunes backed by calcareous sandstone ridges (*kurkar*) (Figure 63). The ridges are packed tight and are often referred to as 'cemented' in the landscape.[755] In the southern area, the Negev coast and the south (Philistine) Plain, the sand dunes extend as much as 4 – 6 km inland (Figures 60 to 62).[756] North of the Yarkon river, the coastal plain changes as the sand dunes have been eroded by coastal waves and transferring sediment northwards. Consequently, the waves of the Mediterranean have reached the foot of the kurkar ridges to create intermittent cliff shores (c. 40 metres high) in some areas (Figure 12).[757] The sands of the southernmost coastal area are created with the coastal current and the erosion of the coast of the north Sinai.[758]

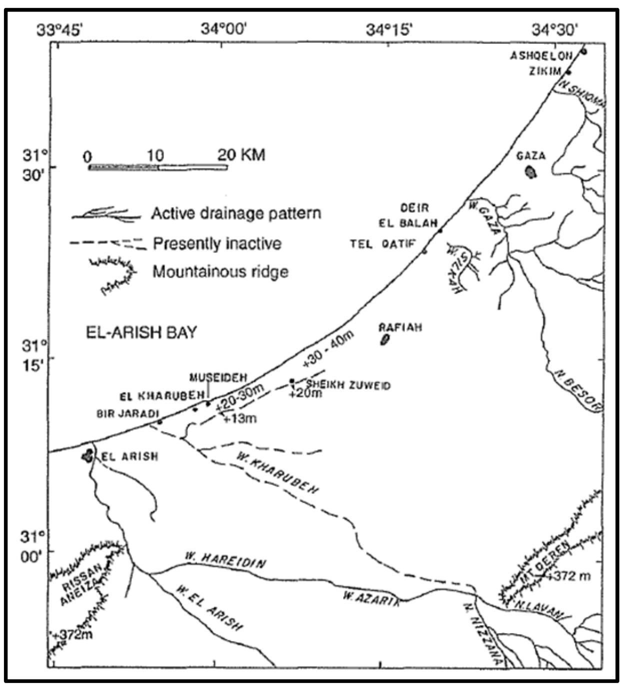

Figure 62 – Eastern north Sinai and southern Israel (Stanley 2002, fig. 5.12).

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[755] Karmon 1971, 14 – 15; Orni & Efrat 1964, 35-36
[756] Karmon 1971, 20
[757] Karmon 1971, 20
[758] Orni & Efrat 1964, 35

The southern Levant's coastal environment extends 300 – 400 metres inland.[759] In 3,000 BCE, the coast of Gaza lay approximately 1 km offshore from the present day coastline.[760] Much like the coast of the north Sinai, if this area had anchorages in antiquity they are located under the Mediterranean waters today.[761] The erosional forces of the waves create an almost uniform coastline, nearly devoid of any natural breakwaters for mooring ships.[762] Ancient shipping traffic relied upon the use of smaller craft to transport personnel and materials inland. In addition, ancient stream-mouths were also subject to erosional forces. Consequently, the mouths of streams for shipping and transport are now buried offshore.[763] Traces of the streams onshore are often buried under alluvial deposits and migrating sand dunes.[764] Locating sites along ancient waterways in Israel is very problematic. Adding to the difficulty for archaeological investigation, the Judean coast is the most densely populated area today. Therefore, Tel Mor is a unique opportunity for examine of a site located on the southern Levantine coast.

The rainfall isohyet of the southern Israel is <300 mm while northern Israel is >600 mm.[765] The location of Tel Mor falls in the isohyet of 401 – 500 mm (Figure 64).[766] The winter season, which brings the most rainfall, begins in mid-October and lasts until the beginning of May. The majority of the precipitation occurs between the months of December to February.[767] The average humidity of the coastal plain is 65 – 70%.[768]

The temperature variance of the area is based on modern data from Tel Aviv (about 30 km north of Tel Mor). The highest temperatures are recorded in July, averaging 22.6°C with the coolest month being January, 13.2°C.[769] However, Karmon noted that southern Israel can experience heat waves in May and June that can be as high as 38°C. Winter temperatures can be as low as 1.3°C.[770] The southern part of Israel has a high level of solar radiation, a 75% chance of being cloudless.[771] Thus, much like the Sinai, southern Israel is characterised as having a high rate of evapo-transpiration. In the Köppen Climate Classification, the

[759] Karmon 1971, 17
[760] Enzel et al. 2008, fig. 7; Stanley 2002, 111; Karmon 1971, 20
[761] Karmon 1971, 20
[762] Orni & Efrat 1964, 35
[763] Stanley 2002, 114
[764] Karmon 1971, fig. 1.5
[765] Enzel et al. 2008, fig. 1; Stanley 2002, 108; Karmon 1971, fig 1.10
[766] Bruins 2012, fig. 1; Orni & Efrat 1964, 106
[767] Bruins 2012, 29; Karmon 1971, 27; Orni & Efrat 1964, 107
[768] Orni & Efrat 1964, 111
[769] Karmon 1971, Table 1.2; Orni & Efrat 1964, 101, 112 gives an average annual high temperature of 24.8 (August) and an average low of 13.7 (January) at Tel Aviv.
[770] Karmon 1971, 25, 27
[771] Karmon 1971, 29

southern Levant is classified as a 'hot-summer Mediterranean climate' ('Csa').[772] The summer winds on the southern Israel coast can reach speeds of 10 – 15 kmph.[773] The winds in the summer usually reach their peak velocity between the hours of 10:00 to 17:00 which would have facilitated maritime travel.

Most of the agricultural land is southern Israel is located away from the coast and is confined near riverbeds that have transposed alluvial deposits from the central hills.[774] Tree growth in antiquity was sporadic and confined in areas of sedimentation. Evergreen Palestinian oak (*Qeurcuscalliprinos*) and terebinth (*Pistaciapalaestina*) predominated in elevations of +300 metres.[775] The areas of sedimentation were valued as places for agriculture and pastoral grazing land. Today, the natural forests of the southern Levant are almost extinct.[776] In the LBA, it is possible that a low population in Canaan may have witnessed a wave of forestation due to low pressure on agricultural land (Section 5.3.1). However, the extent of these forests in the LBA will have to be investigated further by archeobotany projects to validate this claim. The southern Levantine coast is categorised as a transitional zone; Saharo-Sindian in the southern part, while the north is Mediterranean.[777] In general, the southernmost coast of Israel has sparse vegetation that rarely exceeds one plant per 10 m^2.[778] Among the most common plants in this area are bean capers (*Zygophyllumdumosi*) and varieties of thorny Acacia located along the wadi networks.

The Negev coast has only one river in the area, the Nahal Besor (Figure 61). Much like the el-Arish wadi network, this river is a major catchment of winter rains in the area.[779] Moving to the north, the Philistine Plain and the Judean coast are transitional geographic areas in which the kurkar cliffs begin to appear. Portions of the western half of the region are used today for citrus farming while the eastern half is good for field and garden crops.[780] This is partly due to less sendimentation in the area.[781]

Tel Mor is situated near the Judean coast on the northern bank of the Nahal Lakhish, which is actually the convergence wadi for three streams (Nahal Ha-Ela, Wadi Zeitah and the Wadi

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772 Peel et al. 2007
773 Karmon 1971, 25
774 Karmon 1971, 29
775 Karmon 1971, 33; Orni & Efrat 1964, 121
776 Orni & Efrat 1964, 120
777 Orni & Efrat 1964,119
778 1,000 feet124
779 Orni & Efrat 1964, 41
780 Orni & Efrat 1964, 42
781 Enzel et al. 2008, fig. 7; Mazar 1992, 7

Qubeibah).[782] The coast of the area is characterised by sand dunes with short segments of the coast to the north and south composed of coastal cliffs where the Mediterranean met the line of kurkar ridges (Figure 63). The geographic position of the site implies that the area would have had a limited agricultural potential and therefore would have had to rely on provisions being delivered to the site.

[782] Barako 2007, 3 citing Baly 1974, 141

Figure 63 - Physical Map of Israel. 1 – Coastal Cliff, 2 – Sand Dunes, 3 – Red Sands, 4 – Loess, 5 – Kurkar ridges, 6 – Hills and Mountains (Karmon 1971, fig. I.5).

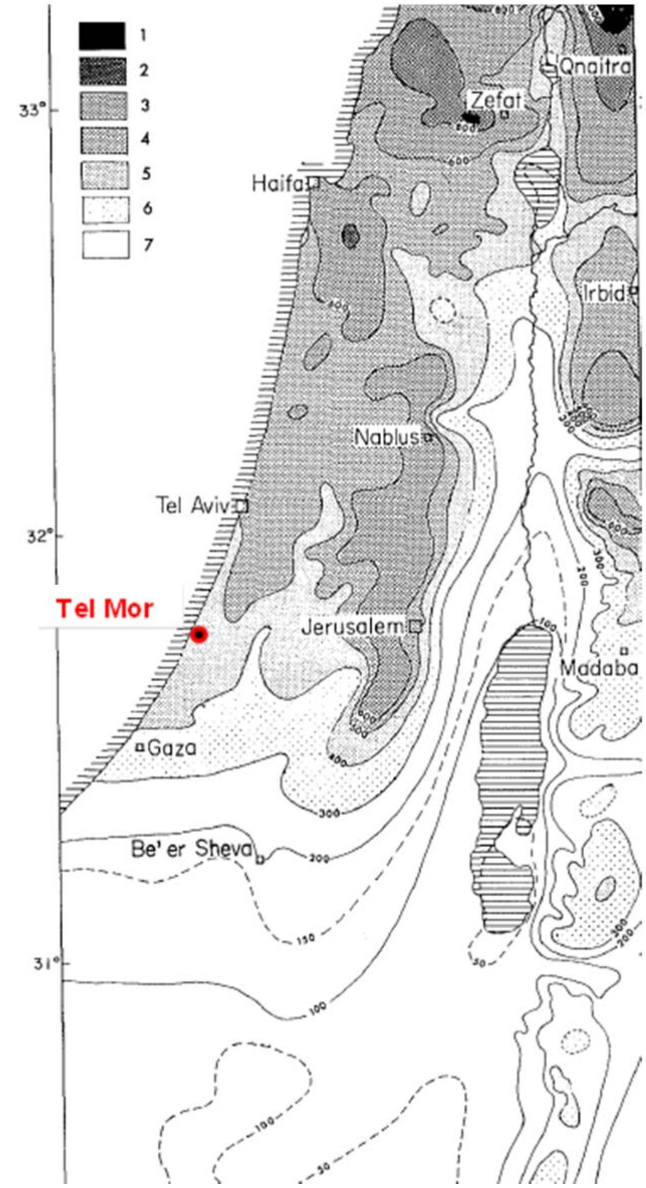

Figure 64 - Rainfall isohyet of Israel. 1 – Over 1000 mm, 2 – 801-1000 mm, 3 – 601 – 800 mm, 4 – 501 - 600 mm, 5 – 401- 500 mm, 6 – 301 - 400 mm, 7. Below 300 mm (Karmon 1971, fig. I.10).

4.4.3 Textual and Pictorial Evidence

4.4.3.1 Textual Evidence

Dothan had originally suggested that Tel Mor be equated with the site of Mikhes (, *miḫs*) and the Ugaritic *Mḫd*.[783] Barako reexamined the claim and found that Dothan was probably right. Mikhes first occurs in the topographical list of Thutmose III's first campaign at Karnak Temple, entry no.#60, between Yurza (#61, Tel Jemmeh) and Jaffa (#62, Tel Yafo).[784] The next instance of the name (transliterated *m'wḫ3ḏ3*) comes from the topographical list of Ramesses II at 'Amara West in Nubia.[785] The name in Ramesses II's topographical list occurs after Sharuhen (Tell Ajjul) and Socoh (Khirbet Shuweiketer-Ras), indicating a southern Levantine locality.

Barako also pointed out that it is possible to locate the site in close relation with Gezer.[786] This supposition is based on EA 298 in which Yapaḫu of Gazru (Gezer) informs the pharaoh that his younger brother has become his enemy by travelling to *Muḫḫazu* to ally with a contingent of Apiru.[787] Considering that Gezer is located in the Judean foothills, Barako made the supposition that this trek of Yapaḫu's younger brother took place towards the coast.

Other possible candidates that have been suggested for Mikhes are the sites of Yavne-Yam and Tell es-Sultan. However, as Barako demonstrated, both sites have no LBA strata while Tel Mor was continuously occupied throughout the LBA.[788] Thus, although he urges caution, he concluded that the LBA strata at Tel Mor make it the strongest possible candidate for Mikhes. Instances of Mikhes do not reveal an abundance of information other than a possible site name. Barako suggested that the name of the site can be equated with the Hebrew word for 'harbour' (נָמָל) with overtones of this area being a place for commerce. Considering Tel Mor's close association with the Mediterranean coast, this association seems probable.

[783] Dothan 1981, 151 n. 3
[784] Simons 1937, 117
[785] Barako 2007, 4; KRI II, 75
[786] Barako 2007, 4
[787] Moran 1992, 340 EA 298
[788] Barako 2007, 5

4.4.3.2 Pictorial Evidence

There is a dearth of pictorial representations of Egyptian centres in the Levant. For instance, Jaffa, although it had a monumental gateway of Ramesses II, numerous Egyptian artefacts and was written about in the ancient text, *The Capture of Joppa*, was never depicted in New Kingdom art.[789]

In the Sety I battle scenes, there are a few Levantine centres depicted. They appear to have employed tower-piers, rectangular doorways and semi-circular merlons that are common with Egyptian centres shown along the Sinaitic route (Figure 17). However, these Canaanite-fortress compositions differ from the Egyptian fortified centres in the Shasu Register in that they are usually drawn on a hill and have a 'double enclosure' to depict a multiple-trace system of defence. It is likely that these differences are 'cultural markers' in the representations to indicate to the audience that this was a foreign locality.[790] Since we do not have a depiction of an Egyptian fortress in Canaan, it is unclear if the depiction would have had these cultural markers in their composition.

What was the motivation for the New Kingdom Egyptians in not depicting these Egyptian garrisons in Levantine locales? Gaballa has noted that in the transitional period between the Sety I battle scenes and those of Ramesses II, there is a shift away from detailed, pictorial scenes and a coherent narrative.[791] Instead, it was more important to display the king actively assaulting Levantine centres to display his right to rule. Thus, Egyptian garrison centres in the Levant would be unlikely to be depicted as they were merely bases for the Egyptian military to resupply before campaigns. It is unlikely that fighting would have taken place at a resupply station and therefore, inappropriate for pictorial recording on a temple's exterior.

Barako has relied upon the Sety I battle scenes to suggest what a pictorial rendering of the fortified enclosure at Tel Mor would have looked like. Using the installations along the northern Sinai as a guide, Barako took the representation of a northern Sinai fortified way-station and argued that the fortresses' image depicts only one wall and does not show all four corners simultaneously.[792] Influencing his decision is Dothan's unique reconstruction of the Tel Mor's Building B as it is composed with a salient and recessed façade (see below).[793]

[789] Burke & Lords 2010, 29
[790] Wernick 2011
[791] Gaballa 1967, 339
[792] Barako 2007, 22, fig. 2.15
[793] Oren & Shershevsky 1989, 9-10

Archaeologically, the layouts of Bir el-Abd's BEA-10, Haruba Site A-289 and Tell el-Borg all indicate a square structure.[794] In addition, the depiction of Tjaru displays all four doorways at once to the viewer. Therefore, it is likely that the fortresses along the northern Sinai route are shown with all four corners depicted rather than displaying one wall's face. Consequently, Dothan's reconstruction of Building B is too speculative (Section 4.4.6.2).

4.4.4 Physical Location

Tel Mor is a small mound on the southern coast of modern day Israel, 200 metres north of the Nahal Lakhish, approximately 1 km from the present day coastline of the Mediterranean Sea (Figure 65).[795] The site's location may have been a deliberate attempt to establish a centre that could be protected from storm-wave surges while monitoring the coastal overland route.

The site is positioned on a sandstone outcrop amidst a belt of sand dunes, 17 metres high above the basal level of the coast.[796] The tell covers an area of 5,000 m^2 but erosion has left the top with an area of only 1,000 m^2 at present.[797] The large site of Ashdod is in the relative vicinity, 6 kilometres away to the south-east.

Since there are no protected harbours for maritime traffic along the coast, Dothan suggested that the Nahal Lakhish would have been of vital importance to Ashdod's commercial interests.[798] Barako noted that although the stream does not seem large today, it might have been much larger in antiquity and has since been constricted by the deposition of sediment.[799] Tell Ajjul located along the Nahal Besor on the Negev coast and Tel Michal near the mouth of the Nahal Yarkon in the Sharon coast indicate an Egyptian focus on centres having maritime access.[800]

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[794] Wernick 2011, 161
[795] Barako 2007, 1; Dothan 1993, 1073
[796] Barako 2007, 1 – 3; Morris 2005, 558
[797] Barako 2007, 3; Dothan 1973b, 3.Barako opted to use the measurement of dunhams – for ease of understanding, I have converted 1 dunham = 1,000 m^2.
[798] Dothan 1973b, 1-2. See also Vitto & Edelstein 1993, 1283
[799] Barako 2007, 4
[800] Fischer 2004, 249 – 250; Herzog 1993, 1036; Tufnell & Kempinski 1993, 49; Dothan 1973b, fig. 1

Figure 65 - Map of area around Tel Mor (Barako 2007, fig.1.1).

4.4.5 Phases and Dates

Tel Mor has approximately 12 strata, 7 metres thick, dating from the MBA IIC to the Hellenistic period (c. 300 BCE) (Figure 66).[801] The principal remains on the tell date to the LBA IIA – IIB (1400-1200 BCE) and the early Iron IA – IB (c. 1200-1000 BCE). It must be stressed that most of the dating of these strata were based upon the ceramic remains which have long curation cycles and could have been used for years after manufacture.

Tel Mor's earliest strata was difficult to define as there was no coherent picture of architectural development. Stratigraphic separation of Strata 12 – 10 was based on ceramic finds and elevation.[802] Accordingly, Barako advised the reader to view these strata as being phases rather than fixed distinguished levels.[803]

[801] Dothan 1973b, 3
[802] Barako 2007, 15
[803] Barako 2007, 15

The initial settlement of Tel Mor, Stratum 12, was only investigated in a 20 m^2 area (Squares M22 and N22 of Area B) in the north-eastern part of the tell's summit.[804] The remains were mainly confined to a courtyard that had 2.5 metre accumulation and appeared to be in use during Strata 12 – 9.[805] In Stratum 12, the excavators found a small amount of MBA IIC pottery along with some Cypriot imports. Based on finds of 'cultic pottery' (specifically, a Bichrome Ware goblet) the courtyard (Courtyard 118) might have been a space outside a sanctuary located somewhere near the western edge.[806] Glyptic finds from this stratum yielded two Hyksos 'design' scarabs and pottery impressions that suggest a late SIP date.[807]

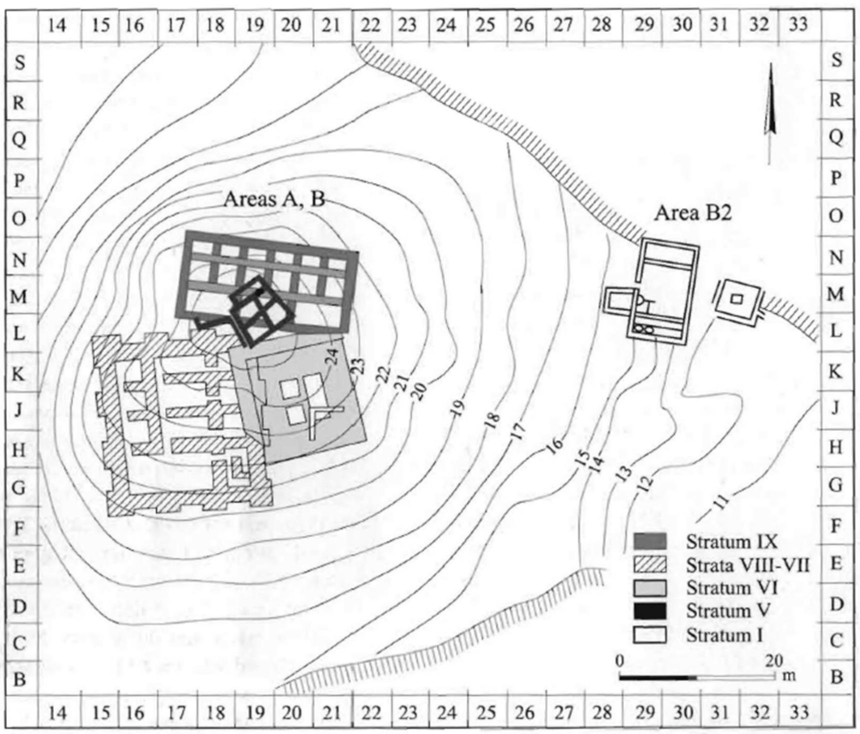

Figure 66 - Interrelationships of architectural elements at Tel Mor (Barako 2007, plan 1.1).

[804] Barako 2007, 11
[805] Barako 2007, 11
[806] Barako 2007, 11
[807] Brandl 2007, 196-197

Figure 67 - Slender ovoid jar, Stratum 11 (Martin and Barako 2007, fig. 4.10).

Little remains of Strata 11 and 10 because the area investigated was prone to erosion due to its location on the north-eastern part of the tell.[808] The presence of monochrome Cypriot pottery and red-on-red pottery indicates that Strata 11 – 10 should be assigned a date between 1600-1400 BCE (LBA I).[809] An example of an Egyptian slender ovoid jar from Stratum 11 was only in use in Egypt after the reign of Thutmose III and before the end of the Amarna period (Figure 67).[810]

Stratum 9 was the first stratum that was excavated across a substantial area, over 200 m^2 and contained remains of significant architectural features.[811] Dothan had dated this stratum to the "days of the 18th Dynasty" and Barako dates this it to LBA IIA based on the remains found in Burial 152.[812] The main feature of this stratum is a cellular building, Building A, located on the northern side of the tell's summit. A good example of a Canaanite storage vessel can be equated to Aston's Type A1, dating morphologically to the reign of Ahmose to Thutmose III, and was found in Building A (Figure 81).[813] Egyptian ledged-rim bowls and an example of a *zir* (a very large storage jar) indicate a date before the end of the Amarna period.[814]

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[808] Dothan 1960, 123-125
[809] Dothan 1993, 1073
[810] Martin & Barako 2007, 150
[811] Barako 2007, 15
[812] Barako 2007, 18; Dothan 1993, 1073
[813] Barako 2007, 110, Figure 3.22, no. 2 (no registration number); Aston 2004, 176-177, fig. 1a
[814] Martin & Barako 2007, 150

The end of this stratum experienced a destruction event, primarily witnessed in Building A's fallen mudbricks and broken pottery. Dothan suggested that Sety I might be responsible for this destruction event (c. 1300 BCE), possibly being influenced by the Sety I battle scenes.[815] Although Barako noted this destruction level, he did not ascribe it to one particular pharaoh.[816]

After the destruction of Building A, a new building had been founded to the southwest, Building B, in Stratum 8. This building was larger than Building A and Barako was eager to assign an Egyptian agency to its construction based on the lack of a stone foundation, square layout and a large 'front-room'.[817] Egyptian beer bottle examples suggest that this stratum had an Egyptian presence during the LBA IIA – Iron IA (Figure 84).[818] The majority of Egyptianised pottery in Canaan is derived from shallow to medium-deep bowls from the LBA IIA to Iron IA contexts.[819] The Canaanite storage jars represent a long occupation at the site as there is a range of rims that are indicative of the LBA.[820]

In Stratum 7, there is very little to indicate a new period architecturally as Building B's layout remained the same and it appears only the external buildings to the east (Buildings C and D) went out of use.[821] Dothan suggested that this stratum should be ascribed to the reign of Ramesses II.[822] However, his reasons are not explicitly stated. At the end of this stratum, Building B appears to have been attacked and partially destroyed. Dothan thought that the destruction level can be attributed to Merenptah (1213-1203 BCE) as retribution for an uprising or "by the Israelite tribes" devastating the coastal plain.[823] This historical reference is presumed but cannot be confirmed in the archaeological remains.

Strata 6 – 5 was attributed to the beginning of the Iron IA – IB by Dothan (1200-1050 BCE).[824] Dothan based this on the 'migdol' structure, Building F, which he says was founded at the beginning of the 12th century (c. 1200 BCE). Dothan claimed that the presence of Egyptian scarabs and pottery indicated that this place was still under the

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815 Dothan 199, 1073
816 Barako 2007, 241
817 Barako 2007, 22
818 Martin & Barako 2007, 129
819 Martin & Barako 2007, 134
820 Barako 2007, 62 Canaanite storage jars often have bulbous rims in the early LBA and begin to flatten out in the beginning of the Iron IA.
821 Barako 2007, 25
822 Dothan 1993, 1073
823 Dothan 1993, 1073. See also this explanation for the end of Building 1104 at Aphek (Gadot 2010, 62).
824 Dothan 1993, 1073

hegemony of Ramesses III.[825] However, Martin and Barako noted that the pottery assemblage of Strata 6 – 5 is very similar to the preceding Strata 8 – 7. The only evidence that this could be dated later was the larger number of everted-rim bowls with are characteristic of the 12th century of Egyptianised pottery in Canaan.[826] Near the end of Stratum 5, Dothan argued that the existence of Philistine pottery meant that the garrison was taken over by the Philistines (Sea Peoples). This stratum did not have a clear destruction level. The buildings fell out of use and were eventually covered up by earthen deposition.[827]

Strata 4 – 3 was occupied by Philistine-related settlers. However, Cline and Yasur-Landau argued that Tel Mor might have been abandoned for the majority of the 12th century and possibly into the 11th century BCE.[828] The corpus of Philistine pottery is relatively small (70 sherds and few intact vessels) but it displays a similarity with the sites of Ashdod and Tel Miqne-‘Eqron.[829] The tell’s summit did not have a dominant structure in these strata but was more exposed. Egyptian wares are virtually absent from Stratum 4. Stratum 3 had an increase in Philistine pottery and no substantial architectural features.[830] The end of this ‘age’ was witnessed in the end of Stratum 3 with a destruction level (demonstrated in the deposition of a thick ashen layer above Stratum 3), which Dothan attributes to the beginning of the 10th century BCE.[831] The agent of this destruction was postulated by Dothan to be either representative of the campaigns of David against the Philistines or the pharaoh Siamun against Philistia. However, Barako noted that it is unclear why an unfortified and unthreatening settlement would have been attacked.[832]

The site was abandoned until the 8th century BCE. The settlement of this layer, the top-most on mound, had a casemate building which would indicate an Iron II date. Dothan suggested that this occupation was by King Uzziah and possibly destroyed by Sargon II of Assyria when the site was abandoned for Ashdod-Yam as the new port city.[833]

Stratum 1 dates to the Hellenistic period. A large building was found on the eastern side of the mound as a processing area for murex shells for the fabled purple-dye of the Phoenicians.

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[825] Dothan 1993, 1074
[826] Martin & Barako 2007, 151
[827] Barako 2007, 32; Morris 2005, 773 is mistaken on the assumption that possession passed from Egyptian or Egyptianised Canaanites to a Philistine agency in light of no cultural link in ceramic finds at the site.
[828] Cline & Yasur-Landau 2010, 5
[829] Martin & Barako 2007, 72
[830] Barako 2007, 246
[831] Dothan 1993, 1074
[832] Barako 2007, 246
[833] Dothan 1993, 1074

Dothan claimed that the production in this area was around 300 BCE. In the Roman-Byzantine period, the site only functioned as a poor agricultural settlement.

4.4.5.1 Brick Sizes

Unfortunately, the excavations did not measure the bricks used in the various buildings during the LBA.

4.4.6 Architectural Features

4.4.6.1 Building A

The main feature of Stratum 9 (LBA IIA; 1400-1300 BCE) is a cellular building, Building A (Figure 68). Although only ⅓ of the building was preserved on the northern side of the tell, the dimensions of this structure are estimated to be 11 x 22 metres. Only the eastern half of the interior rooms and the length of the northern wall are preserved. The reconstructed layout is based on what appeared to be a "consistency of room sizes".[834] The interior and exterior walls were at least a metre thick and some of the walls were preserved to a height of 1.5 metres. Based on the thickness of the walls, Barako suggested that there may have been an upper storey to this building. However, looking at the overall layout of the site and comparing it with Egyptian examples, albeit from a much later time, one could argue for a controlled-access storage area that could only be reached from above and required the usage of ladders to enter the rooms.[835] A large quantity of storage jars found in these rooms, especially the largest room (Room 111), led Dothan to suggest that Building A was a depot for the site.[836]

Curiously, the end of Building A was characterised by Dothan as having a destruction level.[837] However, this is suggested by the remains of Building A as having an amount of pottery smashed within the cellular rooms and fallen mudbricks. There is no evidence of conflagration nor of any other systematic human involvement that would suggest a human agency. Although a destruction through military activity would assist an interpretation that could be merged with historical events, we must concede that this destruction may have been caused by natural forces.

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[834] Barako 2007, 12, Plan 2.1, 15
[835] Spencer 1999, 296-297 examined Late Period buildings in Egypt (using the alternative form of 'casemate' construction). See also Deir el Balah (Dothan 1993, 343; 1987, 125) and Tell el-Dab'a (Bietak 1996, 68-71, fig. 57)
[836] Dothan 1993, 1073
[837] Dothan 1993, 1073

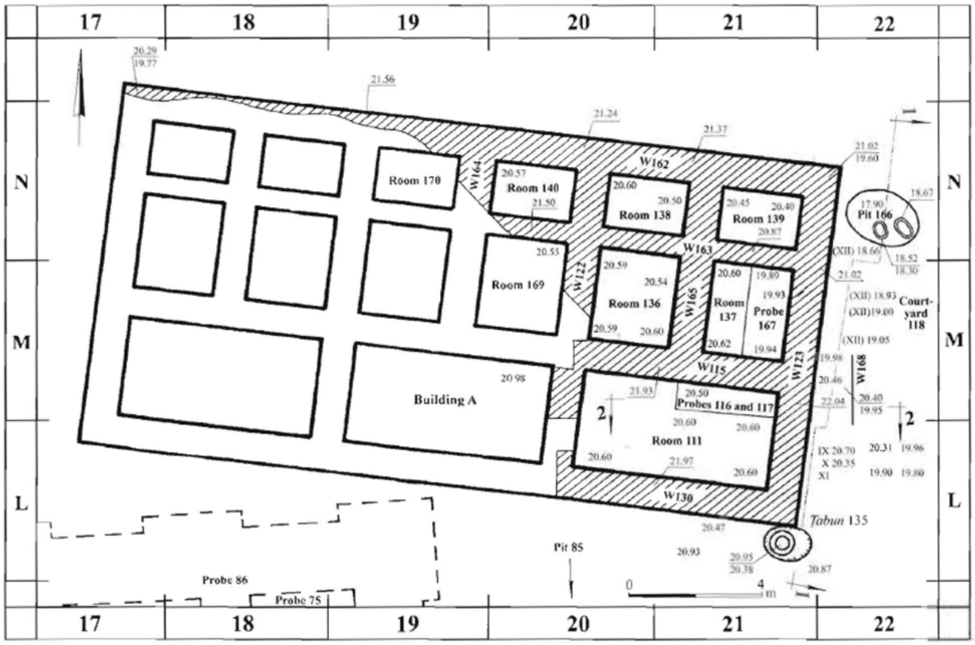

Figure 68 - Building A, Stratum 9's storehouse (Barako 2007, plan 2.1).

4.4.6.2 Building B

After Building A went out of use or was destroyed, Building B was constructed to the southwest (Figure 69). The layout was compared to one at Deir el-Balah's Stratum VII (LBA IIB; 1400-1200 BCE) having thick external walls and laid out in a square shape.[838] The length of the external walls is 22.5 x 22.5 metres (covering an area of 506.25 m^2).[839]

However, Barako's published findings reveal that this layout was largely reconstructed. Dothan presented this building numerous times as being relatively complete. However, the excavation drawings make it clear that less than ⅓ of this structure remains. The fortress' enceinte could not be located on the southern or western side. It is curious that Dothan chose not to lay out this structure as an exact square but has the western wall slightly slanted to the southern wall. Furthermore, excavations could not locate three of the corners of this building, raising questions about its overall dimensions. Much like Hoffmeier's reconstruction of the gateway at Tell el-Borg, Barako noted that the extent of the building is based on the presence of a sand foundation layer that provided support for the mudbrick superstructure.[840]

[838] Brandl 2010b, 77-84, fig. 5.12
[839] Barako 2007, 20-21
[840] Barako 2007, 20

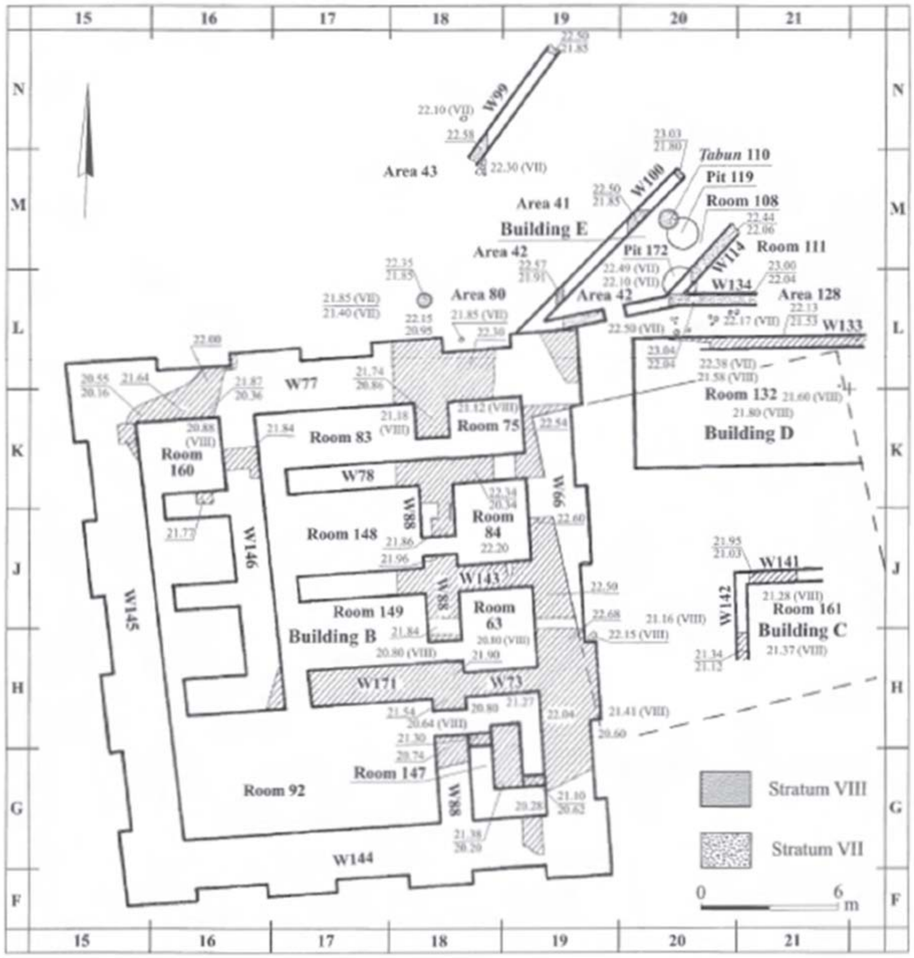

Figure 69 – Architectural Features of Tel Mor, Strata 8-7 (Barako 2008, Plan 2.4). The unpreserved areas are outlined in white.

Dothan's reconstruction included salient-and-recessed walls (Figure 85).[841] Each external wall's length was recreated with four slight projections (salients) that measure 3.2 metres long and 2.6 metres thick with a shallow foundation of 0.2 m.[842] Three recesses were similarly estimated to be 3.2 metres long but with a thickness of 2.1 metres. The slight projection of the wall is not enough (0.5 cm) to facilitate machouli or a substantial wall-walk assuming that these salients carried up to the top of the wall. Morris, in her description of the wall, described it as 'bastioned' but that would leave an impression of a formidable curtain wall.[843] Barako noted, quite rightly, that the tactical value of the salients would have been negligible.[844] Most likely, this kind of jogged trace would have been for stabilizing the

[841] Morris 2005, 559 refers to these slight salient features incorrectly as 'bastions'.
[842] Barako 2007, 20, 22
[843] Morris 2005, 559
[844] Barako 2007, 23

wall and possibly creating an aesthetic appearance.[845] This is the only kind of building, small in comparison to larger Levantine LBA settlements that employed this slight jogged trace on its façade.[846] Considering that the south and eastern sections of this external wall are entirely reconstructed by only the presence of sand, we should be wary of the reconstruction's appearance. The fortress of Haruba possessed an odd, singular salient on its north wall and only a slight salient on the north-eastern corner. Salient features were not mirrored on the opposite sides.[847] If a wall has a salient, we cannot assume that walls of a structure had a jogged trace façade.

The external walls in some sections were preserved to a height of 2.8 metres above the stratum's basal level in the southwest corner of the building.[848] The building appears to have supported a second storey as evidenced by the presence of a stairwell in Room 147, 3 x 5 metres, located in the south-western corner of Building B (fig. 93). Barako gives an overall description of this feature:

> "Three clay steps, 0.38 m wide and 0.17 m high, were excavated between W73 [the northern wall of this room] and a rectangular (1.30 x 2.70 m) mudbrick support or 'pillar' in the middle of the room. The excavators estimated that around the pillar there was space for 20 steps, which allows for a distance of 3.4 m between the floors of the first and second stories. If one assumes that the space between floors taken up by the joists and compacted brush probably did not exceed 0.5 m, then the ceilings of the ground floor of Building B were approximately 3 metres high. Given the building's monumental nature, this unusual height in possible."[849]

Therefore, if we use Barako's estimates, we can calculate a rough height of the building to be approximately 6 – 8 metres. Stairwells around a central pillar are common to both Egyptian and Canaanite architecture.[850] Therefore, the layout of the stairway does not indicate definitive proof of Egyptian manufacture.

Like the external walls, the internal walls of Building B are largely reconstructed. The overall layout of Building B's internal floor plan is comprised of a large hall, presumably near the entrance and a series of screening walls to create smaller internal spaces. The

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845 Wright 1985, Vol. 1, 178-179
846 Barako 2007, 22
847 Wright 1985, Vol. 2, Fig 79 B, D and E (Megiddo)
848 Barako 2007, 21
849 Barako 2007, 21
850 Badawy 1968, Vol. 3, 91-top left; Kempinski 1992a, 72; 1992b, 134

internal walls of the structure created 3 main areas; the front room or reception room, transverse halls in the eastern half and a longitudinal passage on the western side.

Outside of Building B, there was evidence of more structures. These buildings' were poorly preserved and the archaeological material was disrupted. The remains of Building C were a 0.50 cm thick wall (composed of wall W141 and W142) which was partially preserved to a height of 1 metre.[851] The mudbrick floor of this building was approximately 0.50 cm thick. To the north, there was a structure, Building D, with a similar wall and floor thickness. Barako noted that these buildings were dated to Stratum 8 even though their elevation corresponds to Stratum 7.[852] If Building B was designed to be a military installation, one would expect to have a clear field-of-fire around it to deprive an attacking force of cover. Thus, these external buildings indicate that this site may have served as an administrative installation.

Tel Mor's Stratum 7 (LBA IIB; 1400-1200 BCE) shows little architectural difference. Building B's layout remained the same and the external buildings to the east (Building C and D) went out of use.[853] A layer of debris was uncovered in the interior of Building B that was 0.9 metres thick. The majority of this matrix was composed of mudbrick fall but there was no evidence of conflagration. Barako suggested this was evidence of a partial collapse of the upper storey during an earthquake.[854] The end of Stratum 7 had a thick 'destruction layer' (1.5 metres) that contained ash and burnt mudbrick. This was interpreted as a 'fiery destruction' that left the site abandoned for some time as evidenced by a thin layer of windblown sand.

4.4.6.3 Building F

In Stratum 6 (LBA IIB-Iron IA horizon; 1200-1150 BCE), a new building was constructed, Building F, that stands in stark contrast to Building B's layout (Figure 70). This new building was roughly 13 x 13 metres and was founded directly over the north-eastern corner of Building B.[855] Building F was not preserved well as only the eastern half of the structure survived. This building's outer walls (Walls W39 and W129) were 4.0 metres thick. The rooms are divided up by internal walls 1.5 metres thick. The walls were set in foundation

[851] Barako 2007, 24
[852] Barako 2007, 24
[853] Barako 2007, 25
[854] Barako 2007, 25
[855] Barako 2007, 26

trenches that were between 0.2-0.3 metres deeper than the stratum's basal level.[856] The internal rooms of Building F are very small; L71 and L64 measure 1.9 x 2.4 metres and the larger room, L79, measured 1.9 x 6.3 metres. The parapet of this building could be reached by a ramp.

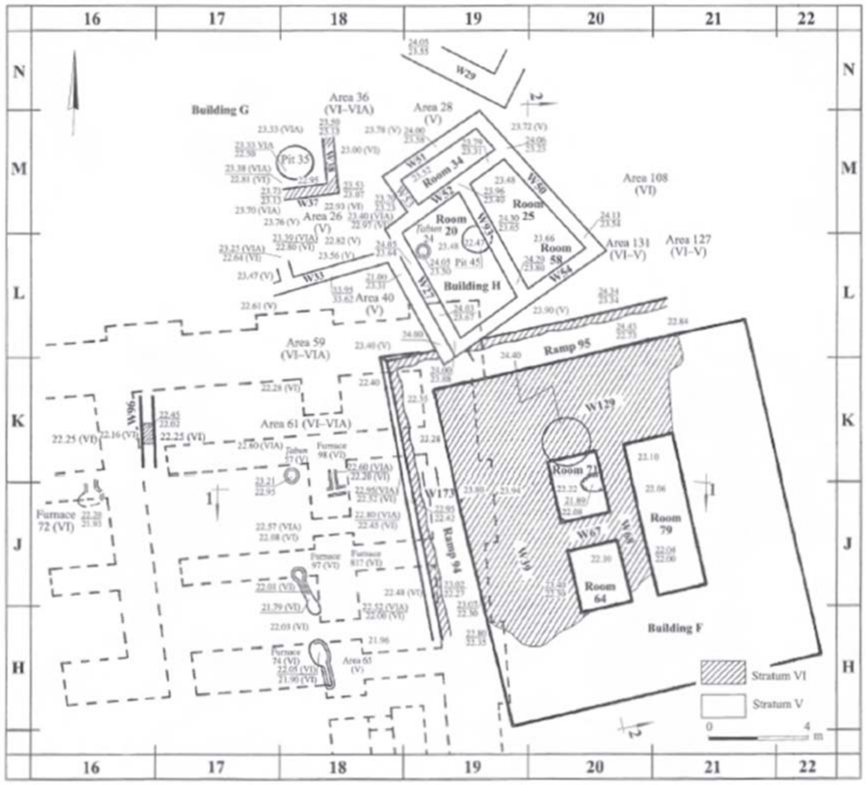

Figure 70 – Architectural features of Tel Mor, Strata 6-5 (Barako 2008, Plan 2.5). The relationship with Building B is outlined in a dashed line.

The ramp starts from the western side, L94, and increases in height until the northwest corner of the building where it takes a 90° turn to the east.[857] The ramp's exterior face was covered in mudbrick and aggregate was used to fill in the space between the ramp's edge and the main body of the building's wall, approximately 1.8 metres wide. The ramp was preserved to a height of 1.5-1.7 metres in areas.

Dothan described Building F as a 'migdol' and compared it to a type of construction of Canaanite buildings (Section 4.5.3).[858] Barako claimed that the building's thick walls were designed with defence in mind but it was shown by that these kinds of buildings were used in

[856] Barako 2007, 27
[857] Barako 2007, 27
[858] For a more complete discussion of the 'migdol', see Burke 2007

Egypt, during the Late Period, to limit access to storerooms.[859] However, in Spencer's examples, these types of storage structures are exclusively associated with temple storage. The small size of this building suggests that it was not able to withstand an assault. Barako noted that the closest parallel is a rectangular building found at Beth Shean.[860] Room 71 provides evidence of a 'destruction' level as numerous whole or semi-whole vessels were crushed when mudbrick debris collapsed.[861]

Building F did not fall completely out of use in Stratum 5 (Iron IA; 1200-1150 BCE) as it was rebuilt but without the ramps to reach its parapet.[862] To the north, Building H was constructed. The purpose of this structure is not clear but one of the rooms had a *taboon* (L24) which might indicate either cooking or production of some type. This stratum did not have a clear destruction level; the buildings simply fell out of use and were covered up with earth.[863] When the site was reoccupied, in Stratum 4, there were no major architectural developments.

4.4.7 Material Culture

4.4.7.1 Seals and Seal Impressions

Tel Mor yielded three scarab impressions, three scarabs, one cowroid, two bifacial angular plaques and two cylinder seals.[864] In the lowest phase of Stratum 12, a scarab (IAA no. 1960-1150) was found which was first reported to contain the name of Amenemhat II (Figure 73). Brandl later interpreted it as dating to the Hyksos period; having the three hieroglyphic signs for linen (*sšr*), ka (*k3*) and gold (*nbw*).[865] A scarab impression from a base of a storage jar (IAA no. 1960-1149), also recovered from Stratum 12, did not possess coherent hieroglyphs but depicts scroll-work in the shape of the 'unification knot' of Upper and Lower Egypt. This was common on design scarabs between the late Middle Kingdom and SIP (Figure 72).[866] Additionally, two virtually identical impressions on jar handles (IAA nos. 1960-1147 and 1960-1148) have two horus falcons in the middle with two wadjet cobras

[859] Spencer 1999, 300
[860] Barako 2007, 28; James & McGovern 1993, 2 Map 1, 56-57
[861] Barako 2007, 30
[862] Barako 2007, 31
[863] Barako 2007, 32; Morris 2005, 773 is mistaken on the assumption that possession passed from Egyptian or Egyptianised Canaanites to a Philistine agency in light of no cultural link in ceramic finds at the site.
[864] Brandl 2007, 205
[865] Brandl 2007, 199; Dothan 1973b, 8-9
[866] Brandl 2007, 197-200

on either side of a gold (*nbw*) symbol (Figure 71). This examples dates to the MBA IIB-IIC period and has a similarity with those found at Tell Ajjul.[867]

Figure 71 - Jar handle impression, stratum 11 (adapted from Brandl 2007, fig. 7.4).

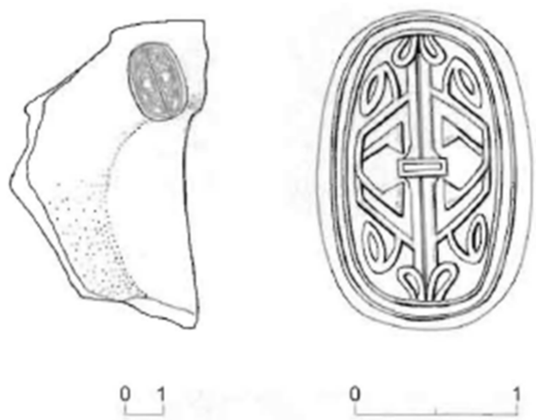

Figure 72 - Jar base impression, stratum 12 (Brandl 2007, fig. 7.6).

Figure 73 - Hyksos design scarab, stratum 12 (Brandl 2007, fig. 7.7).

[867]Brandl 2007, 196-197

Figure 74 - Scarab IAA no. 1959-142 (Brandl 2007, fig. 7.2).

Figure 75 - Scarab IAA no. 1959-140, stratum 6 (Brandl 2007, fig. 7.1).

Figure 76 - Cowroid IAA no. 1959-143 (Brandl 2007, fig. 7.3).

There are two scarabs (IAA nos. 1959-140 and 1959-142) that date to the New Kingdom. Both scarabs possess humeral callosities on the elytra and so indicate a New Kingdom date.[868] Scarab 1959-142 came from the courtyard that was in use throughout Strata 12-9. Brandl suggested that the inscription on it: "Amun [gives] a good (or definite) old age" (*Imn (di) nfr i3w*) can be compared with a scarab from Memphis which reads: "Amun [gives] a good (or definite) youth" (*Imn (di) nfr ḥwn*), and inferred from its shape that it dated to the 18th Dynasty (Figure 74).[869] Scarab no. 1959-140 was found in Stratum 6 and depicts Horus and Thoth flanking a figure of Amun (Figure 75). Stylistically, there are other parallels to this scarab and those found at other sites in the southern Levant. Based on the composition, Brandl suggested that it was made locally and dates to the 19th Dynasty.[870] Similarly, the

[868] Wilkinson 2008, fig. 11
[869] Brandl 2007, 194
[870] Brandl 2007, 192-193

cowroid inscribed with the name of Amun-Re (*Imn-r'*) stylistically dates to the 19th Dynasty (Figure 76).[871]

The two bifacial angular plaques and two cylinder seals unfortunately do not have a secure provenance. However, the rough designs carved in faience and serpentine are indicative of Canaanite origin.[872] Other than a suggestion of a 14th century BCE manufacture, there are no specific dating criteria for these pieces.

4.4.7.2 Pottery

Martin and Barako decided not to employ a typological sequence for Tel Mor's pottery because of its relatively small size and its questionable stratigraphic context.[873] There are four types of fabric found at Tel Mor; kurkar, hamra, alluvial loess and dune sand. The predomiant type produced is composed of clays that fire a light red, red or reddish yellow. During the LBA, the appearance of Egyptianised forms can be seen in the assemblage.[874]

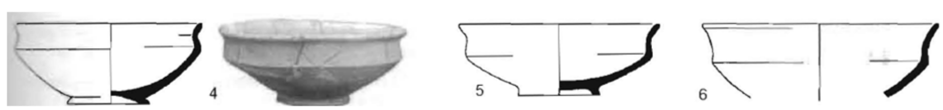

Figure 77 - Carinated Canaanite Bowls, Strata 12-10 (Barako 2007, fig. 3.3).

Figure 78 - Canaanite cooking pot, Stratum 11 (Barako 2007, fig. 3.17).

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871 Brandl 2007, 195
872 Brandl 2007, 200-205
873 Barako 2007, 43
874 Barako 2007, 45

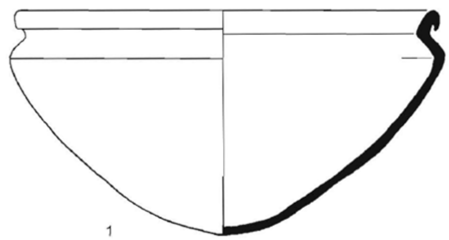

Figure 79 - Canaanite cooking pot, Stratum 8 (Barako 2007, fig. 3.19).

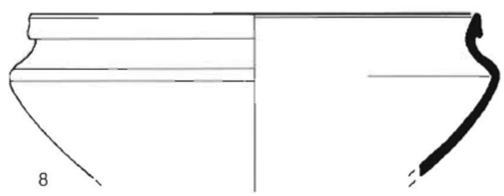

Figure 80 - Canaanite cooking pot, Stratum 7 (Barako 2007, fig. 3.20).

Figure 81 - Canaanite amphora found in Building A, stratum 9 (Barako 2007, fig. 3.22).

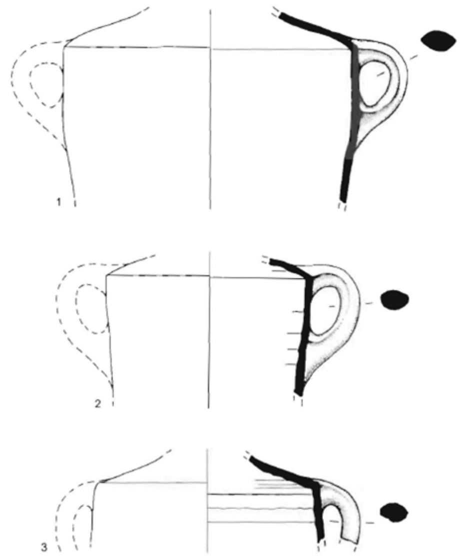

Figure 82 - Carinated storage amphorae, Strata 7 - 6 (Barako 2007, fig. 3.24).

The Canaanite ceramic assemblage of Strata 12 – 10 is denoted by carinated bowls and cooking pots (Figures 77 to 80). In addition, the storage amphorae are almost exclusively of Canaanite origin.[875] In Stratum 9, a good example of a Canaanite storage vessel can be equated to Aston's Type A1, dating morphologically to the reign of Ahmose to Thutmose III, and found in Building A (Figure 82).[876] Canaanite pottery from Stratum 8 conforms to previous shapes and forms. It is only in the later levels of Stratum 7 that hybridisation appears.[877] The majority of vessels came from Building B's Room 63 (8 baskets, 56 registered sherds) and Room 75 (10 baskets, 83 registered sherds). The most significant area to produce sherds was Area 128, near Building D (22 baskets, 242 registered sherds).[878] The majority of storage jar fragments were not found in Building B, but outside it.[879] Canaanite storage jars, with sharply carinated shoulders, first appear in Tel Mor's Stratum 7.[880] These types of storage jars occur first in the LBA IIA at sites along the southern Canaanite coast and a comparable example is known from the Uluburun shipwreck.[881] The examples of these jars have a correlate with Aston's Amphorae Type A3.[882] Canaanite juglets are rarely found

[875] Cline & Yasur-Landau 2010, 2;Martin & Barako 2007, 152;
[876] Barako 2007, 110, fig. 3.22, no. 2; Aston 2004, 176-177, fig. 1a
[877] Barako 2007, 45 noted that these Canaanite hybridisation forms are not so much in the way vessels are formed but more from the Egyptian practice of using an Egyptian straw-tempered fabric to produce Canaanite vessels.
[878] Barako 2007, 45
[879] Barako 2007, 62
[880] Barako 2007, 63, 114, fig. 3.24, no. 1-3
[881] Barako 2007, 63 citing Pulak 1997, fig. 9b; Pulak 1998, 201 – 202, fig. 15
[882] Aston 2004, 181-183, fig. 3

at Tel Mor and Barako suggested that this was mainly due to Cypriot imports serving this purpose at the site.[883]

Egyptian wares at Tel Mor strongly suggest an Egyptian presence during the LBA IIA – Iron IA.[884] Martin and Barako point out that the number of imported Egyptian vessels is small compared to the overall assemblage. Only 11 vessels were recovered by Dothan's excavation team, but the forms are more diverse than those from Beth Shean.[885] There are more vessels that were locally produced that imitate Egyptian forms which indicate an Egyptian pressence. Absent from the ceramic assemblage is pottery that could be classified as 'prestige-ware' such as handled cups made from local clays or Marl D.[886] There is a general lack of imported Egyptian storage containers at the site.[887]

The evidence of Egyptian pottery techniques that were used at the site could be seen by the use of straw temper in ceramics. As Martin and Barako point out there are several advantages to using straw temper:[888]

- It enhances the plasticity of the clay.
- It allows the vessel to dry more evenly, quickly and with less shrinkage of the original form.
- It decreases the amount of raw material required.
- It decreases the amount of fuel and firing time because of the increased porosity of the clay.

Despite these advantages, Martin and Barako point out that the adoption of such a technique might have more to do with a cultural background than a functional advantage.[889] The use of straw temper in fabrics is an attempt to recreate Nile Silt forms and it might be significant that marl clay forms were not focused upon.[890] In summation, Martin and Barako claim that the potters might be Egyptian, or individuals' intimately familiar with Egyptian ceramic forms and production methods to be able to produce Tel Mor's Egyptianised pottery.[891]

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[883] Barako 2007, 66
[884] Martin & Barako 2007, 129
[885] Martin & Barako 2007, 129
[886] Martin 2004, 272 this is curious as handled cups appear, "at almost every site with an Egyptian presence."
[887] Cline &Yasur-Landau 2009, 2; Martin & Barako 2007, 158-161, fig. 4.4
[888] Martin & Barako 2007, 132-133;Martin 2004, 275
[889] Martin & Barako 2007, 133
[890] Martin 2004, 267
[891] Martin & Barako 2007, 133; Martin 2004, 265

Sherds with straw temper were considered to be 'Egyptianised' while those without were considered 'Canaanite'.[892]

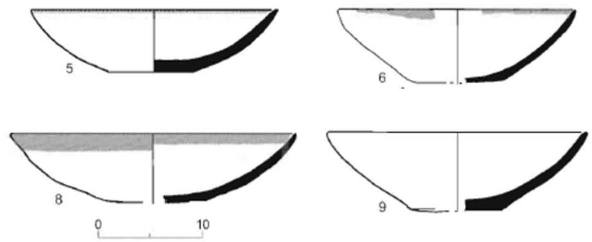

Figure 83 - Egyptian bowls with rounded walls and plain rim, strata 7 - 6 (Martin and Barako 2007, fig. 4.6).

From the LBA IIA to Iron IA contexts, shallow to medium-deep bowls represent the majority of Egyptianised pottery in Canaan (Figure 83).[893] Most bowls in Canaan have flat bases while the 19th and 20th Dynasty forms from Egypt have rounded bases.[894] Dothan attributed the bowls from Stratum 12 to Megiddo's Strata 10 – 11 and Hazor's MBA strata based on their rounded sides and disk-bases.[895]

Cooking pots from Strata 12 – 10 also have parallels with the pots at Tell Beit Mirsim and the MBA II strata at Hazor.[896] One example was found with an adze-rim and this is a diagnostic artefact that dates to MBA II-early LBA I.[897] Jugs with parallel double-handles were also found in Strata 12 – 10 and is dated in MBA II contexts at Megiddo and Hazor.[898] A find of a complete krater suggests an early LBA I date.[899]

Cypriot pottery from this early strata (12 – 10) is shown in red-on-red ware by the presence of a bowl with a horizontal spout and a handle known to date from the Middle Cypriot III period (1750-1650 BCE).[900] Monochrome Cypriot pottery and red-on-red indicates that Strata 11 – 10 should be assigned to the 16th to 14th centuries.[901]

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[892] Martin & Barako 2007, 135
[893] Martin & Barako 2007, 134
[894] Martin & Barako 2007, 135
[895] Dothan 1973b, 5
[896] Dothan 1973b, 5, fig. 3.6
[897] Dothan 1973b, fig. 3.7
[898] Dothan 1973b, 5
[899] Dothan 1973b, fig 4.1
[900] Dothan 1973b, fig.4.4
[901] Dothan 1993, 1073

Although there were no 'flower pots' found in the excavations at Tel Mor, approximately 50 beer bottle fragments were found (Figure 84).[902] The beer bottles were found throughout Strata 9 – 5 (Table 8).

Table 8 - Beer Bottle frequency in the Strata of Tel Mor

Beer Jars at Tel Mor	
Number Found	**Strata**
8	9
4	8
18	7
15	6
4	5

Figure 84 - Beer jar, strata 8 - 7 (Martin and Barako 2007, fig. 4.11).

Holthoer was the first to coin the term 'beer bottle' to describe a distinctively shaped jar characterised by careless manufacture with deep fingerprints near a heavy, flat base.[903] This vessel, associated with beer, was supported by indirect evidence. Beer jars were usually associated with 'flower pots', which we have seen are conical bowls with a heavy, flat base. Holthoer thought that the shape of the beer bottles and the flower pots represented offering in the *ḥtp di nsw* formulae. However, Higginbotham demonstrated although flower pots and

[902] Martin & Barako 2007, 162-163, fig. 4.11
[903] Martin & Barako 2007, 147 citing Holthoer 1977, 86-87

beer bottles can found in the foundation deposits in the 18th Dynasty, tombs usually contained either a flower pot or a beer bottle, not both.[904]

Holthoer developed a typology of beer bottles with four subtypes, the first three being produced in the early-mid 18th Dynasty. The fourth subtype, BB4, had the longest development in the archaeological record. It was introduced in the early 18th Dynasty, increased in popularity in the 19th Dynasty and continued with slight modifications until the TIP.[905] The presence of deep rilling on the exterior and their wide-shoulders make this vessel easy to recognise. The outside of the vessel usually has no surface treatment. The jars are morphologically the same whether produced in Egypt or in Canaan. For their composition, beer jars produced in Egypt are usually made from Nile Silt (types B and E) whereas the ones produced in Canaan are produced from local clays.

The basal diameters of beer jars gradually became smaller throughout their development with 10 – 12 cm examples being indicative of the 18th Dynasty, 7 – 9 cm for the 19th Dynasty and 6 cm or less for the 20th Dynasty.[906] The examples from Tel Mor show this development with basal diameters between 6 – 11 cm (with an average of 8.8 cm). The comparable beer jar corpus at Beth Shean has jars with a basal diameter of 5.5 – 9.5 cm for Strata S-5 to S-3.[907] Given that the occupation of Beth Shean appears to be more entrenched in the 19th and 20th dynasties than Tel Mor, this is not surprising.[908]

Beer jars from sites in Canaan often have their bases perforated either before or after the firing process. At Tel Mor, at least a third of their bases treated as such.[909] This would have rendered the vessel unsuitable for storage but Petrie's excavations at Rifeh found these vessels with the remains of barley mash and grains.[910] Petrie suggested that this type of vessel was used in the process to ferment beer.[911] The other beer jars, that do not possess a perforated base, could have been used as storage jars. Thus, it is likely Tel Mor's beer jars

[904] Higginbotham 2000, 157
[905] Martin & Barako 2007, 147
[906] Martin & Barako 2007, 148 citing a personal communication with Aston.
[907] James & McGovern 1993, Vol. 2, fig. 10.7
[908] Martin & Barako 2007, 148
[909] Martin & Barako 2007, 149
[910] Martin 2004, 271; Martin & Barako 2007, 149
[911] Martin & Barako 2007, 149 citing Petrie 1907, 23

were involved in producing beer for the garrison. The examples from Tel Mor fit well within the existing corpus of this type of pottery form.[912]

The earliest levels of Tel Mor (Strata 12 – 9) had very few Egyptian imported forms (1%). In the subsequent stratum, Stratum 8, the presence of Egyptian beer bottles suggests there was some form of Egyptian occupation at the site. Egyptianised pottery, that is locally made Egyptian forms, primarily took on the form of course bowls (75% of the total assemblage) and beer jars with a substantial increase in Stratum 7. In Stratum 6 – 5, there is a twofold increase of the Egyptianised pottery and an increase in Egyptianised bowls (91% of the total corpus).

4.4.8 Discussion

The position of Tel Mor in relation to Nahal Lakhish can be compared to Tell el-Ajjul's location along the Nahal Besor or Tel Michal's close relationship with the Nahal Yarkon. As mentioned, the southern Levantine coast has very few mooring locations and so these perennial streams would have served as vital links to the interior of Canaan. By positioning a base of operations along such a route, not only would the garrison benefit from the supply of fresh water but also, the position could have monitored shipping traffic making their way to larger Canaanite centres. This would suggest that the site was carefully selected for maximum efficiency as a small group of personnel could be stationed at small fortified enclosures to impose tax collection on passing traffic. In addition, the position of Tel Mor on the coast might indicate that this was a place for communication with the Egypt itself.

In the earliest strata of Tel Mor, the site appears to have operated as a landing point for water transport. The site was not immediately located on the Mediterranean coast but rather 1 to 2 km inland to protect the installation from storm surges. The vantage point on the summit of a large kurkar ridge would have also allowed the inhabitants to monitor the surrounding area and the overland coastal route. During Stratum 9, Building A's construction suggest that the site was important for the storage of goods. However, the lack of a coherent fortification system seems to indicate that this was not a place that could defend itself if it came under threat. Although it appears Tel Mor's inhabitants may have had contact with Egypt through maritime trade, the lack of flower pot vessels indicate that there was not a permanent Egyptian presence at the site as at Bir el-Abd, Haruba A-345 and Jaffa.[913] It is possible that

[912] Higginbotham 2000, 157-158 gave a comprehensive list of sites that have yielded flower pots and beer bottle forms of pottery in Canaan, Egypt and Nubia.
[913] Burke & Lords 2010, 18-19

the site was an outpost for Ashdod's shipping traffic. Whether we should see this stratum as being representative of one of Thutmose III's coastal bases is not clear from the current evidence.

In the next Strata (8 – 7), we witness the establishment of Building B and the twofold increase of Egyptianised pottery. The ceramic corpus of the Egyptianised pottery mainly takes the form of bowls and beer jars. Imported vessels from Egypt are very rare in the ceramic assemblage with only 11 examples having definitive Egyptian origins. This is similar to other Egyptian-held sites in southern Canaan.[914] Storage-jar ceramics were confined to Canaanite amphora throughout the site's LBA strata. This indicates that outposts located in Canaan were not dependent on imperial support from Egypt for their sustenance. Rather, the personnel stationed there, whether native-born Egyptians or Canaanites serving as mercenaries, depended on the surrounding areas for their immediate needs.[915] As mentioned, grain analysis from Deir el-Balah indicates that requisitioned goods from the area would have been important to maintain these administrative bases.[916]

For the storage facilities at Tel Mor, it cannot be calculated what capacity the storehouse could have held to possibly supply a campaign force. It is likely that this could have been considerable as Building B was multi-levelled and did not have any domestic housing on its ground floor.[917] The ceramic material of Egyptianised wares should take into account the Canaanite assemblage. In comparison, the Egyptian material, although seen as the most comprehensive link with a foreign presence at the site, is very small; 4% Egyptian wares in the 18th Dynasty (Stratum 9), with an increase to 7% in the 19th Dynasty (Strata 8-7) and, the highest, being in the 20th Dynasty (Strata 6-5) at 13%.[918] The increase in the 20th Dynasty could be related to Singer's suggestion that when that dynasty was on the verge of being ousted from their sphere of influence in southern Canaan, the Egyptian presence in the Levant expanded significantly.[919] Absent from the Egyptianised corpus are cooking wares (cooking pots and bread moulds). Canaanite cooking vessels were found at the site and indicate that the personnel were not being supplied from Egypt but rather from locals in the area.[920]

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[914] Martin 2004, 265
[915] Cline & Yasur-Landau 2010, 3;Ahituv 1978, 96.
[916] Kislev 2010, 307 -308
[917] Morris 2005, 559
[918] Martin & Barako 2007, 151
[919] Singer 1988, 4-5. See also Gadot 2010, 62-63
[920] Martin 2004, 280. Martin & Barako 2007, 153 *contra* Cline & Yasur-Landau 2010, 3

It cannot be shown that Building B is of an Egyptian design. If this reconstruction is correct, we should acknowledge that no military buildings were found in Egypt or the north Sinai that employed this kind of architectural feature (Figure 85 - right). Wright argued that this is a feature of Levantine sites in LBA Canaan and is usually employed for long curtain walls to encircle a settlement.[921] This type of façade would not have added to the defence of a structure. Comparing Building B to the images of fortresses depicted in the Sety I battle scenes does not yield an explanation of the reconstructed façade.[922] Considering the comparative architectural features at our examined sites (Tell el-Borg, Bir el-'Abd BEA-10, and Haruba A-289) and the fact that less than one-third of Building B was preserved, it indicates that the reconstructed exterior of this building was more due to Dothan's imagination than archaeological fact. Instead, we should re-envision this building to be a square structure with an odd salient feature, much like the north wall of Haruba A-289. Unfortunately, the preservation of Building B cannot answer the question if the thick walls of the building had a parapet upon which personnel could stand. It seems likely that there was some access. Whether or not the parapet of the structure was crenellated cannot be determined from the archaeological remains.

Another site that should be considered in an analysis of Building B at Tel Mor, are architectural features at Aphek excavated in Area X on the upper tell (Figure 5).[923] Although the site is located in the interior of the country, on the Sharon Plain along the Nahal Yarkon, the similarities of Aphek and Tel Mor are remarkable and might reveal some information on the transitional horizons between strata. In Aphek's Stratum X13, a large building, Palace 4430 (or 'Palace VI'), was constructed that had slight walls and a colonnaded court.[924] Although larger than Building A, it had a similar plan and layout. When Palace 4430 went out of use, Building 1104 ('Palace 1104', 'Palace V' or the 'Egyptian governor's residence') was erected in Stratum X12. The layout of Building 1104 with Tel Mor's Building B is striking when compared side-by-side (Figure 85).

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[921] Wright 1985, Vol. 1, 179
[922] Barako 2007, 241
[923] Beck & Kochavi 1993, 65
[924] Gadot 2010, fig. 2; 2008, 60

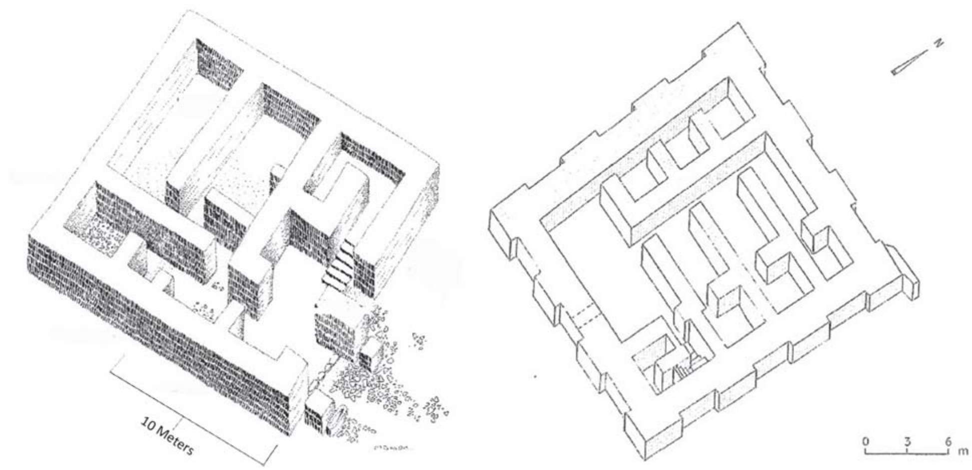

Figure 85 - Building 1104 from Aphek (left) and Tel Mor's Building B (right) (Beck and Kochavi 1993, 68; Dothan 1993, 1073).

Building 1104 had an entrance court, horizontal and longitudinal rooms for storage and a stairwell leading up to an unpreserved second storey. The measurements of Building 1104 are 20 x 20 metres (or 400 m^2) with walls 1.4 metres thick with stone foundations.[925] Palace 4430 and Building 1104 at Aphek were the only major buildings to have been constructed on the summit of the tell, much like Tel Mor's relationship of Building A, B and F in its LBA strata.[926] Kochavi had argued that Egyptian control of Aphek was strategic as the site could monitor the interior travelling route in the Sharon Plain.[927] The pottery corpus is small but almost mirrors Tel Mor's as Egyptianised forms are mainly confined to bowls while storage is confined to Canaanite amphorae.[928] Grain was analysed from the pottery from Aphek's store-rooms and it was concluded that the wheat and barley (with the inclusion of weed-seeds) were all native species to the Sharon Plain, implying that these residences abroad were dependent on local support.[929] Aphek's Building 1104 witnessed a destruction through conflagration and collapse but had evidence of a human agency in that several arrowheads and javelin-heads were found imbedded within its exterior walls.[930] Although we should be cautious about a direct comparison, this would seem to suggest a link with Building B's terminus with violence rather than the suggestion of Barako that is was an earthquake.

[925] Beck & Kochavi 1993, 67; Kochavi 1978, 14. The use of stone in this building's construction must have been due to the higher rainfall isohyet in this region.
[926] Gadot 2010, 53
[927] Kochavi 1990, xii
[928] Gadot 2010, fig. 3 and 4
[929] Gadot 2010, 54 citing Kislev & Mahler-Slasky 2009
[930] Kochavi 1978, 15, fig. 7

It is unclear why Building F is radically different than Building B. Although, it appears to be not of Egyptian design, Egyptianised pottery increased to its highest level at this time (LBA IIB-Iron IA). There is no evidence of the Sea Peoples's ceramics at the site (Mycenean IIIC:1b pottery, Philistine Monochrome ware) so postulations that they were responsible for the construction appear erroneous.[931] Building F functioned as a storeroom but this was significantly decreased in the 20th Dynasty. Therefore, if Egyptian personnel served at the site, it would seem that their numbers were significantly decreased. Indeed, Martin sees the increase in Egyptianised pottery at Tel Mor as an attempt by Egypt to station more men at the site to buffer possible attacks by the Sea Peoples.[932] If this was the case, it begs the question why no fortification at the site is present. The singular 'watchtower' could not have served as a sufficient defensive feature against any force. Morris pointed out that such a structure has no direct parallels with Egyptian architecture in a military context.[933] Despite the problems in interpretation of Building F's context, we might surmise that this building was not constructed with defence in mind and that the motivation for its thick walls and layout seem to support a functional objective. It was constructed as a watchtower that would limit access to goods stored inside of it.[934]

Barako surmised that Tel Mor was populated by 50 Egyptian males serving as the garrison.[935] He saw this site operating as a base for a circuit official (a person who would travel to Egyptian-held outposts in southern Canaan periodically). He was responsible for collecting goods for a campaign force if they needed to resupply.[936] This theory can be considered a possibility. However, there is no inscriptional evidence from Tel Mor, nor in the Amarna Letters, to show this conclusively. The shipping of goods is not addressed by Barako. The archaeological evidence does indicate that the site was not directly supported by Egypt but trade goods could have been sent to Egypt by seagoing transport. The evidence for this practice is lacking but it seems likely.[937] The answer might lie with the Canaanite amphorae found in Stratum 7-6 contexts as this type, Type A3, was found in Egypt at the

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931 Morris 2005, 560 mistakenly claimed that Mycenaean IIIC:1b ware was found in the stratum dating to the 19th Dynasty.
932 Martin 2004, 280
933 Morris 2005, 773
934 Cline & Yasur-Landau 2010, 4-5
935 Barako 2007, 241
936 Barako 2007, 241-242
937 However, as Ahituv (1978, 104-105) argued the drain on economic resources would not have been significant and New Kingdom Egypt was operating Canaan as a buffer zone rather than exploiting Canaan's resources. See Na'aman 1981 for counter-argument.

sites of Qantir, Amarna, and Memphis which could account for goods flowing out of Tel Mor to Egyptian markets.[938]

The Egyptian presence at Tel Mor was based on logistical considerations in that both buildings B and F were designed for storage rather than defence. The main importance of Tel Mor was in its contribution to the logistical network that had been created in the New Kingdom that supplied campaigning Egyptian forces as they came into Canaan.

4.5 Implications of Examined Archaeological Sites

4.5.1 The Position of Fortified Buildings in the Ancient Landscape

The New Kingdom sites examined above indicate an advanced logistical network facilitating campaigns into southern Canaan by focusing on communication and supply storage. The archaeological evidence suggests that this network was in place by the reign of Thutmose III. Before his reign, there is a lack of archaeological data to indicate that a formalised logistical system was in place. However, there is a general absence of records and artefacts that date to military action during the earlier 18th Dynasty.[939]

The physical geography of the eastern Delta and northern Sinai had an impact on the size and layout of these archaeological sites. Situated on the edge of Egypt proper, Tell Heboua was the largest military settlement in northern Egypt. Its location on the edge of the Sinaitic route and at the mouth of the Pelusiac branch meant that its inhabitants could monitor naval and foot traffic. This responsisbility of the garrison was enhanced by not having one settlement but rather a series of installations that could monitor several avenues of ingress. Furthermore, a hostile force attempting to forcibly enter the Delta would have found it difficult to launch an assault on Tell Heboua as it would have required a coordinated attack on multiple centres at once. Otherwise, the attackers would have found themselves enfiladed by Egyptian reinforcements.

Tell Heboua is the largest site along the Sinaitic route since it had access to a supply of fresh water. In addition, the strength of a logistical supply network will always be the strongest near its source (Table 9). Its extensive use of storage silos and rectangular magazines

[938] Aston 2004, 181-183
[939] Morris 2005, 36 ft. 50

emphasised that it was a departure point for a campaign force: the last chance to stock up on supplies before the journey to southern Canaan. Although finds of military equipment are not common in the excavated remains of Tell Heboua, the textual instances citing Tjaru's arsenal are compelling.[940]

Control of water resources in the north Sinai would have been critical for the security of Egypt and would have impacted the capabilities of Egyptian armies entering southern Canaan. The inclusion of water resources in the artistic scenes of Sety I at Karnak are significant (Table 3, Figure 18 to Figure 19). Besides the scenes displaying the new pharaoh as an active force, the images demonstrate the importance of water along this travel conduit. However, Sety I's artists made have been prone to hyperboyle in the case of the 'Bedouin battle'. The small carrying capacity of the northern Sinai suggests that the resistance on this campaign by native Bedouin would have been negligible. By far, the principal obstacle in a north Sinai campaign would have been the environment itself.

Tell el-Borg was located near the southern edge of the lagoon-plain in the transitional zone of the eastern Delta and northern Sinai. The area surrounding the site was not suitable for farming and thus, it relied on outside supplies. Its size and features indicate that this was not a fortification designed to withstand an assault but rather that it functioned as a monitoring post for incoming traffic. Additionally, its location challenges the suggestion by Gal that fortified centres would be located about a day's march (c. 25 km) from one another.[941] By being located 5 km away from Tell Heboua 2, Tell el-Borg's military personnel would have relied upon reinforcements from Tell Heboua to come to their aid if they detected a threat. Tell el-Borg's external water sources can be interpreted as a stopping point for incoming campaign forces to recuperate before making their journey to Tell Heboua and possibly Pi-Ramesses (Qantir).

Bir el-'Abd's cistern indicates it is of logistical importance. Since the only precipitation in the area falls in the winter and campaigns took place in the spring and summer (Section 5.4.3), Oren's suggestion that this depression was filled by local rains is no longer tenable. In order for this cistern to have operated efficiently, it would have required that the personnel at this centre were expected to concentrate water resources in the cistern before a large force arrived. The cistern's position outside the main curtain wall may seem an unusual strategy of the New Kingdom Egyptian architects. However, the high evapo-transpiration of the area

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[940] Battle of Kadesh - Poem version P29 – 32 (Table 4 no. #19; Gardiner 1960, 7 – 8) and Pap. Lansing, Lines 9.9 - 9.10 (Table 4 no. 26; Caminos 1954, 401).
[941] Gal 1993, 80 – 81

and the gradual seepage of the lining indicate that this cistern did not contain water throughout the year. Its location outside of the fortified enclosure is likely to be a response to the logistical pressure of trying to water a large body of people and animals simultaneously. Although the water cistern relied upon human agency to stock it, we cannot be certain if the water came from wells inside the fortress or a naval supply chain. It seems likely that it was a combination of both.

Bir el-‘Abd’s external granary and the storage magazines are confusing considering the defence of the enclosure. Given how the cistern operated and that this required communication beforehand, it is likely that these features were not used throughout the year. Rather they represent overflow storehouses that were used when notification was received about a campaign force. Much like the cistern, these features’ location on the exterior would have avoided the ‘bottle-neck’ effect. A hostile force encountering the external cistern and storehouses would have probably found them completely devoid of resources for most of the year. This may also be the case for the local garrison’s numbers; it is likely that the fortress had a small contingent outside of the campaigning season.

Table 9 - Comparison of examined archaeological sites.

Site		Estimated area within curtain wall (m^2)	Silo Storage Capacity (litres)	Architectural features outside curtain wall?	Additional Notes
Tell Heboua					
	Site 1	120,000+	193,900 (Phase 1) 227,900 (Phase 2)	No	Large portion of eastern side destroyed
	Site 2	110,000	N/A	N/A	
Tell el-Borg					
	18th Dyn. Fort	N/A	N/A	Yes	No remains of 18th Dyn. fortress. Settlement area in Field 4 (approx. 200 metres away from enclosure)
	19th Dyn. Fort	6,241	N/A	Yes	Badly damaged curtain wall and gateway. Settlement area in Field 4.
Bir el-'Abd					
		1,600	58,974 – 70,974	Yes	Granary, cistern and magazine complex outside enceinte. Campsite clustering around central site.
Haruba					
	Site A-345	20,000 – 60,000	N/A	Yes	Unfortified, excavation revealed 3 – 10% of overall site. Campsite clustering around central site.
	Site A-289	2,500	N/A	No	Campsite clustering around central fortified enclosure.
Tel Mor					
	Building A	242	N/A	Yes	
	Building B	506.25	N/A	Yes	
	Building F	169	N/A	Yes	

The location of Haruba, much like Tell Heboua, indicates that it could have served a two-fold purpose of monitoring overland and maritime traffic. Although it is clear that A-345 received timber from the Palestinian heartland for the pottery kilns, it is harder to verify its grain supply source. However, the barley grains recovered from Deir el-Balah's Pit 1207 are two-rowed barley which only derive from Canaan since New Kingdom Egyptian varieties are six-rowed.[942] That sites in Canaan were supplied from the Levant strongly indicates that Oren's suggestion was correct. The pottery kilns at the Haruba suggest that A-345 was important for the redistribution of goods with the surrounding area in addition to supplying campaign forces with containers as they made their way in and out of Canaan. The fortified enclosure of A-289 might represent a refuge for forces in the area but it was not an installation that could withstand a siege. Rather, A-289 would have functioned in the monitoring of the Sinaitic route. Thus, the sites of Haruba emphasise their importance of the logistical network in storage and communication.

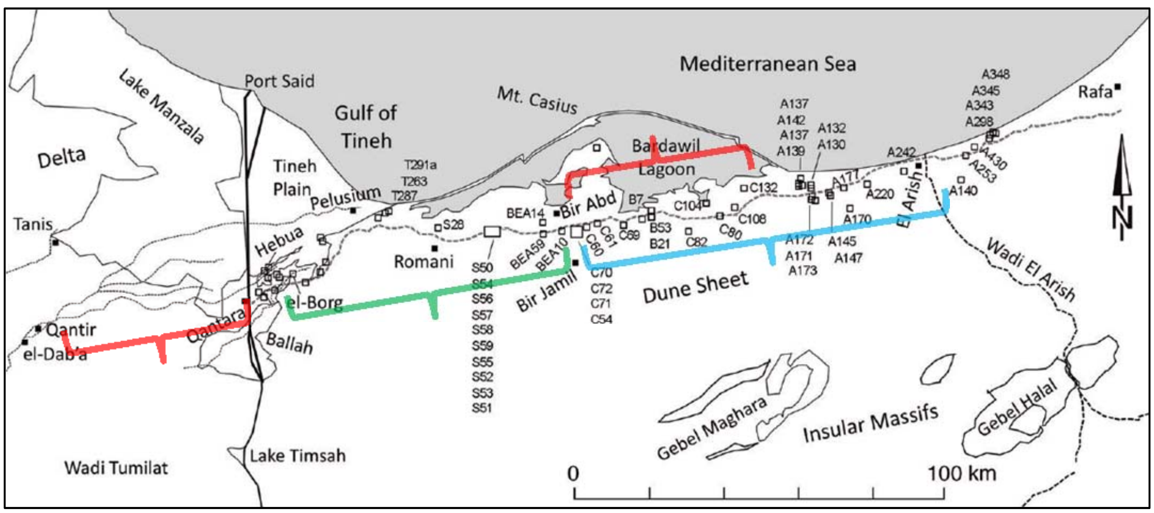
Tel Mor's location along the Nahal Lakhish made it important for Ashdod's maritime trade. By securing the waterway, a small group of soldiers could monitor the maritime traffic along the sea-coast and ships making their way to Ashdod or further inland. The mound on which Tel Mor was located would have also provided a good vantage point for surveying the surrounding countryside. By being strategically located along the seacoast, it can be assumed that this site was also important for communications with the Egyptian administration. Egyptian ceramics at this site were very much in the minority, much like material from Haruba, suggesting that the site relied on its provisional support from the surrounding countryside. Whether these goods were forcibly requisitioned or whether they arrived in Tel Mor's storehouse as a payment of Egyptian-imposed duties or taxes cannot be determined.

Table 10 - Overland distances between sites.

Route	Distance (km)
Tell el Dab'a/Qantir to Tell Heboua	54
Tell Heboua 1 to Tell Heboua 2	1
Tell Heboua 2 to Tell el Borg	5
Tell el Borg to Bir el-'Abd	70
Bir el-'Abd to el-Arish / Haruba	82 / 94
Haruba to Deir el-Balah to Tel Mor (coastal route)	100

[942] Kislev 2010, 308

Considering that an average campaigning force could travel about 25 km per day, the distances between sites demonstrate that they were located according to logistical and strategic reasons (Section 5.5.2) (Table 10, Figure 88). The expanses between the larger Sinaitic sites appear to correlate with Engels' "4 Days Rule"; the maximum a campaigning force could carry provisions in a desert environment (Figure 86). Critical in Engel's analysis is the claim that if soldiers had to transport their own water, they could only carry enough for 2.5 days. Oren's survey found artefact-concentrations at roughly 50 km apart. Although the survey did not find the remains of architecture between Tell el-Borg to Bir el-'Abd and Bir el-'Abd to Haruba, it is very likely that sites in these interim-areas represent 2-day campsites that would have supplied water either from wells or depots of amphorae.[943]



Legend

Bracket	Marching Time / Distance
	2 Days (c. 50 km)
	3 Days (c. 75 km)
	4 Days (c. 100 km)

Figure 86 - Oren's survey points compared with marching distances (adpated from Hoffmeier 2013, fig. 2).

[943] Morris 2005, 527. Amphorae dumps may have been similar to that of Abu Ballas (Förster 2007) but initially transported by ship.

The utility of having established centres located 3 – 4 days apart would have also assisted in the defence of the Egyptian frontier. Considering that these centres may not have been stocked year-round, enemy forces could not have relied upon them for resupply. If an enemy force reached one of these centres, they would have arrived at the site when their own supplies would have been dangerously low, making a protracted siege impossible. Current evidence indicates that the Egyptian administration considered logistical implications in the establishment of bases on the Sinaitic route. Although Egyptian forces could have used naval transport to deploy to the Levant (Section 5.5.3), Bir el-'Abd's and Haruba's remains indicate that the overland route was always used to some extent during the Ramesside period.

The position of a fortress and how it functioned was greatly influenced by environmental factors. Above all, a fortress' main duties were to stock provisions and monitor traffic in the area. Communication would have played a critical role in their operation as they would have relied upon the central administration for some of their supplies. In addition, the personnel could inform the central Egyptian authority if there were any potential threats in the immediate vicinity and request reinforcements. To perform these tasks, the sites did not need to possess massive fortifications but a vigilant body of personnel that understood their duty in the management of the Egyptian hegemony in Canaan.

4.5.2 Architectural Comparison with Other Installations

The importance of military logistics for the ancient Egyptian New Kingdom military is evident in the archaeological sites examined. These sites, with the exception of Tell Heboua, are very small which implies that their importance was to enable the rapid transport of troops to combat threats to the Egyptian hegemony. A brief comparison with Nubian sites demonstrates the different strategy that the New Kingdom Egyptians took in their dealings in the Levant; not in the level of control but in the intensity of defensive features. The New Kingdom was a time for an architectural divergence in the imperial strategies for Nubia and the Levant.

The main curtain wall of Tell Heboua would have reached a considerable height and was unique by having an outwork wall. The double-walls would have impressed upon travellers that garrison could have defended itself from outside forces. The height of the wall required external buttresses to stabilise it. These external buttresses were not included into the main curtain walls of smaller fortified sites in the north Sinai (Tell el-Borg, Haruba A-289 and possibly Bir el-

‘Abd) and smaller enclosures did not reach a height over 6 metres. If these buttresses were used in some way for a defensive feature (such as machicolation, wooden hoarding, or a ‘tower’), they were not incorporated into the smaller fortified centres along the north Sinai.[944]

Although Dothan reconstructed Tel Mor’s Building B to possess a jogged trace, we have determined that this is a highly speculative interpretation considering that only 20% of the building’s exterior walls were preserved.[945] It is possible that this building can be reconstructed as a square structure given parallels in Canaan and along the north Sinai (Figure 90). As noted, if we are to accept Dothan’s reconstruction of Building B, the salient and recesses façade would not have aided in the defence of the building. Morris claimed that there is uniformity to ‘governor’s residences’ in Canaan but this is a gross over-simplification.[946] The work of Oren and Higginbotham has shown that ‘governor’s residences’ in LBA Canaan were laid out in various sizes and in their number of rooms (Figure 87).[947] Although Aphek and Tel Mor appear to be similar, they are not comparable to other suspected residences (i.e. at Beth Shean, Bir el-Balah, Tell Jemmeh, etc.). Thus, it cannot be substantiated that ‘governor’s residences’ are arhcitectrally uniform; the material culture is the strongest indicator of an Egyptian presence.

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944 Oren 1987, 87
945 To achieve this, the rough measurements of the extant curtain walls’ exterior (roughly 18 m) were divided against the assumed total length of the external walls (22.5 * 4 = 90 m).
946 Morris 2005, 826
947 Oren 1984; Higginbotham 2000, 284 – 301

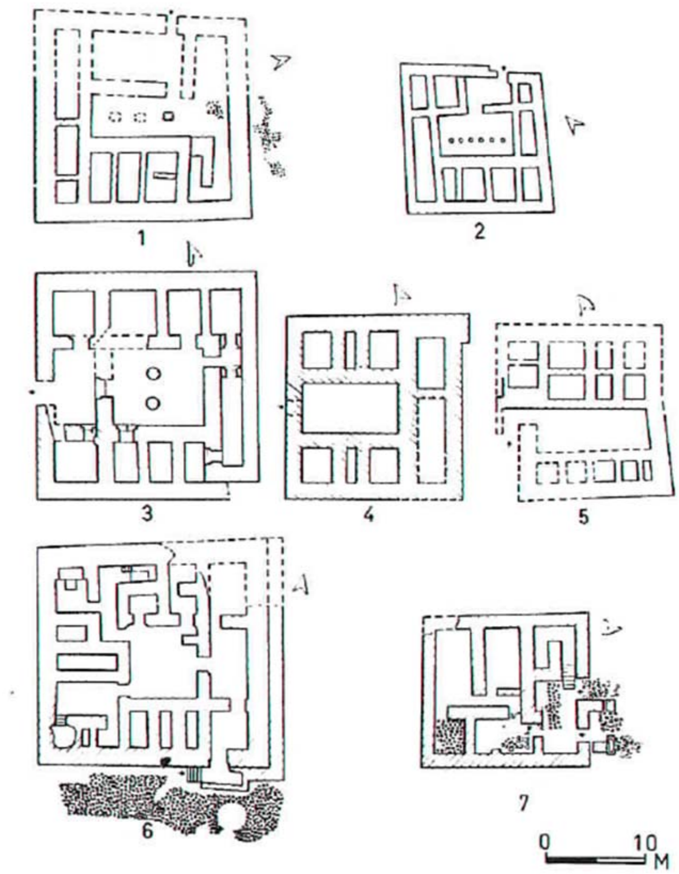

Figure 87 - Suspected Egyptian 'Governor's Residences' in Canaan. 1-Tel Sera', 2-Tel Masos, 3-Beth-Shan, 4-Tell el-Hesi, 5-Tell Jemmeh, 6-Tell el-Far 'ah (south), 7-Aphek (Oren 1984, fig. 2).

A brief comparison of Nubian fortifications demonstrate the difference in the fortification strategy of the LBA Egyptians in the Levant. In Nubia, the Egyptians relied upon the principle of entrenchment to extend their influence. In addition, these sites determine that the pharaonic Egyptian architects were capable of building formidable defensive architecture if they so wished. From this examination, the approach to the Levant during the New Kingdom was markedly different from preceding efforts to extend control beyond Egypt's borders.

The fortresses built during the Middle Kingdom in Nubia demonstrate that the Egyptian military was committed to building impressive fortifications. Buhen's Phase 2 had a multiple-trace system of defence with two walls (10 – 15 m high and 4 – 5 m thick) and possessed two large fossae (8.4m wide x 6.5m deep) that surrounded the exterior of both walls (Figure 88).[948] In addition, there was the presence of a berm-parapet with multi-faceted embrasures or 'arrow loop-holes' (Figure 89).[949] Similar features can be seen in the Nubian fortified sites of Aniba, Kor, Mirgissa and Semna-West.[950] The sizes of Nubian sites are more comparable to Tell Heboua than any other fortified structures we have examined. Buhen's inner-fortress covers roughly 25,500 m^2 and Kor's settlement is estimated to have covered 86,100 m^2 (Figure 90).[951]

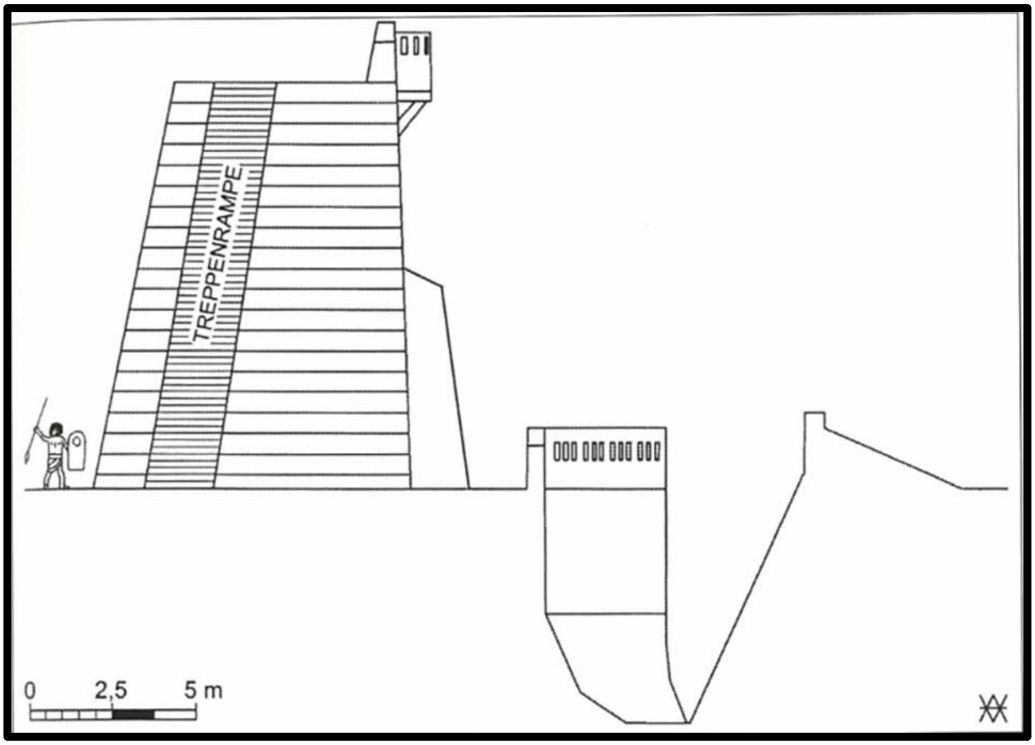

Figure 88 - Dimensions of Nubian fortifications (Vogel 2004, 123 fig. 15).

[948] Vogel 2004, 230 – 235; Emery et al. 1979, 4
[949] Emery et al. 1979, 4
[950] Vogel 2004, 219 – 222, 236 – 245, 259 – 262
[951] Uphill 1999, 329; Emery et al. 1979, 4

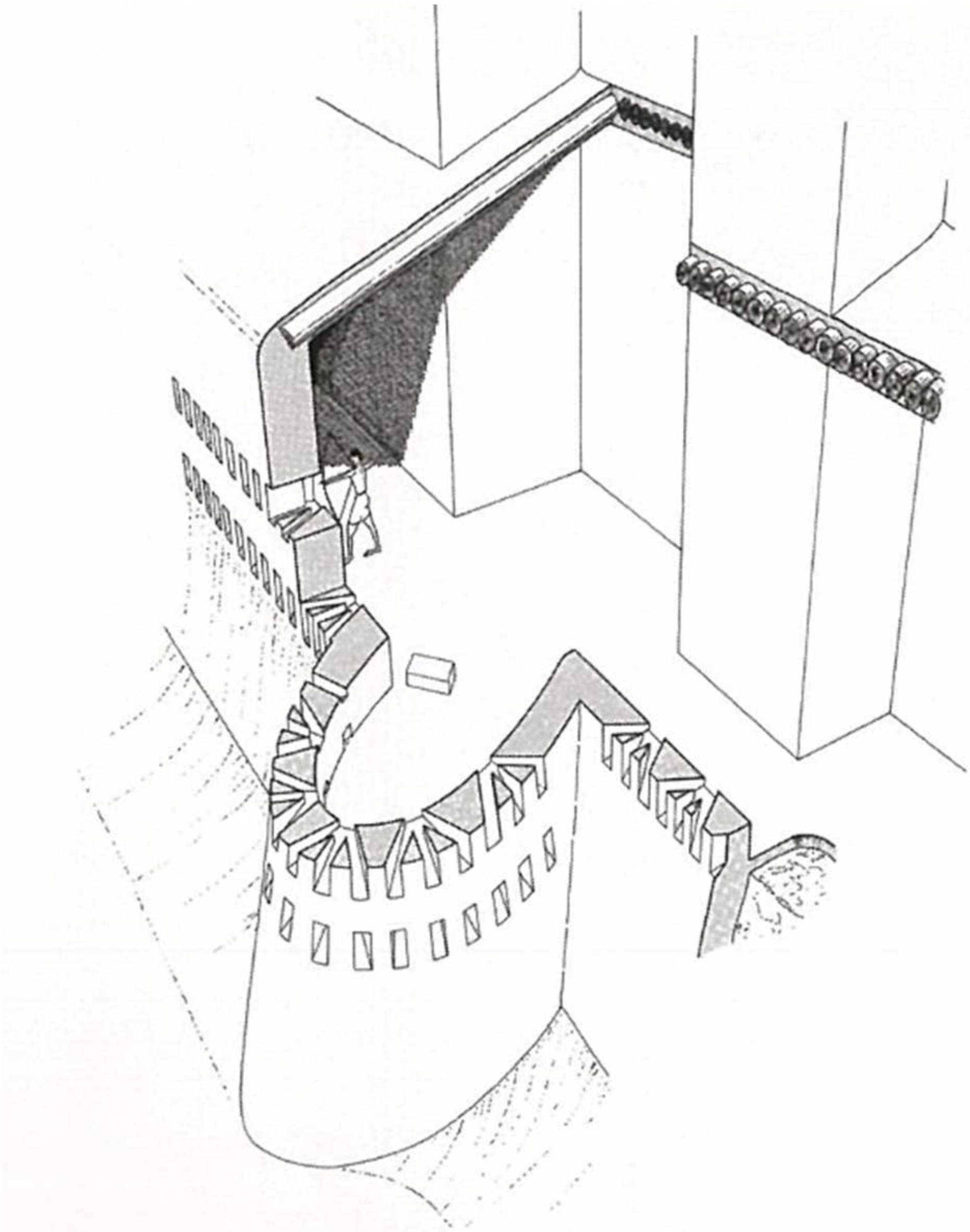

Figure 89 - Reconstruction of Buhen's outwork parapet with multi-faceted embrasures during the Middle Kingdom (Kemp 2006, 234 fig. 86).

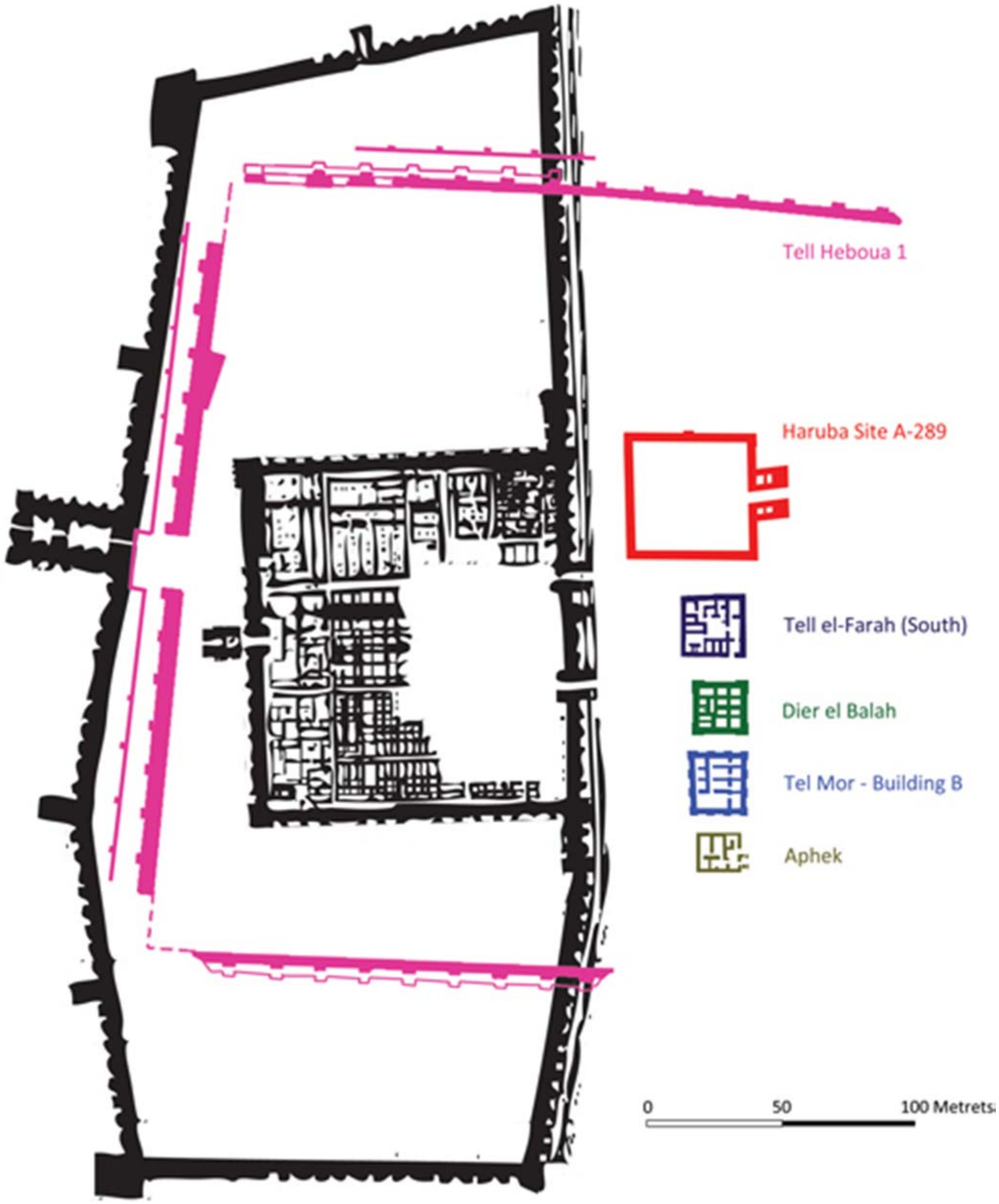

Figure 90 - Size comparison of the Nubian site of Buhen with sites in the eastern Delta, north Sinai and the Levant.

During the New Kingdom in Nubia, some of the innovative defensive features built in the Middle Kingdom went out of use.[952] Buhen's fossae were reduced considerably and the berm-parapet with embrasures was not incorporated into New Kingdom rennovations.[953] One possibility for this change is that the acculturation of local Nubian groups had been achieved and that they were no longer perceived as a threat. The other possibility is that the Nubian population during the New Kingdom was not substantial enough to muster a large body of forces to warrant such fortification projects (c. 17,000 inhabitants).[954] As described by Vencl, fortifications are built upon a perceived threat and a desire for security.[955] The fact that fortifications changed to simpler designs in the New Kingdom demonstrates the Egyptian military had addressed the issue of maintaining a large standing force in foreign localities as transport and communication became more important.

Another divergence that becomes apparent in a contrast of Nubian sites with their northern counterparts is the size of these settlements. Although the building of sophisticated defensive systems appears to have shifted in the New Kingdom, the size of Nubian sites founded in the New Kingdom are quite large (such as at, Sesebi 54,000 m^2, Soleb 48,000 m^2 and Sai 33,320 m^2).[956] In direct comparison, the average Nubian settlement covers 18,000 m^2 while the sites of Bir el-'Abd and Haruba cover considerably less (1,600 m^2 and 2,500 m^2 respectively).[957] The average Egyptian governor's residence in Canaan covers an average of 350 m^2 (Table 9). It is clear that there was a different tactic employed by the New Kingdom Egyptians in their dealings with the Levant.

Instead of building massive fortifications in the Levant, the Egyptians chose to rely upon smaller centres. The architecture reflects a strategy that focused to reduce the cost of maintaining foreign influence and also avoided putting Egyptian personnel at risk. By circumventing a large force abroad, the central administration did not need to concentrate on supplying a large body of soldiers over a long distance. Therefore, large centres were unnecessary in the operation of the hegemony as the Egyptians relied upon communication to alert the adminstration of potential threats. By having sites strategically located to supply campaign forces and rely upon for rapid

[952] Morris 2005, 337, 506
[953] Emery et al. 1979, pl. 9 and 11
[954] Shinnie 1996, 55
[955] Vencl 1999, 67
[956] Morris 2005, 674
[957] Higginbotham 2000, 284

deployment, New Kingdom Egypt could extend its reach and avoid the large cost. Therefore, the size and geographical location of the sites in the north Sinai demonstrate that the purpose of the relatively small Egyptian presence at each fortified site was important primarily for resupply and information gathering. Examining Tel Mor, this also becomes apparent for centres in the Levant. Governor's residences in Canaan are even smaller than the installations of the north Sinai. Although Barako, James and McGovern characterised these buildings as military installations, the martial quality of the sites is markedly absent.[958] In most cases, material culture is the only indication that there was an Egyptian presence at the site, usually as locally-made pottery in Egyptian forms. The assemblages at Egyptian-held Levantine sites indicate that these bases were supplied from the surrounding area, possibly through the collection of taxes or tribute.

The imperial approach to controlling the Canaanite area appears to have a discernible shift in that the New Kingdom Egyptian military did not pursue a policy to build large centres to control areas of the Levant. This reliance upon smaller centres does not appear to have curtailed Egyptian political dominance in the Levant and thus, it would appear that large centres with multiple-trace systems of defence were not necessary.

4.5.3 Problems of Terminology with Fortified Archaeological Sites

As discussed above, these sites examined are all indicative of an advanced logistical network. It may be important to define these sites more precisely in relation to their purpose within the Egyptian hegemony. However, such an endeavour is problematic since the archaeological remains do not differentiate administrative function beyond the general aspects mentioned.

The term, 'fortress', is used as a blanket term in scholarly literature that cannot denote the particular function of an architectural unit in the framework of Egyptian New Kingdom warfare. 'Outpost' is a virtually synonymous term that reinforces a fortress' location in a frontier area. There is a desire to delineate fortresses further with more precise nomenclature to reflect how these bases operated. Although our analysis examined the various sizes of fortresses and their material remains from the New Kingdom, note that this thesis deliberately avoided further

[958] Barako 2007, 241; James & McGovern 1993, Vol. 1, 238

classification of the bases up to this point. This was done for a thorough discussion of the archaeological assemblage to illustrate each site. However, there is a fundamental problem in the nomenclature for fortified sites since a researcher might designate a site with a modern term to allude to a specific function without sufficient evidence.

In interpreting the sites of the northern Sinai, Oren and Shershevski used the terms 'police station' and 'customs-post' to describe Egyptian sites of the north Sinai. The assumption is that personnel at these centres would have assisted in the primary goal of protecting merchants and travelling campaign forces.[959] However, one could question exactly how a small garrison could have 'protected' a campaign force. Obviously the terminology used to describe these centres in the north Sinai should be more context-specific to enable a more accurate and detailed discussion of warfare in this area.

Morris directly addressed Egyptian terminology in association with the fortified archaeological sites.[960] She proposed four genre-terms that could be utilised by the New Kingdom Egyptians to describe a fortress:

1.) *ẖtm* – 'seal'. Morris evaluated this term to mean a border fortress, one that would 'seal up' the Nile Delta and Valley from the ingress of outside groups.[961] In this fashion, Morris presented that the *ẖtm*-fortress operated as a doorway to Egypt proper. This term is relevant for our study as she identified Tell Heboua/Tjaru as an example of a *ẖtm*-fortress. In addition to a local garrison, the *ẖtm*-fortress also employed scouts to travel in the surrounding area to monitor traffic. The dimensions of a *ẖtm*-fortress were directly proportional to the region where it was located; larger in the areas that could supply a large body of soldiers.

2.) *mnnw* – 'fortress-town'.[962] Morris noted that this would be a fortress that housed a garrison and pointed out that the term is far more common in relation with installations in Nubia than the Levant. Nubian *mnnw* lost their military disposition during the New Kingdom and became more civilian. Although the fortifications of these *mnnw* were

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[959] Oren & Shershevski 1989
[960] Morris 2005, 803 – 827
[961] Morris 2005, 808 – 809 c*ontra* Valbelle 1994, 384 which defines a *ẖtm* as a place for the secure storage of goods.
[962] Morris 2005, 814

quite large, Morris described the curtain walls as: "purely perfunctory".[963] In the north of Egypt, she concluded that the Libyan sites of El-Alamein, Zawiyet umm el-Rakham and El Gharbaniyat should be classified as a more militaristic *mnnw* and that they would have monitored the overland route into Egypt serving a vital function to combat hostile forces making their way towards the Nile Valley and Delta.

3.) *dmi* – 'town' or 'population centre'. Morris noted that this term was used for Egyptian installations in the Levant (Gaza, Sharuhen, Beth Shan and Sumer) and in Egypt. In the Sety I battle scenes, there are three double-enclosure fortresses that are designated as *dmiw*. She postulated that these were located near the eastern end of the northern Sinai, where resources were capable of: "…supporting a significantly larger population than could the barren regions to the west".[964] In the archaeological remains, Morris concluded that there have been no excavated fortified *dmiw* in the northern Sinai nor in Canaan. Instead, she described the Egyptian-held structures in Canaan as 'administrative headquarters'. Due to the range of archaeological remains, Morris was unable to ascertain what their primary function was beyond facilitating 'administration' of the Egyptian crown.[965]

4.) *mktr/mkdr*, *nḫtw*, *bḫn*, *sgr* – General terms for fortresses outside of Egypt founded in the 19th Dynasty. In Morris' summary analysis, she claimed that these terms have particular attestations. The term *mktr* was equated with the Semitic term 'migdol', *nḫtw* with 'stronghold', *bḫn* with 'foreign estate', and *sgr* with 'mercenary enclosure'. In relation with the Sety I battle scenes, Morris noted the variety of terms that are used to denote the single-tiered fortresses of the north Sinai and speculated that they all would have served the same function.[966]

One of the primary problems in Morris' analysis is her assertion that these terms to mean different things but in reality, the duties of each of the fortress-types are virtually identical. Undoubtedly, all the sites that we have examined played a role in the monitoring of traffic in their immediate environs. Personnel at each of these sites would have noted the composition of travellers and notified their superiors if they would have posed a threat. Similarly, all the sites

[963] Morris 2005, 811
[964] Morris 2005, 815
[965] Morris 2005, 817
[966] Morris 2005, 818

examined had the capacity to store goods. The distribution and delivery of goods to overland and maritime traffic was undoubtedly a primary function of all the fortresses examined. The textual terms do not appear to relay any information about the operation about the sites other than generalities.

For example, the term 'migdol' is especially problematic in scholarly literature. 'Migdol' is a Semitic term used to mean 'tower' or 'fort'.[967] The term occurs 6 times in the Old Testament (Ezekiel (29:10 & 30:6), Jeremiah (44:1 & 46:14), Exod. 14:2 and Num. 33:7) but there are no descriptions of any architectural details.[968] Morris designated the fortified enclosures of Bir el-'Abd and Haruba A-289 as representative of 'migdols' and claimed that they were only constructed in the north Sinai.[969] This analysis deliberately excludes Deir el-Balah's fortified enclosure of Stratum VII which is curious as it has a similar general layout to the sites of the north Sinai (Figure 90). Similarly, Hasel noted that there were only two sites that had 'migdols' in all of Canaan. Interestingly, he did not designate Bir el-'Abd and Haruba A-289 but Tel Mor's Building B and a building at Beth Shan.[970] Likewise, Cavillier claimed that Medinet Habu's 'Syrian gate' was representative of a 'migdol' while Seguin claimed Tell el-Herr was the 'migdol' of the Old Testament.[971]

If it was clear what an actual 'migdol' was, should not researchers be reaching the same conclusion on what sites possess migdol-architecture and which ones do not? As noted, the term, 'migdol' has been brandished so haphazardly in the description of architectural features that Barako and Burke have noted that the term does not denote anything other than a strategically located fortress.[972] Hence, this thesis has deliberately avoided using this architecturally unspecific term.

In describing border-fortresses or *ḫtmw*, Morris stated: "The purpose of many of these bases (*ḫtmw*), especially at the very beginning and end of the New Kingdom, almost certainly was to help protect vulnerable areas from outside penetration".[973] Later, in her discussion of fortress-

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[967] Hoffmeier 2008, 3; Burke 2007, 30 – 34
[968] Hoffmeier 2008, 3
[969] Morris 2005, 817 – 819
[970] Hasel 1998, 96
[971] Cavillier 2008; Seguin 2007
[972] Barako 2007, 41, ft. 13; Burke 2007, 46 – 47. Although, Burke (2007, 35 – 36) stated that migdols may have been exclusively Canaanite.
[973] Morris 2005, 824

towns (*dmiw*), she described that the Libyan fortresses served virtually the same purpose.[974] Therefore, the argument that these two terms are two separate architectural units with a different *modus operandi* is mistaken. The interpretation of a fortress-site is more related to its geographic position and its overall size. As such, the examined sites revealed that there was a focus on a minimal imprint of the Egyptian hegemony in architecture in the northern Sinai and the Levant. Characterising a site as a 'border fortress' or a 'police outpost' is a terminological exercise that does not illustrate how the site operated in antiquity.

It should be pointed out that the function of all fortresses could fit a general description in that they secure the surrounding area for the benefit of Egyptian interests. It appears Morris' terms are based on the size of the fortress rather than the material remains. For example, the designation of Tell Heboua as a 'customs check point' is not informative of a specific function.[975] Therefore, attempts at a more precise nomenclature are elusive as they are based on the size of the fortified installation and the opinion of the researcher which has no objective criteria for its demarcation.

The archaeological evidence of the sites examined confirms administrative aspects and indicates that they were primarily concerned with the storage of provisions. Therefore, in presenting these sites in the context of the ancient Egyptian military, it should be urged that these sites should be discussed with a strong logistical emphasis; that supplying forces was the key to the creation and maintenace of the Egyptian hegemony in the Levant. However, the current evidence cannot support that there was a delineation of duties from site to site. Therefore, the use of the terms 'fortress' or 'outpost' in analyses may be appropriate for the time being.

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[974] Morris 2005, 824 – 825. Similarly, Morris claimed that Tell el-Borg should be classified as a *ḫtm* (526) and then stated that only *ḫtm* in northern Egypt was Tell Heboua (685, 804).
[975] Morris 2005, 810

Chapter 5: Movement and Maintenance of the New Kingdom Egyptian Military

"In a contest for the possession of Syria, victory ultimately went to the preponderant power with the surest supply lines"

-William Murnane[976]

5.1 Introduction

Military logistics is the science of facilitating the sustenance and movement of a military force on campaign and it applies to ancient warfare as much as it does today. As suggested by the examination of archaeological sites in the previous chapter, the New Kingdom Egyptians appear to have forgone large installations in the Levant in lieu of storage centres situated at strategic points along a campaign trail. Thus, an analysis of military logistics is relevant for our study since questions of supply, distance and movement speed must have influenced the location of Egyptian outposts in the Levant. Resupplying the army at critical junctures would ensure that a campaign was successful. Therefore, to understand how these bases functioned in antiquity, we must have an understanding of the logistical limitations of ancient armies.

Evaluating logistics in New Kingdom warfare is difficult because it requires data from very different disciplinary fields and a thorough analysis of the relationships between them. Considering this, most treatments of the ancient Egyptian military (and of the ancient Near East as a whole) have opted to ignore the subject altogether.[977]

A further problem in analysing this subject is the sporadic coverage of the ancient textual documentation in its preservation and the logistical aspects that the ancient authors recorded.[978] For example, there are textual indications of military expeditions but crucial details of how a campaign was conducted are usually absent. For instance, in the Year 1 Beth Shan stele of Sety I indicated an uprising in Canaan but did not relay the specifics on how each division achieved success,

[976] Murnane 1990, 104
[977] Yadin 1963; Drews 1993; Bryce 2005
[978] Eyre 1995, 176; 1994, 57 – 58; 1987, 167

> “The despicable chief who is in the town of Hammath has gathered to himself many people, seizing the town of Beth-Shan, and is joined up with those from Pahil (Pella); he is preventing the chief of Rehob from coming out. Then His Majesty sent out the First Division of Amun, 'Rich in Bows', against the town of Hammath; the First Division of Re, 'Abounding in Valour', against the town of Beth Shan; and the First Division of Sutekh (Seth), 'Strong of Bows', against the town of Yenoam. And so, when the span of a day had elapsed, they were (all) fallen to the might of His Majesty, the King of southern and northern Egypt, Menmare, Son of Re, Sety I Merenptah, given life.”[979]

When one reviews the texts of military campaigns, the details of campaigns are missing. This type of documentation is heavily slanted towards the concept of divine investiture; that the ruler is favoured by the gods and thus will attain victory against those who would oppose him (Section 6.1.1).[980] Therefore, the practicalities of warfare are not detailed (e.g. how much does a soldier need to eat while on campaign? What distance could LBA armies cover in a day?).

To attempt a study of this type, we must consult the rare mentions of logistical practicalities and compare them with the modern evidence. However, we have to be conscientious that the textual record might be trying to relay thematic concepts rather than reality (i.e. whether to glorify a ruler for travelling very fast on campaign or an administrator giving the equivalent of double-provisions for a mining expedition, etc.). Since researchers are dealing with ancient civilisations, there will always be aspects of ancient battles that require inferred deductions.[981] The only thing that we can do is to approach the material cautiously and openly state, in some cases, that we simply do not know how some aspects of military campaigns were conducted. It is not a failure of analysis from a researcher’s perspective but due to the differential presrvation of the archaeological record.

This chapter will begin with a discussion of how ancient military logistics were presented by academic researchers to show the changing approaches to this subject over time. After reviewing this material, then we can analyse the population densities between Egypt and Canaan during the New Kingdom to assess the possible size of military forces before discussing the physical requirements of soldiers and animals while on campaign. These basal parameters will

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[979] KRI I, 10, 12:5 – 12:10
[980] See also Mayer 2002, 7; Shaw 1998.
[981] Mayer 2002, 20

have implications on the following discussions of the army's ability to procure sustenance, transport and also the army's rate of speed while travelling between outposts while on campaign. From this examination, we can then calculate the logistical requirements of military forces to view how physical limitations would have affected a military campaign.

5.2 Background

Donald Engels was one the first scholars to place logistical analysis at the forefront of ancient military studies in his book, *Alexander the Great and the Logistics of the Macedonian Army* (1978). The book stands as a cornerstone in the study of military logistics in the ancient world as it attempts to answer the questions of supply, rate of movement, and the itinerary of the Macedonian war machine travelling in the ancient Near East. Although Engels noted that there are many variables and assumptions that take place in any analysis of ancient military logistics, the attempt must be made to place logistics away from conjecture and into the realm of scientific study.[982]

Engels' book was largely surpassed by Jonathan Roth's *The Logistics of the Roman army at War (264 B.C. - A.D. 235)* (1999). This volume re-evaluated Engel's claims and found that some of his logistical analysis required amendments. One of the primary disagreements was what provisions a soldier would require to remain in "fighting strength" while he is on campaign.[983] Roth noted that the success of Roman armies lay partly in their military culture (their weapons and training) in addition with their ability to provision large armies at long distances.[984] The Romans did lose battles but their success in 'winning the war' was due to having a seemingly inexhaustible supply of goods and men, i.e. their logistical capabilities.[985] Roth pointed out that projecting modern data onto the past is an issue of which we must be wary. Conclusions based on such comparisons must be considered tentative, and our analysis must be revised when new evidence is discovered.

As noted in Chapter 2, in Egyptology the subject of logistics has only been examined at a cursory level. Donald Redford's volume on the wars of Thutmose III devoted two appendices on logistical topics: the travel speed of 18th Dynasty armies and the size of military forces under the

[982] Engels 1978, 25
[983] Roth 1999, 67
[984] Roth 1999, 279
[985] Roth 1999, 279

command of Thutmose III. Redford's analysis was innovative as there were no Egyptological standards to base his research upon. Consequently, it represented an attempt to place the campaigns of Thutmose III in a physical context and demonstrated logistical aspects would have affected the military. However, there was no attempt to consult the works of Engels or Roth in his analysis and thus, Redford's examination lacked critical details. Furthermore, there are aspects in his analysis that inappropriately compared material of different cultural groups living in different times to that of the Egyptians. For instance, to suggest the size of ships in Thutmose III's fleet, Redford consulted data of Athenian ships from the Classical Period in Greece without consulting the evidence from the LBA shipwrecks.[986]

Rather than focus on the historical survey of New Kingdom warfare, Anthony Spalinger claimed his volume on Egyptian warfare was written to directly address logistical aspects of the ancient military.[987] Generally, he did focus more on the physical constraints of the New Kingdom Egyptian army than previous examinations. However, there are aspects in his volume that are erroneous. For instance, his claim that a soldier required a minimum of 6.6 kg of grain per day represents an amount too large for daily intake.[988] Similarly, his presentation of the requirements for equids does not consult modern veterinarian data. Suggesting that the Egyptian military switched from a naval-orientated force in the Middle Kingdom to a land-based force in the New Kingdom, Spalinger did not factor naval logistics into his calculations.[989] In addition, Spalinger claimed that military technology was always introduced to Egypt and thus implied that the New Kingdom Egyptian military was less advanced or innovative than its Near Eastern neighbours.[990] The reason for Egypt's success in the creation of the Levantine hegemony is not discussed in detail. As it will be shown, logistical aspects had the largest impact upon the New Kingdom army in how many troops they could put in the field and how rapidly they could respond to an external threat to their hegemony.

5.3 The Size of Ancient Egyptian Military Forces

The size of an army will invariably affect its success, or defeat, in the field. Similar to the seasonal aspects of campaigning (Section 5.4.3), the size of ancient Near Eastern armies is often

986 Redford 2003, 205
987 Spalinger 2005, xiii
988 Spalinger 2005, 35
989 Spalinger 2005, 71
990 Spalinger 2005, 10 – 11, 16, 121

not mentioned in ancient documentation. Troop sizes are usually mentioned when an expedition force was unusually large.[991]   Engels noted that the first problem of all ancient logistical analysis is to determine the size of the military force. However, the issue of how many additional people and animals travelled with the army is the more difficult problem. One has to apply many assumptions in obtaining estimates.[992] Despite the inherent problems with estimating troop size, it is useful for our examination to consider the size of the expedition forces. However, to properly approximate the possible size of military forces at this time, it is necessary to address the issue of population size in the area first.

5.3.1 Population Estimates for Egypt and the Levant during the LBA

The population of the Levant and Egypt is relevant to our discussion because it has an impact on estimates for manpower and the size of forces that could be raised. Population estimates for ancient Egypt and the Levant are based on various factors and many of the studies employed note their shortcomings. There are no LBA settlement studies for Syria and the Anatolian regions because there are numerous difficulties, primarily the sizable nomadic population and the patchy geographic coverage of archaeological investigation. [993] Although Spalinger acknowledged the lack of studies for Syria, he speculated there were 450,000 people living in the whole of the Levant during the New Kingdom.[994]   Therefore, the present examination of population size must be confined to Egypt and Canaan.

The population estimates of Canaan have been examined primarily by Broshi and Gophna in a series of articles claiming that similar cultural traditions will result in similar geographic settlement patterns over time.[995] Starting in the EBA II – III periods (3050 – 2300 BCE), Broshi and Gophna's research relied on the correlation of population densities with the size of settlements. They categorised settlements into ranges that can be compared with one another. Estimating 250 persons per hectare for the EBA, they estimated that the total area of known settlements in Palestine was 600 hectares, thus the population assessment for EBA Canaan was

[991] Redford 2003, 196
[992] Engels 1978, 11
[993] Akkermans & Schwartz 2003, 399 – 401
[994] Spalinger 2005, 124, 147 this speculation is not backed up by any population studies and is therefore conjectural.
[995] Broshi & Gophna 1984, 42

150,000 people.[996] The settlement pattern of EBA Canaan demonstrated that large settlements, although less numerous than smaller ones, consisted of nearly two-thirds of the total area studied. This disparity in settlement size was reliant upon security concerns and they noted that many of the large centres have thick fortification walls. In times of crisis, it would have been prudent for the populations of these smaller areas to seek refuge within a large centre's fortified area.[997]

In Borshi and Gophna's followed with an analysis of the MBA II period in Palestine. They noted that their sample size was 80% of the total number of ancient sites but these sites were large and fortified. They claimed that all large centres have been discovered and that the remaining 20% of "missing" sites would have been classified as smaller settlements.[998] Utilising their figure of 250 persons per hectare, Broshi and Gophna concluded that Palestine had a population of 100,000 people in the MBA I (2300 – 2000 BCE) and 138,000 people in the MBA II (2000 – 1550 BCE).[999] The study specifically noted that large "rampart settlements" were common and that the majority of Palestine's inhabitants settled along coastal areas while the Jordan Valley had a noticeable decline.

Following a similar methodology to Broshi and Gophna, Gonen examined the population density of LBA Canaan and found that the total settled area was 45% less than the MBA.[1000] Although Gonen does not hazard an exact figure for the population of the southern Levant, we can use Broshi and Gophna's assertion to arrive at an estimate. If the population of the MBA II period was 138,000 and there is a 45% decrease in the settled area, this would suggest that LBA Palestine had a population of 75,900.

In comparison with the population estimates of New Kingdom Egypt, LBA Palestine was very small. Butzer's ecological study of the Nile Valley produced the most systematic analysis of pharaonic Egyptian populations.[1001] However, Butzer noted that there are some major shortcomings in his analysis. First, many of the ancient settlements have been either reduced or

[996] Broshi & Gophna 1984, 45
[997] Broshi & Gophna 1984, 49
[998] Broshi & Gophna 1986, 73
[999] Broshi & Gophna 1986, 86 – 87
[1000] Gonen 1984, 65
[1001] Butzer 1976

destroyed by modern disturbances.[1002] Secondly, he noted that his results would have been affected by the intensity of archaeological investigation; regions that had been studied in more detail would have yielded more sites.[1003] Thirdly, this anlysis incorporated a total of 217 dynastic settlements of "reasonable size" to derive its conclusions but he admited that only 57% of the settlements could be located. The remaining 43% are known through literary texts with a regional assignment.[1004] He noted that this analysis did not encompass some sites that are only localised to a particular time period. Which such exclusions in the analysis, the reader is only presented with total figures of arable land areas for roughly 2,000 years of dynastic Egyptian history.

Noting that Egyptian terminology is "vague and inconsistent", Butzer ranked sites by their importance within the political structure (e.g. Nome, Tomb Groups, Mayor, Temple, Settlement, Fortress/ Keep, Villa and Quarry). Unlike Broshi and Gophna's studies, Butzer's analysis did not estimate the size of these distinguishable units nor the methodology of how these figures were derived.[1005] Given these shortcomings, he noted that: "…the reader is forewarned that none of the numerical data is to be taken literally" and claimed that this analysis demonstrated population density varied from nome to nome with the highest densities being located in the regions of Aswan to Qift and Memphis to the Faiyum.[1006] Butzer's analysis follows Baer in estimating population based on total cultivatable land (c. 8,000 km^2), not settled area.[1007]

Butzer's population estimates can be misleading as his analysis presents a population calculation that only encompasses Middle and Upper Egypt. He determined that there were roughly 1.1 million people living in these areas in his initial analysis and this correlated with Baer's estimate of 4.5 million for the whole of Ramesside Egypt.[1008] However, Butzer later increased his original estimate by a different set of criteria and revised the population of Ramesside Egypt to 1.6 million, living in Middle and Upper Egypt.[1009] To explain the discrepancy, Butzer noted: "The figures in table 3 (1.1 million) probably tend to the high side, whereas the estimates of

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[1002] Butzer 1976, 58
[1003] Butzer 1976, 71
[1004] Butzer 1976, 59 – 60
[1005] Butzer 1976, 60, 74 Table 3
[1006] Butzer 1976, 76, 80
[1007] Butzer 1976, 76 – 77; Baer 1962
[1008] Spalinger 2005, 158 nt. 12; Butzer 1976, 76; Baer 1962, 44
[1009] Butzer 1976, 83 Table 4

table 4 (1.6 million) are more conservative. The discrepancies should serve to remind the reader that both methods of reconstruction are fraught with assumptions and uncertainties".[1010]

For other estimates on the New Kingdom Egyptian population, O'Conner claimed that Egypt had a population of 2.9 – 4.5 million but did not reveal his criteria for this assertion.[1011] Lloyd's estimate of the population of Egypt is partially derived from Butzer's criteria in the amount arable land and the claim of Baer that 2 *arourae* (798 km²) was enough to support one person.[1012] Claiming that the population of warriors in Saite society held half of the total arable land and were allotted about 12 *arourae* apiece (4,788 km²), Lloyd estimated a population of 3 million for Egypt during the Late Period.

The LBA population estimates revealed the large discrepancy between the two areas as Egypt had a population of 2.9 million as opposed to the population of Canaan at 75,900 inhabitants. Although population studies may have shortcomings in their analyses, they can approximate densities. In this case, it is clear that the New Kingdom Egyptian administration had an advantage of provisional support and manpower as opposed to their Canaanite neighbors. The implications of these population estimates do demonstrate Goedicke's claims that the Battle of Kadesh; that it was a pre-planned battle agreed to by both sides.[1013] This seems most likely given the amount of troops that would have come into the area and the extent of pressure on local resources. No military commander would have relied solely on 'living off the land' with an influx of soldiers totalling close to the entire population of Canaan (c. 47,000 Hittite troops and c. 20,000 Egyptian troops). The battle 'meeting' had to be carefully planned beforehand because of logistical concerns. Otherwise, both armed parties would have quickly devastated local resources.

Despite the problems of Butzer's analysis and the claims of other authors, we should see that the population of New Kingdom Egypt easily outnumbered the total population of Canaan. This would directly impact the size of expeditionary forces that could be raised, what supplies were required and what kind of resistance could be encountered. Even if we reduce population estimates by 50% for the Nile, it is clear that the New Kingdom Egypt had an abundance of resources and manpower compared to her Canaanite neighbour.

[1010] Butzer 1976 84
[1011] O'Conner 1983, 190
[1012] Lloyd 1983, 300 citing Baer's assertion in Butzer 1976, 77
[1013] Goedicke 1985, 83 – 84, 90 ft. 71

5.3.2 The Composition of Egyptian Military Forces

The recruitment of troops for an expedition force and from what background they came is mentioned only in passing.[1014] Pap. Anastasi I suggests that divisions comprised between 4,500 and 5,000 men.[1015] Redford noted that the rough number of 5,000 and multiplications thereof is attested in troop estimates in other ancient sources.[1016] In addition, he claimed that 2,000 troops would have been sufficient for smaller expeditions. To compare, the pyramid workforce in the Old Kingdom was estimated to have at least 1,600 – 2,000 workmen and the Gebel Sisila quarry expedition of Sety I utilised 1,000 men.[1017] There is no mention in the ancient military texts of attendants, porters or skilled labourers (such as chariot repairmen). If these additional personnel were added to the total expeditionary force, the draw on provisions would be far greater than just the division's 5,000 soldiers.

Estimating the additional personnel for a division can lead to many assumptions. For instance, Gabriel claimed that 700-900 additional personnel accompanied a standard military division of 5,000 infantrymen that included: "technicians, carpenters, quartermasters, scribes, logisticians, intelligence officers and so on for a total of more than 6,000 soldiers".[1018] This statement cannot be substantiated and we should dismiss such 'additional personnel' estimates as erroneous unless it is explicitly mentioned in the ancient documentation.

For an attested comparison, the expedition to the Wadi Hammamat ordered in Year 1 of Ramesses IV recorded 5,000 infantrymen in addition to other personnel bringing the total force to 8,368 individuals.[1019] Due to this evidence, we will have to consider that there were more people travelling with the military than indicated in the records. In addition, we must take into account that those travelling with the military were not included in the official record of the size of expedition forces. In some cases, the size of work forces is considerably smaller. Obviously, the size of an expedition force would vary depending on what the aims were; smaller in cases where minimal resistance was expected as opposed to larger forces that needed to overpower and lay siege to enemy combatants and installations. Assessments on level of resistance relied upon

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[1014] Redford 2003, 196
[1015] Faulkner 1953, 42; Gardiner 1911, 19 – 20 § XV
[1016] Redford 2003, 196
[1017] KRI I, 59 – 61; Eyre 1987, 202. Lehner noted (2002, 70) that this pyramid-workforce estimate is the minimum based on the current archaeological evidence.
[1018] Gabriel 2009, 62
[1019] Eyre 1987, 181 – 182, 187; Faulkner 1953, 42 ft. 4

intelligence from vassals and functionaries and thus, communications played a critical role in expedition numbers.

In relation to the military force that accompanied Thutmose III for the Battle of Megiddo (c. 1456 BCE), we are left with a problem. The size of the force is not explicitly mentioned.[1020] Spalinger estimated the expedition force was no more than 2,500 troops travelling with Thutmose across the north Sinai and added an additional 2,500 troops from garrisons posted at Gaza and "other towns" on the way to Megiddo to fight 2,000 enemy combatants.[1021] Redford estimated the number of Egyptian troops to be 10,800 based on the mention that soldiers had to march single file through the Aruna pass which was completed in 6 hours.[1022] He made a further deduction that the Megiddo Coalition combatants numbered 10,717 based on calculation of livestock taken after the battle.[1023] I find this calculation to be highly dubious since Redford arrived at this estimate from 32,151 goats/sheep even though the text only indicates that 20,500 sheep and 2,000 goats were captured.[1024] Gabriel gave a high estimate of 12,000 Egyptian soldiers based on the emergence from the Aruna Pass.[1025] It appears with each analysis of this battle, the sizes of Thutmose's force and the Megiddo Coalition are based on speculations which are not reliable.

The number of personnel at the Battle of Kadesh (c. 1274 BCE) was much larger than those at the Battle of Megiddo.[1026] We are not told the size of the Egyptian forces that left from Egypt, only that there were four divisions with Ramesses II as he approached Kadesh.[1027] Breasted reasonably deduced that 20,000 men travelled in Ramesses II's army from the division size mentioned in Pap. Anastasi I.[1028] The numbers of the Hittite forces are listed in the Egyptian records of the battle; 3,500 chariots with two infantry divisions of 18,000 and 19,000.[1029] It should be noted that there was scholarly confusion over the Hittite numbers of infantry before Gardiner's publication, *The Kadesh Inscriptions of Ramesses II* (1960). Gardiner argued that

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[1020] Gabriel 2009, 83
[1021] Spalinger 2005, 36 – 37
[1022] Redford 2003, 197
[1023] Redford 2003, 198
[1024] Redford 2003, 35 derived this number from a purported coefficient of cattle to sheep.
[1025] Gabriel 2009, 83 – 84
[1026] Kitchen 1982, 53; Santosuosso 1996, 429
[1027] Poem version, Lines 17 – 18 (BAR 3, 139 § 310; Gardiner 1960, 8 P55 – P65).
[1028] BAR 3, 127, 153 ft. a; Faulkner 1958, 94; Burne 1921, 191
[1029] Kitchen 1982, 53; Gardiner 1960, 41 R43, 42 R44. Attack force of 2,500 chariots (Poem, line 84 (Gardiner 1960, 9)) + 1,000 chariot force relief (Poem, line 154 (Gardiner 1960, 10)).

prior readings of 8,000 and 9,000 Hittite infantry: "…failed to recognise the sign for 10,000".[1030] The Hittite forces stationed three men to a chariot-team (10,500 charioteers) and thus, the total number of Anatolian combatants was 47,500.[1031] This number seems exceedingly large and some scholars have arbitrarily reduced it in their analysis. Yadin decreased the number of Hittite infantrymen to 6,000 but he did not state his criteria for doing so.[1032] Similarly, Santosuosso estimated the total Hittite force was 15,000 (including both charioteers and infantry). However, he demonstrated confusion in his analysis stating that: "The charioteers must have been less than the 10,500 we assign them on the basis of the Egyptian claim that the Hittites fought three men to a chariot".[1033] The number of 10,500 charioteers is inferred from the 3,500 chariots mentioned in the texts, not by the claim that the Egyptians said there were 10,500 charioteers.

Bryce maintained that, although the number seems large and exaggerated for the Hittite force at the Battle of Kadesh, it is possible that they could have raised a large number by drawing on their own troops and 16 vassals.[1034] If the figure of 47,500 personnel is maintained as literal truth, the logistical supply to such a body would be enormous (Section 5.6.1).

There is a tacit assumption that Egyptian expedition forces travelled with pack animals. This is exemplified by Redford noting that Pap. Anastasi I was no help in devising the rations for 5,000 men as the text did not mention a baggage train.[1035] The lack of a baggage train is not surprising however, as the intention of the satirist is to intentionally underestimate the quantity of supplies to illustrate how unlearned the addressee is. However, we should note that there is no agreement on the existence of a baggage train in ancient Near Eastern armies amongst scholars. As noted, Schulman claimed there was no baggage train for any Egyptian campaigns.[1036] This is unlikely considering that there would have been utility in having pack animals carry additional supplies. There are mentions of pack animals and carts accompanying expeditions to quarries.[1037] Therefore, it should not be assumed that an Egyptian military force did not travel without even a remedial baggage train but this will remain problematic for estimates as baggage trains are not

1030 Gardiner 1960, 42 *contra* Santosuosso 1996, 436; Faulkner 1958, 99; BAR 3, 154; Wilson 1927, 285
1031 Gardiner 1960, 8 P65-70; BAR 3, 140, Poem line 19; Wilson 1927, 269 Poem line 19-20; Atlas II, pl. 16 – 29, 83 – 89.
1032 Yadin 1963, 108
1033 Santosuosso 1996, 437
1034 Bryce 2005, 235. For texts, see Wilson 1927, 268 Poem line 13-15; Gardiner 1960, 8 P40-P50.
1035 Redford 2003, 200
1036 Schulman 1995, 297, 298
1037 Adams 2007, 63 – 64; Eyre 1987, 182;

mentioned in the ancient documentation. Therefore, we must conclude that there is no way to determine the size of the baggage train that travelled with the military.

In some instances, we have evidence of logistical issues on mining expeditions. We can presume that some of these issues could also occur on military campaigns. The Kuban stele of Ramesses II recorded a mining expedition to the Wadi Allaqi in which 50% of the personnel and transport donkeys would be lost from dehydration.[1038] The Year 1 Wadi Hammamat expedition of Ramesses IV indicated that there were 900 dead; a mortality rate of 9.3% if inclusive in the 8,368.[1039] This is good evidence that planning did not provide a foolproof method of supply in expeditions. We should not assume that every expedition did not encounter some hardships in supplying their troops. Centres would have been located in strategic areas to resupply campaigns to mitigate losses as well as ensure tactical success.

5.4 Sustenance Needs and Resource Acquisition

5.4.1 Basic Requirements of a Soldier

A basic premise of all military logistics lies in how much an individual needs to eat and drink to remain healthy enough to fight a battle. This assessment is deceptively straightforward. However, there are a variety of opinions amongst scholars researching the ancient world.[1040] This is not to say that nothing can be gained from calculating how an army would have been supplied in antiquity but we must keep in mind that we are basing some of our calculations on assumptions that should be explicitly stated.

The subject of the stature and weight of an average Egyptian soldier is relevant to our study because it will invariably affect calculations. Most modern studies on calorific intake and hydration requirements utilise average body sizes that are consistent with antiquity. This thesis has opted to use the average size of an adult male based on the remains of the Montuhotep 'slain soldiers'.[1041] The reason for this is that they appear to have made up a military unit serving in ancient Egypt. The average height of this group is about 1.69 m tall and their weight ranges

[1038] KRI II, 353 – 360; Eyre 1987, 182
[1039] KRI IV, 12 – 16; Eyre 1987, 181 – 182
[1040] Eyre 1987, 201
[1041] Vogel 2003, 239 – 245; Winlock 1945

from 56.4 – 71 kg with an average weight of 63.5 kg.[1042] Although one could argue that the 'slain soldiers' come from the 11th Dynasty and might not be representative of New Kingdom male physique, the height of this group is comparable to Zakrzewski's analysis of Egyptian stature which determined the average height was 1.68 m from the Early Dynastic to Middle Kingdom.[1043] It is unlikely that size would have changed that much in the New Kingdom.[1044] However, note that this is an estimate and that this will have to be revised as ancient Egyptian physiques are investigated further.

It is interesting that the subject of calorific intake for the ancient Egyptian military has not been approached by a researcher with a medical background. Engels was one of the first military historians to postulate the calorific requirement for an adult male on campaign. His opinion was that a soldier required 3,600 calories (kcal.)/day to remain in combat strength.[1045] This claim was derived from a personal communication with a US Army Quartermaster. Roth re-examined this assertion and found that the US Army endorsed this in a 1961 publication and deduced that this must have been taught as standard practice.[1046] Roth noted that 3,600 kcal. and 70 grams of protein are only the *recommended* daily allowance (RDA) for an individual to accommodate for activity that involved extended periods of physical exertion. This would supply the soldier with sufficient nutrients to obtain additional health benefits.[1047] Noting that modern nutritional requirements are based on modern physiques, Roth stated that the requirements for the average soldier in antiquity would require fewer calories and protein because of diminished body size.[1048] With his analysis, Roth estimated that the RDA for calorific intake of Roman soldiers would be approximately 3,000 calories as the average Roman soldier was 65.8 kg and 1.73 metres.[1049] It is interesting that Winlock and Derry's estimates of the Montuhotep soldiers concluded similar results. Roth assumed that modern data on calorific intake would have to be reduced to apply to the smaller stature of soldiers in antiquity. However, recent studies on nutirtion do account for reduced body size.

[1042] Spalinger 2007b, 130 – 131 ft. 42; 2005, 40; Winlock 1945, 7

[1043] Zakrzewski 2003, fig. 3. For comparison and diverging theory, see Raxter et al. 2008

[1044] Raxter et al. 2008, 151

[1045] Engels 1978, 123, ft. 1

[1046] US Army 1961, 23

[1047] See also Palmer (1989, 104) who also uses RDAs to achieve 3337 kcal./day for workers at Pylos (Table IV).

[1048] Roth 1999, 7 – 8

[1049] Roth 1999, 12, 67. See also, Krentz 2007, 151

RDAs were first published in the United States in 1943 and the levels of intake were based on amounts that prevented nutrient deficiencies.[1050] In response to changes in diet and health, these were replaced by a set of nutritional recommendations called Dietary Reference Intakes (DRIs) and these tables are used today in the United States and Canada. The DRI recommendations for energy intake are referred to as Estimated Energy Requirements (EERs). They take variables into account (such as age, gender, height, and level of physical activity) to keep an individual's body weight stable.[1051] EERs are constantly re-evaluated and traditionally lowered as more data becomes available.[1052] The Institute of Medicine has established EERs for a 30 year old male of varying height and weight. If we apply our average Montuhotep soldier to this data we can estimate their calorific needs (Table 11).[1053]

Table 11 - Calorific intake for a 30-year-old male.

EER for a 30 Year Old Man[1054]					
Height (m [ft])	**Activity**	**Weight for BMI of 18.5 kg/m2 (kg [lb.])**	**Weight for BMI of 24.99 kg/m2 (kg [lb.])**	**EER (kcal./day)**	
				BMI of 18.5	**BMI of 24.99**
1.70 (5'7)	Sedentary	53.5 (118)	72.2 (159)	2144	2442
	Low Active			2339	2670
	Active			2586	2959
	Very Active			2993	3434

Although Roth estimated that a Roman soldier needed 3,000 kcal./day, these figures demonstrate that calorific values are much lower if an individual is not engaged in physical activity or if they have a low BMI (body mass index) score. Furthermore, if we compare further DRI data to our

1050 Grosvenor & Smolin 2006, 26 – 27
1051 Grosvenor & Smolin 2006, 28
1052 Stare & McWilliams 1973, 225, Table 10.1 display that the RDA in 1973 had been lowered to 2,800 kcal./day for an adult male between the ages of 25-35. This can be referenced against Barasi 2007, 132, Table 1 stating that the Estimated Average Requirements (EARs) for energy in 2007 for an adult male, aged 19-50, should intake 2,550 kcal./day.
1053 Raxter et al. 2008, 148
1054 Institute of Medicine 2005, 186 – 187, Table 5-22

Montuhotep soldier, we find that their Mean Basal Energy Expenditure (MBEE) is 1,769 kcal./day and their Mean Total Energy Expenditure (MTEE) is 3,081 kcal./day.[1055]

To previous analyses, we can contrast Spalinger's assertion that an Egyptian soldier required 3,250 kcal./day. Spalinger's analysis arbitrarily reduced Engels' claim of 3,600 kcal. but his motivations for doing this are not explicitly mentioned. Furthermore, Spalinger claimed that 3,250 kcal./day is the *minimum* necessity required per soldier and argued that 3,000 kcal./day is "too low".[1056] As we have seen with the Institute of Medicine's data, the minimum required is much less for either a low or high BMI score based on the stature of the Montuhotep soldiers. Furthermore, in comparison with textual data on rations in the pharaonic period, it becomes clear that Spalinger's estimates are too high.

The pharaonic textual data offers insight into the Egyptian militaryand work group supplies. The documentation from Deir el Medina indicates that the workmen in the village were with a monthly wage (4 khar of emmer and 1.5 khar of barley) which could support a household of 8 – 10 people.[1057] However, it is clear from Miller's analysis that this amount was for the upper echelon of New Kingdom society. The textual documentation indicates that the average conscripted worker or soldier had to contend with rations that could barely meet subsistence.

Miller submitted a much lower calorific intake for a conscripted Egyptian workman based on the textual data.[1058] He noted that there were very few attempts to establish the nutritional value of ancient Egyptian 'rations' or 'payments' and that his analysis utilised modern data of Mediterranean and Middle Eastern crop yields to determine calorific values.[1059] Ration dockets from the fortress of Uronarti, dating to the Middle Kingdom (2055-1650 BCE), indicate that a 10 day ration was made up of 60 units of bread baked from ⅔ of a heqat of northern barley and 70 units baked from 1 heqat of emmer; being the equivalent of 3.75 kg of emmer and 2.25 kg of

[1055] Institute of Medicine 2005, 154 – 155, Table 5-10 – This estimate covers the age range of 19-30 with a mean weight of 71.0 kg, a height of 1.7 m and a BMI of 22.0. Although this is slightly heavier than our average soldier, it demonstrates how a lower BMI score can affect the results.
[1056] Spalinger 2005, 44 – 45 nt. 12. Similarly, Spalinger (2005, 96) claimed that 3000 – 4000 kcal./day is a "reasonable amount". Spalinger mistakenly asserted that Janssen's comment about the rations for a Tudor soldier (1975, 463, ft. 49) was lower than what could be expected for a soldier in New Kingdom Egypt.
[1057] Janssen 1975, 460, 463
[1058] Miller 1991, 257 – 269
[1059] Eyre 1995, 176; Miller 1991, 257

barley.[1060] Thus, the daily ration for a garrison soldier was 600 grams a day, a number which corresponds to Assyrian army rations.[1061] Utilizing energy values for Near Eastern grain of 354 kcal./100 grams, this would have amounted to 21,362 kcal. for a 10 day period (or 2,136 kcal./day).[1062] Miller compared this to rations for expeditions to the Sinai and the Wadi Hammamat and found that workers were allotted 10 units of bread a day with each bread 'loaf' yielding 213.6 kcal.[1063]

Not all researchers are satisfied with Miller's estimate for calorific values for emmer and barley. Kemp estimated the calorific value of a heqat to be much lower; emmer values equivalent to 8,100 kcal. and barley 9,720 kcal. as opposed to Miller's 13,340 kcal. for emmer and 12,180 kcal. for barley.[1064] Therefore, Kemp reduced the Uronarti ration amounts to 1,458 kcal./day but added that the diet may have been supplemented by food items not listed in the dockets.[1065] Similarly, Miller noted that there was a discrepancy when comparing the bread rations of Uronarti with the amounts at Abydos during the reign of Senwosret I. As the Abydenne workers received a low ration of 8 bread 'loafs' per day, he thought this allotment must have been supplemented with personnel stores as they were local inhabitants of the area.[1066] There is an indication from Pap. Anastasi V that a garrison soldier could be sent additional provisions from his household to supplement his usual rations.[1067] However, this textual instance is isolated and it is not known how common this practice was.

At Abydos, the lowest category of workers barely received enough to meet subsistence levels at 1,709 kcal./day.[1068] This amount is comparable to the Athenian quarrymen at Syracuse in 410 BCE who could survive on about 1400 – 1200 kcal./day, albeit not without a high mortality rate.[1069] Similarly, this can be compared with the high mortality rates experienced in the 1978

[1060] Miller 1991, 258 – 260 – To gain a weight estimate for grain, Miller stated that 1 litre of barley weighs 705 grams (see also, Kemp 2006, 178; 1986, 132). He estimated that one heqat was 4.78 litres and that 1 khar was 10 heqat (47.8 litres) based on Baer's estimate (1962, 42 – 43). This amount has been generally agreed for volume (Marcus 2007, 149; Kemp 2006, 178; 1986, 132). However, it should be noted that there is a divergent opinion as Janssen gives a higher amount of 7.688 litres per heqat (1975, 109).
[1061] Fales-Padova 1990, 29. See also Janssen 1975, 463 ft. 51
[1062] Miller 1991, 258
[1063] *Contra* Eyre 1987, 203; Kemp 1986, 131.
[1064] Kemp 2006, 178, 405 nt. 25
[1065] Kemp 2006, 178 – 179, 259 fig. 94
[1066] Miller 1991, 258
[1067] Pap. Anastasi 5, Lines 21.5 – 21.8 (Caminos 1956, 259); Gnirs 2013, 701.
[1068] Miller 1991, 258, ft. 9
[1069] Palmer 1989, 111, 113; Kemp 1986, 132

Burmese refugee camps in Bangladesh that allotted 1,300 kcal./day per person.[1070] This seems a reasonable estimate for the 'danger level' of calorific intake especially compared with the Lipton's results.[1071]

In his analysis, Lipton separated the people of lower income in western India in 1971-1972 into "other poor" and "ultra poor". The 'ultra poor' of Maharashtra (20% of the total population) consumed an average of 1,556 kcal./day as opposed to the 'other poor' (41% of total population) receiving 2,312 kcal./day.[1072] Lipton's analysis confirmed that Miller's was correct in the assertion that roughly 2,000 kcal./day maintained a basic subsistence level while 1,300 kcal./day was hazardous.

The Rhind Mathematical Papyrus presents us with a ration calculation example in which a student is expected to divide 100 units of bread amongst 10 soldiers, 3 of which will receive a double amount. It is calculated that the lower paid men will receive 7.33 bread loaves amounting to 1,643 kcal./day while the higher paid individuals would receive to 3,286 kcal.[1073] The amount cited for a regular soldier in this text does leave one to speculate if this is an accurate estimate, it seems too low to accommodate the strenuous exercise required in travelling and engaging in combat. If this is correct, discipline in the army could have been severely strained.[1074] It is tempting to suggest that because of hunger, Thutmose III's military force opted to attack the baggage train at Megiddo rather than go after their enemies.[1075] Similarly, at the Battle of Kadesh, Hittite military discipline broke down as the attacking forces chose to plunder the Egyptian camp rather than press the attack on Ramesses II himself: "…the Hittite army was made up of a motley collection of vassal troops…discipline in the Hittite ranks broke down when the Egyptian camp was reached, with its enticing prospects for looting and plunder".[1076]

The mainstay of the Egyptian diet was grain; emmer for bread and barley for the production of beer.[1077] Eyre noted that these products are predominant in ancient texts as this is representative

[1070] Miller 1991, 259
[1071] Lipton 1983
[1072] Lipton 1983, 72, Table 1
[1073] Miller 1991, 259 The higher rationed amounts are similar to Hekanakhte's daily calorific intake of 3,512 kcal. (260).
[1074] Van Wees 2004, 102
[1075] Redford 2003, 30
[1076] Bryce 2005, 239; Yadin 1963, 108
[1077] Janssen 1975, 460

of differential survival: “Other foods (other than grain), however important to calorific intake, were treated as secondary or even unimportant in the documentation”.[1078] Most logistical calculations are based on grain alone but we should keep in mind that, according to the World Health Organization,

> “Most population groups who are deficient in micronutrients subsist largely on refined cereal grain or tuber based diets, which provide energy and protein (with an improper amino acid balance) but insufficient levels of critical micronutrients. There is a need for a broadening of the food base and a diversification of diets… Adding reasonable amounts of these (micronutrient rich) foods will add micronutrient density to the staple diet and in doing so could reduce the prevalence of diseases resulting from a micronutrient deficiency across populations groups.”[1079]

Although logistical calculations take grain as the primary source of calorific intake, we must consider that other food items were a critical part of the ancient Egyptian soldiers’ diet.[1080] However, for the sake of analysis, we must examine grain products as they are the best source for comparative intake. As Foxhall and Forbes comment: “Calorific requirements merely provide a set of independent parameters, useful for determining the limits of human food consumption, and thus useful as ‘yardsticks’ against which modern hypotheses about ancient food consumption can be measured”.[1081]

The major staple of the Macedonian army would have been grain products. Engels defined that this is anything produced from wheat (emmer), barley or millet.[1082] These products can be stored for over 10 years and especially in hot environments where meat, fish and produce (vegetables and fruit) would have spoiled much sooner.[1083] As noted, Spalinger argued that a New Kingdom soldier would have required 6.6 kg per day.[1084] There is nothing in the textual records or in modern tables that would give such a high number. Therefore, we must utilise the data from Engels’ analysis to estimate the weight of provisions while carried on campaign.

[1078] Eyre 1995, 184; Eyre 1994, 73
[1079] World Health Organization 2005, 319 – 320. See also Zakrzewski 2003, 219.
[1080] Eyre 1987, 179, 202; Janssen 1975, 463
[1081] Palmer 1989, 103 citing Foxhall & Forbes 1982
[1082] Engels 1978, 123
[1083] Roth 1999, 185; Sippel 1987, 39 ft. 39
[1084] Spalinger 2005, 35

Engels stated that 1 kg of wheat, when milled, yielded 900 grams that would contain 3,150 calories and 90 grams of protein.[1085] However, the production of bread from this material will lose some its calorific content. Grain was not eaten in raw form. Thus, 1 kg of bread will yield 2,500 kcal. with 100 grams of protein. Furthermore, Engels pointed out that only 90% of the calories in bread can be absorbed by the human body due to the high cellulose content. The original 1 kg of grain, when made into bread or biscuits and then digested, contained 2,025 kcal. and 80 grams of protein of nutritional value.[1086] Based on these facts, Engels calculated that 1.77 kg of grain was required to yield 1.59 kg of bread to meet the base level of 3,600 calories which we have seen is a high estimate for intake.[1087] Therefore, we should reduce this number to an appropriate level of 3,000 kcal./day based on the Institute of Medicine's estimate of the optimal amount for the stature of our average Egyptian soldier. This results in the amount of 1.48 kg of grain needed for a daily ration per individual. However, looking at the data from Miller, we can say that achieving 3,000 kcal./day while on campaign was far from the reality and many soldiers must have gone hungry for the duration. To compare, the amount of grain to reach 1,600 kcal./day would have weighed 0.82 kg. Calculations of daily rations should be produced from the weight of raw grain as Pap. Lansing indicates that grain was supplied to the soldiers for meals: "He receives the corn-ration when he is released from duty, but it is not pleasant when it is ground".[1088] Grain was probably given to Egyptian soldiers because the water in the bread would have resulted in quicker spoilage but it is unclear if this grain would have been hulled.[1089]

This variance in rations could greatly impact our calculations for the soldier's daily requirement in relation to how much he could carry. In addition, it could affect an estimate for how many soldiers a frontier fortress could provision. The wages of Sety I to the quarries at Gebel Sisila indicate a large amount was allocated to the individuals of the expedition. Each person was to receive a daily ration of 20 offering loaves, a bundle of vegetables, a roast of meat and 2 khar of grain a month.[1090] However, the text indicates that this was an exorbitant amount and this implies that the motivation of this document was to indicate that the king was supplying more than enough for his forces.

[1085] Engels 1978, 123, ft. 3 citing Clark & Haswell 1970, 58; Altman & Dittmer 1968, 26; Albritton 1954, 115; Burton 1965, 430
[1086] Engels 1978, 124
[1087] Engels 1978, 124
[1088] Pap. Lansing, Line 9,9 (Caminos 1954, 401).
[1089] Palmer 1989, 94 ft. 17
[1090] KRI 1, 51 – 53; Hikade 2006, 164 – 165; Eyre 1987, 202;

For hydration, Engels stated that the daily requirement for water was 2.27 litres/day but it is known that desert environments (e.g. the Sinaitic route) can increase this to 8.52 litres/day.[1091] The human body (which is composed of 60% of water) has mechanisms to regulate water intake.[1092] Most of the water required is absorbed from drinking fluids but fruits and vegetables can offset water amounts as they are composed of 80% water.[1093] An individual doing light work in a 28.8°C will lose 2 to 3 litres in perspiration per day. For strenuous activity in hot environments, water loss can be as high as 2 – 4 litres per hour.[1094] Without food, an individual can survive up to 8 weeks but without water, humans can only survive for a few days. The water amount required depends on an individual's diet, their level of activity and their environment. The environmental data shows clearly that Egyptian armies were travelling in hot to warm environments with very little rainfall and that the marching pace was a strenuous exercise (Sections 4.2.2.2, 4.3.1 and 4.4.2). It should be noted that the burden on transport would have been extensive as 1 litre of water weighs 1 kg.[1095] It is not uncommon for ancient forces to travel far from a source of potable water. Alexander the Great's army was never more than 16.1 km away from a drinkable water supply.[1096] Similarly, Cambyses is said to have made advance depots of water before crossing the Sinai into Egypt.[1097] The march across the north Sinai obviously needed comprehensive logistical planning before it could be attempted.

A mention of the salinity of the water, presumably referring to the Sinaitic route, is made in Pap. Lansing in relation to the quality of water a soldier was expected to drink while on campaign. "During his long marchings on the hills he (the soldier) drinks water every three days, and it is smelly and tastes like salt. His body is broken (with) dysentery".[1098] From this text it is clear that the brackish water in the overland route in the north Sinai had a saline content high enough to have caused health problems. So even if the provisional supply network was running at optimum efficiency for campaign forces, health hazards still might be associated with the overland journey.

[1091] Engels 1978, 18, 125
[1092] Grosvenor & Smolin 2006, 325
[1093] Grosvenor & Smolin 2006, 284
[1094] Grosvenor & Smolin 2006, 285
[1095] Note this is the exact weight of a litre of water at 4°C. I am aware it would weigh slightly less at higher temperatures but this detail is not necessary for this examination.
[1096] Engels 1978, 36
[1097] Herodotus *Hist*. 3.5-8
[1098] Pap. Lansing, Lines 10,1 – 10,2 (Caminos 1954, 401).

Engels also made a further observation that the area between Tyre and Gaza did not have a great water supply as there are few perennial streams and these would have been: “little more than stagnate pools from July to August”.[1099] The wells that supplied the coastal towns of Dor, Accho, Joppa and Ashkelon would have contained very little water in the summer months.[1100] A further problem lies with wells and how fast the working personnel could draw out the water.[1101] Rivers therefore held a more important role for logistical supply as they allow many individuals to drink simultaneously.[1102] Another item to consider in the importance of hydration is Eph’al’s comment that sieges could be resolved in days, rather than months, if a settlement’s supply of water was affected or scarce.[1103]

5.4.2 Basic Requirements for Pack Animals

The subject of New Kingdom military logistics also needs criteria for the requirements of draught animals that travelled with the military. However, it should be noted that mentions of animals, besides horses, accompanying the troops in Canaan are very rare. Due to this disparity of textual information, academic discussion of draught animals, other than the horse, is relatively uncommon.[1104] Again, the archaeological record is relatively silent while the textual documentation only makes fleeting suggestions on which animals travelled with the military. In representational evidence, there is a general lack of depicting draught animals accompanying a campaign force. However, the scenes of the Hittite and Egyptian camps at the Battle of Kadesh are the exception as they depict horses, donkeys and oxen being utilised in the baggage train (Figures 91 to 92).[1105] The requirements for these animals must be factored in logistical calculations as their needs would have been considerable.

[1099] Engels 1978, 57
[1100] Engels 1978, 57
[1101] Engels 1978, 57, ft. 23
[1102] Engels 1978, 57 – 58
[1103] Eph’al 2009, 64 – 66
[1104] Adams 2007, 49; Förster 2007, 2 ft. 11
[1105] Beal 1992, 134; Littauer & Crouwel 1979, 73

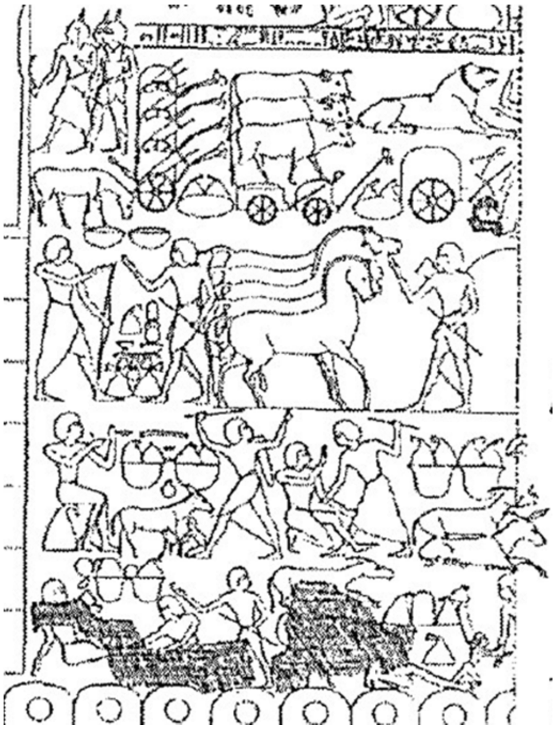

Figure 91 - Battle of Kadesh, Egyptian camp (Heniz 2001, 291 pl. V-1).

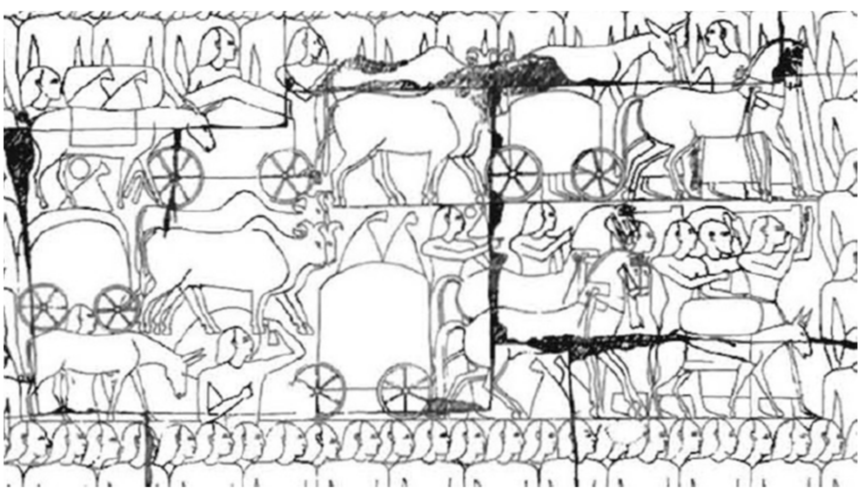

Figure 92 - Battle of Kadesh, Hittite camp (Spalinger 2003, fig. 13).

Horses are said to have accompanied the military on several occasions, presumably to pull chariots. Since modern tables for dietary nutrition for horses are derived from a percentage of their total weight, we must estimate the average size of a horse in ancient Egypt during the New Kingdom. The remains of an equid were found on top of the secondary wall's parapet of the

Middle Kingdom Nubian fortress of Buhen that was destroyed (c.1680-1640 BCE).[1106] The remains were of a male horse, about 19 years in age and stands 1.5 m at the withers.[1107] When these remains are compared with modern classifications, they barely fall into the "small horse" category.[1108] Furthermore, the 'Buhen horse's' remains correlate with the equid remains found at Osmankayasi near Boghazköy (the modern name of Hattusa, the capital of the Hittites) in central Anatolia. This specimen had a withers height of 1.40 – 1.45 metres.[1109] In addition, we can include the incomplete skeleton of a horse from Soleb in Upper Egypt which had a withers height of 1.34 – 1.38 metres.[1110] The example from Senemut's Deir el Bahri burial (TT353), fits well within this grouping with a wither height of 1.43 metres.[1111] Littauer and Crouwel claimed that this diminutive kind of horse type was widely utilised in the ancient Near East during the 2nd millennium BCE.[1112]

Therefore, the food requirements of a horse should be contrasted against the smallest versions of a modern horse to attain an accurate estimate of daily needs. A small horse weighs about 408 kg. Horses are grazing animals and their major source of nutrients is good quality forage from hay or pasture. They can consume approximately 2 – 2.5 % of their body weight in dry feed each day. Therefore, a small horse would require 8.2 – 10.2 kg of food. Concentrated feed, such as cereal grain is fed in addition to pasture or hay, especially when the horse is very active as it contains twice as much digestible energy per pound as does hay.[1113] For optimal health, concentrated feed for working horses should not exceed 0.75 – 1.5 % while forage (pasturage) should be 1.0 – 2.0 % of the horse's total body weight.[1114] Cereal grains are fed primarily to horses as sources of energy and, although all of the common grains of ancient Egypt (barley, wheat and millet) may be used as feed, the nutritive value of barley (which was the major crop grown in Egypt) was shown to be preferable due to its digestive properties.[1115] If we are to apply these figures to a small horse of 408 kg, we find that 3 – 6 kg of hard fodder (grain) and 4 – 8 kg

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1106 Dixon et al. 1979, 191, Pl. 9, Pl. 107; Littauer & Crouwel 1979, 56; Clutton-Brock 1974, 89
1107 The "withers" are the most prominent part of an equid's or bovid's spine. The height is measure from the ground to this highest point. Dixon et al. 1979, 192; Clutton-Brock 1974, 95
1108 Littauer & Crouwel 1979, 57
1109 Littauer & Crouwel 1979, 82
1110 Dixon et al. 1979, 192; Littauer & Crouwel 1979, 82; Clutton-Brock 1974, 95
1111 Clutton-Brock 1974, 95
1112 Dixon et al. 1979, 192; Littauer & Crouwel 1979, 82
1113 Giffin & Gore 1989, 361
1114 Hall 1992, 1
1115 Eyre 1995, 180; National Research Council 1989, 34

of green fodder (forage - clover, berseem, meddick, dock, etc.) is the daily requirement.[1116] This contrasts with Engels who claimed that a horse will require 9.1 – 10.9 kg of food on a daily basis but could increase to 10.9 – 14.5 kg if the animal is working very hard. He elaborated that this ration should be composed of 50% of hard fodder (grain) and 50% of green fodder (forage or hay).[1117] If we were to apply these figures to our smaller horse, we find that it amounts to 2.2 – 2.7% (for hard work, it would amount to 2.7 – 3.8 %) of the animal's total body weight which is within the modern requirements. Roth, who did not estimate the size of a horse in antiquity, makes the claim that a horse requires 5.5 – 6.5 kg of hard fodder and 6.5 – 7.5 kg of green fodder.[1118] Giffin and Gore note that concentrated feed should never exceed 50% of the total weight of the daily ration for a horse as this could lead to overfeeding and may lead to medical problems such as founder, acute gastric dilation, azoturia and epiphysitis.[1119]

A small horse requires a minimum water ration of 13.65 litres of water a day, an average ration of 20.47 litres and a maximum ration of 27.3 litres.[1120] Engels gaves an estimate for the water requirement for horses; 22.7 – 68.2 litres which he averages to 36.4 litres per day. In addition, he claimed that warmer environments and harder work will double the "ordinary requirements".[1121] This is much too high when compared with modern nutritional information on equid care.

Horses are mainly viewed as the driving force for the ancient Egyptian chariot but it is unknown if they were used as pack animals. There was a suggestion that horses were used for transporting pottery in the MBA II period at the Syrian site of Qatna based on hoof prints in association with a kiln area before their becoming elite commodities in later periods.[1122] However, horses were rarely used as pack animals in the Roman army during the Republican and Imperial periods (264 BCE – 235 CE) but they played an important role in battles and denoted the status of high ranking officials.[1123]

[1116] Moens & Wetterstrom 1988, 164
[1117] Engels 1978, 126
[1118] Roth 1999, 62;
[1119] Giffin & Gore 1989, 361
[1120]Canadian Agri-Food Research Council 1998, 4 Table 1; Giffin & Gore 1989, 349
[1121] Engels 1978, 127
[1122] Al-Maqdissi & Bonacossi 2005, 41
[1123] Adams 2007, 59; Roth 1999, 62. Similarly, for the Iron Age (Dorsey 1991, 7).

In textual documentation from New Kingdom Egypt, there are strong indications that horses were considered a rare and valuable import from the Levantl; they were held in high esteem.[1124] The Amarna Letters note that the standard greeting between the 'great kings' was to wish the well-being of horses after that of the royal family.[1125] In addition, the Amarna Letters provide insight that trade in horses was common in the LBA (Section 6.1.2).[1126] It is unconfirmed whether Egyptian troops rode their horses on the march or weighted them down with supplies.[1127] The claim that ancient horses were too small to carry a rider is rendered invalid due to faunal analysis and artifact evidence of a linen saddle found in the tomb of Senenmut and depictions of riders from the pharaonic period.[1128] Engels made the point that horses have to be cared for very carefully as, unlike humans, they cannot recover with rest and instead can be rendered 'lame' if they have been driven too hard.[1129] Schulman claimed that a horse's value for the ancient Egyptians was considerable since the Egyptians had no breeding program of their own.[1130]

So assuming that horses were seen as valuable commodity items, we should consider that mules and donkeys were used as pack animals while on campaign.[1131] Donkeys were the most common pack animal in the ancient Near East.[1132] With their resilience to graze on tough fodder along with their ability to go without water for 2 – 3 days (c. 60 hours), the donkey represented the most resilient pack animal to the New Kingdom Egyptians.[1133] Modern field manuals assess that donkeys require 1.5 kg of hard fodder, 5 kg of green fodder and 20 litres of water per day and this corresponds to textual data from the Iron Age Levant to the Roman Republican period.[1134]

[1124] Drews 1989, 83; Littauer & Crouwel 1979, 83.
[1125] Standard greeting of great kings, "For your household, for your wives, for your sons, for your magnates, your horses, your chariots, for your countries, may all go very well". Mentioned numerous times, but see EA 1 for an example (Moran 1992, 1).
[1126] EA 1, 9, 15, 16 17, etc. (Moran 1992).
[1127] Littauer & Crouwel 1979, 83
[1128] MMA # 15.2.3; Littauer & Crouwel 1979, 11; Healy 1992, 23; Hayes 1959, Vol. 2, fig. 66 fourth row right, fig. 195; Lansing & Hayes 1937, 10, fig. 14
[1129] Engels 1978, 129
[1130] Schulman 1995, 296 although Schulman makes this claim it does lead one to question what would be the archaeological or textual proof of such actions.
[1131] Adams 2007, 61 noted that the evidence for mules in Egypt is very scanty.
[1132] Adams 2007, 57, 71; Förster 2007, 2; Dorsey 1991, 14
[1133] Adams 2007, 57 – 58, 60; Förster 2007, 5; Dent 1972, 31; The Veterinary Department of the War Office 1923, 319
[1134] Adams 2007, 71, 85; Roth 1999, 65; Dorsey 1991, 13

The evidence for the use of mules in Egypt is textually non-existent for the New Kingdom and is sparse even in the Roman period.[1135] However, it is possible that mules were utilised in some form as the New Kingdom Egyptians would have had access to both donkeys and horses to produce the breed. A scene from the the Tomb of Nebamun possibly depicts a mule harnessed to a chariot but it is unclear if this practice was just for civil use or if this was an option for the military in the Levant (Figure 93). Although we cannot be positive that mules travelled in the baggage train, we can postulate they were in New Kingdom Egypt. Thus, some basic information should be put forward to assess the requirements of this type of animal as further faunal analysis might produce examples. Engels claimed that mules require the same rations as a horse.[1136] This contrasts with Roth as he claimed that mules require only 75% of the requirements of horses.[1137] Similarly, the Veterinary Department of the War Office commented that mules are "…a near relation of the horse, and with a digestive system of the same pattern, all the general rules for the care of horses may be applied to mules…".[1138] If we are to apply Roth's figure to modern calculations, we find that a mule would require 2.3 – 4.6 kg of concentrated feed, 3.1 – 6.1 kg of green fodder and 20.5 litres of water.

Figure 93 – Agricultural scene from the Tomb of Nebamun, 18th Dynasty. Mules (?) harnessed to a chariot in the lower register (BM EA37982).

[1135] Adams 2007, 61 – 62
[1136] Engels 1978, 127; The Veterinary Department of the War Office 1923, 313
[1137] Roth 1999, 65
[1138] The Veterinary Department of the War Office 1923, 313

It is unknown to what extent bovids (oxen) were used while the military was on campaign. Engels calculated requirements for the military baggage train based on camels and horses being used as pack animals. There were restrictions on the Macedonian army utilizing oxen or ox-driven carts given their geography and opting to deploy their army quicker than other armies at the time.[1139] Bovids have large feed requirements and Cato noted that oxen require 6.8 kg of hay plus 11 kg of mash per day.[1140] This can be compared to Bachrach's modern estimates that a modern ox requires 12 kg of dry matter per 450 kg.[1141] Oxen have the benefit of attaining their nutritional requirements through grazing. The Veterinary Department of the War Office claimed that oxen used as pack animals in India would require 2.2 kg of hard fodder with either 13.6 kg of green fodder or 6.3 kg of dry fodder.[1142]

The water requirements for oxen are considerable and are based on the temperature in which they operate. Roth states flatly that a bovid would need 30 litres/day.[1143] Bachrach made the claim that they need 15 – 30 litres/day in normal weather and more when the temperature rises. However, Bachrach's claims must be contrasted with the conclusions of Pearson and Djikman, as they state that feed tables for draught animals have not been sufficiently proven.[1144] However, Hersom, in advising on the dietary nutrition of beef cattle claimed that the ratio of provisions for beef cattle is in the neighborhood of 1.8 – 2.5% of the animals total body weight.[1145] In addition, Hersom has conclusively demonstrated water intake for bovids is proportional to the temperature they are in. A beef cow weighing 408 kg in a 4.4ºC environment will require 25.4 litres of water per day, while the same sized cow in a 32ºC environment will require 51.8 litres of water; over double the original amount. Therefore, we are left with a problem trying to estimate what the temperature was, given the environment. Due to the aridification of the Sinai in antiquity to what it is today (Section 4.3.1), we can utilise modern temperature data to infer that oxen travelling the Sinaitic route would have required 51.8 litres a day in the spring/summer months. This would have been a considerable factor in their usage and the ancient documentation demonstrates oxen were commissioned for use by the Egyptian army via Levantine vassals and

1139 Engels 1978, 12, 15, 23
1140 Roth 1999, 66 citing Cato *Agr*. 30
1141 Roth 1999, 66 citing Bachrach 1993, 718, ft. 48
1142 The Veterinary Department of the War Office 1923, 345
1143 Roth 1999, 66 – 67 Table IV
1144 Pearson & Dijkman 1994, 176
1145 Hersom 1994, 5 Table 1

functionaries.[1146] Oxen are not tolerant of climatic changes and their use in desert environments would have been limited.[1147]

The camel does not appear to have been in use in Egypt until they are mentioned in the 7th and 6th centuries BCE invasions of Egypt by Assyrian and Persian forces.[1148] Before this, it is clear that the Egyptians were aware of the camel but there is a significant gap of representations of camels in dynastic art from the 6th Dynasty to the late 18th Dynasty.[1149] For the New Kingdom, a late 18th Dynasty – 19th Dynasty bowl from Qantir depicts the animal in a naturalistic pose which demonstrates the animal was known but it is unclear from this artifact if the animal was used as a draught animal (Figure 94).[1150] However, from a 19th Dynasty tomb at Rifeh, a small model depicts a camel with two large containers, probably water jars, on its back suggesting its use as a draught animal (Figure 95).[1151] Adams and Saber have suggested that perhaps the camel was associated with the god Seth (probably due to its connection with the desert) and might have had a religious restriction on widespread use.[1152] Although this is certainly a possibility, there is not enough textual or faunal information to confirm this claim. If the camel was used as a draught animal in the New Kingdom, it was in such a restricted fashion that it would have had little impact on campaign forces which required many animals to bear the burden of overland transport.[1153]

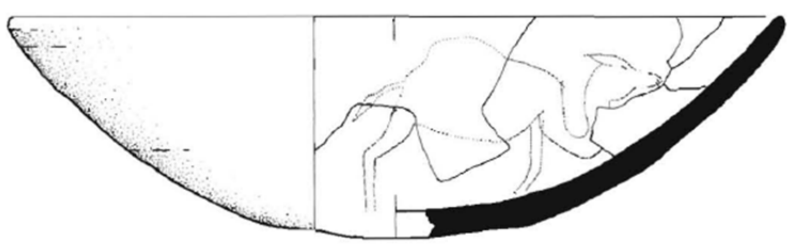

Figure 94 - A New Kingdom bowl from Qantir that depicts a camel (Pusch 1996a, fig. 5).

[1146] EA 55, 193, 242, 301, 324, 325
[1147] Adams 2007, 62 – 63
[1148] Saber 1998, 209; Ripinsky 1985, 140
[1149] Adams 2007, 50 ft. 2; Saber 1998, 209 – 211
[1150] Pusch 1996a, 107. See also, BM EA65553.
[1151] Ripinsky 1985, 139 – 140
[1152] Adams 2007, 50; Saber 1998, 209
[1153] Adams 2007, 52

Figure 95 - Model of a camel with two jars on its back, Rifeh (Saber 1998, fig. 4).

It must be noted that the numbers for food and water based on modern studies are aiming at optimal nutrition and that, while on campaign, horses, donkeys, mules and bovids were probably not always given optimal amounts of food and water. Hyland has argued that as little as 1.5 kg of hard fodder could be given to a small horse along with 4.5 kg of hay fodder.[1154] From our examination, nutritional requirements rely more on the animal's weight and the environment. What we can establish though is a baseline for further inquiry and refine the logistical requirement range as more data becomes available (Table 12).

Table 12 - Estimated Requirements for Pack Animals

Animal	**Green Fodder (kg)**	**Hard Fodder (kg)**	**Water (litres)**
Horse	4 – 8	3 – 6	13.65 – 27.3
Mule	3.1 – 6.1	2.3 – 4.6	20.5
Donkey	5	1.5	20
Bovid (Oxen)	13.6	2.2 – 7.0	51.8
The suggested amounts in this table are rough approximations of requirement ranges for each animal. Calculations have to consider level of exertion, hours of labour and temperature.			

[1154] Hyland 1990, 90

5.4.3 Seasonal Timing of Campaigns

Generally, military campaigns were seasonally punctuated in association with the agrarian cycle.[1155] The Nilotic regime in Egypt dictated that the inundation would have initiated in late August, reaching its highest in October and slowly levelling by late December (Figure 96).[1156] During the winter months, expeditions to quarries were usually organised by the Egyptian administration that were composed of members of the military and conscripted workmen.[1157] The timing of these quarry missions implies that the military and idle laity would be kept busy while not actively engaging in military manoeuvres or agrarian activities.[1158] The size of mining expeditions in the Middle Kingdom indicates that the Egyptian administration could raise working groups similar to the large Egyptian contingent that was sent to the Battle of Kadesh.[1159] Mentions of travel in the LBA during winter months in the ancient Near East are rare as the winter rains would have effectively blocked many travel routes through heavy seasonal rains (Section 4.4.2).[1160] As a general rule, campaigns would have been confined to the spring and summer months. Roman armies did not generally engage in military campaigning during the winter months either, using the traditional start of spring to begin assembly. The month of March was so named as to refer to when an army marched out to war.[1161] The reason why campaigns took place during this time was to ensure that the land had enough fodder which would lessen the burden of logistical support and avoid the poor route conditions.[1162]

Depots and vassals must have planned ahead for the campaigning season. The attendants knew that their storehouses should be adequately stocked for an army's arrival. The Karnak Annals of Thutmose III's 9th campaign noted this explicitly: "…all the harbours of His Majesty were supplied with every good thing of that which his majesty received in Djhay…".[1163] The campaigns of Thutmose III predominately took place in the spring and summer, so it is likely that functionaries would have focused on the filling of storehouses during these seasons.[1164]

1155 Eyre 1995, 175
1156 Antoine 2009, fig. 1
1157 Eyre 1987, 181. For a full listing of mining expeditions and their seasonal timing, see Hikade 2006, Table 1
1158 Shaw 1998, 246; Eyre 1987, 181
1159 Shaw 1998, 250 – 251
1160 Dorsey 1991, 32 – 33; Eyre 1987, 181; Heagren 2007, 140
1161 Roth 1999, 279
1162 Dorsey 1991, 32
1163 BAR 2, 206 § 492. See also BAR 2, 200 § 472, 204 § 483, 212 § 519; 216 § 535; EA 226, 367
1164 Redford 2003, 220, 255

Later in the 18th Dynasty, the Amarna Letters indicate that a basic duty of a Canaanite vassal was to make preparations for an Egyptian campaign force coinciding with spring and summer months (Section 5.4.4).[1165] Besides preparing the storehouses with provisions and providing draught animal support, we often find that the vassals stipulate that their own forces are prepared to accompany the Egyptian military in their campaigns. Communication and supply thus played an important component in Egyptian military manoeuvres at specific times during the year.

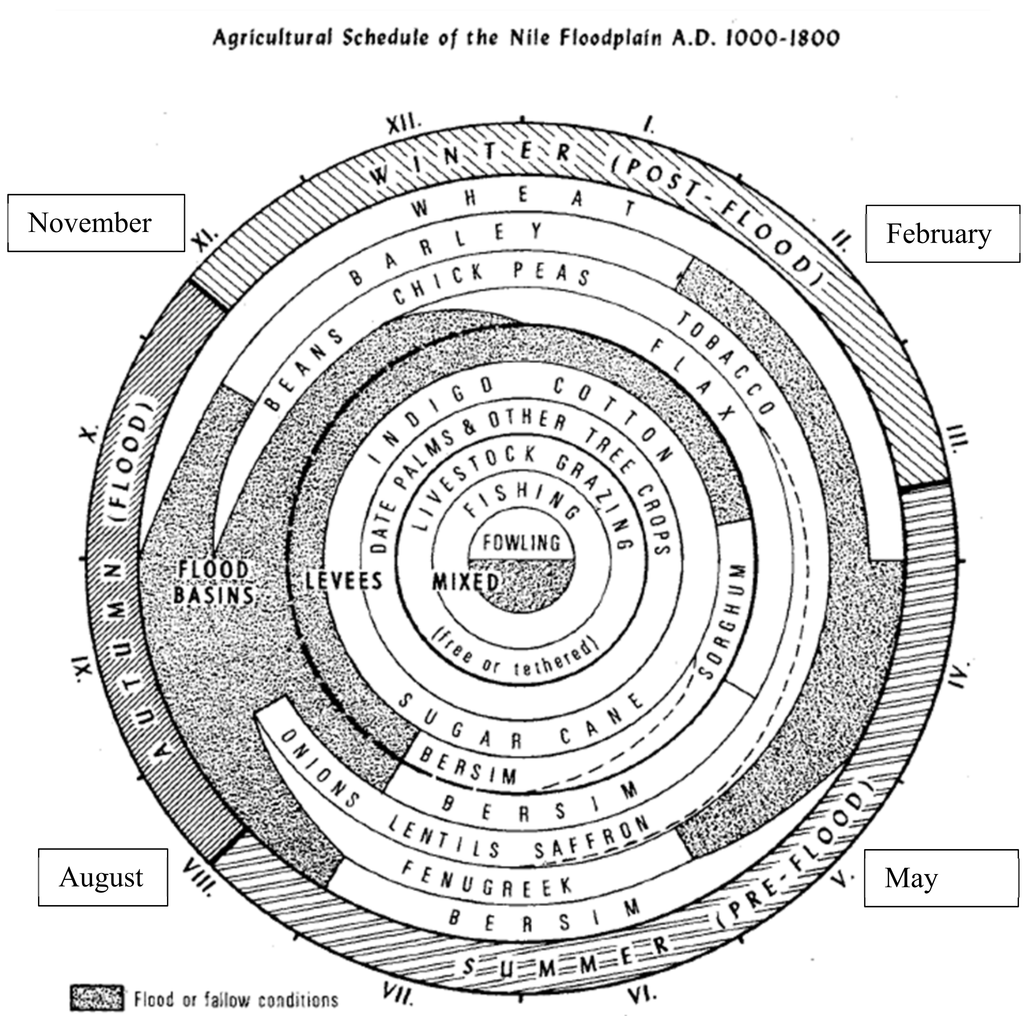

Figure 96 - Schematic of the Egyptian agricultural cycle for the harvesting of major crops and livestock. Months indicated in Roman numerals on the periphery (adapted from Butzer 1976, fig. 10).

[1165] Redford 2003, 199; Liverani 1990

The grain harvest season in Egypt began in mid April while some places in Canaan, such as Megiddo, the season began in June (Figure 96).[1166] This would have had a tactical impact as the Egyptian army could mobilise and arrive in Canaan just as their first crops were becoming 'milk-ripe'. Food supplies would have been at their lowest prior to harvest season and this would have expedited capitulation if a settlement had not stockpiled enough to withstand a siege.[1167] The evidence from Deir el Medina indicates that fish supplies would have been at their highest in March – June.[1168] If a campaign force stocked up on supplies at Tell Heboua, dried and salted *bulti*-fish may have supplemented their diet while making the trek along the Siniatic route.[1169] Supplying the Egyptian forces placed a large burden on a Canaanite vassal and it is likely that stocking food stores could only be attempted during when production levels were at their highest in June – July.

The departure dates of campaigning forces are rare in the textual record and scholars have to infer when a force left Egypt. Goedicke noted that the departure date for the Battle of Kadesh is missing from the Bulletin version. This text does not describe the departure but that Ramesses II was in the region of Djahy (northern Canaan) during the third month of summer.[1170]

The Poem version specifically mentions the departure from Egypt:

> "Behold, his majesty prepared his infantry and his chariotry, the Sherden of the captivity of his majesty from the victories of his sword…they gave the plan of battle. His majesty proceeded northward, his infantry and his chariotry being with him. He began the goodly way, to march. Year 5, the second month of the third season (tenth month), on the ninth day, his majesty passed the fortress of Tharu (Tjaru)…"[1171]

Kitchen postulated that the departure for Ramesses II's campaign in Year 5 took place at the end of April and travel required a month to reach Kadesh.[1172] This would have allowed for the crops to have been partially harvested and stocked at Sinaitic installations to supply the military. The

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[1166] Eph'al 2009, 57 – 64; Redford 2003, 68; Goedicke 2001, 108; Janssen 1975, 117, 126
[1167] Antoine 2009, 4
[1168] Antoine 2009, 3
[1169] Wilson 2007, 22
[1170] Pap. Anastasi IV, 12/5 – 13/7 (Redford 1992, 206); Goedicke 1966a, 72 citing line 4 of the Bulletin.
[1171] BAR 3, 136 – 137; Wilson 1927, 267
[1172] Bryce 2005, 236; Kitchen 1982, 53 (probably following BAR 3, 127-7 and 137 ft. d) *contra* Santosuosso 1996, 429, ft. 26

"orderly disengagement" back to Egypt witnessed the Egyptian army entering Egypt in June/July.[1173]

The 'General's Letter' (RS 20.33) is an anomaly in the assertion that campaigns coincided with the spring and summer months. The 'General's Letter' is a tablet found in the archive of Rap'anu at Ugarit.[1174] The artefact's content reveals that it was written by a general, named Šumi, to his unnamed king (presumably the Hittite sovereign), informing him of troop movements of an unnamed enemy in the region of Amurru (the coastal area of Lebanon).[1175] The date of the tablet is still debated as Nougayroul, Izre'el and Singer suggested the Amarna period. Liverani opted for it to be placed shortly before the Battle of Kadesh and Schaeffer suggested it should be associated within the 20th Dynasty Sea Peoples' activities.[1176] Despite the problems in dating the General's Letter, it remains clear that this text dates to the LBA. The letter includes a passage on the interrogation of an enemy prisoner regarding the Egyptian king's intentions. This indicated that if the opposing army were not Egyptian, it was at least Egyptian-aligned.[1177] The document indicates that this military action was not taking place in the spring or summer but in October, at the beginning of the winter rains. The text reads: "rains are falling, the pond('s water) runs…Now, for 5 months the cold has been gnawing me".[1178] Izre'el and Singer suggested that this document detailed an attempt by Akhenaten to retake the Lebanese coast as it was lost with Aziru pledging fealty to the Hittite king.[1179] Thus, the letter's context demonstrates if the stakes were high enough, the Egyptian military could be sent on campaigns outside of spring and summer. Regardless of the motivation for this attack, this piece of evidence shows that it was possible that military campaigns could have taken place in various months of the year. However, the dictates of provisional supply would have prescribed that the *majority* of campaigns would have taken place in the spring or summer months.[1180]

[1173] Goedicke 1985, 78; Kitchen 1982, 63.
[1174] Izre'el & Singer 1990, 9, 12
[1175] Izre'el & Singer 1990, 13
[1176] Izre'el & Singer 1990, 14 – 15
[1177] Section 2, Lines 10 – 14; Izre'el & Singer 1990, 13 – 14, 24 – 25
[1178] Section 1, Lines 21 and 27; Izre'el & Singer 1990, 23, 25, 29
[1179] Izre'el & Singer 1990, 180 – 183
[1180] *Contra* Hikade 2006, 163

5.4.4 Requisition of Goods in the Ancient Near East

The ancient Egyptian army resupplied by engaging in forcible requisition and pillaging as this would have relieved some of the burden on transport. Requisition of goods was a common practice for Hittite, Levantine, Assyrian, Greek and Roman armies (Latin, *postulation*; Greek, *angari*).[1181]

There are numerous instances of the Egyptian army engaging in this activity. Hasel has noted that the term of  *ḥwtf* "to rob, to plunder" (Wb. 3: 56) is only found in the Beth Shan stele of Rameses II but it is employed in the context that Egypt had been robbed by Asiatics and that it was the king's duty to restore order.[1182] This term does not have connotations for forceful requisition. However, the term  *ḫf* "to capture, to plunder" (Wb. 3: 271) appears many times in the inscriptions of the 19th Dynasty (with a limited usage in the 20th Dynasty).[1183] The term was used to refer to a geographic region or a city. Hasel found the term in at least one instance to refer to an action that would not include the destruction of the town itself.[1184] He concluded that the term did not imply wholesale destruction of a city or region but that the city was entered and that confiscation of goods took place.[1185] A similar association applies to the terms  *ini* "to carry off, to obtain, to bring back" (Wb. 1: 90),  *ḥ3ḳ* "to capture, plunder, to make prisoner" (Wb. 3: 32) and  *kf* "to capture, plunder" (Wb. 5: 121).[1186] The requisition of goods from a city, rather than relying on its transportation must have lessened the burden on the supply chain (Figure 97). The siege scene of Dapur depicts inhabitants carrying baskets towards the image of Ramesses II while he is engaged in shooting arrows at the town (Figure 98).

[1181] Eph'al 2009, 52 – 53; Roth 1999, 141; Cole 1995, 29-40; Beal 1992, 134 – 136
[1182] KRI II: 151,7; Hasel 1998, 37
[1183] Hasel 1998, 40.
[1184] Hasel 1998, 43
[1185] Hasel 1998, 44, 52
[1186] Hasel 1998, 67. 71 – 72, 74 – 75

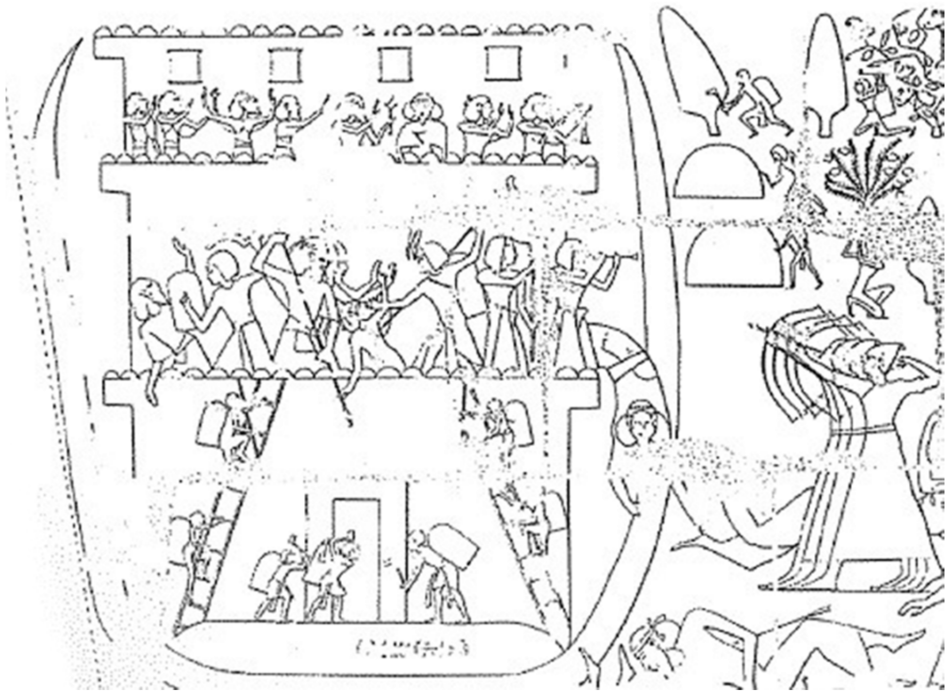

Figure 97 – The conquest of Tunip depicting Egyptian soldiers forcibly requisitioning goods (top-right) (Heinz 2001, 313 no. I-32).

Figure 98 - Detail of inhabitants pacifying Egyptian troops with supplies, Siege of Dapur, Ramesseum (adapted from Heinz 2001, 278 no. IX.1).

In the wake of the attack on Megiddo, Thutmose III's forces captured 2,041 mares (horses), 6 stallions (horses), 387 bulls, 1,929 cows, 2,000 goats and 20,500 sheep along with weaponry.[1187] Redford postulated that one sheep or goat could supply 300 kcal./day (presumably in dairy products) and therefore 3 sheep were required by each soldier to give them 900 kcal. to

[1187] Redford 2003, 35

supplement their bread intake of 1,500 kcal./day, resulting in a total of 2,400 kcal./day.[1188] From this record, these animals were requisitioned and used to supply the Egyptian army while in Canaan.

The actions of the ancient Egyptian military towards agriculture and resources are well documented. Thutmose III's troops specifically targeted these areas: "Now his majesty destroyed the town of Ardata with its grain. All its fruit trees were cut down".[1189] This was not an isolated incident in the campaigns of Thutmose III but a pattern of systematic action taken by the military.[1190] This practice is also mentioned in the 19th and 20th dynasties. One of these events is depicted on the distal end of the 2nd register (the 'Yenoam Register') on the exterior of the Hypostyle Hall (northern side) with Lebanese 'chiefs' presenting Sety I with trees that are being cut down.[1191] Hasel noted that attacks were directed at crops, orchards and trees to deprive a rebellious groups' "life support system" in Canaan and Syria.[1192] It also provided logistical support for the Egyptian military as it is unlikely that the produce would not have been collected. It is possible that the inhabitants of some areas would offer produce before the ancient Egyptian army entered their territory so that violent seizure and destruction of crops was not necessary.

Foraging for firewood, food, water, etc. must have taken place while on campaign as well and would have required planning. Pillaging is contrasted with foraging as the former implies the violent seizure of goods to supply a military force. The choice of route was contingent on the high availability of local resources in relation with tactical goals.[1193] If the intention of the Egyptian hegemony in Canaan was driven by economic ends, it would not make sense to cause starvation in a particular area since this would impact the economic productivity. However, depriving a group of surplus must have been a common practice. We are at the mercy of an *ex silentio* argument here, as the manner in which armies conducted their foraging is not recorded and nor is it recognizable in the archaeological record.

Requisition requests appear to have been an aspect of vassalage in LBA Canaan. The evidence from the Amarna Letters indicates that vassals would receive requests from the Egyptian

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[1188] Redford 2003, 198
[1189] Urk. IV, 689 no. 5 – 7
[1190] Hasel 1998, 75
[1191] Atlas II, pl. 34.
[1192] Hasel 1998, 88
[1193] Saggs 1963, 148

administration to make supplies available to a campaign force.[1194] Understandably, we do not have a record of these initial requests for provisions and supplies, but we do have an indication of what was requested as a vassal's reply is preserved: "(W)hen the troops and chariots of my lord (the Egyptian king) have come here, food, strong drink, oxen, sheep, and goats, honey and oil, were produced for the troops and chariots of my lord".[1195] In addition to supplies, vassals would mention that they had prepared a contingent of their own forces to assist the Egyptian army: "I listened very, very carefully, and I have indeed made preparations, including my horses and my chariots and everything of mine that is available to the servant of the king, my lord, before the arrival of the archers of the king".[1196] The additional manpower would have been of value to a campaign force's tactical ability. In addition, this practice would have provided invaluable intelligence on geographic information, political alliances and the level of resistance that could be expected on particular routes. Subsequently, the Egyptian hegemony in the Levant had appropriated Canaanite intelligence and it played a crucial part of the hegemonic system. No doubt that by incorporating vassals' resources into the logistical network, the Egyptian army was able to campaign further to advance their political control over a larger geographic range.

5.5 Transport Capacity and Rates of Travel

The need to properly supply campaign forces with provisions and materiel would have served a critical role in campaigns. The weight that a soldier or pack-animal could carry should factor into our analysis as it invariably affects the speed at which an army could travel and the distance a campaigning body could march. Another factor is the role of naval transport to in provisioning a military force. In this section, the transport capacity of both overland and maritime modes of transport will be assessed in conjunction with their rate of travel. By this examination, we can place parameters on a military campaign force to emerge with a comprehensive view on what the physical constraints on ancient military forces would have been during the LBA. The New Kingdom Egyptian military relied upon the speed at which they could respond to threats. This allowed them to rely upon smaller bases in Canaan to inform them of potential upheavals in their dominance of the area.

[1194] EA 65, 144, 191, 193, 201, 203 – 206, 213, 216, 227, 302, 324, 325, 337

[1195] EA 55

[1196] EA 141. The Ne'arn troops at the Battle of Kadesh are of debated ethnicity. Goedicke (1985, 95) has plausibly suggested that the Ne'arn may have been foreign soldiers serving in the Egyptian army's fourth division, Seth (*contra* Spalinger 2005, 210 – 211). For further discussion, see Morris 2005, 363 – 365 (esp. ft. 73); Santosuosso 1996, 432 – 433 (esp. ft. 42).

5.5.1 The Transport Capacity of Soldiers and Draught Animals

References to packs or bundles carried by the ancient Egyptian soldiers are very rare in the ancient documentation. In addition, soldiers on the march are not shown burdened down by supplies in artistic representations.[1197] However, it is unlikely that men did not proceed on the march without carrying some of their own supplies. Pap. Lansing, a scribal exercise text that deplores the life of a soldier, has a fleeting mention of a soldier's rucksack but the specifics of its capacity and whether its straps or handles allowed the soldier to manage the weight for long distances are not described.[1198] To make an informed speculation on how much a New Kingdom infantryman could carry, we should examine the transport capacity of soldiers serving in militaries outside of ancient Egypt.

Engels claimed that an adult male could carry 36.4 kg for extended distances.[1199] This contrasts with his later calculations that an infantryman could carry 13.6 kg of provisions.[1200] It is unclear if Engels is referring to 13.6 kg plus the added weight of equipment or if he is taking into account the lesser carrying weight of children and women who travelled with the Macedonian military (thus, being an average based on his own personal estimate). Roth assessed that Vegetius' statement that that a Roman soldier was expected to carry 60 Roman pounds (19.74 kg): "…ought to be taken seriously".[1201]

A Roman infantryman was expected to carry about 22.7 – 27.3 kg according to the Marian reforms of 107 BCE. This amount corresponds to a personal communication with a former US Army veteran stating that the United States Army expected their infantrymen to carry 20.4 – 29.5 kg of weight.[1202] Spalinger, citing Delbrück, claimed that 22 kg was easily managed by soldiers and the load only became a problem when it approached 27 kg.[1203] Krentz's estimate of

[1197] Darnell & Manassa 2007, 88 ft. 249
[1198] Pap. Lansing, Line 10,5 (Caminos 1954, 402, 408). See also, Pap. Koller, Line 1,3 (Caminos 1954, 431). Redford 2003, 201; Heagren 2007, 142.
[1199] Engels 1978, 17
[1200] Engels 1978, 20, ft. 30
[1201] Roth 1999, 115
[1202] B. Shaker, of the 1st Armored Division, serving 1990-1996, personal communication, March 2009.
[1203] Spalinger 2007b, 132

Greek soldiers being able to carry up to 45 kg appears to be too high for long-distance marching even if the load was distributed properly.[1204]

We can only assume how an ancient Egyptian soldier carried supplies since all of the evidence we have are comparisons with older (and modern) accounts. Although it is likely that the ‘ceiling’ transport capacity of a soldier would have been around 27.2 kg, we lack archaeological or textual evidence to confirm this speculation. It can be noted that the army did not necessarily need to carry their maximum if they were in an area that could furnish them with supplies, whether through requisition or established storehouses.

Logistical calculations should not assume that the only things that were carried by the military were provisions.[1205] We must consider that they carried gear (for sleeping or food preparation) as well as their own weapons. Although, the military equipment that a New Kingdom Egyptian soldier would have been considerably less than the 30 kg suggested for Greek soldiers.[1206] The asumptions needed to determine the weight of an Egyptian military pack are too speculative for a satisfactory estimate. For a general estimate, this thesis assumes that 25% of their maximum carrying weight was filled with other supplies leaving the rest to be allocated for provisions (20.5 kg).[1207]

The amount that animals could carry is also significant. Roth reasoned that animals in the ancient baggage trains were expected to carry more weight than their modern counterparts asthe health of the animal was not the primary concern of their attendants.[1208] The popularity of the donkey for transporting loads in the ancient Near East means that a researcher should use their transport capacity as a baseline for baggage train capabilities.[1209]

Scholars have said that donkeys could carry 70 – 90 kg while mules can carry in the range of 72 – 135 kg.[1210] These amounts seem slightly higher when compared to Old Assyrian trading caravans which mention donkeys were loaded with 130 – 150 *minas* (65 – 75 kg) for long

1204 Krentz 2008, 152
1205 *Contra* Spalinger 2005, 38; Engels 1978, 19
1206 Krentz 2008, 150
1207 See, van Wees (2004, 104) for a listing of possible supplies.
1208 Roth 1999, 203
1209 Dent 1972, 33
1210 Mayer 2002, 58; Roth 1999, 205 – 206 (esp. ft. 37); Sippel 1987, 37

distances.[1211] Förster's speculation that donkey-loads for water transport on the Abu Ballas trail in the Libyan Desert might appear low at first (60 kg) but this would have preserved the animals for future use.[1212] Adams noted that there are many attestations of donkeys carrying 150 kg in the Roman period but these amounts are usually in relation with shorter distances.[1213] For long distances, the most common load for a donkey was 3 *artabas* or 81.6 kg.[1214] The Veterinary Department of the War Office claimed that a donkey was only intended to carry 45.4 kg against 72.6 kg of the animal.[1215] Again, this is a low number and may reflect preserving it for future use.[1216] Spalinger's claim that a donkey could carry an astounding 220 kg and a mule 550 kg is erroneous as there are no attestations of such heavy loads from ancient nor modern accounts.[1217] Such weights would have surely killed the animal very quickly if the load did not crush them.

If they were used as pack animals, Engels claimed that horses were able to carry up to 90.7 kg.[1218] However, much like our analysis of other animals, this depends largely on the animal's size. If we are to apply a modern maxim of a horse's carrying weight being equal to 20% of the animals weight, we could calculate that the small horse types of the ancient Near East could carry around 81.6 kg.[1219] Due to their transport capacity of a being equivalent of a donkey, Adams noted that horses made generally poor pack animals.[1220]

Conveyances may have been employed when loads were too heavy to be placed upon a pack-animal's back.[1221] Since the Old Kingdom, sledges and travois had been employed for the transport of heavy loads. They could have been used in crossing the Sinaitic route. However, the mountainous landscape interspersed with forested terrain in the Levant would have likely limited their use. To accommodate the transport of heavier loads, wagons and carts may have been employed. Wagons should be differentiated as four-wheeled vehicles as opposed to carts

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[1211] Astour 1995, 1403. See also, Redford 2003, 201 ft. 38
[1212] Förster 2007, 6
[1213] Adams 2007, 58
[1214] Adams 2007, 79 – 80 citing Habermann 1989, 50 – 94 the common transport capacity of a donkey in the Roman period was between 2 – 4 artabas or 54.4 – 108.8 kg.
[1215] The Veterinary Department of the War Office 1923, 319
[1216] Roth 1999, 105
[1217] Spalinger 2005, 35
[1218] Engels 1978, 14 *contra* Adams 2007, 58
[1219] The 20% rule of a horse's carrying weight is a old maxim in horse rearing but it is captured in http://ezinearticles.com/?How-Much-Weight-Can-a-Horse-Carry?&id=341252 and http://www.outfitterssupply.com/russon/how-much-weight.asp
[1220] Adams 2007, 58
[1221] Astour 1995, 1402; Littauer & Crouwel 1979, 31

which are two-wheeled.[1222] These types of vehicles could be drawn by any variety of pack animals that we have discussed so far but it is likely that donkeys and oxen were preferred for this task. To date, there are no archaeological remains of a wagon or cart specifically designed for the transport of heavy materiel from the Near East dating to the LBA.[1223] Accordingly, the researcher must rely heavily on the textual and representational record for attestations for their use.

The text of the Gebel Barkal stele shows that Thutmose III had a series of cedar ships constructed in Syria-Lebanon in order for the Egyptian force to cross the Euphrates.[1224] In the transport of these ships, oxen-drawn carts are mentioned in their conveyance and Faulkner noted that the term for 'wagon' or 'cart' is the same for 'chariot',  *wrry.t* (Wb. 1: 334), possibly indicating that wagons were not common at this time in LBA.[1225] In the Year 3 Wadi Hammamat Expedition of Ramesses IV, there is a mention of 10 carts being used but it is unclear what an individual cart's capacity was, which animals were used and in what numbers.[1226] In the depictions of the Egyptian camp at the Battle of Kadesh, bovids stand beside two-wheeled carts that appear to be heavily laden with supplies (Figure 91). In the Hittite camp, there are depictions of four-wheeled wagons (Figure 92). At Medinet Habu, carts are shown in the baggage train of the Sea Peoples, pulled by a team of four oxen (Figures 99 to 100).[1227] However, Littauer and Crouwel have suggested that some of the oxen may have been tethered to the wagon not to pull it but for securing the animals to the baggage train.[1228] Therefore, while instances in the textual and pictorial record are rare, they do show that carts and wagons were used in the New Kingdom, although the extent of this use is uncertain.

[1222] Littauer & Crouwel 1979, 64
[1223] Adams 2007, 66 notes that even from later periods, the use of wagons and carts is not certain.
[1224] Redford 2003, 106
[1225] Gebel Barkal stele, line 19 (Redford 2003, 106); Faulkner 1946, 40
[1226] KRI IV, 12 – 14; Eyre 1987, 181 – 182
[1227] Drews 2000
[1228] Littauer & Crouwel 1979, 74

Figure 99 - Detail of oxen-drawn carts (upper register) in the 'Land Battle' at Medinet Habu (University of Chicago (Epigraphic Survey) 1930, pl. 32).

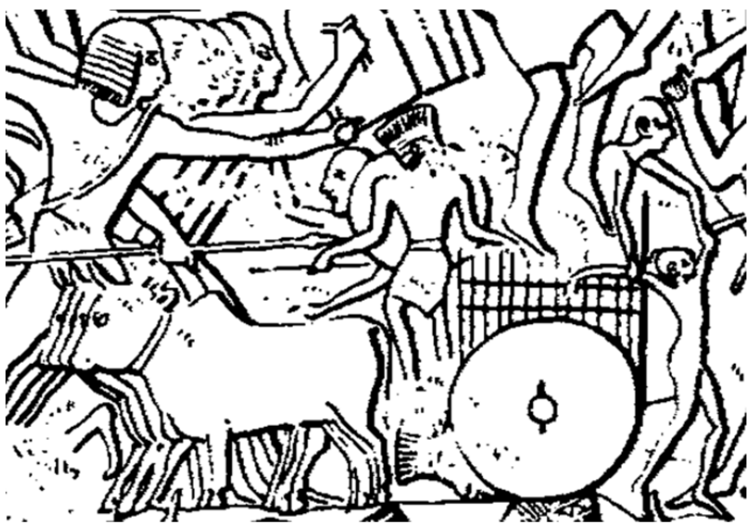

Figure 100 - Detail of oxen-drawn cart (lower register) in the 'Land Battle' at Medinet Habu (University of Chicago (Epigraphic Survey) 1930, pl. 32).

Engels claimed that a wagon could carry approximately 454.4 – 545.4 kg.[1229] This is considerably higher from wagon weights mentioned in Diocletian's *Edict of Maximum Prices* (301 CE) which set a load at 1200 Roman pounds (394.8 kg).[1230] The later Theodosian Code (438 CE) specifically: "…restricted weights to be drawn by teams to just under 500 kg, including the vehicles, allegedly to protect the animals from injury".[1231] However, Adams argued that ancient harnessing techniques could enable wagon-loads of 1,000 kg.[1232] Carts could carry less

[1229] Engels 1978, 15 – 16, ft. 15
[1230] *Ed. Dio*. 17. 3 – 5; Adams 2007, 81; Allen 2007, 6; Sippel, 1987, 36 – 37
[1231] Langdon 1986, 8
[1232] Adams 2007, 76 – 77 *contra* Drews 1989, 77

than a wagon but exact figures for their capacity are difficult to ascertain without archaeological data.

Nevertheless, when considering the use of wagons in the New Kingdom Egyptian military, we must consider route conditions. With flat terrain, wagons could be used but as Dorsey pointed out, there is little evidence that paved roads existed in the LBA or IA and that 'road maintenance' was mainly restricted to the removal of obstacles and stones.[1233] This dearth of information also applies to later periods. While the textual evidence indicates that the communication networks on the late-Assyrian road system were paramount to Assyrian conquest and administration, the archaeological remains are meager.[1234] The material evidence indicates that four-wheeled wagons were known to Near Eastern polities as they were introduced in the third millennium BCE (Figure 101) but how common they were in the LBA for the transport of materiel is open to debate.[1235]

Figure 101 – Anatolian model of a wagon drawn by oxen, 3rd – early 2nd millennium, MMA 66.15 (Muscarella 1988, 414 no. 568).

Wagon and cart usage in the New Kingdom was relatively restricted in military campaigns as they would have slowed the progress of an army (Section 5.5.2). If the need arose to transport heavy materiel (such as in the case of Thutmose III's Euphrates crossing), carts were probably acquired in the Levant to avoid the logistical burden of transporting both the vehicle and oxen

[1233] Dorsey 1991, 2, 31
[1234] Kessler 1997
[1235] Muscarella 1988, 414 – 415; Littauer & Crouwel 1979, 15 – 20

across the north Sinai. This type of requisition was relatively common practice as there are some Amarna Letters that specifically mention that a vassal has prepared a supply of oxen being made available to the Egyptian campaign force.[1236] However, it is not clear whether their purpose was as draught animal or provisions for the military. In short, wagons were utilised in some form possibly with a maximum capacity of 500 kg (Table 13). Without archaeological remains, it is currently impossible to ascertain the capacity of an ancient wagon or transport cart and to what extent they were used. By contrast, Heagren has assumed that transport carts always travelled with a campaign force and dictated which routes could have been taken.[1237]

Table 13 - Estimated Transport Capacities

Mode of Transport	Transport Capacity (kg)	Notes
Humans – packs	27.2	
Horses	81	Unlikely mode of transport – highly valued animal.
Mules	72 – 135	Indeterminate usage during pharaonic period.
Donkeys	70 – 90	Most common draught-animal in pharaonic period.
Wagons - Oxen	395 – 500	Debated usage
Seagoing Ship	18,143	Maximum capacity

5.5.2 Rates of Travel for Ancient Egyptian Armies

The speed of an ancient army travelling in New Kingdom Egypt is directly linked with our analysis of ancient fortifications and resupplying military forces. As we have seen, fortified enclosures for resupply are located at strategic points to monitor the surrounding area and possibly were supplied by coastal routes (Chapter 4).[1238]

The elimination of slow-moving units would increase the overall speed of a campaign force. Infantrymen were the main component of the ancient Egyptian military. Analysis of the ancient

[1236] EA 55, 161, 193, 242, 301, 324, 325
[1237] Heagren 2007, 143
[1238] *Contra* Gal's claim (1993, 80 – 81) that fortified way-stations should be located about one-day's journey from one another.

Egyptian army's travelling speeds is, much like most logistical concerns for this time period, problematic as exact days are only mentioned occasionally.

Armies generally travelled at slower speeds than a single individual could cover in a day (32 km/day [kmpd]).[1239] The 'bench-mark' for an army's rate of speed was established by Engels, citing Neumann, claiming that the average speed of an adult male travelling in Alexander the Great's army had an average speed of 4.2 km per hour [kmph].[1240] However, this claim would indicate a speed of 32.19 kmpd based on an assumed 8 hours of marching. It is strange that Engels later claimed that the whole of Macedonian army achieved an average speed of 24.14 kmpd as this accounts for 6 hours of marching a day.[1241] The discrepancy between a single individual's travel rate and that of an army is likely to lie in the need to rest troops while on the march or while in unfamiliar terrain. Therefore, in our calculations we should note that any estimates should be based on 6 hours/day.[1242] This rate of speed was demanding and would have amounted to a 'forced march'.[1243]

Saggs' estimate of travelling speeds of late-Assyrian armies (48.3 kmpd) seems overzealous compared with Egyptian textual instances of military traveling speeds (Table 14).[1244] Generally, the textual mentions of travel rates correlate with Engels' analysis. There is one anomaly from the pharaonic period in the rate of speed recorded for Sety I travelling from Tjaru to Memphis, averaging 48.2 kmpd.[1245] However, this exceptional speed is probably indicative of Sety leaving the bulk of his forces at Tjaru and travelling to Memphis with a smaller party, possibly via chariot or naval transport.

[1239] Hamblin 2005, 197; Dorsey 1991, 12
[1240] Engels 1978, 52, ft. 135 citing Neumann 1971, 196 – 198
[1241] Engels 1978, 16
[1242] Heagren 2007, 143; Gal 1993, 77 *contra* Spalinger 2005, 32.
[1243] Burne 1921, 192
[1244] Saggs 1963, 147
[1245] Murnane 1990, 69 ft. 38

Table 14 - Textual instances of travelling speeds in New Kingdom Egyptian military campaigns (and scholar's estimates).

Commander	Location	Distance	Days	Rate	Ancient Text	Reference
Thutmose III	Tyre to Gaza	217 km	15	14.5 kmpd	Battle of Megiddo Urk. IV 648-57	
	Tell Heboua to Gaza	201 km	10	20.1 kmpd	Battle of Megiddo Urk. IV, 662, 5	Faulkner 1942, 2
	Tell Heboua to Gaza	220 km	9	24.4 kmpd		Redford 2003, 8, 13, 202
	Tell Heboua to Gaza	223 km	9	26 kmpd		Yadin 1963, 101
	Gaza to Yehem	115 km	11	10.5 kmpd	Battle of Megiddo Urk.. IV, 669	Redford 2003, 202
Sety I	Megiddo to Tyre	72 km	3	24.1 kmpd	Karnak Stela (Year 1) KRI I, 39	Murnane 1990, 68
	Tyre to Gaza	217 km	10	21.7 kmpd		Murnane 1990, 68
	Gaza to Tjaru	227 km	11	20.6 kmpd		Murnane 1990, 68
	Tjaru to Memphis	145 km	3	48.3 kmpd		Murnane 1990, 69 ft. 38

Table 14 (cont.)

Commander	Location	Distance	Days	Rate	Ancient Text	Reference
Ramesses II	Gaza to Megiddo	182 km	12	15.1 kmpd	Battle of Kadesh, Bulletin, B5 - B8	Spalinger 2005, 212
	Sile to Gaza	227 km	10	22.7 kmpd	Battle of Kadesh Depart: Poem, P30 Arrival in Djahy Bulletin, B1	Spalinger 2005, 212
	Tharu (Sile) to Djahy	542 km	30	18 kmpd		
	Tharu (Sile) to Djahy	542 km	30	20.9 kmpd		Burne 1921, 192
Alexander the Great	Gaza to Pelusium	227 km	7	32.3 kmpd	Arrian, *Anabasis* 3.1.1	
Ptolemy IV c. 217 BCE	Pelusium to Gaza	227 km	6	37.8 kmpd	*Polybius* 5.80, 1-3	
Titus c. 70 CE	Pelusium to Gaza	227 km	5	45.4 kmpd	Josephus, *Jewish War*, 4.661-3	
NOTE: The highlighted portions of estimated distances and their calculated average speed is of the author, not the reference its mentioned in.						

The average speed of a horse following in marching file is 6.4 kmph (on a 4 point gait) and they can walk up to 8 hours a day.[1246] Dorsey claimed that a horse-rider or a chariot-borne courier could reach an average distance of 40 – 48 kmpd.[1247]

Roth claimed that the average speed of mules is relatively slow, traveling at 7.2 – 8 kmph.[1248] This speed is higher than what had been quoted for average horse speed. However, Sippel's analysis has suggested a slightly slower pace of 4.8 kmph for a mule on a walking gait.[1249] If speed were not a main factor in the use of the mule, its real benefit came from its capacity to march for 10 – 12 hours. By contrast, a donkey's pace is 4 kmph and they can cover approximately 24 kmpd as opposed to a mule which could travel 32 – 40 kmpd.[1250]

These estimated speeds for animals on campaign all seem to outpace the 3.2 kmph for an ox.[1251] However, Engels claimed that the working capacity for an ox is much lower at only 5 hours a day as their hooves are "unsuitable for travelling long distances".[1252] For the most part, this '5 hour' figure was accepted by academic researchers examining logistical topics.[1253] Hoof-strength factors into the capacity an animal can work as soft hooves would abrade quickly while on the march.[1254] However, horses' hooves become much harder and wear-resistant with hot, dry environments that are either sandy or rocky in conditions.[1255] The Veterinary Department of the War Office does not comment directly on the suitability of oxens' hooves, only that they are 'shoed' in India which may tacitly give weight to Engels claim.[1256] If this is the case, then we could expect oxen to travel a shorter distance while serving as a pack animal. However, the Veterinary Department of the War Office states that these 'shoed' bovids could walk for 7 to 8 hours a day and achieve a speed of 3.2 – 4 kmph and can cover 24 – 32 kmpd.[1257] It would appear that the '5 hour' claim needs to be re-examined. It is likely that their seemingly restricted usage was a result of their large water requirements.

[1246] Engels 1978, 15, ft. 15; Drews 1989, 84 added that a horse 'trotting' could achieve 10 mph. and 30 mph. at a full run.
[1247] Dorsey 1991, 13
[1248] Roth 1999, 206 ft. 387 – citing US Army 1917, 144.
[1249] Sippel 1987, 37
[1250] Dorsey 1991, 13; Dent 1972, 165 – citing a passage from Her Majesty's Stationery Office 1915
[1251] Sippel 1987, 36; Engels 1978, 15, ft. 15
[1252] Engels 1978, 15
[1253] Spalinger 2005, 130; Sippel 1987, 36 ft. 4
[1254] Hyland 1990, 226
[1255] Hyland 1990, 124
[1256] The Veterinary Department of the War Office 1923, 346
[1257] Heagren 2007, 143; Drews 1989, 77; The Veterinary Department of the War Office 1923, 341, 346;

Carts appear to have slowed down the entire process of a military march. Carts were dispensed with when a force needed to be more mobile and tackle harsher terrain. As Xenophon urged his comrades to flee from Persian territory, he opted to get rid of his wagons: "I think we should burn the wagons which we have in order that our cattle may not become our captains, so that we can take whichever route may be advantageous".[1258] Alexander the Great largely upheld Philip II's ban on wagons travelling with the military as wagons encumbered a military unit's travel speed.[1259] Similarly, Hannibal followed a comparable course of action when entering Italy.[1260]

The lack of evidence from ancient Egypt during this time is striking. Are we to assume that wagons travelled with the military? Are we more inclined to view the questions of resupply had been sufficiently answered by a series of garrisons and depots in Canaan (thereby making wagons unnecessary)? We should not assume that carts were always used by an Egyptian force (Figures 99 to 100). To speculate on the travelling speed for a transport cart or wagon, we can assume that it travelled at 3.7 kmph (the median rate of oxen) until further evidence comes to light.

In reaching a conclusion about travel speeds in ancient Egypt, we must consider that horses were not used primarily as riding animals. Oxen appear to have a poor reputation as pack animals in light of the data provided by the Veterinary Department of the War Office. It is more likely that their daily requirements would have been a major factor hindering their usage on a widescale. However, we cannot disregard the possibility that oxen were used in some form as draught animals while on campaign. Although we do have animals (horse, etc.) that have a longer range capacity, we should consider that the Egyptian military was made up largely of archers and infantrymen; their average speed of 4 kmph for 24 kmpd represents the average speed of an ancient army's progress in overland travel (Table 15).[1261] It must be noted that this latter speed figure does not rule out an infantry/archer based army travelling faster in some situations, but merely projects an average speed to be used in calculations.

[1258] *Ana*. 3, 2:27
[1259] Sippel 1987, 35; Engels 1978, 12, 15.
[1260] Hyland 1990, 87 citing Polybius, *Hist*.III.79
[1261] Marcus 2007, 147; Wiseman 1989, 36; Dorsey 1991, 13

Table 15 - Average Traveling Speeds of Personnel in Military Campaigns

	Hours per day	Average speed (kmph)	Distance (kmpd)
Horses	8	6.4	38.6
Mules	11	6.4	38.6
Donkeys	6	4.0	24.0
Ox	7.5*	3.7	27.8
Human	6	4.0	24.0

In our examination of archaeological sites there was consideration to Engel's "4 Days Rule" and where sites in the northern Sinai were located. If a force was travelling through a hot, desert environment, such as the Sinaitic route, the water-transport requirements would have limited the transport capacity of a force to 2.5 days.[1262] This is because as a force uses more pack-animals, the effort to support them increases exponentially and the resulting effect is that they are effectively carrying their own provisions. If the force was able to rely upon water resources in an area, the force could carry enough supplies for 4 days.[1263] By the 5th day, all of the provisions would have been consumed by soldiers and pack-animals, even at half-rations.[1264] The patterning of sites in the northern Sinai appears to correlate with logistical constraints for travel distances of a military force without significant resupply, roughly 2 days (c. 50 km) apart for temporary encampments for water and 3 – 4 days for provisions (c. 75 – 100 km) (Figure 4, Section 4.5.1).

5.5.3 Naval Transport in Logistics

Considering the logistical burden in overland travel, the sea presented an alternative option for transport. In such a system, the bulk of provisions and materiel could have been shipped on the eastern Mediterranean to Egyptian-held centres along the coastal margin of Canaan, allowing the military to travel without a large baggage train. Vessels could also have carried military units more rapidly to locations along the southern Canaanite coast and maintained lines of

[1262] Engels 1978, 20
[1263] Engels 1978, 22
[1264] Engels 1978, 21

communication with Levantine vassals. Gilbert has noted that there was a substantial increase in the use of maritime operations to the Levant during the New Kingdom from previous periods.[1265]

The fact that logistical concerns for the military were carried out by seagoing shipping should be considered when we look at how an army was supplied in the LBA. Water transport could travel faster and farther while carrying more provisions than any comparable overland force.[1266] Shipping was so efficient along Egypt's Nile that a system of roads was not developed until Roman times.[1267] Dynastic Egypt depended upon on water transport from early on and it is logical to assume that the Egyptians applied this knowledge to seagoing vessels (Figure 105).[1268] The utilisation of seagoing ships played a large part in the maintenance of the hegemony.

Considering the current evidence, there is no separate naval branch specifically for the Egyptian military.[1269] Although there are 'naval warfare' scenes depicted on the walls of the Tomb of Inyotef from the Middle Kingdom and in the scenes at Medinet Habu depicting Ramesses III fighting the Sea Peoples, a closer look reveals that most of these scenes incorporate ships that are utilitarian in nature and not specifically designed for war.[1270] The ships in these scenes provide a mobile platform from which archers could loose their arrows upon their foes. The waterline ram ship, like the design of the ancient Greek triremes, was not constructed in the Bronze Age. Wachsmann's analysis of ships in the Bronze Age concluded that ships were primarily used in a military capacity for rapid deployment and transporting troops.[1271] Seagoing shipping must have had a large role in the supply of Egyptian campaigns as they were the: "…only practical method of transporting troops and merchandise".[1272]

Provisions and materiel for the Macedonian and Roman militaries were routinely carried by sea transport.[1273] Weinstein's argument that coastal sites in southern Palestine, at the onset of the

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[1265] Gilbert 2008, 105 Table 5
[1266] Marcus 2007, 157
[1267] Ward 2000, 8; Sippel 1987, 35; Stieglitz 1984, 134;
[1268] Säve-Söderbergh 1946, 16; Faulkner 1941b, 8 *contra* Georgiou 1991, 69. For a full listing of Egyptian campaigns that included maritime transport, see Gilbert 2008, 112 – 133.
[1269] Schulman 1995, 290 *contra* Spalinger 2007b, 136 – 137
[1270] Located in the western side of Theban necropolis (Nr. 386 – Bildatlas, Vol. 1, 169 – 170, Vol. 2, pl. LXXVII). Jones 1995, 59 -60; Schulman 1995, 299
[1271] Wachsmann 1998, 332; Schulman 1995, 299; Castle 1992, 245; Faulkner 1941b, 4
[1272] Säve-Söderbergh 1946, 1
[1273] Arrian *Ana*. 3.1.1; Diodorus, 17 – 20.73-74; Roth 1999, 189; Engels 1978, 34

LBA, recovered more quickly than those inland is a reflection of such a situation.[1274] Based on artistic evidence, we know that ships not only could transport foodstuffs and water but also materiel (Figures 102 to 104). A cursory examination of 'governor's residences' in southern Canaan demonstrated most of them are located near the coast with further inland installations along navigable rivers (Figure 5).

For the New Kingdom, Thutmose III is the most forthcoming ruler about his use of water transport to deploy expeditions to the Levant. In his 5th campaign (Year 29), Thutmose appears to have commandeered vessels of Tunip for the transport of slaves and goods back to Egypt.[1275] In his 6th campaign (Year 30), Thutmose specifically mentions that he began with the use of Egyptian maritime transport as the word 'expedition' began to have a boat determinative beside it.[1276] The 7th campaign describes requisitioning of tribute from harbours along the Levantine coast: "Now every harbour at which his majesty arrived supplied sweet bread and other assorted breads with oil, incense, wine, honey and fruit … they were abundant beyond everything, beyond that which was known by his majesty's forces".[1277] From the 7th campaign onwards Thutmose used harbour bases for supplies as he mentions how well stocked they were in the subsequent 8th, 13th, 14th and 17th campaigns.[1278]

19th Dynasty textual instances of the use of naval transport in the Levantine theatre of war are rare. In the texts of the Battle of Kadesh it is clear that Ramesses II's Ne'arn troops marched from the coastal area of northern Syria but there is no indication that this military force was transported by ship.[1279] However, we are informed of the transportation of chariotry via vessels that were sent to pick up Matnefrure, one of Ramesses II's Hittite brides: "His majesty commanded to cause Khonsu-the-Plan-Maker-in-Thebes to proceed to a great ship, five transports, numerous chariots and horses of the west and the east".[1280] It can be assumed that the use of maritime transport was maintained for the same reasons as previously mentioned: it overcame many of the logistical problems in supporting overland forces. It was common for the king of the 19th and 20th dynasties to declare that he made a fleet of ships in honour of Amun and

[1274] Weinstein 1981, 7, 12
[1275] Urk IV, 686 – 687; BAR 2, 196 § 460; Gilbert 2008, 90
[1276] Urk. IV, 689. Gilbert 2008, 90
[1277] Urk. IV, 692 – 693; BAR 2, 200 § 472. Gilbert 2008, 90
[1278] BAR 2, 204 § 483, 206 § 492, 212 § 519, 216 § 535; Redford 2003, 218 – 219
[1279] Mentions of this group on the coast are in the Poem (Gardiner 1960, 8 P65, 17 P63-64) and in the Pictorial version (Gardiner 1920, 37).
[1280] BAR 3, 189, 193 § 441

that these ships would transport the commodities of the Levant to fill Egypt's temples.[1281] Ramesses III states his piety to Amun in Pap. Harris and he briefly described the use of maritime forces in the maintenance of the Levantine hegemony,

> "I made for thee transports, galleys, and barges, with archers equipped with their arms, upon the sea. I gave to them captains of archers, and captains of galleys, manned with numerous crews, without number, in order to transport the products of the land of Zahi (Djay) and the countries of the ends of the earth to thy great treasuries in 'Victorious Thebes'"[1282]

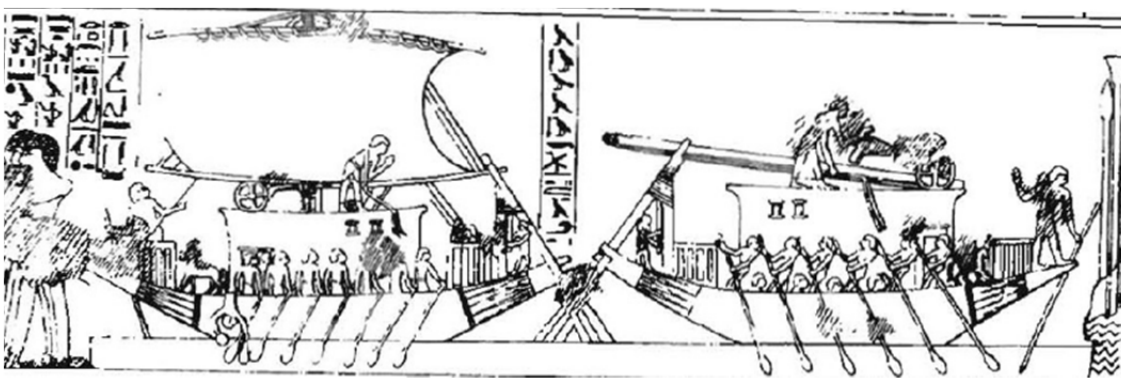

Figure 102 - Chariots and horses depicted as being loaded for upsteam (left) and downstream (right). Tomb of Pahori, reign of Thutmose III, El-Kab (Bildatlas, pl. 102 no. I23).

[1281] KRI I, 43.49:14 – 50:3; BAR 3, 113 § 274

[1282] BAR 4, 120 § 211; Gilbert 2008, 96

Figure 103 - Chariot and horses loaded on a ship. Tomb of Khauemhat (TT 52), reign of Amunhotep III (Bildatlas, pl. 109 no. I49).

Figure 104 - Depiction of a donkey on a boat, Dynasty 19 - 20 (MMA no. 22.2.27).

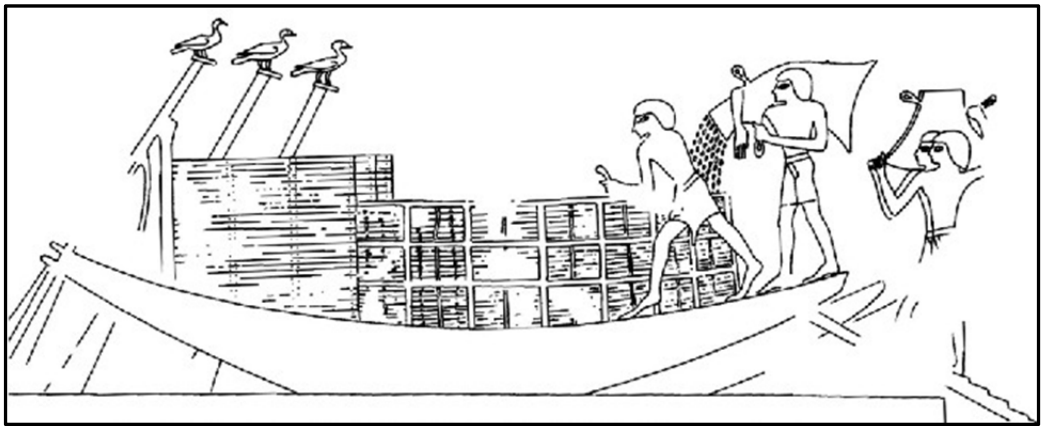

Figure 105 – A riverine ship being loaded with grain (adapted from Kemp 2006, 260 fig. 95).

It is plausible that sea transport was used as a regular means of supplying and transporting troops in Canaan and Syria. As a result, coastal Egyptian holdings were seen as more valuable. These centres were vital for campaigns to be successful and critical for communication. The loss of a strategic coastal site would have impacted the operation of the hegemony in Canaan by leaving the army at a serious disadvantage.[1283] However, seafaring was not without its hazards and the army could easily be handicapped by placing too much of its logistical support in sea transport.[1284] Overland transport was always used to some extent. Therefore, we could postulate that Egyptian 'outposts' in the Levant were located based on strategic aims for military supply rather than simply being a day's march apart.

5.5.3.1 The Size of Late Bronze Age Seagoing Vessels

Seagoing ships in later antiquity were capable of carrying heavier loads than ships utilised in the LBA. For example, Roth claimed that a ship in the 1st century CE could transport 900 metric tonnes of grain and that there were vessels that could carry 360 – 450 tons.[1285] Roth estimated that a Roman army of 40,000 that needed a 6 month ration would have weighed 6,320 tons and that this could have been carried by 200, 30-ton ships.[1286] During the Macedonian campaign ships could carry 100 – 150 tons.[1287] However, Monroe pointed out that there is a tendency to project these figures of Greco-Roman shipping capacities onto the Levantine Bronze Age

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[1283] Engels 1978, 32
[1284] Sippel 1987, 44
[1285] Roth 1999, 192
[1286] Roth 1999, 193
[1287] Monroe 2007, 2 *contra* Engels 26, ft. 3

without considering archaeological evidence.[1288] Obviously, the physical remains of water transport should be consulted. However, there are no complete seagoing Egyptian nor Mediterranean riverine vessels that have been located in the archaeological record.[1289]

However, the archaeological site of the Uluburun shipwreck is located several kilometres east of the town of Kaş in southern Turkey (Figure 1). The ship is the largest vessel found dating to the LBA and is presumed to have held 15 tons of cargo at the time of its sinking (c. 1315 BCE).[1290] The ship was 15 to 16 metres long and had a theoretical maximum capacity of 20 tons.[1291] Two smaller ships, from Cape Gelidonya, Turkey and Point Iria, Greece date to c. 1200 BCE and are estimated to be both 9 – 10 metres long with a capacity of 10 tons.[1292] In Egypt, the remains of seagoing vessels were found at Mersa/Wadi Gawasis. Although this site has not yielded a complete vessel, the remains of ship-planks have allowed a reconstruction of a seagoing vessel that was 20 m long with a cargo capacity of 17 tons.[1293] Hatshepsut's vessels of the Punt Expedition, depicted at Deir el-Bahri, are estimated to be 20 metres long.[1294] These amounts of ship transport capacity appear to correlate with a letter from Aphek that requests 15 tons grain to be shipped to the Hittite empire.[1295]

It is true that riverine vessels in New Kingdom Egypt could be built very large.[1296] The massive obelisk barges of Hatshepsut (1473-1458 BCE) was estimated to carry the 350 ton monoliths along the Nile from Aswan to Karnak. A computer modelling program has estimated the size of these vessels to be 58 x 5.6. x 20 and 70 x 24 x 6 metres.[1297] However, Egyptian ships were built without keels and relied upon the use of the hogging truss to prevent "hogging" (the middle of the ship rising while the ends droop downwards).[1298] Egyptian seagoing ships often employed this truss in their construction and Egyptian riverine vessels only utilised it when the load was

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[1288] Monroe 2007, 2. The numbers of ships to transport goods from the Levant to Egypt as suggested by Marcus (2007, 174 Table 4) are erroneous and are based on dimensions of riverine vessels.
[1289] Ward 2000, 141. Stieglitz 1984, 135 pointed out, quite rightly, that researchers should not assume that one political entity (and by extension, a particular ethnicity) dominated the Mediterranean sea at any one time.
[1290] Pulak 1998; Wachsmann 1998, 206, 303 citing Pulak 1991, 8; Bass 1995, 1428; Pulak 1988
[1291] Monroe 2007, 2, 13, 15; Pulak 1998, 210
[1292] Monroe 2007, 2
[1293] Ward 2012, 219 – 220, 222, 224; Borojevic et al. 2010; Ward & Zazzaro 2009
[1294] Monroe 2007, 6; Wachsmann 1998, 41. See also Ward
[1295] Vidal 2006, 273; Singer 1983, 4; Owen 1981, 8, 12
[1296] For a list of large Egyptian riverine ships from ancient documents, see Castle 1992, 240.
[1297] Ward 2000, 126; Jones 1995, 65
[1298] Gilbert 2008, 33; Pulak 1998, 210; Wachsman 1998, 25; Jones 1995, 41, figs. 36 – 37; Stieglitz 1984, 136 – 137

particularly heavy. However, the oceanic forces of the Mediterranean dictated that seagoing vessels would have been restricted in their length and thus, the sizes of riverine vessels are not comparable to the size of seabourne transport.[1299]

Redford claimed that the average LBA seagoing vessel's length was 35 – 70 m based on the dimensions given in the Shipwrecked Sailor text which stated the vessel was 100 x 40 cubits (52.3 x 20.92 m).[1300] Besides the oceanic forces, the use of this text can be questioned on the basis that it is allegorical literature that is not be taken at face value.[1301] There are no archaeological remains that would indicate such a large seagoing vessel. Similarly, Stieglitz claimed that seafaring ships of the LBA were capable of hauling 250 ton loads and claimed that the Theban tomb of Kenamun is an example of such a trading vessel.[1302] This assertion is not verified by an archaeological source and should be dismissed as too assumptive. Therefore, we must conclude that the largest seagoing ships in the LBA must have been similar to the Uluburun vessel's dimensions.[1303]

To demonstrate the transport capacity of shipping compared to its overland counterpart, a single 9-ton ship was capable of hauling the equivalent of 18 wagons or 108 donkey-loads.[1304] For a 20-ton ship, the amount is even higher (40 wagons or 244 donkey-loads). The quantities that a ship could carry at sea appear to correspond with Ramesside documentation about the transport of grain along the Nile.[1305] The archaeological and textual evidence for water transport in the LBA indicated that such vessels could carry a sizeable amount of troops and materiel.

5.5.3.2 Rates of Travel for Water Transport

The speed of water transport should factor into our logistical analysis. There is the claim that water transport along the Nile was much more efficient than foot traffic. Spalinger noted the 'top range' of ancient boats on the Nile was 55 kmpd based on Herodotus' journey from Thebes

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[1299] Ward 2012, 219
[1300] *Ship. Sailor*, Lines 26 – 27 (AEL 1, 212; Parkinson 1997, 92). A cubit is 52.3 cm long (Eyre 1987, 11). Redford 2003, 205. See also, Parkinson 1997, 98 nt. 4; Edgerton 1930.
[1301] Monroe 2007, 5; Baines 1990. Similarly, the size of the 4th Dynasty vessels attributed to Sneferu is suspect (Raban 1991, 133).
[1302] Stieglitz 1984, 139-140
[1303] *Contra* Marcus 2007, 157, 176
[1304] Roth 1999, 197
[1305] Castle 1992, 240

to Elephantine, taking four days to travel the 220.6 km distance.[1306] However, this ancient claim is unreliable.[1307] Murnane argued that the journey took a minimum of 13 days, and finds this number consistent with Sety I's two week journey from Memphis to Thebes (leaving on 2 Akhet [*3ḫt*] 1 and arriving in time for the Opet festival which took place in the middle of that month).[1308] The return journey was shown to be much faster in certain conditions. Weni's journey in the 5th Dynasty only took 7 days to reach Memphis from Elephantine.[1309] If we are to assume then, that it took an average of 13 days to reach Thebes from Memphis (roughly 600 km), the resulting number (46 kmpd) would be slightly lower than Spalinger's estimate. Murnane noted that in the 1800s, the journey between Cairo and Luxor took longer than 13 days. Therefore, the 13-day figure is a *minimum* estimate to cover the distance between Thebes and Memphis.[1310]

Ancient seagoing ship's speed impacted the logistical supply chain of troops in the Levant. The weather conditions dictated that shipping was an activity in the eastern Mediterranean from April to October because of the likelihood of capsizing during winter storms.[1311] The eastern Mediterranean current would have facilitated seagoing craft making their way from Egypt to Canaan as it flows in a counter-clockwise direction at a speed of 2 knots (Section 4.2.2.2).[1312] Ship travelling distances should be measured against the coastline as it would have been difficult for a vessel to have navigated in open-water.[1313]

Casson, while dividing up travel rates for ships into 'favourable' and 'unfavourable' winds, arrived at estimates of 4 – 6 knots (7.52 – 11.28 kmph) under favourable conditions.[1314] In unfavourable conditions, Casson asserted that a speed of 2 – 2.5 knots (3.76 – 4.63 kmph) was common.[1315] If we are to estimate that a ship, travelling for 4 days (8 hours/day) could cover 360.7 km at a rate of 6 knots.[1316] This would make the trip from Tell Heboua or Qantir to Jaffa a

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1306 Marcus 2007, 146; Spalinger 2005, 32 citing Herodotus, *Hist*. II.9
1307 Murnane 1990, 147
1308 KRI 1, 247:10; Murnane 1990, 147 – 148 (especially ft. 8).
1309 Murnane 1990, 148 assumes that this journey was conducted 24 hours a day in this case and claims that it took place at the height of Inundation in September.
1310 Murnane 1990, 149 – 150
1311 Marcus 2007, 145 -146; Vidal 2006, 270; Raban 1991, 130; Sippel 1987, 42.
1312 Georgiou 1991, 64; Lambrou-Phillipson 1991, 13; Summerhayes et al. 1978, 47
1313 Vidal 2006, 270; Bass 1995, 1428; Lambrou-Phillipson 1991, 13
1314 Casson 1951, 142 Table 2 *contra* Roth 1999, 195
1315 Casson 1951, 143
1316 See also, Lambrou-Phillipson 1991, 7, 12.

matter of 4 – 5 days.[1317] For the lower estimate of 2 knots, a ship could cover 120.3 km. Ward's reconstruction of an ancient Egyptian seagoing ship has revealed results that coincide with Casson's estimates. This reconstructed ship, 20 metres in length, had an average speed of 6 knots over 6 days.[1318]

Despite the range of assumptions one has to employ in estimating the speed of seaborne transport in the LBA, the point is clear that ships could travel faster and farther than an army travelling overland (a land army could cover about 96.5 km with the same variables).[1319] Calculations of supply should factor in the crews of these ships. However, it is unknown how large the crews were.[1320] Some of the crewmen could also have been serving in the military, much like in the case of Ahmose son of Ebana in that he served aboard a vessel as well as a soldier.[1321] Altough we cannot be certain that LBA sailors served in the military, there would have been an advantage in transporting troops by sea as they would be fresh and not exhausted from an overland march.

The overall evidence for shipping supports Roth's estimate that shipping was 40 – 50% cheaper than overland transport.[1322] With its capability to deliver large stores of provisions/materiel and its ability to travel great distances in a short span of time, the use of naval transport had advantages in logistical supply. However, the extent of its usage is indeterminate. Since most of the examined archaeological sites exhibit material from the 18th – 20th dynasties, researchers should consider that overland routes were always used in some capacity.

5.6 Case Study: Logistical Calculations

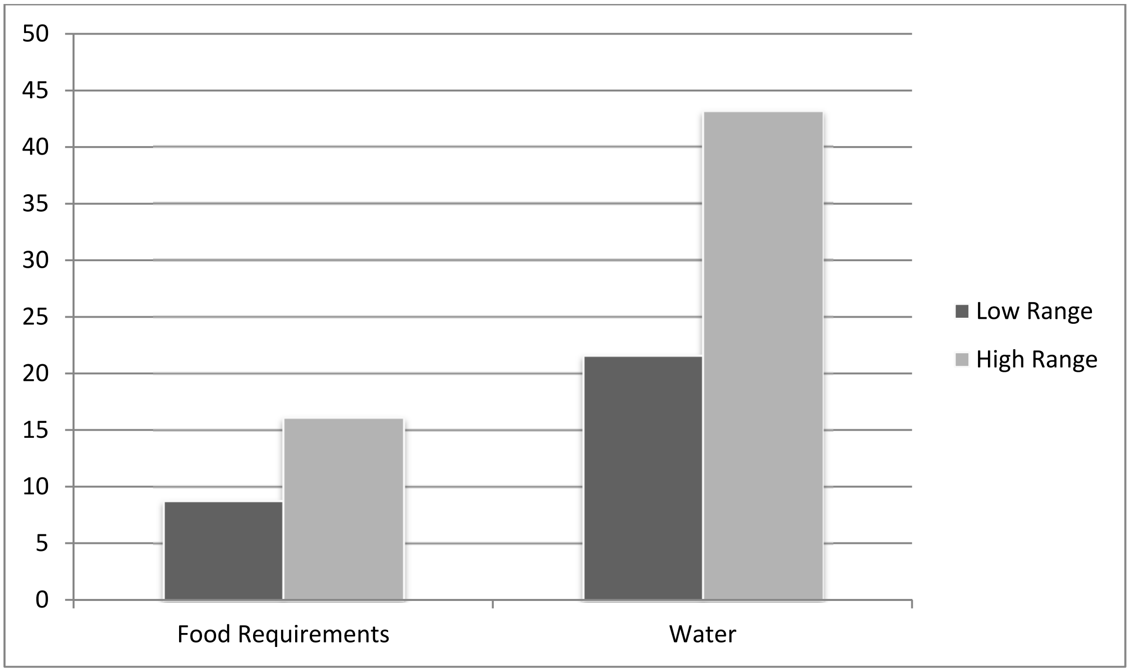
This case study of calculations is relevant for our discussion as it illustrates how the data from a logistical analysis can be drawn together to formulate estimates. Although exact numbers are difficult, we can put forward spans of calorific requirements for a campaign force. By doing so, we can approximate how logistics would have impacted a campaign force and speculate on how requirements would have been supplied while in certain areas of the Levant.

[1317] Stanley 2002, 101
[1318] Ward 2012, 224
[1319] Marcus 2007, 146
[1320] Roth 1999, 195
[1321] AEL 2, 12 – 15
[1322] Roth 1999, 199

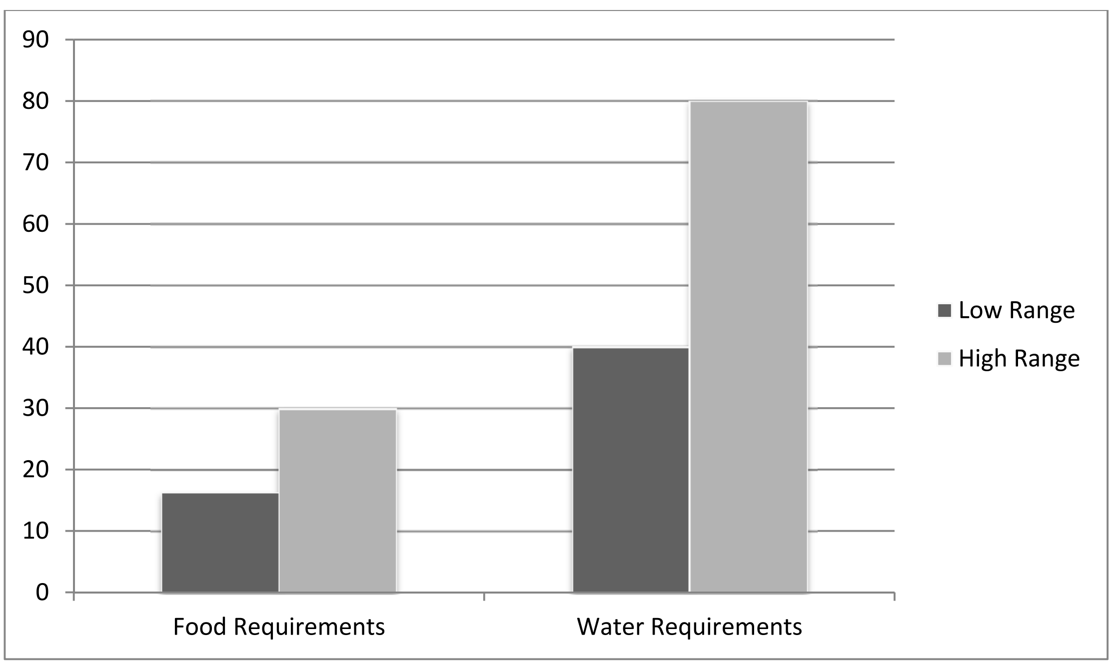
5.6.1 Logistical Requirement Ranges (LRR)

The complexity of logistical requirements can vary due to a number of factors and results should reflect a flexible range. Calculations should incorporate new information as it becomes available. Thus, a researcher should be presented with the span of low values and high values of calorific and hydration requirements. To facilitate logistical analyses, it should be presented as a 'logistical requirement range' (LRR) for daily consumption with a minus-sign (-) for the low value and plus-sign for the high value (+). For example, if we were to present the provisional requirements for our average Montuhotep soldier, the notation would read LRR -1800/+3086 kcal. and a water LRR of -2/+4 litres. Presentation of such material would facilitate the results of logistical research more concisely without lengthy explanations of how these assessments were derived. This section details the application of the above logistical data to the Battle of Megiddo and the Battle of Kadesh.

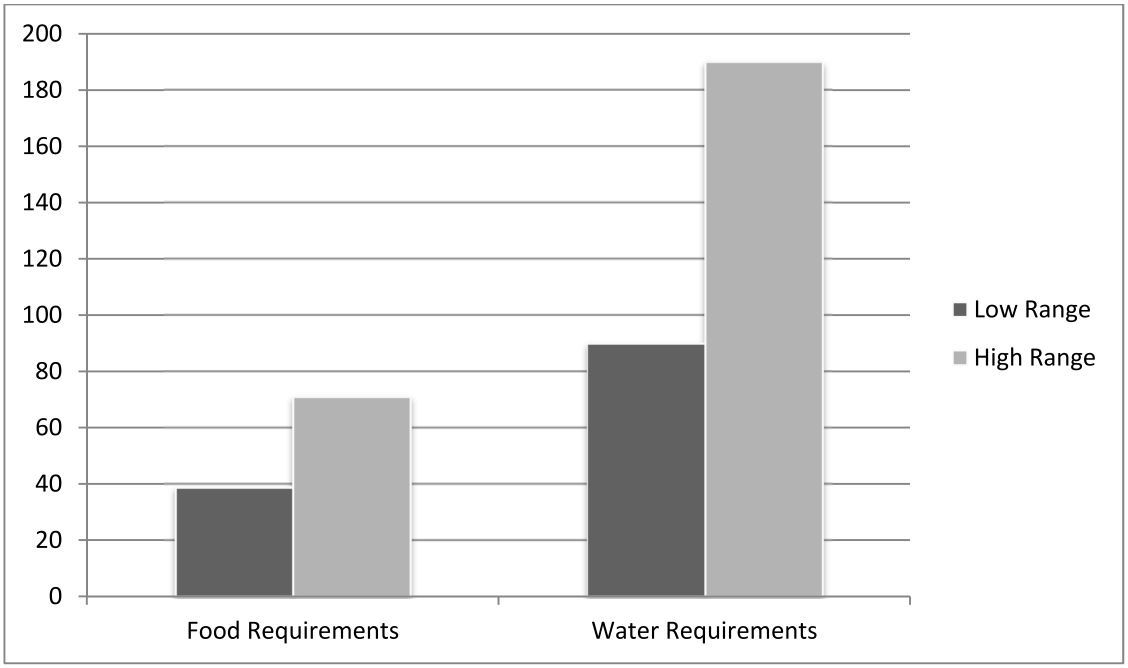
If we consider Redford's estimate of 10,800 Egyptian troops at the Battle of Megiddo, we can produce a logistical calculation. The food estimate can either be high, at 1.5 kg, or low, at 0.81 kg. Thus, an LRR -8,748/+16,200 kg is food required for the campaign force on a daily basis. Similarly, the daily water LRR presented for this campaign force would be -21,600/+43,200 litres. This makes the assumption that each individual received the same ration. In applying the same data to the Battle of Kadesh, we find that the Egyptian forces (c. 20,000 troops) would have required a daily food LRR -16,200/+30,000 kg with a water LRR -40,000/+80,000 litres. The Hittite forces, estimated at 47,500 troops, would need a daily food LRR -38,475/+71,250 kg and a staggering water LRR of -95,000/+190,000 litres. Since we do not know the exact number of horses that travelled with the Egyptian force, only a calculation for the Hittite chariotry can be generated. The data in modern tables has presented values for optimal nutrition and do not present a span of requirements. So although we can calculate the necessities for the horses in the Hittite chariotry, we should be aware that these numbers can be reduced if we assume that they were receiving smaller rations. The 3,500 Hittite chariots would have employed two horses apiece. Thus, for concentrated feed the calculation would follow, 7,000 horses (1% of 408 kg) = 28,560 kg/day. For pasturage, 7,000 horses (1.5% of 408 kg) = 42,840 kg/day. The water requirement for the Hittite horses would have been very high as well with each horse consuming about 20.47 litres/day. The Hittite horses would have required a total of 143,290 litres/day. Presumably, the burden of transporting such vasts amounts of water would have been avoided for both forces as they could rely upon the Orontes River for intake.



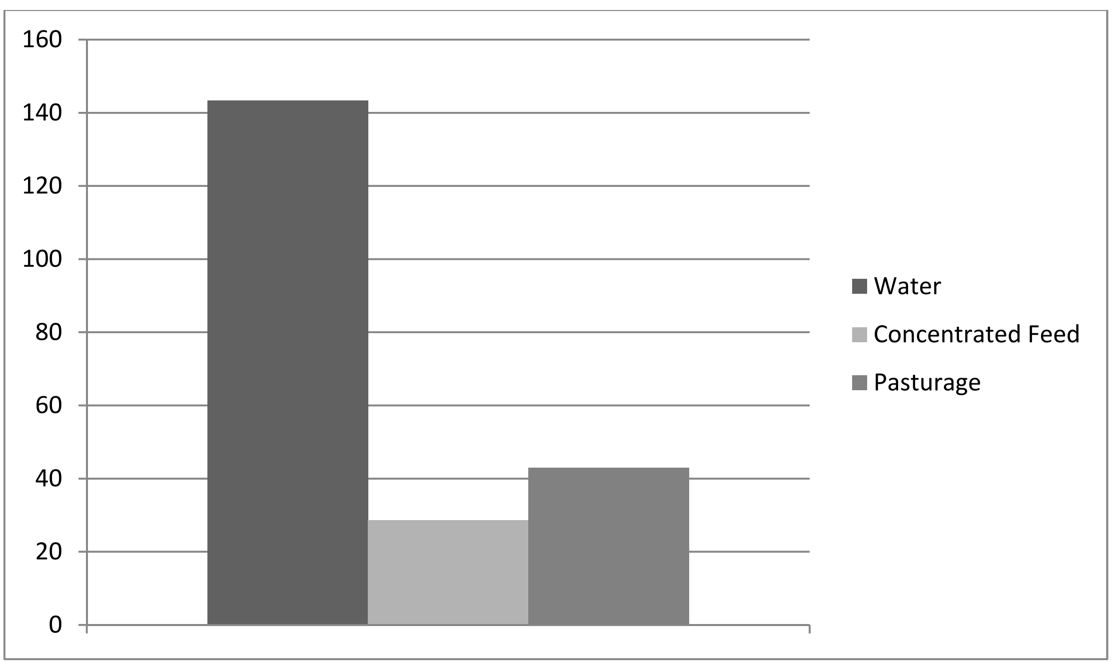
Graph 1- Battle of Megiddo – Daily Requirement Range for Egyptian Infantry in metric tonnes.



Graph 2 - Battle of Kadesh – Daily Requirement Range for Egyptian Infantry in metric tonnes.



Graph 3 - Battle of Kadesh – Daily Requirement Range for Hittite Soldiers in metric tonnes.



Graph 4 - Battle of Kadesh – Daily Requirements for Hittite Horses in metric tonnes.

5.6.2 The Engels Formula

For calculations of campaign requirements, the 'Engels formula' is a useful method but it has to be adjusted in light of our logistical examination. However, it should be noted that, like any calculations in ancient military logistics, there are a number of assumptions that have to be incorporated. By this line of investigation, we state what the assumptions are and adjust them accordingly. The formula is presented as follows:[1323]

$$N = \frac{d(a+b+c) - \ (yz + 200x)}{250 - d(e+f+g)}$$

Engels described that N = the number of pack animals; a = the army's total of grain; b = the total ration of fodder; c = the total ration of the army's water requirement; d = the number of days the provisions need to be carried for; e = a pack animal's daily ration of grain; f = a pack animal's daily ration of fodder; g = a pack animal's daily ration of water. Engels adds the caveat that we should calculate that marching troops could carry their own supplies. In these cases, y = the number of personnel; z = the average weight a person could carry. If horses are assumed to carry supplies, then x = the number of horses. However, the use of horses as pack animals is highly improbable.[1324]

The formula is very concise but it does have some suppositions that should be addressed. Engels based his '250' number on the average number for pack animal carrying weight; claiming that a horse or mule could carry 90.7 kg and a camel 136 kg.[1325] As stated, Engels does not make the claim on how large an average horse or mule was in his treatment of Macedonian logistics. Considering that dietary requirements take into account the animal's size, we must assume that not all horses, especially the smaller horses of the ancient Near East, could all carry this kind of weight. As noted, the '20% rule' should be applied to estimate a horse's transport capacity. Therefore, a 408 kg horse could carry an estimated 81.6 kg. As we saw in our analysis of pack-animals, the use of the camel in baggage trains is not applicable to New Kingdom armies as they were not domesticated in large numbers before 1100 BCE.[1326] To obtain an average for LBA

[1323] Engels 1978, 22, ft. 35
[1324] Engels 1978, 22, ft. 35
[1325] Engels 1978, 14
[1326] Astour 1995, 1402.

armies' pack-animals, we should factor in the donkey due to its popularity in the ancient Near East (81.6 kg).

Therefore, the formula employed for an ancient Egyptian army is:

$$N = \frac{d(a + b + c) - (yz + 81.6x)}{avgPackWeight - d(e + f + g)}$$

We have seen that provisions for quarrying expeditions and building projects were significantly lower than Engels estimate of 3,600/ kcal./day. Therefore, we must assume that each person of the army received approximately 2,400 calories and forego the inclusion of outliers, such as high officials who probably would have received a greater ration.[1327]

The calculation for a single division of 5,000 soliders as specified in Pap. Anastasi I would be:

$$N = \frac{4\ days(5{,}670\ kg + 6{,}804\ kg + 20{,}000\ l) - (((5000\ ppl)(20.4\ kg)) + 81.6(250))}{20.4\ kg - 4\ days(1.6\ kg + 5\ kg + 20\ l)}$$

This rough calculation obviously takes in a number of assumptions and estimates for transport capacity but the utility of using this as a formula is apparent in logistical calculations. Thus, with a soldier carrying 20.4 kg and the administration sending the campaign force to a location roughly 4 days away (for instance, from Bir el-'Abd to Haruba), the division would need a minimum of 108 donkeys. This number seems incredibly low in comparison to the quarrying expeditions to Serabit el-Khadim during the Middle Kingdom that composed of 168 – 734 workers accompanied by an average of 400 donkeys.[1328] However, the formula presents the minimum numbers required for pack weight conveyance, not the variant total of animals to supply additional materiel.

5.6.3 Problems with the Logistical Calculations

There will always be some variance in the requirements of a campaign force. As we have seen with the discussion on calorific requirements for a human male, arguments over a 250 kcal.

[1327] This is a total assumption and the number can be adjusted to what each researcher feels is appropriate.
[1328] Shaw 1998, 247

difference seem unnecessary in light of the textual documentation. Obviously, the requirements for a soldier varied while on campaign because of factors including their environment, the time of year, and level of resistance to foraging activities.

Despite the assumptions that have to be employed when making logistical calculations, it should be noted that estimates assume that the military force did not have some access to resupplying themselves. Although the Engels formula can be useful for calculating requirements when crossing a section of a desert, an area that could have resupplied the military can distort final tabulations. The provisions from the land in antiquity cannot be calculated to a satisfactory degree of accuracy because grain can be stored for years. In addition, it is impossible to calculate how much water should factor into transport capacities if there were water sources along the route. The instance of resupply through fortified enclosures and requisitioning from Levantine settlements can impact tabulations. In short, logistical calculations can be postulated but researchers must consider that the results employ asumptions that exclude some critical data. Undoubtedly, the numbers calculated for the forces in the Battle of Megiddo and the Battle of Kadesh appear to be excessive. It is puzzling how such a large campaign force could have procured enough materiel while on the march. However, though we cannot speak of exact numbers in logistical calculations, we can present ranges of probability for further study.

5.7 Conclusion

The study of ancient military logistics in the New Kingdom is an important field to consider as it illuminates aspects of military forces. The maintenance and movement of Egyptian army influenced how control was extended beyond Egypt and into Canaan. From this analysis logistical parameters were shown to have impacted Egyptian campaign forces in the Levant. Without intense organisation and administration of logistical aspects, the fighting capacity of the military would have been significantly reduced and the central Egyptian authority would not have been able to extend its influence over a wide geographic area.

From our examination of the archaeological sites, the ancient Egyptian military did not rely upon large, fortified centres to maintain their hegemony in the Levant. Rather, the Egyptian military depended on communications and rapid deployment to exert influence beyond Egypt's borders. Scholars' discussions of the capabilities of the New Kingdom Egyptian army have incorporated assumptions without consultation from a variety of fields.

There are significant obstacles in researching warfare logistics in New Kingdom Egypt but by employing an interdisciplinary approach, shortcomings can be diminished. For example, there is no current information on the physical stature of soldiers serving in the New Kingdom military. By looking at the material from earlier periods in pharaonic Egypt, the requirements of a soldier on campaign were assessed against the remains of the 'Montuhotep soldiers'. Although these remains were from the 11th Dynasty, collaborating studies demonstrated New Kingdom stature would not have deviated from this group's physique. The calorific requirements for the average solider were assessed using modern medical data to postulate the range of requirements needed and compared these results against the textual data. This was particularly informative as the textual data indicated that the average soldier or conscripted workman was probably malnourished during a campaign or expedition. Hunger would have impacted discipline within the ranks and it would explain why the pillaging of an enemy camp took precedence over tactical goals.

The amount a soldier and animal could transport is important to establish how many days an army could go before restocking supplies. Therefore, water supply played a central role in all military logistics and it was common for ancient armies to remain close to a viable water source. Other than horses, pack animals have been ignored by most researchers in assessing the capabilities of ancient armies. As such, this examination is significant as it has established a base line for further study into the requirements of animals. Academic debate figures prominently in the study of ancient military logistics. With further discussion and examination, it is hoped that additional data may be applied to the issues of ancient military logistics to refine figures and produce accurate LRRs.

Although military technology had an impact on the New Kingdom Egyptian army, the crucial tactical advantage over Canaanite polities is the differential harvest times and the population estimates during the LBA. By employing a provisional network to accompany marching forces, the Egyptian military could arrive in Canaan and ensure that supplies of local crops had not been harvested and stored within fortified settlements. The benefit of large manpower resources for conscription into the Egyptian military would have impacted the number of troops that could be raised in defence of the hegemony. These two factors can be interpreted to be the greatest advantages of the New Kingdom Egyptian military.

Sea transport played a critical part in the movement of the military and materiel in the LBA. By establishing centres along the coastal route, the New Kingdom Egyptian hegemony utilised the rapid movement of ships to facilitate communication with Levantine polities through functionaries. In addition, these ships delivered the pharaoh's requests to vassals to stock their storehouses for campaigns. Even if the vessel was not large, a small ship would have been able to deliver a vast amount of materiel more efficiently than overland transport. Sites like Tel Mor would have been crucial to the maintenance of the Egyptian hegemony as these centres would have represented concentrations of requisitioned supplies as well as keeping the central authority in Egypt apprised of events in the hegemony.

After consideration of these aspects of New Kingdom military campaigns, calculations were conducted. Although logistical tabluations can be undertaken, the resulting figures should not be considered definitive as the incorporation of new data will invariably affect the result. As we examined with water requirements, the range of adequate supplies for a campaign force can vary widely, depending on which set of modern data is applied. The solution to this problem is to present probable ranges for food and water requirements. Through debate and discussion, these ranges can be refined further to achieve more accurate results.

When we examine ancient Egyptian military activity it is imperative that aspects of logistics are considered. Supplies played a vital role in the establishment of the Egyptian hegemony in Palestine as they dictated how armies performed in the field. The Egyptian military did not focus exclusively on using supply lines, entrenchment (fortifying a location), requisitioning, pillaging, or foraging alone.[1329] They used these tactics in concert to achieve their aims. This led to an army and a logistical system that was adaptable to changing conditions and explains how the hegemony in Canaan was maintained.

[1329] Saggs 1963, 148

Chapter 6: Trade in Military Technology and Siege Tactics in the LBA

"None of these armies existed in isolation from one another…the degree to which they shared tactics, weaponry and personnel is not to be underestimated."

-Ian Shaw[1330]

6.1 The Diffusion of Military Technology in the LBA

6.1.1 Religious Aspects of LBA Warfare in the Ancient Near East

Before we examine how military technologies were distributed in the ancient Near East and their connection with logistics, we should mention how ancient Near Eastern armies viewed the act of warfare. Battles were planned and ritualised to some extent. However, 'ritualised warfare' was no less deadly than organised violence. Instead, it meant that a set of traditions and behaviours were observed in its application.[1331] Deviation from these 'rules' was considered deceitful and deplorable. This chapter will discuss the impact of these warfare customs on the spread of military technology.

Warfare in the ancient Near East was considered to be a sacred act and the prerogative of the ruler.[1332] Violence was utilised to demonstrate the king's majesty over chaotic forces and the ensuing victory proved that the gods' favour was on his side. As Liverani described:

> "…war (in the LBA Near East) is a one-way activity, be it the extermination of rebels or plunder and destruction. No real battle takes place because no encounter between equals, or near equals, is conceivable. The qualitative gap between the cosmic army and its chaotic enemies is too large. In a highly symbolic way, war is similar to hunting and enemies are similar to wild game. As the king demonstrates his valour by killing huge and terrifying animals in

[1330] Shaw 2012, 121 – 122
[1331] Bahrani 2008, 153
[1332] Shaw 2010, 112; 2008, 122; Bryce 2002, 100; Shaw 1996, 241; Spalinger 1982, 238

> the desert or marshes (typically chaotic landscapes), so he has to demonstrate it by 'hunting' foreigners."[1333]

Victory in battle was not gained by the exploitation of innovative military technologies; success in battle was viewed as divinely ordained. Ramesses II described the power of the divine in driving back the Hittite forces: "I found Amun more useful than millions of infantry, than hundreds of thousands of chariotry, than a ten thousand brothers and children united with one heart".[1334] Conversely, the defeat of the military was characterised as an event that demonstrated the disfavour by the divine. In the Tutankhamun Restoration stele, Akhenaten's reign is characterised as detrimental to the Egyptian military: "…if the army was sent to Djahy to extend the frontier of Egypt, no success came of their efforts".[1335] Similarly, the Hittites attributed the defeat of their armies to being ritually impure and had a magical spell to regain their virtuousness.[1336] This conceptual paradigm of warfare was common throughout the ancient Near East during the LBA and indicates that warfare was innately connected with the religious sphere.[1337] Victory or defeat was not associated with the use of a particular type of weaponry or military equipment nor was it associated with the tactics employed as long as these tactics were not deceitful (see below). Victory was given to the pious and ritually pure.

Since it was associated with the divine, warfare demanded the observance of correct behaviour for the king's use of violence not to disrupt social order. Rulers of the ancient Near East were not portrayed as making aggressive moves into foreign territory, only responding to a disturbance in the mandated order set out by the gods.[1338] Thus, ancient Near Eastern rulers appear in a reactionary posture and their success over an opponent is something that was predetermined.

Correct behaviour in military conflict was important. It allowed warfare to be seen as a judicial proceeding in which the victorious party could claim that he was favoured by the gods and that he was correct in his actions.[1339] A Hittite document illustrates the dispute between Mursili and

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[1333] Liverani 2001, 89
[1334] Battle of Kadesh, Poem version, Lines P116 – P119 (Gardiner 1960, 10).
[1335] Urk. IV 2027, 13-14
[1336] Beal 1995, 552
[1337] Liverani 2001, 103; Houwink ten Cate 1984, 72; Korošec 1963, 164 ft. 56
[1338] Bryce 2002, 100 – 101; Spalinger 1982, 240
[1339] Liverani 2001, 109; Houwink ten Cate 1984, 72

Arzawan king Uhhaziti who had disobeyed the Hittite king in the return of prisoners, Mursili states: “Come then! We shall join battle. Let the Storm God My Lord judge our dispute”.[1340]

Rather than meet in open conflict, enemies are typically said to have employed the use of lies and ruses to trap a military force into a position of disadvantage. If they were to clash with the virtuous military force on equal footing, their inferior status in the eyes of the gods would ensure that they would be defeated.[1341] For instance, in the textual description of the Battle of Kadesh, the Hittite king is portrayed as not being equal to Ramesses II as he had to employ spies who spoke falsehoods about the location of the Hittite army.[1342] By not declaring the time and place of his army to the Egyptian forces, the Hittite king and his military are portrayed as resorting to a cowardly act in an attempt to vanquish the Egyptian forces. Similarly, the Memphis stela of Amunhotep II described that tactics of the enemy after crossing the Orontes: “Then His Person turned about to see the rearguard of his army, when he saw some Asiatics *sneaking up*, equipped with weapons of war to attack the army of the king. His Person charged after them…they halted and their hearts weakened; one by one fell upon his companion”.[1343]

This portrayal of the enemies of Egypt using dishonest tactics appears to have been common in the pharaonic period as the late FIP document, The Instruction of Merikare, criticised: “the vile Asiatic is the pain of the place where he is…He does not announce the day of battle…The Asiatic is a crocodile on its riverbank that snatches from a lonely road but cannot take from the quay of a populous town”.[1344] It is clear from this document that military forces from the Levant are not seen as equals to their Egyptian counterparts and that victory over them was a result of Egypt’s observance of *ma’at* (Wb. 2: 18 – 20).

This religious or sacred aspect of warfare must be considered when discussing the capabilities of ancient militaries. According to the world-view exhibited in the ancient Near Eastern texts, weaponry and military equipment is not the sole source of victory in battle. The favour of the divine predetermined if an army would be successful in their objectives. Furthermore, it was antithetical to the religious doctrine that the enemy is shown on par with that of the New

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[1340] Year 3 of the Ten Year Annals (Bryce 2002, 109). See also, Kbo VI 29 (CTH 85) ii I (Byrce 2002, 109, 278 ft. 278); Korošec 1963, 163.
[1341] Liverani 2001, 109
[1342] Battle of Kadesh, Bulletin version, Lines B13 – B19, B35 – B52 (Gardiner 1960, 28 – 29).
[1343] Urk. IV 1302, 7 – 15 (Shaw 2008, 107). See also, Urk. IV 1311, 1 – 12; Urk. IV 1666, 3 – 18; Pap. Anastasi 1, Lines 23.5 – 23.9 (Gardiner 1911, 25).
[1344] The Teachings for King Merikare, §34 – 35 (Parkinson 1997, 223 – 224; AEL 2, 103 – 104).

Kingdom Egyptian military. In their world-view, the pharaohs of Egypt had an ethereal mandate to vanquish the enemies of Egypt. Therefore, factors involving technology are minimised in the ancient textual documentation and instead victory was articulated because of the gods' wishes. Consequently, trade and exchange in military technologies was not restricted in the LBA.

6.1.2 Trade and Exchange in Military Equipment in the LBA Near East

Although the Egyptians attributed their victories to divine sanction, some modern researchers accredit the introduction of the chariot, the composite bow and scaled armour as the tools for Egyptian New Kingdom imperialism.[1345]

The utilisation of technological determinism in academic research has traditionally been employed to explain New Kingdom Egypt's rise to prominence. As noted in Section 2.3.4, technological determinism is a historical philosophy that views the primacy of weaponry and military equipment to be the main component in the dominance of cultural groups and, by extension, that socio-political developments in the ancient world can be attributed to technological factors. However, there is every indication that this explanation has insufficient evidence to support it. The argument presented by technological determinists crucially relies upon the assumption that these new military technologies are strictly guarded secrets and that knowledge of their manufacture is restricted. In this way, dominance could be maintained as opposing cultural groups would be unable to duplicate the weaponry or military equipment utilised by the victorious force.

Although initially one army may be the sole wielder of a new advanced piece of technology, there is nothing to indicate that knowledge and use of military technologies was guarded by the groups that employed them. Indeed, there is evidence that this information was shared in a system of reciprocal exchange during the LBA.

For evidence of this knowledge network, the textual record must be consulted. The Amarna Letters illustrate the exchange of technologies that can be corroborated with the archaeological

[1345] Spalinger 2013b, 409, 436 – 441; O'Brien 2009, 57 – 67; Martínez Babón 2004-2005, 36; Spalinger 2005, 49; Hulit 2002, 16; Partridge 2002, 64; Humble 1980, 44 – 47; Gonen 1975, 9; Yadin 1963, 80 – 82, 84 material. Military technologies were often exchanged amongst the great powers. At first, this appears surprising as the use of these new military technologies is seen as a transformative element in New Kingdom Egyptian military. As Spalinger noted: “Eventually successful at home (against the Hyksos), the Egyptian state found a reasonably sized army at its fingertips, and one that could also be used to re-conquer its older Nubian territories. But this well prepared fighting machine could be employed to strike out even further, whence the creation of a vast area of subjected territories”.[1346] However, Moorey and Morkot noted that the exchange of military technology was an integral part of the international LBA trading network.

Moorey argued that tradesmen and merchants contributed to the exchange of military technologies through knowledge transfer.[1347] Throughout the pharaonic period we find tomb scenes of foreigners in Egypt displaying their wares alongside military technology. At Beni Hasan, in the Tomb of Khnumhotep (BH3), the 12th Dynasty scene of a Canaanite caravan arriving in Egypt depicts some of the merchants with spears, javelins, clubs and archery tackle (Figure 106).[1348] These caravans would have transmitted knowledge of the type of weaponry being manufactured in various parts of the LBA Near East. The maritime trade also had a role in the transmission of military technology and knowledge thereof (Figure 107).[1349]

Figure 106 - Canaanite caravan, Tomb of Khnumhotep, 12th Dyn. (altered from Kemp 2006, fig. 112).

1346 Spalinger 2005, 173
1347 Moorey 2001
1348 Kemp 2006, 319; Moorey 2001, 11
1349 Davies & Faulkner 1947

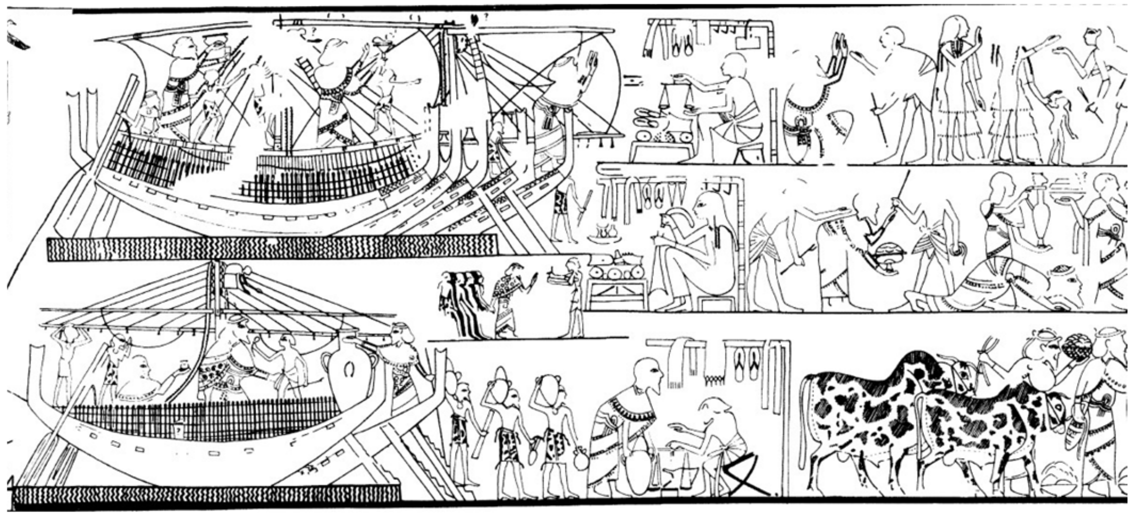

Figure 107 - The 'Syrian trading venture', Tomb of Kenamun (TT162), reign of Amunhotep III (adapted from Davies and Faulkner 1947, pl. 8).

Morkot's analysis of the Amarna Letters about the exchange of military equipment and their manufacture is unsurpassed in scope and detail.[1350] He noted that there is a focus on the 'prestige' weapons composed of precious materials but that these were essentially based on functional military technologies. By giving such lavish gifts to a 'brother' (the term used by rulers for each other in the Amarna Letters), the giver would enhance his international standing.[1351] The amount of weaponry and military equipment exchanged is minimal. However, the utility of these trades, at least in military technology, was not the numbers but the items themselves.[1352] These gifts of weaponry served to illustrate new technological innovations in the eastern Mediterranean during the LBA. The manufacture of such advanced technology would have required an established 'palatial infrastructure'.[1353] With a working prototype of a new innovation from another culture, these could be reverse-engineered in Egyptian workshops (Figures 108 to 109).[1354] In EA 17, Tushratta presented the king of Egypt with a Hittite chariot team taken as spoil after a clash of military forces: "I herewith send you 1 chariot, 2 horses, 1 male attendant, 1 female attendant, from the booty from the land of Hatti".[1355] No doubt that this chariot team was given to demonstrate the prestige of Tushratta by its capture. However, the chariot team also would have served as a valuable source of information on any technological

[1350] Morkot 2007. See also, Shaw 2012, 92 – 126; 2010
[1351] Liverani 2001, 148
[1352] Morkot 2007, 171
[1353] Vidal 2010b, 99; Zutterman 2003, 145; Hulit 2002, 16
[1354] Morkot 2007, 177;
[1355] EA 17, 36 – 38

developments that had taken place in Anatolian chariotry.[1356] Thus, the technological features that had tactical value would have been replicated across the ancient Near East. It would have resulted in LBA militaries having similar weaponry, a phenomenon which Barron refers to as the 'internationalism of arms'.[1357]

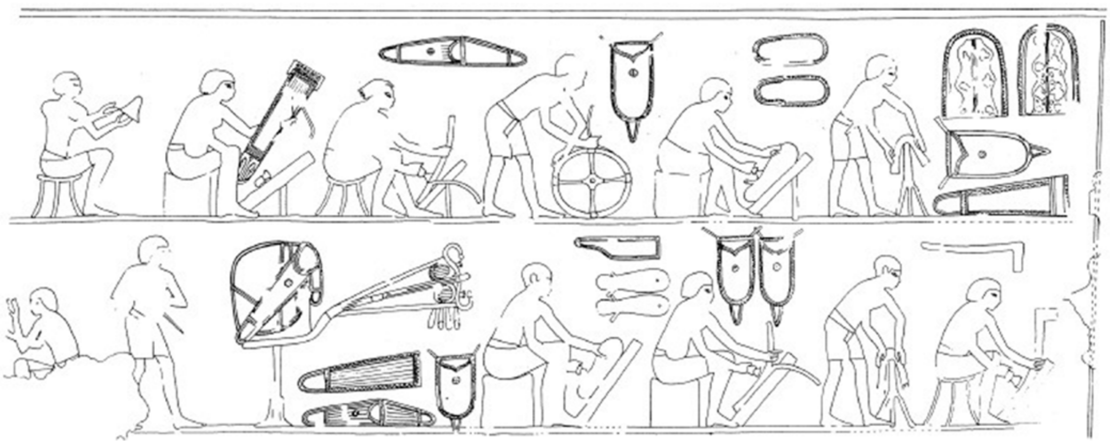

Figure 108 - Weaponry and military equipment workshop, Tomb of Hepu (TT60) (Littauer & Crouwel 1985, pl. 76).

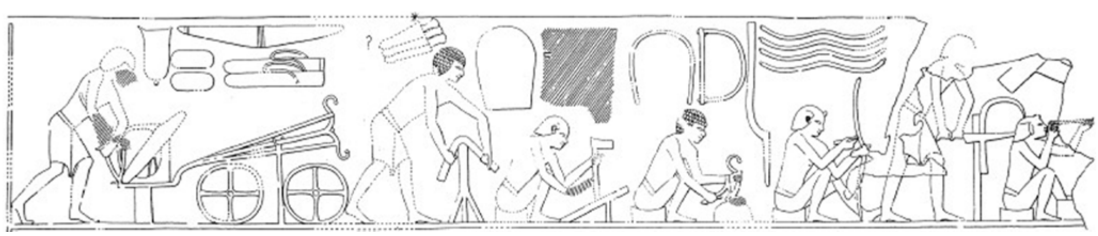

Figure 109 - Weaponry and military equipment workshop, Tomb of Puyemre (TT39) (Littauer & Crouwel 1985, pl. 76).

Attesting to their prominent value, the items of military technology that are predominantly exchanged in the Amarna Letters are horses, chariots and chariot-associated equipment.[1358] A distinction is usually made between chariots worked in precious metals and "wooden" chariots.[1359] Presumably, the latter are representative of a more utilitarian vehicle that could

[1356] Morkot 2007, 175. See also, Shaw 2012, 118 – 119
[1357] Barron 2010, 2. See also, Shaw 2012, 112
[1358] EA 1.88-98, 3.32-34, 9.36-38, 14.II-15-17, 15.7-15, 16.9-12, 17.39-40, 45.80-85, 22, 34.16-25, 99.10-20, 107.37-48, 127.30-41
[1359] EA 3.32-34, 22.2 – 3

have been used in warfare.[1360] The letters also illustrate that horse-stock would have been traded between royal courts. In this way, horse breeds would have diffused across the eastern Mediterranean during the LBA. Although the horse breeds are not explicitly described in the Amarna Letters (the letters just usually list the amount of horses exchanged), no doubt that there were some differences between horses of different regions. This can be inferred from Pap. Anastasi IV in which several breeds of horse are described as being from Khor, Babylonia and Anatolia.[1361]

The most extensive letter detailing the trade in military equipment from the Amarna Letters is EA 22 concerning the dowry of Tushratta's daughter.[1362] Aspects of the letter employ Hurrian terminology to denote a particular type of military equipment and this is not understood fully (e.g. *tilpānu* bow, *makkasu* axe). However, the letter's importance lies in the elucidation of the range of weaponry being exchanged; 13 daggers and knives, 104 bows (presumably composite and self-bow types), 11 shields, an axe, 2 scaled corselets, 2 bronze helmets, 10 spears, 10 maces, 20 javelins, 6,100 arrows, a set of armour and 'helmets' for horses. Indeed, if any Mitannian technological innovations had taken place in military equipment during Tushratta's reign, the exchange of these weapons demonstrate that this knowledge was shared with the court of Amunhotep III.

The exchange of military equipment can also be seen in tomb scenes that demonstrate vassals bringing gifts.[1363] Again, chariots largely predominate in these scenes but some show the tribute of horses, weaponry and military equipment (Figures 110 to 114). The depiction of this weaponry and military equipment represent the latest military technologies to enhance the status of the tomb owner. There is also a brief indication that Egyptian royalty gave gifts of weaponry and military equipment. The request from the king of Alashiya, in EA 34, suggests that in exchange for 100 talents of copper that the king of Egypt could send him a chariot and two horses amongst other items: "And behold, I (also) send to you with my messen(g)er 100 talents of copper. Moreover, may your messengers now bring some goods: 1 ebony bed, gold-(trimmed), [...] ; and a chariot, *šuḫītu*, with gold; 2 horses…".[1364] This implies that exchange in

[1360] Morkot 2007, 175
[1361] Pap. Anastai IV, Lines 3.5 and 17.8 – 17.9 (Caminos 1954, 138).
[1362] Moran 1992, 51 – 61
[1363] For a more thorough discussion on LBA economics, see Liverani 2001, 176
[1364] EA 34 (Moran 1992, 106).

military technology from Egypt was possible. The dissemination of military equipment was not completely one-sided and New Kingdom Egypt participated in the international exchange.[1365]

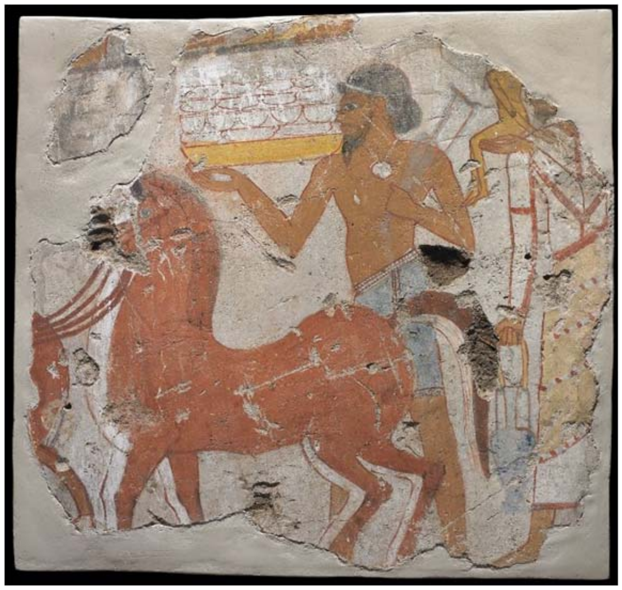

Figure 110 - Depiction of armour, Tomb of Kenamun (TT93), reign of Amunhotep III (Yadin 1963, 197).

Figure 111 - Asiatic tribute bringing horses, Tomb of Sobekhotep (TT63), reign of Thutmose IV (BM EA37987).

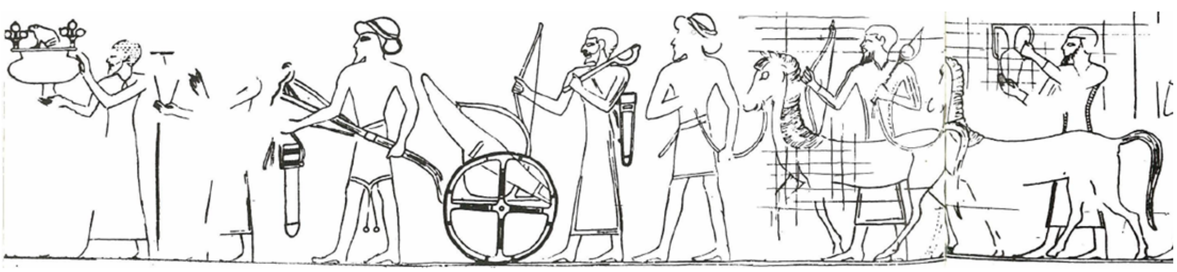

Figure 112 - Levantine tribute that includes weaponry and military equipment, Tomb of Rekmire (TT100), reign of Thutmose III (Yadin 1963, 194 - 195).

[1365] Morkot 2007, 181

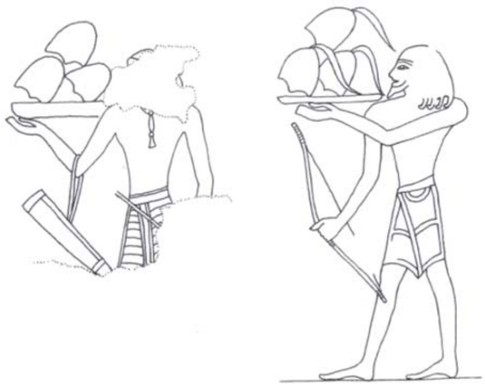

Figure 113- Asiatic tribute that includes helmets and possibly a composite bow, Tomb of Menkheperre-Seneb (TT86), reign of Thutmose III (Kendal 1981, fig. 2).

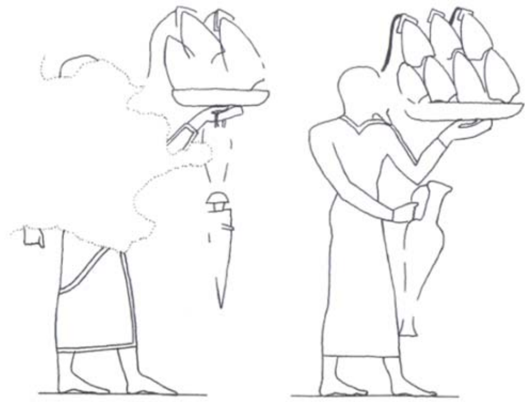

Figure 114 - Asiatic tribute including helmets, Tomb of Amenmose (TT112), reign of Amunhotep II (Kendal 1981, fig. 3).

Weaponry and military equipment would have also been appropriated after a battle. The New Kingdom Egyptian pharaohs listed goods that were taken in the aftermath of a confrontation. Shaw noted that this often gives the ancient records of an Egyptian military campaign the appearance of an accountant's ledger.[1366] In the texts of Ahmose son of Ebana and Ahmose Pennekhbet, they record the capture of chariots in the campaigns of Thutmose I.[1367] Likewise, the annals of Thutmose III frequently list the amount of military equipment that was acquired while on campaign.[1368] In the outcome of the Battle of Megiddo, the amount would have been considerable as the Annals list that 2,041 mares, 6 stallions, 924 chariots, 202 suits of armour, and 502 bows were procured from the enemy encampment.[1369] This focus on the textual recording of military equipment pillaged from the opposition is found throughout the documentation of campaigns in the New Kingdom. In addition, the knowledge of manufacture and use could have been acquired by the taking of captives brought back to Egypt throughout its campaigns. Foreign mercenaries serving in the New Kingdom Egyptian military could have contributed to the knowledge network (Figure 115). "The influx of foreign craftsmen into

[1366] Shaw 1996, 251
[1367] BAR 2, 34 – 35 § 81 and 85
[1368] For a general listing of spoil from campaign to campaign, see Morkot 2007, 174 and Spalinger 2005, 132 – 133
[1369] Redford 2003, 34 – 35

temple and royal service was considerable. They may have been of critical importance in the technological advances seen from the SIP onwards, particularly in areas such as metal working, arms manufacture, glass making and glazing, and may even have influenced artistic styles…".[1370] Therefore, the acquisition of military technologies and knowledge of their manufacture through plunder after a victory served a vital role in technology transmission throughout the ancient Near East.

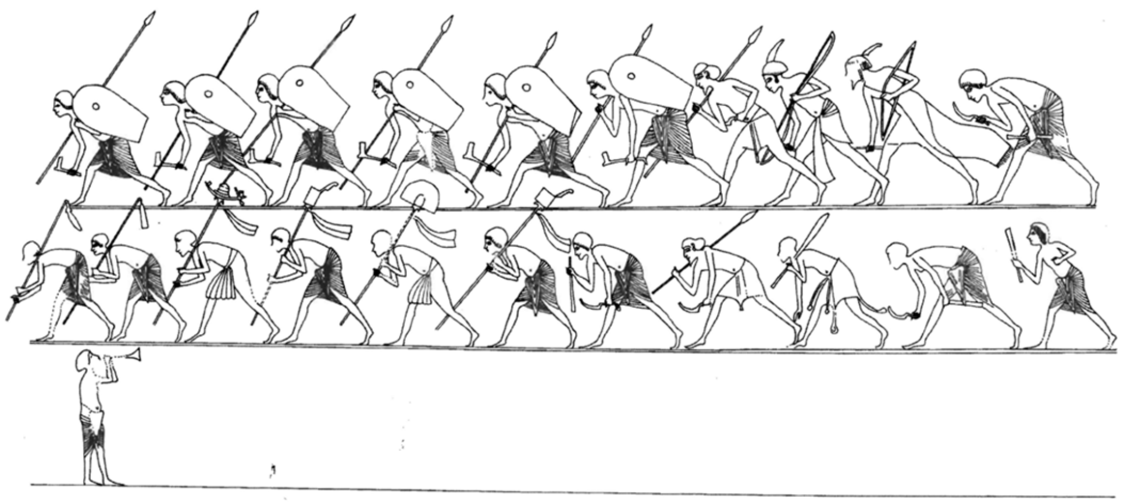

Figure 115 - Depiction of foreign auxiliaries (Asiatic, Nubian and Libyans) serving in the Egyptian military. Tomb of Ahmes, Amarna (Darnell & Manassa 2007, fig. 25).

The 'internationalism of arms' can be seen in archaeological material charting the geographic distribution of weaponry and military equipment. Research has focused on the remains of non-perishable martial artefacts such as bladed weapons and armour scales.[1371] These studies demonstrate that the use of a specific weapon type or military equipment was not the prerogative of any one particular culture (Figures 166 to 123). For example, the armour scale found at Kanakia, Salamis was stamped with a cartouche of Ramesses II, implying that this scale was part of a corselet manufactured in Egypt (Figure 118).[1372] Similarly, artefacts of shield-moulds in a "figure-of-8" shape were found at the Ramesside capital of Piramesses (Qantir).[1373] This shield-form has been attributed to the Hittites based on the scenes depicting the Battle of Kadesh (Figures 129 to 130). These examples attest to the production and exchange of defensive

[1370] Eyre 1987, 195. Similar to the Hittite use of captives, see Bryce 2002,100
[1371] Boatright 2012; Massafra 2012; Hulit 2002; Maxwell-Hyslop 1953; 1949; 1946
[1372] Lolos 2009, 31, 39
[1373] Shaw 2010, 80 – 81; Van Djik 2000, 301; Pusch & Rehren 1997, 128; Pusch 1993b, 140, 143; 1990, 104

equipment in the eastern Mediterranean during the LBA. In addition, the archaeological information indicates that weaponry followed a similar typology at different locations. The fact that manufacturing techniques were comparable across a wide geographic range, such as in the case of khepesh swords (Figures 120 to 123), it is probable that weaponry employed by Near Eastern armies was also used in similar methods.[1374] For instance, the majority of depictions and textual attestations in the Near East indicate that the chariot was used primarily as a platform for archery (Figures 124 to 128).[1375]

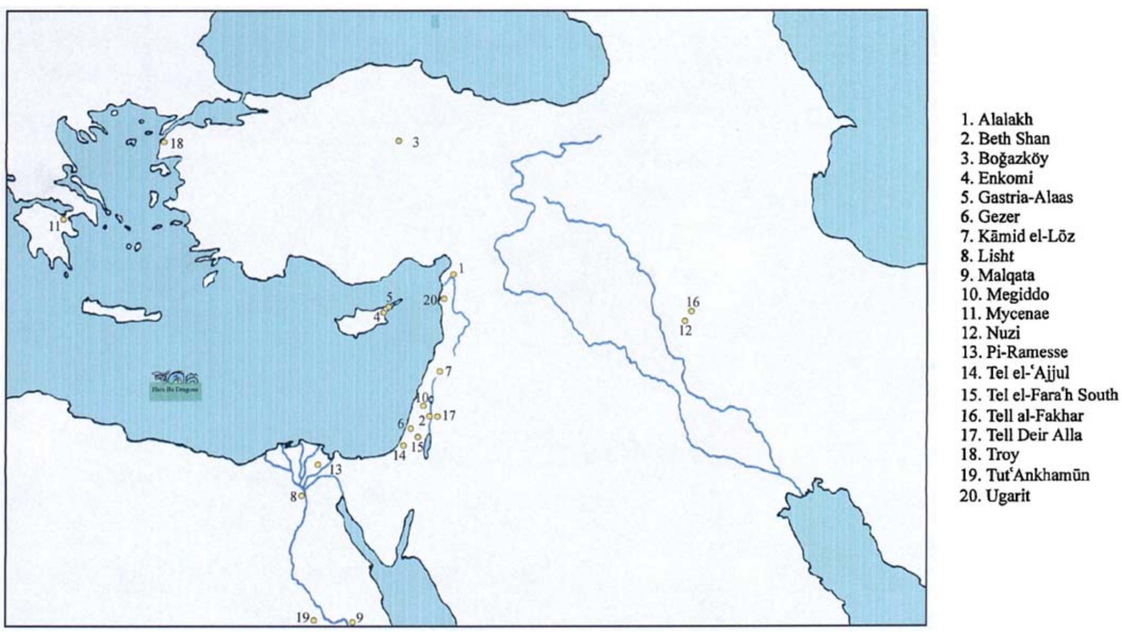

Figure 116 - Distribution of armour scales in the eastern Mediterranean (Hulit 2002, map 1).

[1374] Shaw 2012, 121 – 122. See also, siege techniques below (Section 6.2).
[1375] Archer 2010, 61; Spalinger 2005, 17; Beal 1995, 548; Drews 1993, 128; Houwink ten Cate 1984, 60; Littauer & Crouwel 1979, 63. For arguments against the use of spears from chariots, the so-called "Hittite method", see Wernick 2013; Littauer & Crouwel 1996.

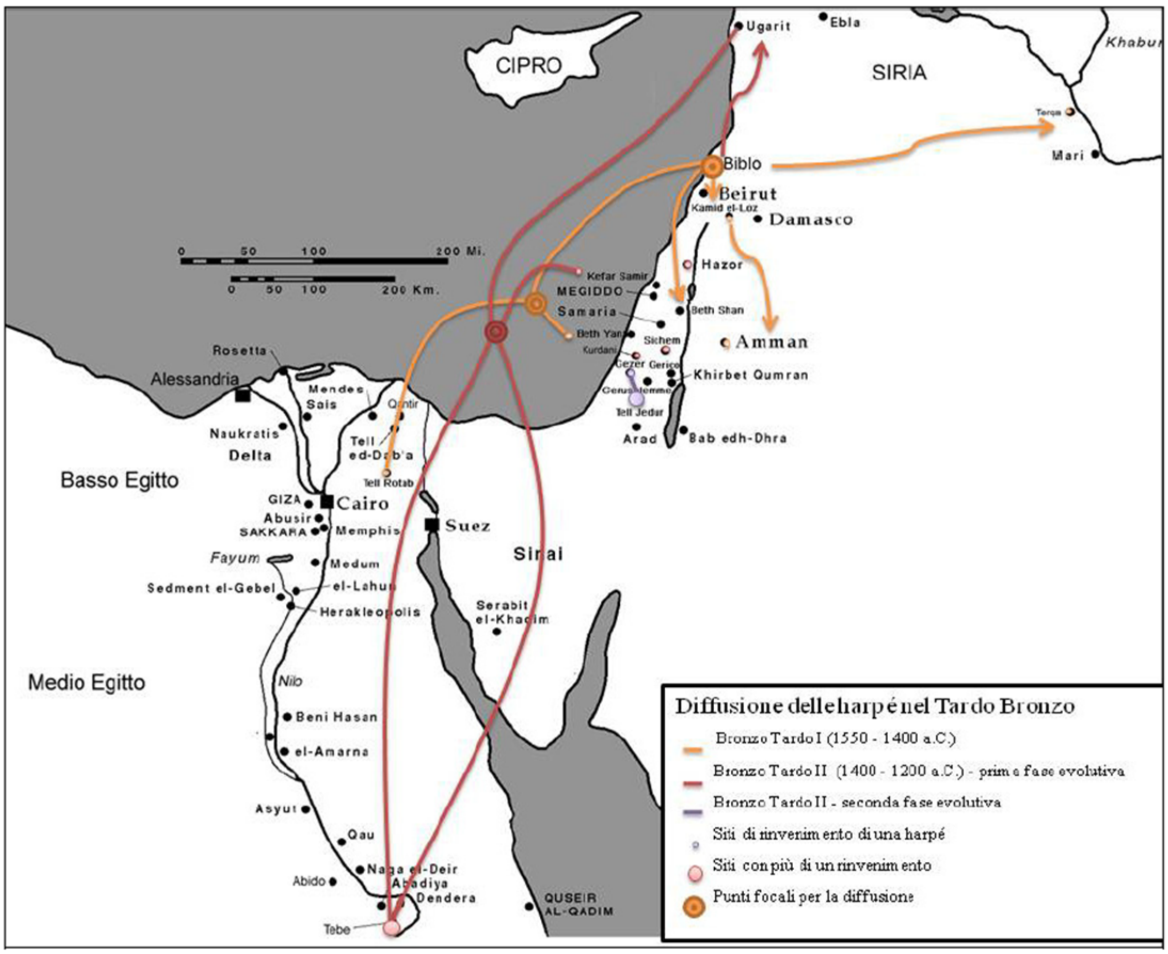

Figure 117 - Distribution nodes of khepesh swords in the eastern Mediterranean during the LBA (Massafra 2012, fig. 3.20).

Figure 118 - Armour scale stamped with a cartouche of Ramesses II on reverse. Found at Kanakia, Salamis (Lolos 2009, fig. 16).

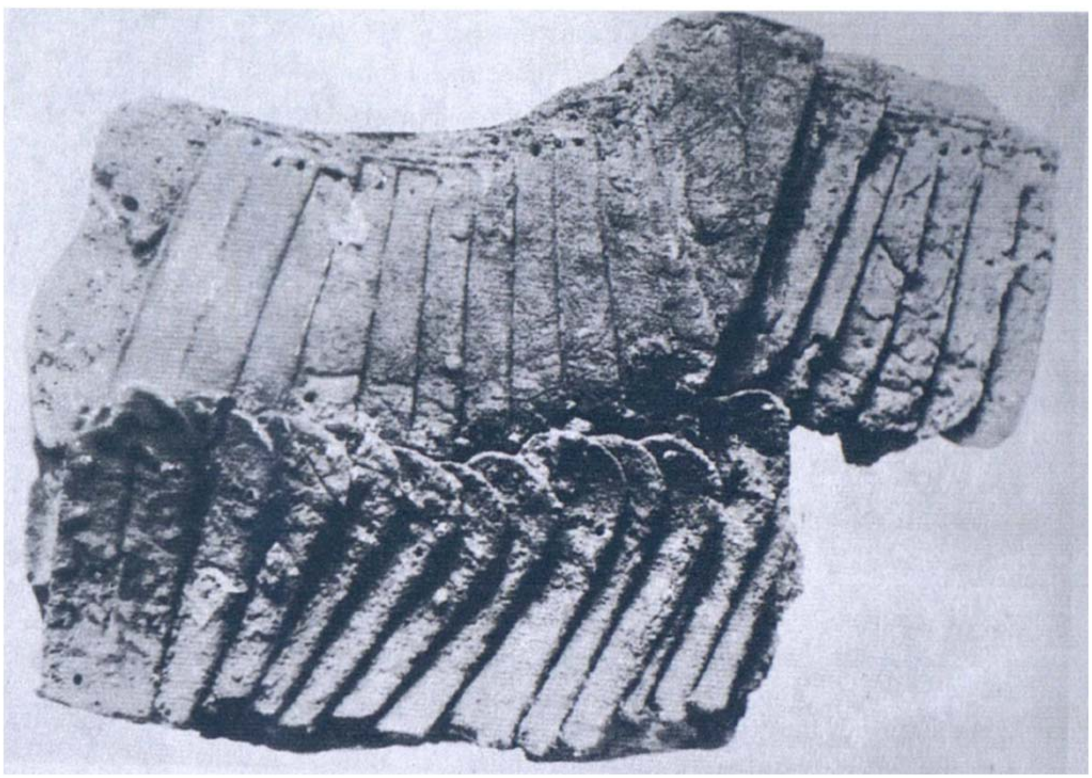

Figure 119 - Armour scales from Nuzi (Yadin 1963, 196).

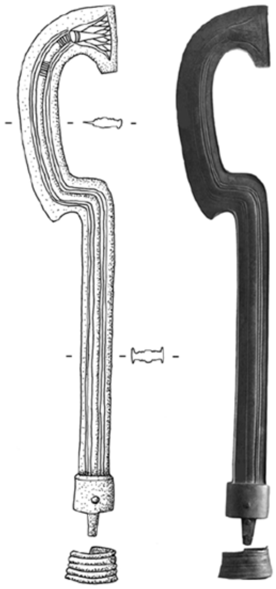

Figure 120 - Crooked khepesh from Abydos (Massafra 2012, 177 E.10)

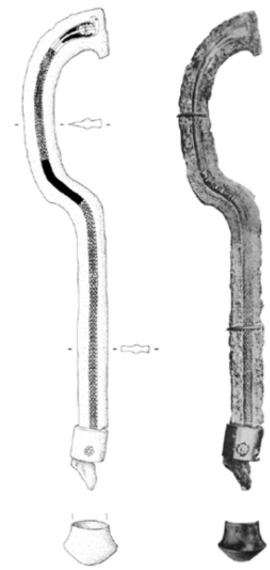

Figure 121 - Crooked khepesh from Byblos (Massafra 2012, 175 L.12).

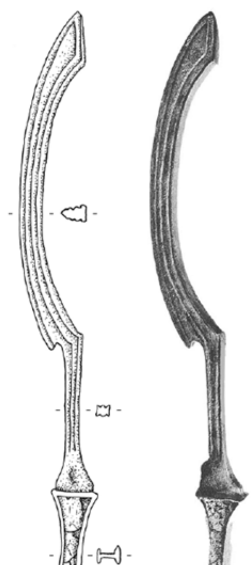

Figure 122 - Formalised khepesh from Ugarit (Massafra 2012, 187 L.24).

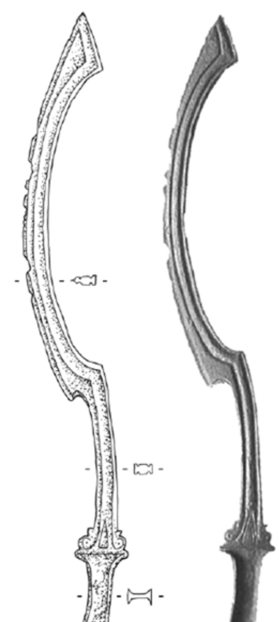

Figure 123 - Formalised khepesh from Tel Aphek (Massafra 2012, 189 L.25).

Figure 124 - Scarab of Thutmose I (BM 475).

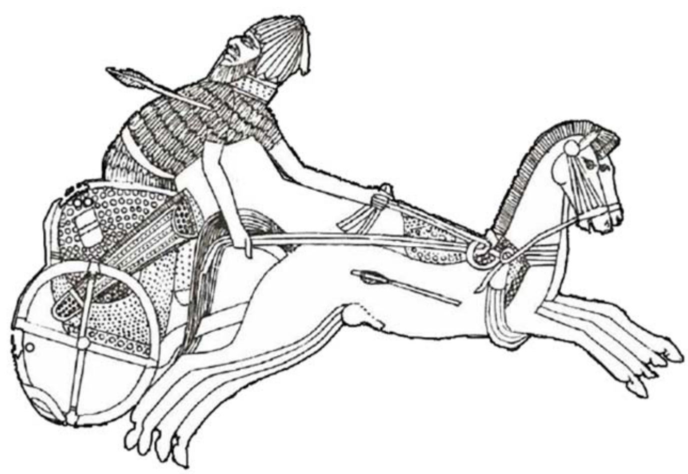

Figure 125 - Detail of a Canaanite charioteer wearing scaled armour, image from the chariot casing of Thutmose IV (altered from Yadin 1963, 192).

Figure 126 - Depiction of charioteer hunting with archery equipment, LBA II, Ugarit (Caubet 1991, 59 top).

Figure 127 - Gold signet ring impression of a chariot, Shaft Grave IV, Mycenae (Powell 1963, 160 fig. 41).

Figure 128 – Neo-Assyrian depiction of charioteer using archery equipment (BM 824167).

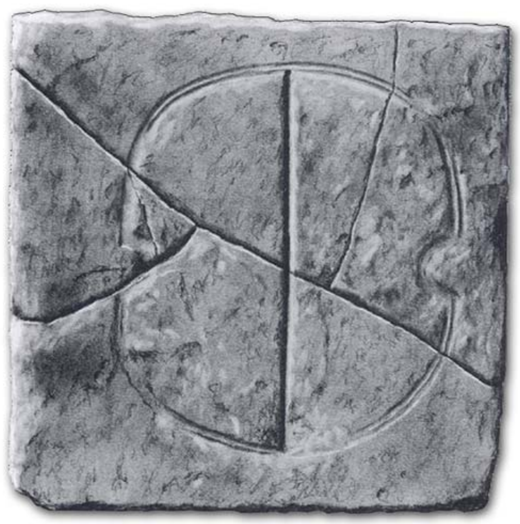

Figure 129 - Figure-of-8 shield mould (Q-1) found in a metallurgy workshop, Qantir (van Djik 2000, 300).

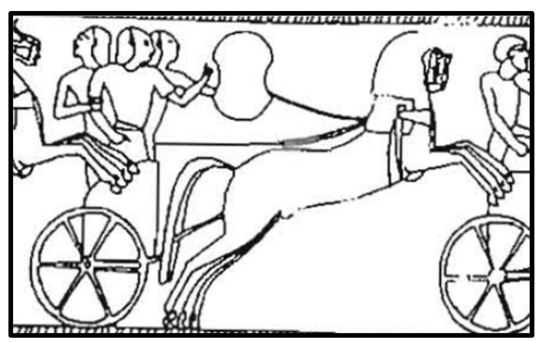

Figure 130 - Detail of a Hittite charioteer in the Battle of Kadesh (Pusch 1990, fig. 12).

The proliferation of similar weapon types argues that no one group could have solely held a distinctive advantage over another in military technology as the system of exchange and plunder dictated that cultures in the ancient Near East would have had some access to new and innovative features. The only foreseeable impediment to military equipment's manufacture would have been the possession of a palatial infrastructure. It also appears that there was no prejudice of adopting weaponry or military equipment from another culture to use in your own. For instance, in Pap. Koller, an Egyptian soldier is specifically instructed to bring along his javelin of the Khatti (Hittites).[1376] Many authors have also noted that the technical terms used to denote parts of chariotry have predominantly Asiatic origins.[1377] Canaanite understanding of chariotry is evident in Pap. Anastasi I in that the text described an Egyptian charioteer visiting a Canaanite-run chariot repair establishment.[1378]

Weaponry and defensive equipment, in itself, does not win wars. A comparison of the dimensions of weaponry demonstrates the military equipment of the New Kingdom Egyptians was relatively small (Figure 131). These dimensions are comparable to finds throughout the ancient Near East. For instance, spears found in Egypt can be correlated to the finds from Boghazköy as they are of similar dimensions and lengths.[1379] Other than the use of the bow, weaponry and military equipment depended heavily on the fighting strength of the user and by extension, the logistical network that supported him. Given the proliferation of similar weaponry types in the LBA Near East, we can see that there was no secret weapon or piece of equipment employed that would have given a tactical edge of one group over another. Crucially important was the ability to raise large enough numbers to ensure victory over another force. To support a large military on campaign, a sophisticated network of supply had to be employed. Therefore, victory is not exclusively determined by advanced military technology. On the other hand, being in possession of a sophisticated logistical system did not create hegemonial spheres; it merely means that a culture has the *capacity* to launch protracted wars. The motivation of Near Eastern rulers to extend their influence beyond their immediate domain played *the* major role in the creation of a hegemonial sphere of influence as the shift from the early 18th Dynasty campaigns to Thutmose III exemplified.

[1376] Pap. Koller, Line 1.6 (Caminos 1954, 431).
[1377] Shaw 2012, 103; Morkot 2007, 180 ft. 66; Moorey 2001, 8; Schulman 1963, 87 – 88. Similarly, Hittite terminology for chariotry was borrowed from Akkadian (Houwink ten Cate 1984, 57 – 58).
[1378] Pap. Anastasi I, Lines 26.1 – 26.9 (Gardiner 1911, 27 – 28); Shaw 2012, 99
[1379] Wernick 2013, 49

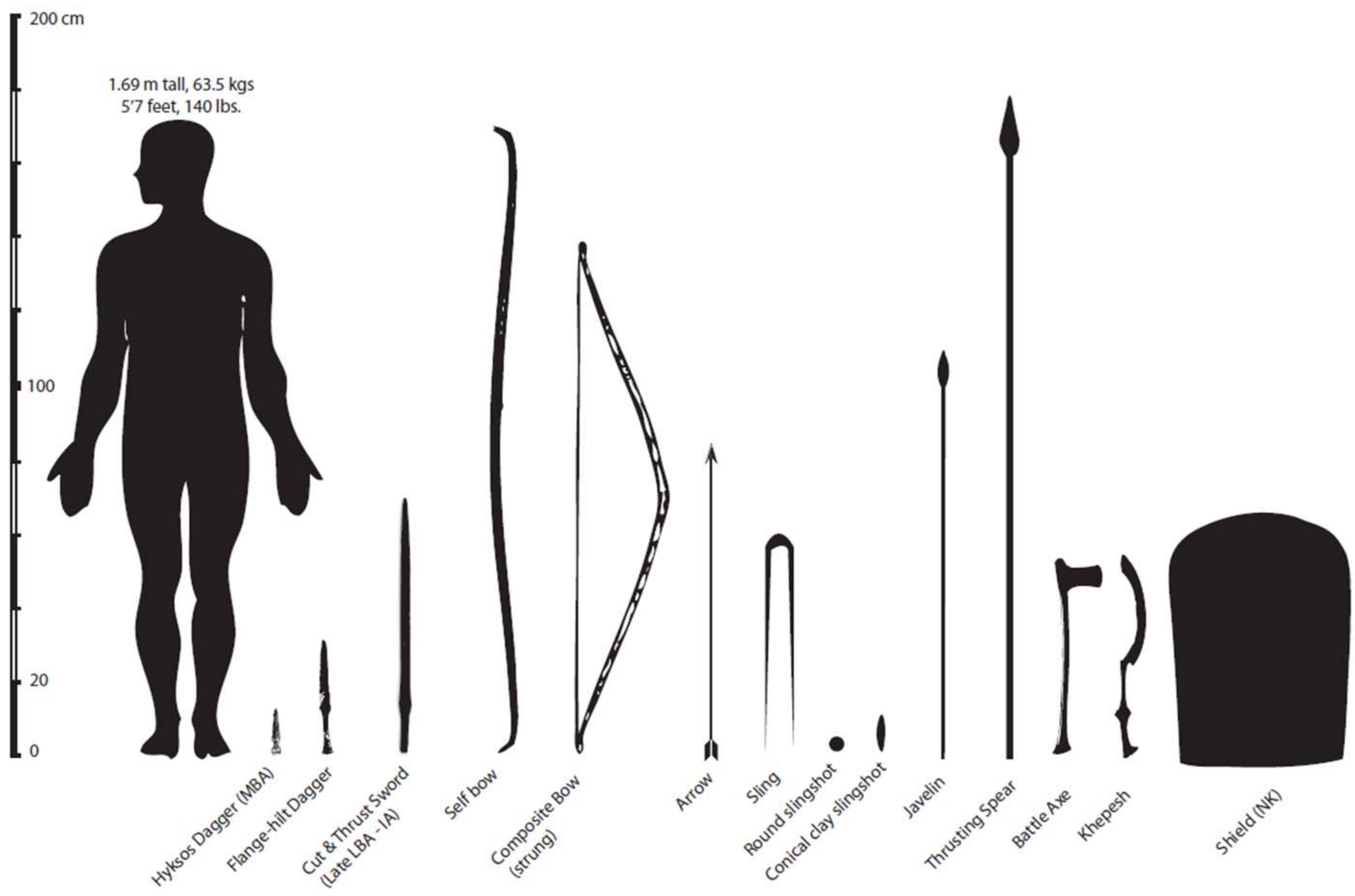

Figure 131 - Comparative dimensions of LBA weaponry and military equipment

6.2 The Importance of the Logistical Network in Sieges

In the LBA Near East, conflict was a way to extend the geopolitical influence of one group over another. By the successful extension of a sphere of influence through combat and subsequent oaths of fealty, the central power had a greater command of an economic surplus.[1380] In addition, the central authority would also demonstrate their divine investiture.[1381] By launching a successful campaign against an opponent, the victorious party had an ideological mandate and thus a moral justification for their conquest.[1382] Furthermore, the act of a conquered ruler declaring an oath not to attack the victor gave the central authority an ethical vindication to discharge military forces against the vassal should they break their promise.[1383] A critical aspect in the creation of an LBA hegemony relied upon the capitulation of settlements. With the submission of established centres, political control could be exerted according to the wishes of the central authority.

Before examining the evidence for siege warfare, we must define 'siege'. Eph'al's definition is succinct in laying out its general features:

> "Siege is a form of warfare in which one of the combative sides defends itself within an area delimited by a system of obstacles, while the opponent attempts to penetrate these obstacles and to engage in hand-to-hand combat, in which its superiority is assured. Unlike pitched battle, which is generally dynamic and brief and in which mobility plays a significant role, siege warfare is protracted and static by nature".[1384]

To this definition, we can add that there are active and passive strategies. Active strategies, or siege assaults, involve violent attempts at ingress of a fortified area. Passive strategy, involving a blockade of an area, is an attempt to claim a settlement through attrition although it may have active elements. Thus, 'siege' is a broad term that can incorporate both approaches to force surrender (Figure 132).

[1380] Bryce 2002, 100
[1381] Bahrani 2008, 189
[1382] Liverani 2001, 90 – 91
[1383] Bryce 2002, 113; Frandsen 1979, 175
[1384] Eph'al 2009, 1

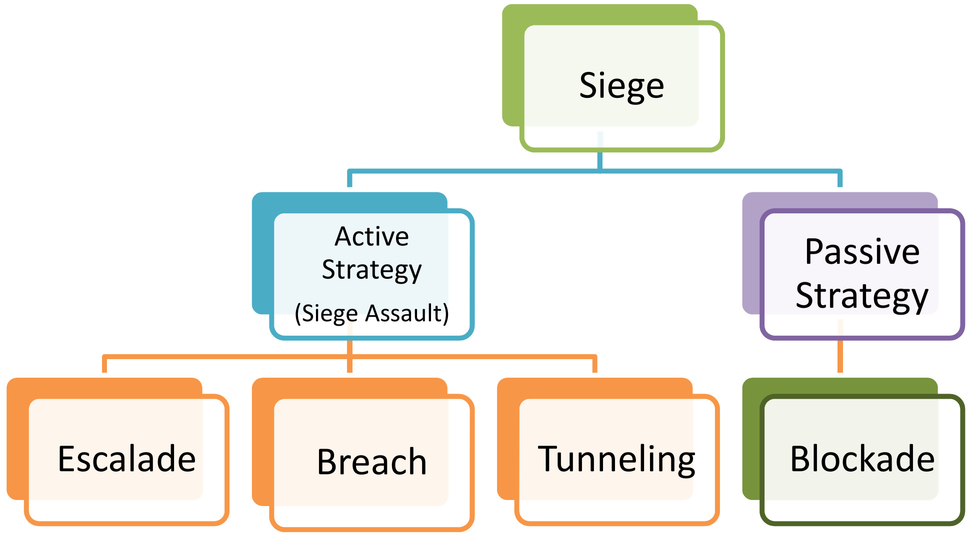

Figure 132 - Tactical options in besieging a fortified location.

Although one might tend to view LBA warfare as being primarily a clash of two groups composed of infantry and chariots in a pitched field-battle, siege warfare appears to have been the most common form of warfare during this period.[1385] Success in open-field battle might have been devastating for an enemy but, as Hannibal's not laying siege to Rome after the victory at Cannae showed, the capitulation of settlements meant real, lasting political victories. Like most aspects of military activity in the LBA, the references to besieged cities are brief and there are few details of how it was conducted.[1386] The two pharaonic texts that do mention sieges in detail are the Battle of Megiddo and the Piye 'Victory Stela'.

In artistic representations, three of the 19th Dynasty depictions of sieges display violent assaults against settlements through the use of massive scaling ladders and soldiers fighting upon the parapets of fortifications (Figures 97, 133 and 134). However, it is clear that after a review of the artistic material depicting warfare, that siege assault compositions are rare as the majority of scenes depict battle in the forefield of a settlement (Figures 135 to 138). Perhaps, escalade tactics were infrequently depicted because they were used rarely. As a rough calculation, based on heights of fortifications walls (Section 4.2.4.5.1), siege-ladders would have to be 18 – 22 metres long to reach the parapet.[1387] Therefore, the construction of siege ladders required a more complicated process to join the wood together to create beams

[1385] Burke 2008, 45; Hamblin 2005, 215; Warburton 2001, 155, 171 *contra* Fagan 2010, 94 ft. 36
[1386] Spalinger 2007a, 120; Bryce 2002, 100; Shaw 1996, 247. See also Shaw 2008, 124
[1387] Provided that there are no additional obstacles on the berm and to allow a Polybius secant to ensure it could not be pushed away from the wall easily (Eph'al 2009, 69 ft. 92).

of sufficient length. In addition, the use of the tactic would have marginalised an attacker's numerical superiority and would have resulted in a high number of casualties.

Figure 133 - Siege assault with scaling ladders against the city of Dapur, Ramesseum. Reign of Ramesses II (Heinz 2001, 278 no. IX.1).

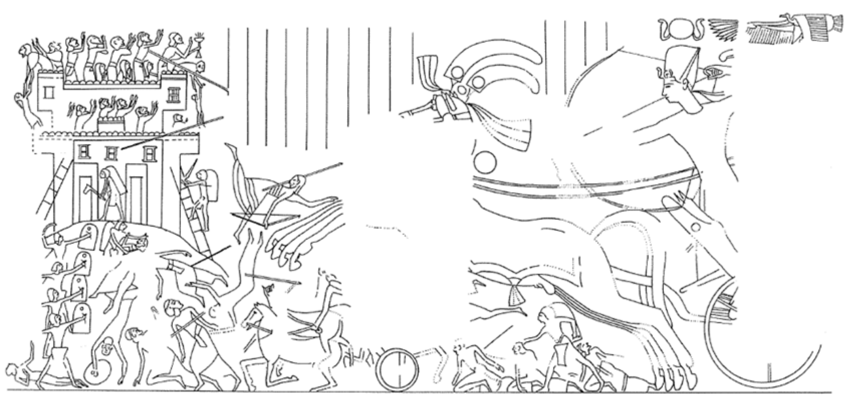

Figure 134 - Siege assault with scaling ladders against the city of Ashkelon, Karnak. Reign of Merenptah (Heinz 2001, 294 no. I.1).

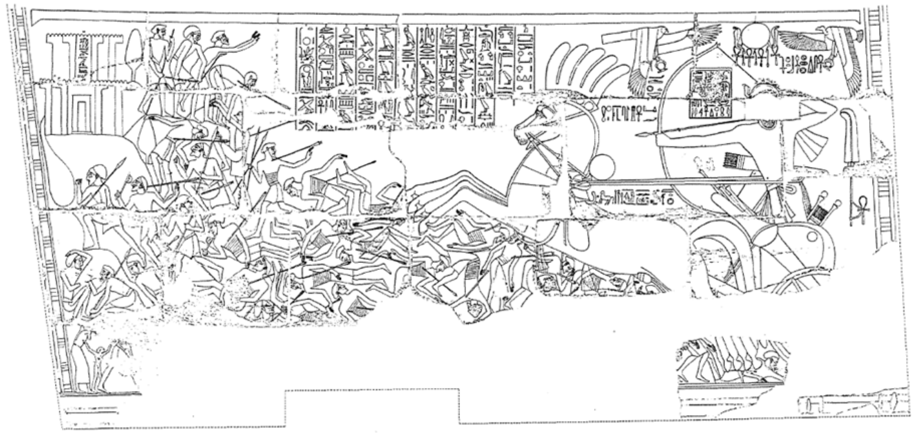

Figure 135 - Siege of Pa-kanaan, Karnak. Reign of Sety I (Heinz 2001, 243 no. I.3).

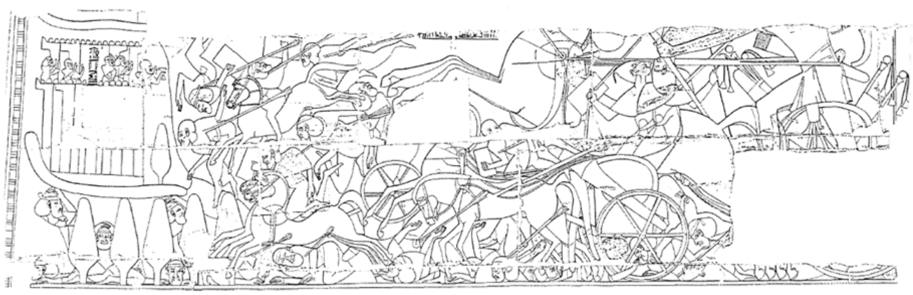

Figure 136 - Siege of Yenoam, Karnak. Reign of Sety I (Heinz 2001, 245 no. I.6).

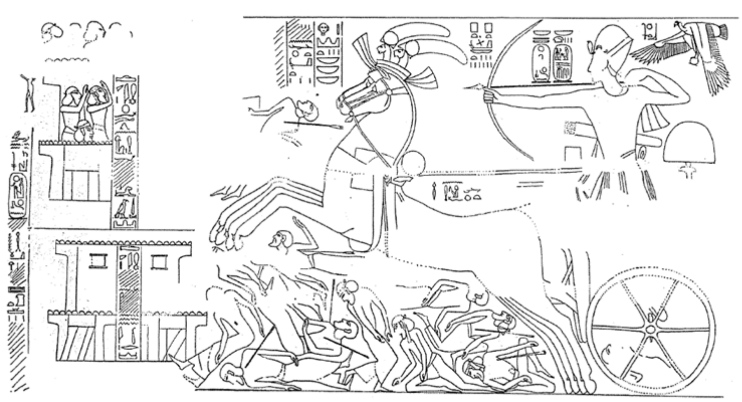

Figure 137 - Siege of […]rḏ-city and Mutir, Luxor Temple. Reign of Ramesses II (Heinz 2001, 266 no. VII.6).

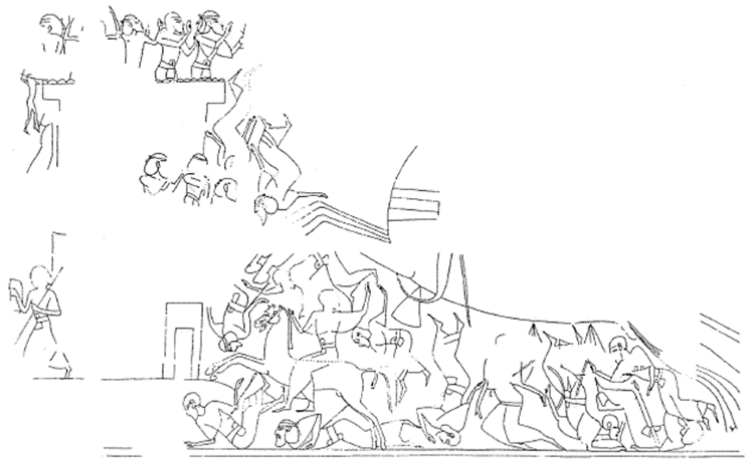

Figure 138 - Siege of Yenoam, Karnak. Reign of Merenptah (Heinz 2001, 296 no. I.7).

The artistic evidence leaves one confused about how frequently siege assault was used. When we review the textual record, it is clear that they were the exception. There is more evidence to indicate that the tactic of the blockading a settlement was the most frequent strategy. However, what about the 19th Dynasty scenes of battles outside of settlements? Considering that these siege depictions are usually carved on temple walls, the impetus for the ancient artist would have been to show the pharaoh in a valiant light by causing the surrender of cities through his raw fortitude and the wrath of his military, not through a long and dreadful act of attrition.

In assessing battle tactics, an issue arises since the impact of sieges upon the archaeological remains appears negligible. The study of sieges in the ancient Near East is essentially the study of corollary attributes in the archaeological material. A blockade is not likely to have left a permanent trace. There is physical proof that supplies ran down to dangerously low levels before surrender was offered by the settled population or, conversely, how the besieger had to return home because his supplies were depleted. Although we do have a mention of a blockade of the city of Megiddo (see below), it is clear that this was a temporary encampment that could have been dismantled when hostilities had ceased. Siege assaults, on the other hand, may have left some archaeological trace. It is the obligation of the excavator to show that the physical remains are evidence of a siege.

To illustrate the ambiguity of the archaeological evidence for sieges, consider an excavator uncovering a damaged gateway or large building in which the bricks show evidence of being scorched and the walls of the building have collapsed. If the excavator is influenced by a text mentioning a siege at the site, this material would likely be interpreted as evidence of an intense incendiary attack (conflagration). Then again, if there is no mention of the site ever coming under attack, this could be interpreted as evidence of an accidental fire. Such is the case for the gateway at Tell el-Borg (Section 4.2.5.5.2).

Similarly, the remains of human bodies that have died in conjunction with a destruction horizon at a site have often been identified as victims of a siege assault. The javelin head embedded in a segment of thoracic vertebrae from Ugarit (Ras Shamra) was used as evidence of the Sea Peoples' devastation of the Levant.[1388] Similarly, the group of bodies found at Shechem that were uncovered beneath the remains of a collapsed building, have been seen as evidence of an attack on the city in c.1130 BCE.[1389] The problem with these interpretations is that they rely tacitly upon the textual and artistic record. It shows the power of the textual and artistic record to fill in the voids of archaeological material. We must be mindful that much of the archaeological evidence for siege warfare is ambiguous, especially without corroborating documentation to assist in its interpretation.

In the LBA archaeological record, the evidence for siege assaults is mainly confined to a series of conflagrations at sites that correspond with the historical record.[1390] However, some siege tactics cannot be evidenced in the historical records nor in the archaeological material. Despite the claim of Yadin and Schulman that the use of the battering-ram was known to the Egyptians in the Middle Kingdom, there is no evidence in textual, artistic or archaeological material for its use during the New Kingdom.[1391] Similarly, the fortification walls being undermined cannot be seen in any written or physical records.[1392] As mentioned, the evidence for scaling ladders to allow soldiers to surmount a curtain wall have been shown pictorially in the 19th Dynasty battle scenes. To date, there is no evidence for such large ladders in the archaeological record. It is conceivable that all these methods could have been employed. However, the infrequency for such tactics and their lack of remains leave the matter open to debate.

It is clear that the capitulation of cities was critical to the establishment of the New Kingdom Egyptian hegemony. The vassalage of these cities meant that logistical support could be

[1388] Drews 1993, 186 ft. 52; Jarry 1939, 293 – 295
[1389] Barkay & Ussishkin 2004, Vol. 1, 358, 361. See also, Beth Shean (Mazar 2011, 160).
[1390] Bunimovitz 1995, 320 – 326; Ilan 1995, 314 – 315; Mazar 1992, 239 – 241; Weinstein 1981
[1391] Schulman 1982; Yadin 1963, 70; 1955, 29 – 31
[1392] *Contra* Burke 2008, 38 – 39; Hasel 1998, 247 – 248. For general description of later periods, see Eph'al 2009, 76 – 81.

requisitioned in the Levant and that this could take a considerable burden from the supply train (Section 5.4.4). Furthermore, the ideological dimension of dominion could have been a major motivation for the creation of the hegemony meaning that the pharaoh could boast that he was representing divine will on earth by having Canaanite vassals under his oversight. By extending the boundaries of Egypt's sphere of influence, he was demonstrating his right to rule.

The textual records demonstrate that blockade tactics were the most common form of siege warfare across the LBA Near East. An examination of blockades is important to the study of military logistics as it directly relates with the supply of forces while on campaign. Blockades are fundamentally a confrontation of two competing logistical systems. On one hand, the defender has to rely upon his stored supplies within a confined area. The attacker has to rely upon a supply chain network and provisions foraged within the vicinity. Blockades would test the resolve and capabilities of two opposing groups through aspects of hunger, thirst and instances of epidemics for both the besieged as well as the besieger.[1393] It is surprising that some academic researchers do not acknowledge blockades as an effective tactic to force the surrender of settlements in the LBA despite numerous references that verify its effectiveness.[1394] To demonstrate the usefulness of the blockade, our examination will consult material from outside of Egypt and from different time periods.

Blockades above all work because of their cumulative effect so, in some instances, they must be maintained for a long time to achieve a result.[1395] As Hasel has pointed out in his analysis of Egyptian military texts, it is rare that the Egyptian forces note their direct actions against fortified centres. Instead, the majority of military actions mentioned are taken against crops and orchards.[1396] The 8th campaign of Thutmose III recorded: "I took away their provisions and reaped their grain. I cut down their plantation and their fruit trees. Their territories have become wasted. My Person destroyed them, they having become denuded and scorched (land) on which there are no trees".[1397] We should not view Egyptian military actions taken against agricultural fields to mean that the Egyptian army was incapable of besieging a fortified location as crop destruction would have definitely affected the local Levantine population.

[1393] Eph'al 2009, 66 – 68. For evidence of the epidemics, see Bietak 1997, 105
[1394] Burke 2008, 31 – 43; Hamblin 2005, 215 – 236, 447 – 451; McDermott 2004, 43; Morkot 2003, 220 – 221; Schulman 1995, 298 – 299
[1395] Eph'al 2009, 35; Campbell 2006, 12
[1396] Hasel 1998, 87
[1397] Urk. IV 1231, 2 – 1232, 1 (Shaw 2008, 99 – 100).

Redford claimed that the Thutmosids were inept at siege warfare because of they focused on destroying the settlement's fields.[1398] This underestimated the effect that this would have on a settled population. In addition, he was critical of sieges taking up to 7 months without noting that many sieges in the ancient Near East were completed, on average, in this time (see below). The fact that we find attacks on agricultural fields and orchards in the conduct of the Neo-Assyrians would indicate that the destruction of agricultural fields was an effective tactic.[1399] For the most part, the destruction of the 'life-support' system would have been devastating not in the immediate blockade but for years to come. Damage to the orchards would have been especially devastating as they do not recover as quickly as grain-crops; they can take 10 years to recover their yields.[1400] A vassal from these affected areas would have found tribute obligations difficult to manage.[1401]

There are two main benefits of using a blockade as a siege tactic. One, blockades would have had little impact on the infrastructure of the settlement and, two, it would have allowed the besieging force not to endanger their forces other than to respond to sorties from the besieged. For cost-effectiveness, blockades were probably conducted as a primary means to neutralise settlements in the LBA as the attackers' risk was mitigated as long as logistical supply was secured. Although we might tend to perceive a blockade as a complete circumvallation of a settlement, an effective blockade can operate without the need for palisade walls and troops evenly spaced around the area in question. Bunimovitz noted that the New Kingdom Egyptians behaviour appears to have been: "…aimed at extracting the maximum possible tribute with the minimum effort (in the LBA Canaan)".[1402] Therefore, the tactical value of blockading a city should be seen as the first option for an attacking force.

In the case of the northern wars of the Theban 17th Dynasty, the failed attempt to end the Hyksos occupation by Kamose "calling out" Apophis should not be interpreted as though the Egyptians were incapable of besieging Avaris.[1403] Hoffmeier noted that the term used in the text of the siege of Avaris is actually  *ḥms* (Wb. 3: 96, "to sit").[1404] The use of this verb suggests that a blockade was employed. It is interesting to note that no destructions are detected at Tell el-Dab'a possibly suggesting that a logistical network was not firmly

[1398] Redford 2003, 239; 1992, 138 – 139, 219. See also, Hamblin 2005, 300; Bryce 2005, 72; Hoffmeier 1989.
[1399] Eph'al 2009, 52 – 53; Cole 1995, 29-40
[1400] Eph'al 2009, 54; Schulman 1964, 17
[1401] Ahituv 1978, 104 – 105 *contra* Na'aman 1981, 172 – 185
[1402] Müller 2011, 236; Morris 2005, 689; Bunimovitz 1995, 325. See also, Schipper 2011, 283.
[1403] Wilkinson 2013, 188, 505 – 506; Redford 1992, 127
[1404] Hoffmeier 1989, 183

established to supply the Theban forces at this time (and that a blockade would have little impact on archaeological remains).[1405] Warburton has suggested that after the Thebans broke off their blockade of Avaris, the Hyksos used the opportunity to make an organised withdrawal across the north Sinai and made their stand at Sharuhen in southern Canaan.[1406] The withdrawal to a Canaanite location reflects a dependence upon the aspects of supply. By relocating, the Hyksos were trying to stretch the supply lines of the pharaonic army while taking advantage of allied locales in southern Canaan for their own supply.[1407] The Ahmose son of Ebana text records the siege of Sharuhen.[1408] This siege was accomplished in 3 years and this would imply that the logistical supply network was still in its infancy. Winter seasons would have been a factor and might represent disengagements, similar to Hittite methods.[1409] In addition, it is possible that the Hyksos focused on the storage of goods to support their population in the besieged seasons.

Blockading a settlement was a very effective tactic to achieve military success. Although undertaken at times, violent siege assaults were not the *modus operandi* of besieging armies in the New Kingdom. Redford opted to view the Egyptians as being inadequate at siege assaults but I think that he may have underestimated the Egyptians' tactical abilities in lieu of tactical efficiency.[1410] By the time that the Egyptians had pursued the Hyksos rulers to Sharuhen, there was no need to press the issue of Hyksos capitulation. The Thebans had expelled and contained a hostile force. Undoubtedly, the nobility of Ahmose wished to consolidate Theban rule in the Delta to prevent a recurrence of foreign or rebellious independence. Kempinski has argued that Sharuhen should be equated with the archaeological remains at Tell el-Ajjul.[1411] If he is correct in this assertion and we consider the textual evidence, it would appear that the city fell to a siege assault after the defenders had been severely weakened by a blockade. The evidence for the siege assault can be seen in the remains of 'City II' and 'Palace 2' at Tell el-Ajjul which have indications of conflagration and installations built over the remains in the subsequent 18th Dynasty.[1412] Burke pointed out that there is a general lack of destruction levels in the southern Levant (east of Tell el-Ajjul) and the area was largely abandoned.[1413] Could we take these abandonments as an indication of blockades or attacks on agricultural fields as well?

[1405] Bietak & Forstner-Müller 2011, 28; Morris 2005, 28; Bietak 1996, 67; Hoffmeier 1990, 85
[1406] Warburton 2001, 160
[1407] *Contra* Hoffmeier 1989, 189
[1408] AEL 2, 13. This text also uses the *ḥms*-term.
[1409] Bryce 2002, 116
[1410] See ft. 1398
[1411] Kempinski 1974, 145 – 152. See also, Fischer 2004.
[1412] Oren 1997, 253 – 283; Tufnell & Kempinski 1993, 53
[1413] Burke 2010, 50 – 51

Possibly, but the matter will not be resolved on our current textual and archaeological information. Unfortunately, other than the length of time indicated to besiege Sharuhen, the text of Ahmose son of Ebana does not record the specifics of early New Kingdom siegecraft. Therefore, when it comes to the SIP–New Kingdom historical transition, we should acknowledge that both Avaris and Sharuhen were blockaded and that both of these ended with the tactical goals of the Egyptians realised.

It should also be remembered that the Battle of Megiddo ended in the capitulation of the "chiefs of the Retenu" after a blockade. However, in this instance, Thutmose III attempted to make a 'hermetic siege' that would provide better enfilading cover which made the besieged less likely to receive supplies from external sources.[1414] The Annals of Thutmose III describe the actions taken after the rout of the Canaanite forces,

> "They surveyed this town which was surrounded by a ditch and enclosed by leafy woods of all sorts of their fruit trees, while His Majesty himself was at the fort east of this town, stationed there and on watch over it by day and night…construction of a block-house provided with a sturdy circumvallation…dubbing it, 'Menkheperre-is-the-trapper-of-Asiatics'. Posting people for sentry duty at His Majesty's fortified camp, with the word: Steady! Steady! Wide awake! Wide awake!...not allowing by His Majesty's army that one of them (the people inside Megiddo) go outside this siege-wall except to knock at the door of their fort."[1415]

This text is repeated in various forms but it usually mentions the circumvallation wall.[1416] Megiddo, unprepared for a blockade and the influx of military forces, fell to the Egyptians within 7 months. This length of time corresponds to the Hittite sieges of Urshu and Sanahuitta that took 6 months to complete.[1417] This length of time probably relates to how much supplies had been stocked by the settled location and indicates that surrender would usually be given before the planting season. The numerous instances mentioning Thutmose III's circumvallation wall indicates that this was a truly a unique feat that established the aptitude of Thutmose III in siegecraft and its publication may have enhanced his standing as a capable ruler.[1418] However, if the construction of the palisade wall was a unique way of blockading a city, how could a blockade operate without it? No doubt the besieger could

[1414] Eph'al 2009, 35; Goedicke 2001, 86
[1415] Redford 2003, 31 – 33
[1416] 7th pylon at Karnak (Redford 2003, 121) and the Gebel Barkal stele (Redford 2003, 129 line 14 – 16, 149 lines 4 – 6, 109).
[1417] Bryce 2005, 72 – 76
[1418] See also Nebuchadnezzar's circumvallation of Jerusalem (Eph'al 2009, 38).

require a few locations to station his forces and rely on rapid deployment of military forces against would-be blockade breakers.

In such a scenario, it is plausible that the encampments of the besieger would require fast-moving mobile forces to intercept those trying to leave or enter the area blockaded. It is unlikely that such blockades operating without a palisade would have been capable of stopping *all* traffic but they definitely could have disrupted the movement of farmers, large groups and transports.[1419] It is evident in requests for Egyptian forces that chariotry was usually required for infantry groups on Levantine campaigns.[1420] Even in small numbers, this strongly suggests that chariots might have played a critical role in blockades. The vassal Biridiya of EA 243 stated the effectiveness of chariots in guarding areas: "By day I guard it (Magidda) from the fields with chariots, and by night on the walls of the king, my lord".[1421] Chariots would have been the fastest responding element of a military force in the LBA Near East. If one were to use chariots as a rapid response force in between siege encampments, it would avoid the cost in manpower and resources to build circumvallation walls. Thus, *contra* Yadin and Burke, chariot teams did take part in sieges and served a fundamental role in the blockade of a settlement and/or area.[1422]

Chariots appear to have been used in blockades throughout the LBA Near East as the Hittite text of the siege of Urshu (Warshuwa) specifically mentions that the settlement was surrounded by 80 chariots and 8,000 soldiers and that the Hittite force was instructed to prevent anyone from leaving or entering the settlement.[1423] The 'General's Letter' from Ugarit recorded that chariots were used to blockade the area of Amurru for 5 months.[1424] Interestingly, the author indicated that half of his chariot forces are along the coast and the rest are located in the foothills of the Lebanese mountains demonstrating that chariots were also used in rugged terrain.[1425]

The Amarna Letters suggest that blockades were the preferred mode of attack upon a city and that either settled vassals or semi-nomadic groups could have employed this tactic.[1426] The 'Apiru employed this method to harass Byblos (Gubla) by stationing troops close to the

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[1419] Eph'al 2009, 35 – 36
[1420] EA 11.13 – 18, 51.7 – 17, 55.16 – 24, 59.25 – 28, 76, 78, 107.37 – 48, 180. Especially, EA 88, 127, 131, 132.
[1421] EA 243.8 – 22
[1422] Yadin 1955, 24; Burke 2008, 31
[1423] KBo 1.11 obv. 13 – rev. 36; Beal 1992, 144; Bryce 2005, 72 – 73; Eph'al 2009, 39
[1424] Izre'el & Singer 1990, 23 line 15
[1425] Izre'el & Singer 1990, 23 lines 18 – 19
[1426] Bunimovitz 1995, 327

entry portals to the settlement and depriving the inhabitants of their livelihood.[1427] Rib-Hadda could not send his inhabitants into the countryside: "For lack of a cultivator, my field is like a woman without a husband.", and petitioned Egypt to send military forces.[1428] Blockades were not contingent upon walls as a besieging force could harass a settlement and essentially wait until the food supply was depleted. "(A)s for Sumer, the war against it is severe, and it is severe against me (Rib-Hadda). Sumer is now raided up to its city gate. They (the besieging 'Apiru) have been able to raid it (the countryside), but they have not been able to capture it (the fortified centre)".[1429] In a similar vein, Biridiya mentioned how Lab'ayu conducted his campaign against Magidda and how an epidemic gripped the besieged: "…Lab'ayu has conducted war against me. We are thus unable to do the plucking (and) harvesting and we are unable to go out of the city gate because of Lab'ayu…Look, the city is consumed by pestilence…".[1430] This can be compared to Abi-Milku's lamentation of the lack of potable water: "… indeed the ruler of Sidon, Zimredda, is hostile to me. Daily he does not permit me to fetch water. I cry out…there is no water for them (the inhabitants) to drink…".[1431]

To shed light on aspects of blockades, we should consult material from later periods. The 'Victory Stela' of Piye (Pianky, 747 – 716 BCE) from the 25th Dynasty demonstrates the effectiveness of blockading a city to ensure their capitulation.[1432] In the opening of the stela, the reader is told how Tefnakhte, the despot from the Delta, besieged Heracleopolis with a circumvallation wall to enhance a blockade. "Behold, he besieges Heracleopolis, he has completely invested it (by circumvallation or the like) not letting the comers-out come out, and not letting the goers-in go in, fighting every day. He measured it off in its whole circuit, every prince knows his wall; he stations every man of the princes and rulers of walled towns over his respective portion".[1433] Similarly, Piye also used blockades: "Let not the peasants go forth to the field, let not the plowman plow…".[1434] Piye even constructed a circumvallation at Hermopolis and took the city within 5 months.[1435] The description of the effectiveness of the circumvallation is described in detail: "An embankment was made, to enclose the wall; a tower was raised to elevate the archers while shooting, and the slingers while slinging stones, and slaying people among them daily. Days passed and Hermopolis

[1427] EA 75, 87, 88
[1428] EA 74 see also EA 81
[1429] EA 106
[1430] EA 244
[1431] EA 146; Moran 1992, 232
[1432] Cairo Museum No. JE 48862; BAR IV, 406 – 444 § 796 – 883; AEL 3, 66 – 84
[1433] BAR IV, 420 § 818 and 425 § 833; AEL 3, 68
[1434] BAR IV, 421 § 821; AEL 3, 69
[1435] BAR IV, 427 ft. C

was foul to the nose without her usual fragrance".[1436] In the later part of the stela, when the capture of Memphis proves to be formidable due to the rebel's high stock of provisions and the (re)made fortifications of the curtain wall, some of the soldiers opted to blockade the city instead of using a direct assault.[1437] Although this text is from a later period than our current study, it is clear that the utilisation of the blockade was an effective tactic to force the capitulation of cities. Indeed, the fact that the soldiers of Piye's army wanted to blockade Memphis rather than attempt an assault with siege ladders demonstrates the blockade had the added benefit of keeping the attacking military forces relatively intact, provided there were enough supplies to outlast the besieged.

Blockades in the LBA could be conducted with a high degree of tactical impact. The textual instances of blockades are much higher than that of any other siege tactic. Therefore, until new evidence comes to light, we should view the seizure of cities in the LBA as being more of a "waiting game" in which the victor was the most sufficiently provisioned and had greater stamina. It is unfortunate, however, that the evidence of such blockades in the archaeological record is negligible.

6.3 Discussion

The creation of the hegemony in the New Kingdom has usually been characterised by the Egyptian military's adoption of the chariot, composite bow and scaled armour. Through a war of liberation of the Hyksos, this 'tripartite association' is often invoked as being the stimulus that allowed the Egyptians to campaign into southern Canaan. However, after an examination of the religious aspects of ancient warfare, we find something different.

The introduction of new weaponry and military equipment obviously had an impact on the ancient military but these technologies were not seen by the New Kingdom Egyptians or their Near Eastern contemporaries to be the root of their success. Their victory in battle was attributed to divine sanction as well as their ideological and moral mandate to conquer foreign territories. This was not seen as a barbaric act of aggression but was articulated in keeping with the cosmic order or *ma'at*.[1438] By gaining victory, the king was demonstrating his right to rule in the eyes of his people as well as in the eyes of the gods.

[1436] BAR IV, 427 § 842 – 843
[1437] BAR IV, 433 – 434 §859 – 865; AEL 3, 75
[1438] Shaw 2008, 122

Since they viewed themselves to be distinctive from other cultures, groups in the LBA Near East did not portray enemy armies to be their equal. Instead, they portrayed enemies as conniving as they employed the use of ruses and lies to achieve their aims. The threat these enemies represented to 'civilised' centres was not they had access to military technology that the other did not. Similarly, defeat in battle was never due to a lack of a piece of particular weaponry or military equipment. It was seen as the disapproval of the gods. By keeping in the gods' favour, a ruler could assure his people victory by observing moral and righteous behaviour in warfare. Moral justification was most important for rationalising warfare. The employment of new and sophisticated weaponry was not seen to have helped secure victory over the opposition.

Despite the perceptions of Near Eastern rulers about technology, it is clear from a variety of sources military technology was traded widely throughout the Near East during the LBA. That these cultures saw the root of victory in the hands of the divine and not in earthly tools, probably facilitated this trade as there is no evidence any technologies were circumscribed in the international network of exchange. The fault of technological determinism to explain sufficiently how one group came to dominate another through the sole use of technological means demonstrates it is a theory that can be dismissed as not applicable in the LBA Near East.

Features which had tactical merit in weaponry and military equipment would have quickly been replicated throughout the LBA provided civilised centres had access to a palatial infrastructure for their manufacture. Subsequently, an 'internationalism of arms' took place in which many armies of the LBA Near East were equipped with similar weaponry to that of their enemies and allies. The work of Morkot illuminated the instances of exchange within the Armarna Letters and although this is a confined set of textual documents, the archaeological evidence across the eastern Mediterranean, shows a progression towards a homogeneity of weaponry and military equipment in the LBA.[1439] Moorey pointed out, that in addition to material artefacts of warfare being traded, we should also consider individuals would have been travelling in the ancient Near East and probably would have disseminated knowledge of weaponry in these place. The supply of plunder from successful battles and the captives brought back to Egypt to work in temple and royal workshops would also have contributed to this knowledge exchange. Since the efficiency of weapons depended highly upon the fighting strength of the individual soldier, his health factored into his ability to fight and thus, demonstrates the importance of the logistical system supporting him.

[1439] Shaw 2012, 112; Morkot 2007

For the creation of the Egyptian hegemony, the capitulation of settled populations was paramount for military success. With the surrender of a city's ruler, the Egyptians maintained not only a moral justification to go to war with a vassal should they oppose Egyptian interests, but they also would have extended their political influence. In such a way, these vassals became an integral part of the logistical network in providing supplies, intelligence and materiel to assist an Egyptian campaign force. Therefore, to establish this advantageous network of vassals, Egyptian military forces focused on the subjugation of cities through siegecraft.

The archaeological evidence for siegecraft in the LBA is very slight. Although, the texts of the New Kingdom and the 19th Dynasty battle scenes indicate it was a relatively common aspect of campaigning in Canaan, the physical evidence of sieges in the archaeological record is difficult to detect. Excavators rely upon textual and artistic evidence for the interpretation of the remains to be indicative of a siege at the site. There will always be some ambiguity in the archaeological record for what we can interpret as siege evidence. There is no direct physical evidence of sapping the foundations of walls or the use of the battering-ram in LBA material in Canaan. Siege-ladders are depicted in Egyptian artistic scenes but a comparison with the textual instances of sieges indicated sending a force up a ladder during battle was not a common tactic.

When we examined the evidence for tactics in siege warfare, we found the most common tactic in sieges was a matter of logistics; the blockade. The blockade has the major benefit of leaving infrastructure intact. In addition, the use of the blockade meant the besieger could keep his forces relatively intact provided the supply chain achieved basal standards of sustenance. Blockades did not always have to rely upon the erection of circumvallation walls as they could also be conducted by using chariots to sweep areas in between infantry encampments. By disrupting the flow of goods and basic agricultural activities, the besiegers would have been striking at the heart of the supplies of the besieged until the only option was to surrender. Blockades depended heavily on the supply of both parties. The fact that blockades were used across the LBA Near East, indicated the tactics involved were widely understood and shared, but deployed with varying degrees of success. It is reasonable to conclude the armies of the LBA Near East did not rely upon superior weapons or innovative siege tactics. An effective logistical network and strategy were the primary factors in achieving victory and establishing dominance.

Chapter 7: Conclusion

This thesis explored the significance of the logistical aspects of the New Kingdom Egyptian military in the Levant. Although, there have been some scholarly attempts to investigate how the fighting capacity of the Egyptian military was affected by physical constraints, the focus in this literature on New Kingdom combat was comprised either as an examination of the textual material or a confined analysis of martial equipment. Although these studies illuminate such aspects of ancient Egyptian warfare, few attempts have been made to integrate archaeological remains and compare it with the textual material. Both types of data must be consulted to form a comprehensive theory on how military campaigns were conducted in the Levant.

Due to the nature of logistical infrastructure and its associated aspects, this thesis necessitated an interdisciplinary approach to elucidate how logistics would have impacted Egyptian campaigns. The range of data to be consulted in an examination of logistics can be overwhelming. Thus, for the sake of space constraints, this thesis selected three themes, which together provided the most information about New Kingdom Egyptian military logistics:

- Egyptian-held fortifications in the north Sinai and in the Levant
- The maintenance and movement of campaign forces
- Military technology exchange and siege tactics

All of these areas are integral to understanding the operation of the Egyptian military in the LBA Levant. There are problems with each type of evidence examined. However, utilising an interdisciplinary approach mitigated the drawbacks in order to answer the following research questions:

- To what extent do the archaeological sites, along the route into Canaan, reflect aspects of Egyptian military logistics in the LBA? Do the remains of these sites differ from the Egyptian-held sites in the Levant and if so, what are the implications?
- What would have been the physical constraints on an Egyptian campaign force in the Levant? How did the Egyptian military approach questions of supply on a campaign?

- How did the New Kingdom Egyptians attribute their success in military campaigns? Was their victory due to technological developments in weaponry and military equipment? Do siege tactics reflect the importance of logistics?

To examine these questions, the historical background was presented to place ancient Egyptian military logistics into context. The motivations for going to war in the Levant comprise a variety of factors. As the Smith-Kemp debate illustrated, these motivations were an interplay of ideological and economic considerations that had varying weight depending on each ruler's objectives. Accordingly, the policies of the New Kingdom pharaohs in their relationships with the Levant were not static and thus, neither were their objectives in military campaigns. However, the importance of the study of military logistics illustrated how the overall use of coercive power was employed in the Levant and by extension how the Egyptian hegemony during the New Kingdom was maintained.

7.1 Results

Logistics comprise how the New Kingdom Egyptian army went to war, the tactics they employed and how infrastructure was established to maintain political control in the Levant. This does not marginalise the impact of the development of LBA technologies in weaponry and military equipment. Rather, the exploration of military logistics enabled an examination of how one group came to dominate another and how the physical constraints affected military capabilities in the ancient Near East.

Archaeological sites along the Sinaitic route suggested logistical factors played a significant role in the establishment of fortified centres. By assessing the logistical limitations of the New Kingdom military, the sites' locations demonstrated that the Egyptian administration was conscientious of environmental factors of the eastern Delta, north Sinai and the Levant. The archaeological evidence indicated in the reign of Thutmose III (or shortly before his reign), a network of resupply was established so campaigns could be facilitated into the Levant with greater frequency.

The site's primary function was to monitor the immediate environs and provide a system of fast and efficient communication across the area. As such, it was not a necessity for the sites of the Sinaitic route to be heavily fortified. In the eastern Delta, Tell Heboua's use of satellite centres and Tell el-Borg's placement at the edge of the southern lagoon meant that garrisons could monitor avenues of travel. The locations of the sites also indicated they were critical to logistical factors of the army in that they were strategically located and served to store provisions.

Based on the current archaeological evidence, Bir el-‘Abd would have been the first major location for resupply after the departure from the eastern Delta. Being located roughly 3 days away from Tell Heboua, the site’s location corresponds to the maximum time a donkey could travel without water. As noted in the remains of the cistern, the evidence pointed to a reliance on communication with the site before a campaign force could make the overland trek and depend on the site’s resources for resupply.

The two sites of Haruba demonstrated a divergent layout and reflected the changing policy in the Egyptian administration’s dealings with the Levant. From the devastation of the early 18th Dynasty campaigns in Canaan and the frequent campaigns of Thutmose III, the area had been pacified to the extent logistical bases could be established without the need for fortifications. The presence of a fortified enclosure at Site A-289 and its reduced focus on the storage of goods indicated this installation was superseded in logistical duties but was still necessary for communications with the Egyptian administration.

Tel Mor is representative of an Egyptian-held site in the Levant. Like other ‘governer’s residences’, these were small buildings that did not possess fortifications and appear to have functioned as storage facilities. Contrasting the sites with Egyptian centres in Nubia, we found this represented a divergent political policy that focused on efficiencywithout having large operating costs in supplying substantial bases and garrisons. By launching a series of campaigns with devastating impact, the Egyptian authorities governed by the implied means of power through the threat of force. However, when subjugated vassals attempted to assert their independence, the Egyptian administration usually responded with a military force that relied upon rapid deployment.

For these campaigns, compliant vassals served a critical role in the administration of the area as they were vital sources of intelligence to potential threats. In addition, vassals would have been relied upon to store supplies for the approaching Egyptian force. Due to the active participation of Levantine vassals and that Egypt did not rely solely on military or economic factors, the term ‘hegemony’ should be utilised to describe Egyptian control.

Predominant in this hegemonial system was the use of naval transport that could have supplied goods in a more efficient manner than overland caravans. Unfortunately, the geomorphology of the area has eroded the coast of the northern Sinai and southern Levant.

Therefore, it is unlikely the remains of mooring locations can be uncovered without significant cost in underwater excavation. Nevertheless, this thesis demonstrated how naval transport would have been a viable option to transfer goods and materiel. The importance of shipping is indicated by the concentration of LBA sites along the southern coast and navigable rivers. The significance of naval traffic is also reflected by the earlier recovery of the Canaanite seaboard than the highlands as the MBA-LBA transition depopulated the area. Shipping would have been important for the transport of materiel and vital lines of correspondence.

The requisitioning of goods in the Levant played a prominent role in relieving the burden on the logistical network of the Egyptian military. The seasonal timing of campaigns and the differential harvest season between Canaan and Egypt meant that the Egyptian military had an advantage over Levantine polities. This, taken in conjunction with the discrepancy in population during the New Kingdom between the two areas, would have been a major obstacle to Levantine vassals claiming independence.

Exact figures for nutritional requirements are difficult to determine. Environment and levels of exertion can dramatically change the necessities needed to remain in optimal health. Although this thesis examined the range of requirements through the use of Dietary Reference Intakes and modern veterinary data, it is clear the ancient documentation stated low figures for calorific intake. To evaluate the capabilities of military forces during the LBA, logistical calculations can be attempted but the results have to include a variety of factors and assumptions. Alternatively, this study recommends that calculations present results in ranges to reflect the complexity of sustenance for a campiaging force.

The exchange in military technologies was shown to be a wide-spread phenomenon throughout the eastern Mediterranean which created armies with similar armaments. Consequently, the philosophy of technological determinism has demonstrated an unsatisfactory theory for causing the creation and maintenance of the Egyptian hegemony in Canaan. Thus, if different military forces were armed with the same weaponry and military equipment, how did particular groups come to politically influence a wide geographic area? It is apparent that organization and administration would have been a prevailing factor in the operation of LBA militaries. If Near Eastern groups could raise large numbers of troops and supply them at long distances, they could force the capitulation of settlements to their authority. Besides demonstrating the authority of the king from an ideological standpoint, the conquest of settlements was central hegemonies as subjugated centres would have added to the logistical network and the military could increase its geographic operating range.

The level of physical activity and nutritional requirements impacted the tactics that were employed in the Levantine theatre of war. Although we tend to view the Egyptian military in a constant state of physical exertion by marching long distances and fighting battles, the majority of sieges used blockade tactics to sufficiently compel the capitulation of settlements. Blockading forces would not require a high calorific intake for the duration, as a soldier containing a population inside a circumscribed area would have had a low activity level for most of the time. In the contest of two opposing logistical systems, blockades would have relied heavily on factors of supply to determine their outcome.

7.2 Limitations and Implications for Future Research

This study represents a first step in the establishment of a baseline for ancient Egyptian military logistics. Logistical factors influenced when and how campaigns were conducted but it is evident that more research is required.

Although it seems doubtful at present, this logistical examination would have been more complete if access to archaeological material in the eastern Delta and north Sinai was unrestricted. Given the problems with security, archaeological projects in the area are not likely to be proposed in the near future. In addition, the sites are currently threatened by the el-Salam Canal reclamation effort. If more investigations into this area are not undertaken, it is possible that Oren's analysis will be the only archaeological investigation of the north Sinai. Thus, any future attempt to explore and record the archaeology of this area is important to the study of pharaonic warfare and moreover to the preservation of its heritage.

In addition, a more thorough investigation of comparative Near Eastern material should be conducted in order to gain insight into logistical concerns of ancient armies. Although this study has utilised some data from other fields, it becomes apparent that a synthesis of the Near Eastern material is necessary to further develop the information on logistics from New Kingdom Egyptian sources.

As suggested in the examination of pharaonic Egypt's population estimates, new research is needed to assess this topic. Butzer claimed that his study was conducted to encourage further investigations but negligible progress has been made to either confirm or refute his analysis. Although the methodology of this new study would be difficult, it would be advantageous for future investigations of Egyptian military personnel and would have implications for the subjects of ancient administration and economics.

This study attempted to assess the physical stature of a typical male serving in the ancient Egyptian military. Although the procedure employed is a good foundation for the study of military logistics in the New Kingdom, additional scrutiny of ancient Egyptian stature is warranted. As noted in the analysis of pack animals, further examination is needed to establish the range of requirements of animals that would have travelled with the Egyptian military. This study had to utilise data on a variety of breeds of horses, donkeys and oxen that might not have existed in the ancient world. More information is required to determine which breeds would have been accessible to the New Kingdom Egyptians.

7.3 Final Remarks

A range of factors should be incorporated into a study of ancient military logistics as it is recognised that the complexity of the material in relation to the Egyptian hegemony in the Levant. Although investigations of weaponry and military technology are a legitimate field of inquiry, an isolated study cannot necessarily explain how the use of coercive force and its implied use was utilised to establish political control. By employing a more broad-based interdisciplinary approach, we investigated how the ancient Egyptian military depended on a logistical network to operate beyond its borders. New Kingdom Egypt was able to extend its geo-political dominance to its greatest height in pharaonic history through its use of a sophisticated logistical network.

Glossary

Glossary of Fortifications and Tactics			
Term	**Specific Features**	**Alternate Name**	**Definition**
Arrow Sail		Sail	A defensive apparatus used by defenders to counteract arrow attack. A piece of sturdy textile was affixed to a T-shaped wooden frame and positioned so the incoming arrows would be intercepted before they hit their intended targets. The use of such devices is unknown in the archaeological record but Burke (2008, 37) does mention that there may be a depiction of such a device being used in Rameses II's Siege of Dapur scenes on the outer walls of the Temple of Luxor (possible arrow sail seen on Wreszinski. Atlas II, pls. 72 107). This might not have been a defensive feature but a standard of the settlement.
Bastion			A salient feature beyond the main body of the curtain wall. It is usually much larger than a tower. The term originates with triangular forms in Renaissance fortifications. However, in the context of the ancient Near East, there are two varieties: ovoid and rectilinear (see below). A bastion may be confused with the term 'tower' as they share many architectural features. Burke (2008, 65) commented on the designation as being different from a 'tower' in that had a face wall of more than 20 metres in length. This defensive structure may 'straddle' the curtain wall; projecting on both the exterior and interior sides of the curtain wall.
	Face		The frontal wall of a bastion facing towards the exterior side. The exterior that attackers would see from the outside.
	Flank		The side walls of a bastion that project outwards from the curtain wall.
	Cavalier		Although no evidence of such architectural features exist (due the modern preservation levels of ancient fortifications), it is a raised platform, usually in the middle of a bastion, that allows for communication for defensive strategies against attack (presumably, a higher-ranked officer would be issuing orders to defenders).
	Flat	Rectilinear	From a bird's eye-view, a bastion with a rectangular layout.
	Round	Ovoid	From a bird's eye-view, a bastion with an oval or semi-circular layout.
Battering Ram			A siege vehicle that is designed for breaching city walls by the use of a 'ram' which is articulated to be pulled or pushed back to generate momentum to dislodge masonry from a wall or structure. There is no physical evidence for these vehicles being used in the ancient Near East; only textual and artistic data attest to their usage. Most academic discussions on this vehicle usually include a description of the use of the 'siege pole'.
Berm			A Roman term to refer to the flat area between the slope of an escarpment and the foot of the rampart. Thought to be kept clear of obstacles to facilitate defenders to have a clear-shot of attackers attempting an attack. Additionally, this flat are would counteract 'slipping' or a wall or an earthen embankment into a ditch or towards the slope of a tell.
Blockade			A strategic manoeuvre of attackers to disrupt the flow

Glossary of Fortifications and Tactics			
Term	**Specific Features**	**Alternate Name**	**Definition**
			of goods and communications to and from a settlement. The strategy is to deprive the inhabitants of a target settlement of food and calling for reinforcements/asking for aid. Due to the nature of some centres having massive fortifications, this was an acceptable strategy to get a centre to capitulate without the need to risk an attack that might fail with heavy losses.
	Circum-vallation	Circumvent	To completely surround a city in a blockade. The term could be extended to include the building of temporary palisades and fortification features (such as ditches, hills, etc.) to inhibit the inhabitants freedom of movement and subsistence activities.
Breach			A hole or collapsed section of a fortification caused from attacking forces. Usually used in the context of fortification discussions, to mean the successful result of using a battering ram against a wall.
Conflagrate		Incendiary Attack	The military use of uncontrolled burning to threaten human life, health, property (including structures with wooden elements and or housing goods) or ecology (for the destruction of crops or combustible resources to deprive a settlement of trade and subsistence activities).
Counterscarp			The casing of a ditch which is opposite to the curtain wall. The raised area before a fosse.
Dead Ground		Dead Space, Dead Area	An area in which an attacker could take cover, against the curtain wall or a feature of the curtain wall, from the defenders' attack because of geometry angles that could not allow a defender to return fire without being exposed to attack themselves (Figure 147).
Embrasure			An opening in a defensive wall that permits a defender to fire against attackers.
	Loophole		This is a more elaborate version of a straight hole in the wall for defensive firing. This feature employs the use of multiple channels (usually two in number) to provide a variety of angles to facilitate a wall's defence.
Enfilade			The tactical surrounding of an attacker against a city wall and to expose them to fire from defenders. For ease of use, this term is employed to mean the area between salient features on a wall; to expose an attacker to multiple angles of attack.
Escalade		Scaling	An attacking siege strategy that uses climbing devices (such as ladders, ropes, etc.) to ascend the face of a defensive wall. The ladders to perform such acts have only been observed in ancient artistic representations (Atlas II, pl. 58f, 151).
	Siege ladder		A ladder, usually built in a more robust fashion, with the intended purpose to ascend a wall. The tomb of Kaemheset at Saqqara (Dynasty 6), depicts a siege ladder being used with wheels to facilitate the movement of the ladder into position.
Escarpment			The exterior slope of a tell. The raised area which fronts the exterior from the bottom of a fosse to the foot or a curtain wall or the summit of an earthen embankment.
Fire Plan			A prearranged plan for defensive missile attack. This strategy can be employed to counteract dead ground areas against attackers.
Forefield			The area before formal fortifications. The area in which an invasion force would encounter first and, presumably, launch their attack from.

Glossary of Fortifications and Tactics			
Term	**Specific Features**	**Alternate Name**	**Definition**
Fortress		Fort	An actively defended fortified area of limited space designed to house military personnel on active service (Wright, 1985, Vol. 1, 206)
	Internal	Secondary	An internal fortress is one that rests within the native area of control to secure the government/power structure in the case of invasion or foreign powers and/or maintain civil order within the country/city. In the case with Levantine defensive strategies, a fortress (usually on a small scale) intended to complement a main centre's defences and ensure the defence of a surrounding territory from invasion. They would usually be positioned about 30 km (a day's travel distance) from the major centre (Burke, 2008, 123).
	Foreign	Imperial	A fortress that is founded in areas which are not considered to be under the native power's ruling authority but under hegemonic control. The purpose of these fortresses could be to maintain civil order over a subject people and/or ensure the flow of resource items to the ruling authority's country.
	Frontier		A frontier fortress is positioned on the edge of a ruling body's territory. The main purpose of these fortresses is to monitor traffic coming into the area under control and restrict access to incoming parties that have been deemed either as undesirable (being a disruption to harmony of governance in the lands) or dangerous (a threat to the security of the ruling area). Conversely, these fortresses also monitored individuals leaving the area of immediate control (such as in the Story of Sinuhe). Much like an internal fortress, these fortresses provided the main line of defence against invasion.
Fosse (pl. 'Fossae')		Ditch	A depression or 'dry-ditch' that would be excavated with the purpose to impede the progression of attackers to the curtain wall or summit of the rampart. This contrasts with the Medieval notion of the 'moat' which is a depression that was filled with water. For the purposes of this study, a fosse does not have to encircle a set of fortifications to be deemed as such.
Gateway			A passage that allows for passage into and out of a set of fortifications. In the levant, they are usually the most elaborate architectural entity (Wright, 1985, Vol 1; 191, 198-199). They are also the most fortified unit of the fortification strategy (Figure 143).
	Portal		This term relates with the main passage; the space in which inhabitants and visitors would use to gain access in and out of the settlement.
	3-toothed	6-piered	A gateway layout that originated in the MBA. From a bird's eye-view, the gateway is usually composed of two flanking towers(sometimes these towers are referred to as 'ressaults') that have 3 protrusions or pilasters facing the interior of the passage (2 towers provides us with a total of 6 protrusions or piers). These protrusions have been debated if they provided the vaulting for arches or square lintels displayed in Egyptian art of fortified centres. Where the masonry is preserved high enough, there may be evidence of a small aperture for the 'locking beam' of a door. This type of gateway was replaced by the 'Solomonic gateway' in the Iron Age (a type of gateway that possesses 8 piers).
	2-toothed	4-piered	The precursor of the 6-piered gateway layout. This

Glossary of Fortifications and Tactics			
Term	**Specific Features**	**Alternate Name**	**Definition**
			type of gateway does employ, usually smaller, towers and has two protrusions or piers on their inner face of the main passage way. Thought to have developed in the late EBA. At some sites, it is clear that design was still in use in the LBA (like those at Akko, Ashdod, Ashkelon, etc.).
	Postern		A small , secondary gateway passage that was intended to be used for 'foot and hoof' traffic (Burke 2008, 71) and were usually not accompanied by defensive features (this has led to speculation that these types of gates were hidden in some fashion). It is unknown how this was employed on a practical level in LBA; if the passage was only used in emergency situations or in the case of daily traffic.
	Bent-Axis		A gateway passage that redirects traffic into another direction (usually at right-angles or a U-turn). It is designed to check the speed of the entry party and, according to Vitruvius, to expose an attacker's flank to the defenders attack (exposing the unshielded, right-hand side). However, bent-axis gateways in the Levant are orientated a number of directions so it is undetermined if their primary layout was taking a defensive strategy into account.
Glacis			The intentionally engineered slope of a tell that was prepared against erosion and/or defence; usually described as a 'casing' for the tell composed of weather-resistant materials. Originally it was considered that they were covered in plaster but this was called into question by Burke (2008, 55) given the large escarpment of some sites (Jericho, Hazor, etc.). This term is not to be confused with 'rampart'.
	Toe	Foot	The area of a glacis that connects with the base level of the ground, or in cases where the glacis ends abruptly along the slope of the tell, the terminus end away from the curtain wall.
Hoarding			A Renaissance term for a wooden gallery that was cantilevered on the parapet of a wall to assist defenders in observation and attack of those attacking at the foot of the wall. The hoarding would provide cover for the defenders as they leaned over the wall to attack.
	Machicou-lis	Machicoula-tion	A wooden cantilevered firing platform on the outward side of a fortification wall that possesses apertures for firing downwards that were situated in the floor. This feature would have provided cover for the defenders against attackers at the foot of the wall. Their use is mainly speculated upon (Yadin 1963, 20) since none have been preserved in the archaeological record.
Intervallum			A Roman term for a perimeter road that follows the interior side of a curtain wall. This feature was a prominent in Roman frontier fortresses to facilitate the deployment of defending forces to particular sections of the wall. Their use in the ancient Near East is somewhat problematic, since very few sites have been systematically excavated to the extent that such a road could be detected at a certain stratum (Figure 141).
Killing Zone			The presumed area in which a defender could give missile fire to an attacker in front of the curtain wall without exposing himself to direct attack.
Mantelet			A shield that was specifically engineered for siege attack. A mantelet would be much larger than hand-

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Term	**Specific Features**	**Alternate Name**	**Definition**
			held versions and, possibly, much heavier. These types of barriers would provide cover for attacking forces against fortifications. Their New Kingdom use is mainly speculated upon by their inclusion on Rameses II's siege scenes of Dapur (Atlas II, pl. 107)
Materiel			The equipment and supplies relating with trade and/or military campaigns.
Merlon			A component of the parapet of a wall that provided cover for defenders after they had fired through an aperture. There is scant archaeological remains for these features but representations of fortresses often include them. There are two main design types; the stepped (also called 'crow-stepping'), and the triangular (semi-circular).
	Crenellatio n	Battlement	A collective noun for reference to a series of merlons and apertures.
Multiple Trace		Outworks	The employment of a series of walls, ditches, slopes to impede an attacking force that is seen as in the foreground of the main city wall. Additional obstacles or pits before the curtain wall.
Orientation			
	Salient		A feature that projects outward, usually in reference from the curtain wall.
	Distal	Outwards	A term to delineate traits that are away from the main body or entity. The term is used in context with a particular feature (Figure 142).
	Medial	Inwards	A term to delineate traits that are toward the main body or central-line of an entity. The term is used in context with a particular feature.
	Interior		A term used to refer to the area within a settlement. In the terms of a wall's face, it refers to the surface that faces the defender's side or a central-point of a settlement.
	Exterior		A term used to refer to a feature outside of the main curtain wall (towards the forefield). In the terms of a wall's face, the surface that is exposed to the attacker's side.
Parapet			The uppermost summit of a wall. This includes wooden hoarding and crenellation.
Rampart		Embankment	An earthen mound piled up around a settlement or camp. However, this can refer to a earthen embankment at just part of the site. Unlike a glacis, a rampart is seen as separate because it does not involve the heavy use of erosion resistant materials but can be composed of composite fill materials.
	Foot	Toe	The distal end of a rampart that usually comes in line with the base level of the ground floor.
	Fill		The core material of the earthen embankment which may be homogenous or composed of a variety of materials.
	Freestand-ing		An artificial earthen embankment that possessed an internal and exterior slope; giving the site a 'crater-like' look (Burke 2008, 48 – 49). The difficulty in locating these types of constructions comes from subsequent occupational levels that could fill with the middle depression (the disappearance of the interior slope).
	Walled		A rampart that had a wall surmounting it (with its core deep within the embankment or tell).
	Supple-mental		Additional sections of ramparts added to already vertically-elevated sites. These were sometimes constructed to get a rectangular layout of the site and/or provide more of a surface for the city's

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Term	**Specific Features**	**Alternate Name**	**Definition**
			inhabitants to expand and build upon (not just for fortifications but may include domestic structures as well).
Sapping		Tunnelling, Under-mining, Mining	An attacking siege strategy that uses mining under the defender's fortifications with the purpose to either cause a collapse in fortification structures or to provide a subterranean passage way for the attackers to enter the defending settlement. The use of such technique is very difficult to determine archaeologically and no conclusive proof was found other than at the remains at Paphos, Cyprus (Maier & Wartburg 2009, 7 – 8).
	Sap-head		The digging end of a tunnel when conducting an under-mining operation.
	Descent of ditch		The angle in which a sapping tunnel ascends to the curtain wall or the base level of the settlement.
Siege pole			A large lance used in sieges to gore or to interfere with the settlement's defenders on top of the parapet. Representations only see this device as being used in combination with a tortoise to provide the operators cover. This type of device can be seen at some tombs at Beni Hassan (Newberry1893, Vol. 1, pl. XIV (BH 2), Vol. 2, pl. V (BH 15), pl. XV (BH 17).
Terre pisée		Beaten Earth	A mound or feature that was constructed by packing earth into a mould or frame. This is a mistakenly use of the term in that it has no archaeological evidence supporting this technique either in Egypt or in the Levant.
Tortoise			A mobile structure and/or vehicle that would provide cover for attackers. For this thesis, it differs from a mantelet in that this was designed to protect against multiple angles of attack. The tortoise would have been employed for actions of initial sapping, siege pole attack and other strategic activities.
Towers			A salient feature beyond the main body of the curtain wall. In the traditional sense of the word, a tower is meant to stand above the wall-walk (this is seen on a few Egyptian representations [i.e. – depictions of Kadesh (Atlas II, pl. 83-89)]). Tower structures are usually sunk into the rampart but do not necessarily have to be a part of the curtain wall. They differ from bastions in that they are less than 20 metres on their frontal face (Burke 2008, 65). There is no evidence to suggest that towers housed heavy artillery in the ancient Near East (if evidence comes to light that Near Eastern defenders did employ such devices, the term 'batteries' should be used). Towers could be situated to be 'straddling' the curtain wall (salient on both interior and exterior sides) or be 'engaged' (salient on the exterior side only). The main strategic use of towers was that defenders had a higher ground to observe and attack dead ground areas (Kempinski 1992b, 127). Towers could be used as defensive fall-back points should the enemy successfully scale a wall (Figure 144).
	Face		The frontal wall of a tower facing towards the exterior side. The exterior that attackers would see from the outside.
	Flank		The side walls of a tower that project outwards from the curtain wall.
	Square	Rectilinear	From a bird's eye-view, a tower with a rectangular layout.
	Semi-	Ovoid	From a bird's eye-view, a bastion with an oval or

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Term	**Specific Features**	**Alternate Name**	**Definition**
	circular		semi-circular layout.
	Ressaults		The flanking towers of a gateway passage. Usually included in discussions of a gateway as a single entity.
Turret			A structure that is engaged with the curtain wall. They have many features in common with a tower but differ in the sense that towers begin at ground level in fortifications while a turret's socle begins on the wall-walk.
Walls			A feature of relatively uniform thickness that encloses a space. The term is quite hard to define in the sense that it had significant construction developments throughout the ancient Near East. To deem a wall as a 'fortified' usually rests with the context of the site. A wall can be seen as a means to impede the ingress of attackers while facilitating the egress of the defenders. For the most part, the top portion of walls do not preserve in the archaeological record so we must carefully use artistic representations to determine what the parapet looked like.
	Curtain	Enciente	The surrounding main fortification wall around an area. A stretch of wall connecting defensive features such as bastions, towers and/or gateways (Wright 1985, Vol. 1, 176).
	Retaining		An internal wall (within a rampart) designed to hold back a fill, usually of earth and stone, from a structure or area. Retaining walls prevent downslope movement from erosion and provide support for elevated mounds or slopes. The term is used to denote structural support for Levantine mounds and tells.
	Revetment		Much like a retaining wall but the term is used exclusively for walls built at the foot of a rampart (Figure 146). Revetment walls were usually better constructed than retaining walls due to their constant exposure to the elements (Burke 2008, 55).
	Batter	Talus	The pronounced outer slope of the lower part of a wall. The use of the term 'battered wall' has come to mean a wall sloping towards the median (Figure 145).
	Buttress		A pilaster or pier projecting from a wall to reinforce it. These architectural features provide a means to counteract the lateral forces upon a wall. Buttresses should be interpretated as structural (non-defensive) entities and not confused with the term 'tower' in site defensive plans (Figure 140).
	Socle	Base	The terminus end of a wall connecting with either the ground or a foundation.
	Solid		A wall composed entirely of material. The term can be applied to walls composed of a variety of materials. This term specifically denotes a wall that does not house chambers of any sort for individuals to fit inside of. However, a wall can still be considered to be 'solid' if there are embrasures perforating the wall.
	Casemate		A wall constructed by erecting 2 masonry walls (for the external surfaces) and infilling it; crosswalls (walls would be erected laterally through the wall) would provided additional strength. It has not been determined if this architectural feature was employed in the Levant in the LBA. However, the method was employed at the Hittite capital of Boghazköy (Nossov

Glossary of Fortifications and Tactics			
Term	**Specific Features**	**Alternate Name**	**Definition**
			2008, 10 – 11) (Figure 139).
	Salient and Recess	Jogged / Indented Trace	A wall that was constructed in sections and sections are intentionally offset from a neighbouring section; giving the wall a look or protrusions and indentations. This type of wall construction appears to be a development in the MBA and LBA. The indentations are, on average, 50cm deep. Interestingly, the salient and recessed wall was pointed out by Wright to not have included towers in defensive perimeters at sites that employed them (Wright 1985, Vol. 1, 178 – 179).
	Flat	Uniform Trace	A wall constructed in a uniform method (without sectional divides between defensive entities such as towers). This type of construction is mainly confined to the EBA in which curtain walls had a tendency to become very thick. The salient and recessed wall design is thought to have superseded this type because long stretches of an unstayed wall are inherently unstable and have a tendency to list & collapse (Wright 1985, Vol. 1, 177).
Wall-walk			An access road or path which is on top on a fortified wall or embankment. It is assumed the width of these wall-walks were at least 3 metres across to facilitate the passage of two armed men.

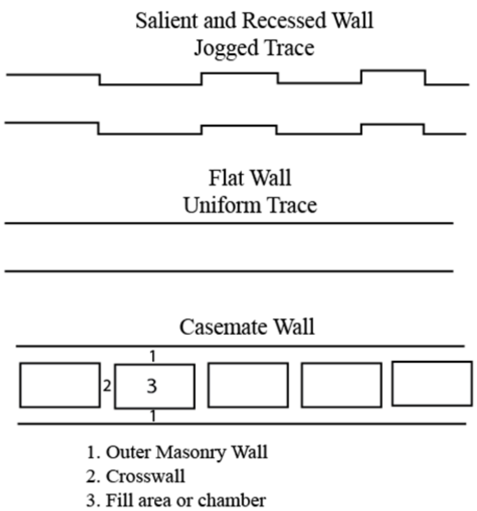

Figure 139 - Types of wall construction.

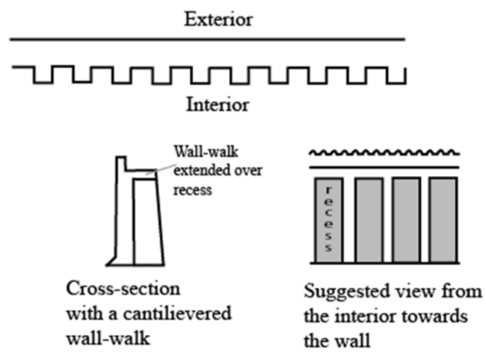

Figure 140 - Reconstruction of an internally buttressed wall.

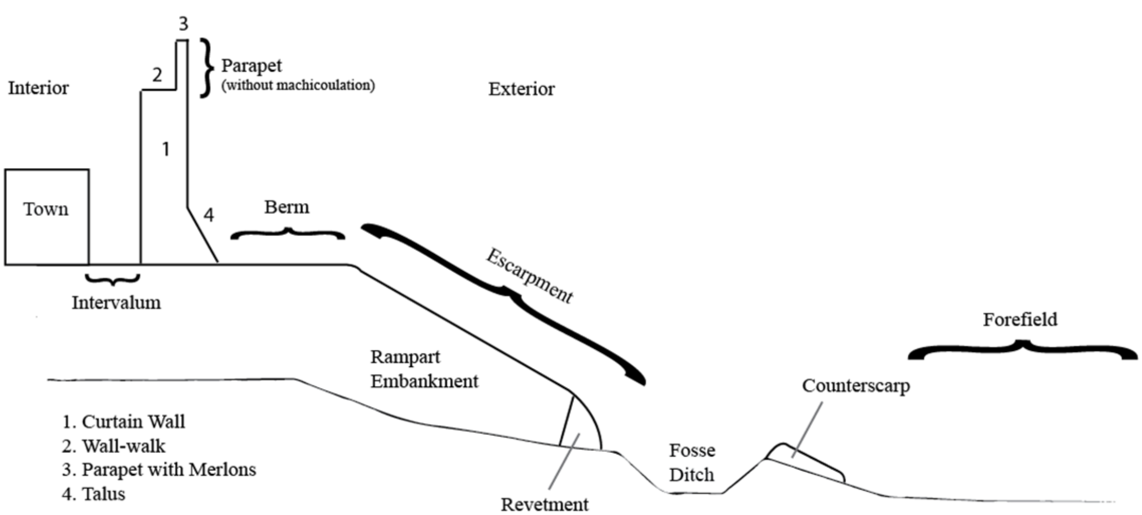

Figure 141 - Fortification terminology.

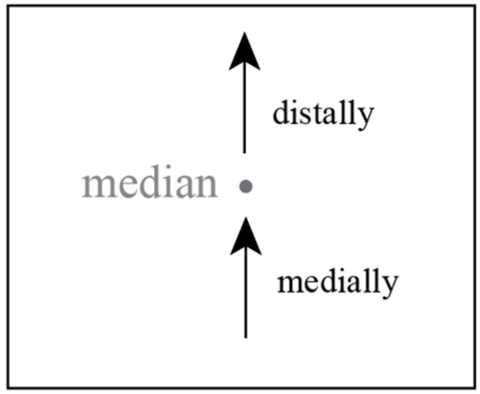

Figure 142 – Orientation terminology (bird's eye-view) in relation with fortification features.

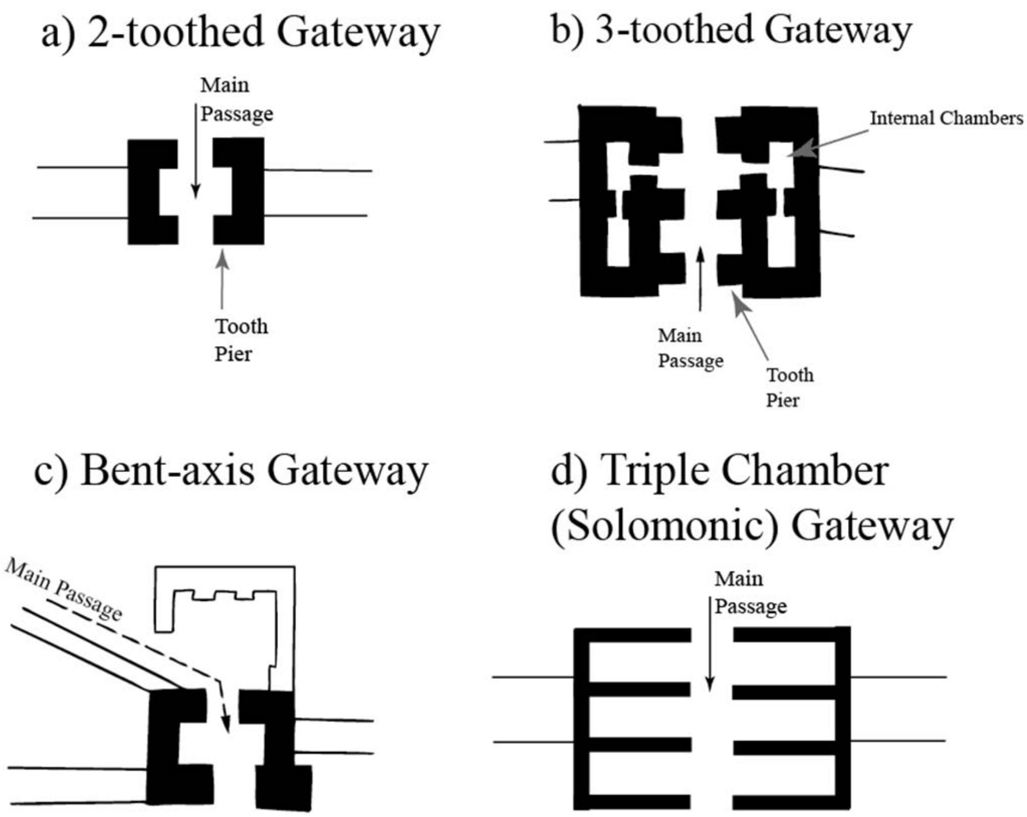

Figure 143 - Types of gateways in Levantine fortification systems.

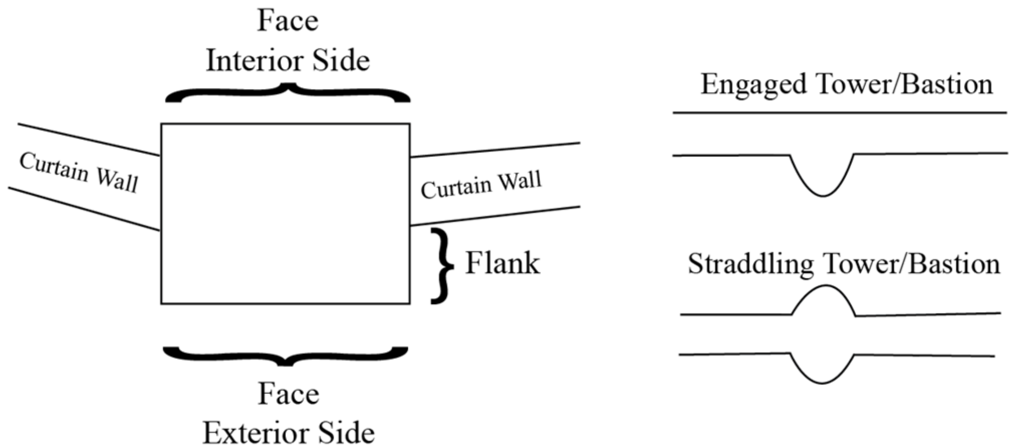

Figure 144 - Bastion, tower and buttress terminology.

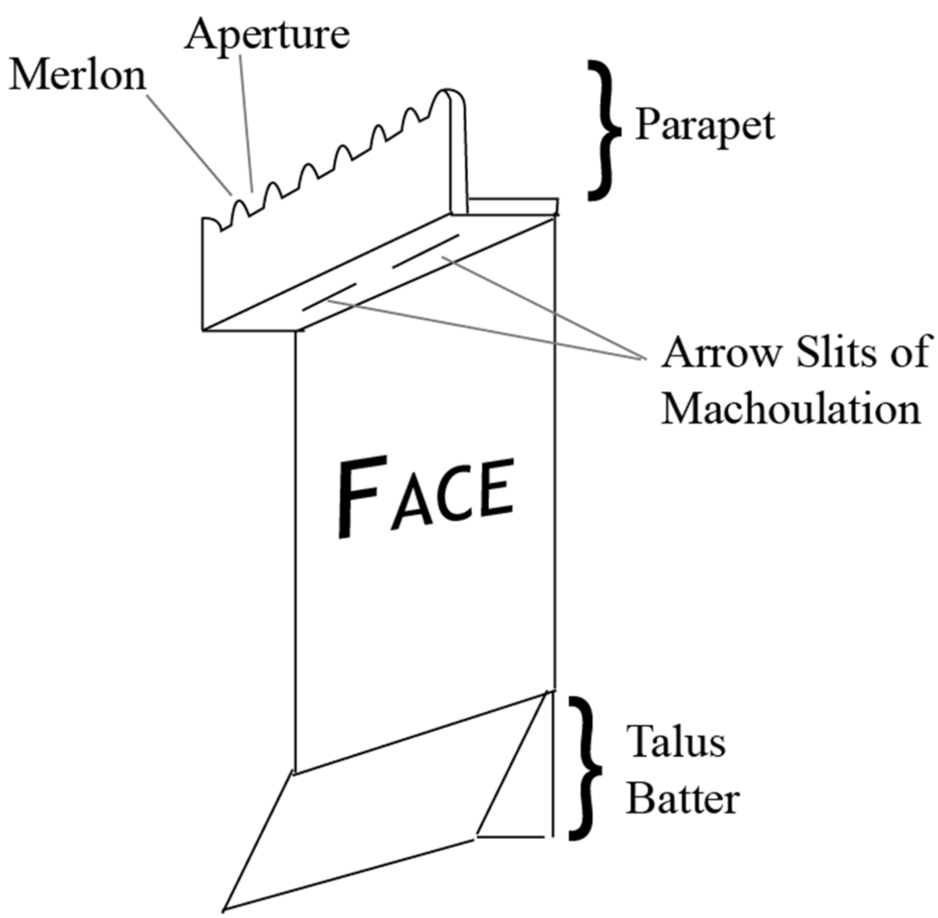

Figure 145 - Frontal cross-section of a fortified wall.

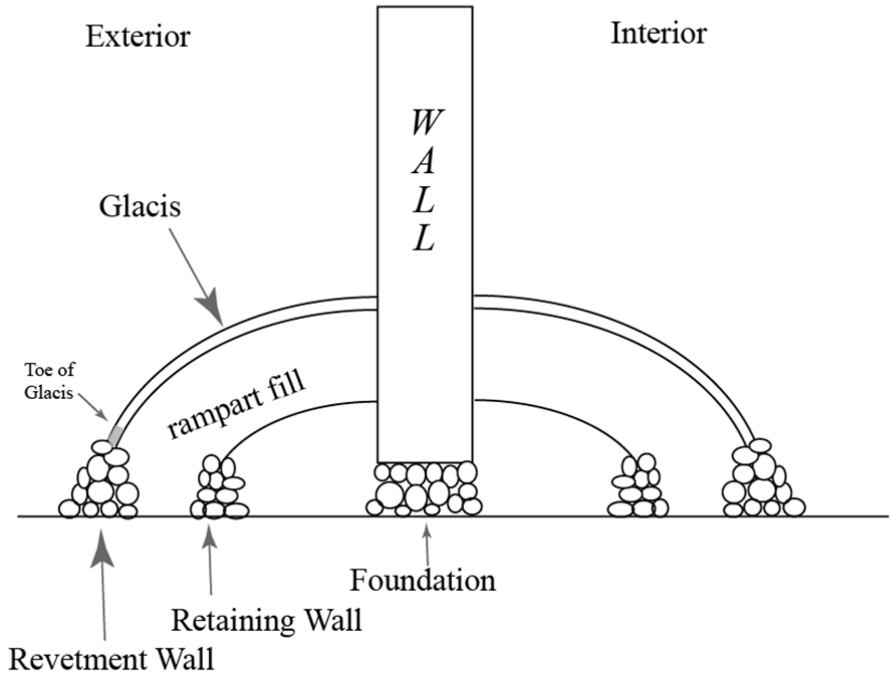

Figure 146 - Free-standing wall rampart.

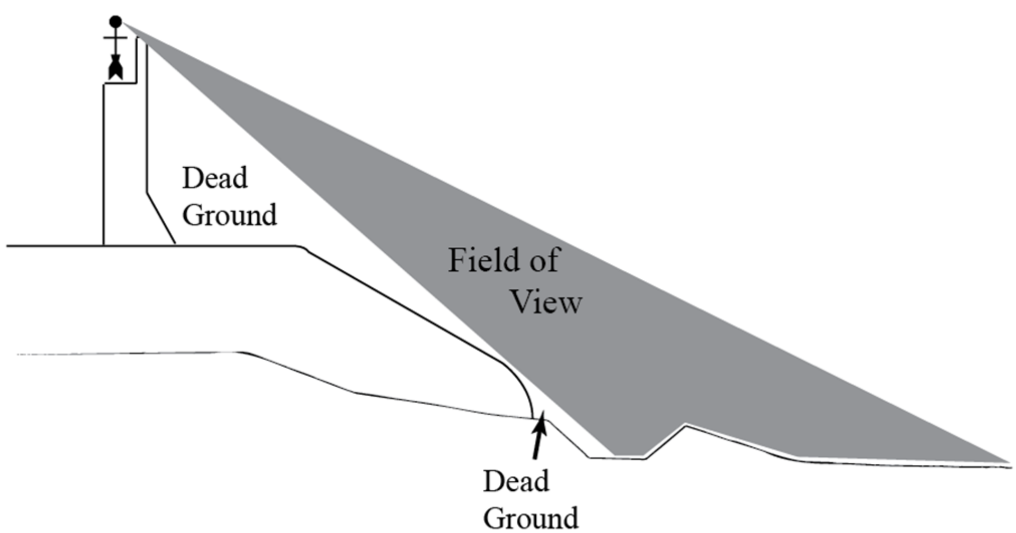

Figure 147 - Defender's field of view.

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