

Georgia State University

ScholarWorks @ Georgia State University

History Theses

Department of History

8-9-2016

Carthaginian Casualties: The Socioeconomic Effects of the Losses Sustained in the First Punic War

Laura Valiani

Follow this and additional works at: https://scholarworks.gsu.edu/history_theses

Recommended Citation

Valiani, Laura, "Carthaginian Casualties: The Socioeconomic Effects of the Losses Sustained in the First Punic War." Thesis, Georgia State University, 2016.

doi: <https://doi.org/10.57709/8898041>

This Thesis is brought to you for free and open access by the Department of History at ScholarWorks @ Georgia State University. It has been accepted for inclusion in History Theses by an authorized administrator of ScholarWorks @ Georgia State University. For more information, please contact scholarworks@gsu.edu.

CARTHAGINIAN CASUALTIES: THE SOCIOECONOMIC EFFECTS OF THE LOSSES
SUSTAINED IN THE FIRST PUNIC WAR

by

LAURA VALIANI

Under the Direction of Lela Urquhart, PhD

ABSTRACT

This thesis seeks to investigate the short- and long-term socio-economic impact of the First Punic War on Carthage and its people. It will do so by exploring three parts of the Carthaginian political and socio-economic system during the fourth through the second centuries BCE. The first is its navy, and specifically the costs – in both material and man – of its use. This will be the subject of the first chapter. The second analyses the additional expenditures which the war extracted from Carthage, such as the outlays to recruit, maintain, and provide for the land army. The final chapter focuses on the long-term ramifications of the war, which will be explored by means of an in-depth analysis of the last few battles of the First Punic War from an economic angle.

INDEX WORDS: War Elephants, Naval Warfare, Numismatics, Tribute, Treaties, Mercenaries

CARTHAGINIAN CASUALTIES: THE SOCIOECONOMIC EFFECTS OF THE LOSSES
SUSTAINED IN THE FIRST PUNIC WAR

by

LAURA VALIANI

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2016

Copyright by
Laura Elizabeth Valiani
2016

CARTHAGINIAN CASUALTIES: THE SOCIOECONOMIC EFFECTS OF THE LOSSES
SUSTAINED IN THE FIRST PUNIC WAR

by

LAURA VALIANI

Committee Chair: Lela Urquhart

Committee: Greg Moore

Electronic Version Approved:

Office of Graduate Studies

College of Arts and Sciences

Georgia State University

August 2016

DEDICATION

To my Zane, who inspired me to set an example for him by pursuing my dreams.

ACKNOWLEDGEMENTS

I would like to express my gratitude to my committee chair and advisor, Dr. Lela Urquhart, at Georgia State University whose expertise was invaluable to the composition of my final thesis. She was always available whenever I had a question about my research, even if it was by email. I appreciate the long hours that she devoted to copyediting my drafts and making suggestions to help me get to the finish line. This thesis would have been much different without her crucial input. I would also like to thank Dr. Greg Moore for taking time out of his schedule to serve as my second reader.

A very special thanks goes out to Dr. Seth Kendall, who motivated, supported, and encouraged me whenever I needed it. It was his story about the “purple people” that inspired my love of the Phoenicians. That love of the Phoenicians carried me into graduate school and matured into my current interest in the Carthaginians. I am grateful for the hours he devoted to discussions about Polybius, the Carthaginians, and the Punic Wars that helped me work out the details of my argument, and especially grateful for the many hours he spent reading and editing drafts of my chapters. I owe him a debt of gratitude.

Finally, I would also like to thank my parents Kathy and Jimmy Whitaker for supporting me emotionally and financially throughout the process of researching and writing this thesis, and my sister, Caitlin Wilson, for listening when I just needed to talk. This process would have been much more difficult without their help. My mom served as my sounding board, my cheerleader, listened to my papers, and consoled me when things got difficult. She also dedicated a lot of her time to watching my son while I was in class or working on this thesis. Thank you so much.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	v
LIST OF FIGURES	viii
1 INTRODUCTION	1
1.1 Historiography: Primary Sources.....	2
1.2 Historiography: Secondary Sources	3
1.3 Outline of the Argument.....	9
2 THE CARTHAGINIAN NAVY AND ITS CREWS	16
2.1 Manning the Navy: Composition of the Crews and Salary Payments	17
2.2 Building and Maintaining the Fleet.....	28
2.3 Loss of Property, Loss of Life	29
3 COSTS OF WAR.....	31
3.1 <i>Manpower Costs</i>	32
3.2 <i>Equipment for War</i>.....	38
3.3 <i>Animal Costs</i>.....	41
3.3.1 <i>Pack animals</i>	41
3.3.2 <i>Elephants</i>.....	43
3.3.3 <i>Horses</i>	45
3.4 <i>Conclusion</i>	46

4 THE ECONOMIC RAMIFICATIONS OF THE PUNIC WARS ON	
CARTHAGE	46
4.1 Tribute: An Essential Contribution	48
4.2 Economic Stress during the First Punic War	53
4.2.1 <i>Tunis and Hermaeum</i>	54
4.2.2 <i>Timing Issues and Economic Concerns</i>.....	56
4.2.3 <i>The Loss of Panormus</i>	60
4.2.4 <i>The Siege at Lilybaeum</i>.....	61
4.2.5 <i>The Battle of Drepana</i>.....	63
4.3 The Neglect of the Navy	66
4.3.1 <i>Treating for Peace</i>.....	70
4.3.2 <i>Paying the Mercenaries</i>	71
4.4 Further evidence of economic stress: The depreciation of money	71
4.5 Conclusion.....	72
5 CONCLUSION	73
REFERENCES.....	77

LIST OF FIGURES

Figure 1: Carthaginian Empire before the First Punic War 264 BCE 16

1 INTRODUCTION

Scholarly investigation of Carthage and the Punic Wars has, to date, tended to be concentrated in scope. Carthage itself frequently appears as an object of study in several works about the ancient Mediterranean, and is certainly prominent in works dealing specifically with the Phoenicians. Yet while these particular works offer useful analysis of the precise use of the word “Punic” and when it came into being, and often provide enlightening commentary on the ways in which Carthaginians diverged culturally from their Phoenician forebears, they rarely focus on the history of Carthage itself. Regarding the Punic Wars, the vast historiography of the conflict between Rome and the North African city-state consists primarily of books focusing on the former; if they involve the latter, the attention is predominantly on Hannibal, not Carthage itself. Three of the more successful narrative histories of the Punic Wars published in recent years include Dexter Hoyos’ *Mastering the West: Rome and Carthage at War*, Adrian Goldsworthy’s *The Fall of Carthage*, and *Carthage Must be Destroyed* by Richard Miles.

While these monographs have helped establish a broader recognition of Carthage in the overall landscape of ancient Mediterranean history, neither they nor more focused studies have specifically addressed the issue of how the Punic Wars transformed the socio-economic structure and relations of Carthage. The primary aim of my thesis is thus to further add to scholarly investigations into ancient Carthage by concentrating on the economic organization of the state, and from that discussion gain a deeper understanding of the costs of the First Punic War on Carthage.

1.1 Historiography: Primary Sources¹

The way that historians have approached the First and Second Punic Wars has largely been based on the literary accounts of the Greeks and the Romans. This is because no Carthaginian primary sources of these wars are extant, and as a consequence, modern scholars are reliant on accounts which are to varying degrees biased in favor of the Romans, even if one of them - Polybius - consulted Philinos of Agrigentum - who championed the Punic cause.² These Greek and Roman sources vary in length and in coverage of the wars. For the first war, the historian must rely almost solely upon Polybius whose extant account starts at the beginning of the first book of the *Histories*. Book Two, chapters 1-36, recounts the recovery of the Carthaginians from their defeat in the First Punic War up through their subsequent establishment of their power in Spain. The Second Punic War is also described by Polybius, as well as by Livy, whose *History of Rome* (books 21-30) provides a more complete chronicle.³ Because of the fragmentary condition of Polybius' *Histories*, it is necessary to use Livy's *History of Rome* books 21-30 for the bulk of the Second Punic War. Livy tends to follow Polybius fairly closely for this portion of history.

Diodorus Siculus, a Greek writer based in Sicily in the first century BCE, also discusses the First and Second Punic Wars in Volume XI of his *Library of History*, though most of his texts are fragmentary. Diodorus compiles information from multiple ancient authors (including Polybius), which is one reason his account can be beneficial. Additionally, Appian of Alexandria devotes book 7 of his *Roman History* to the Second Punic War. Examining Diodorus and Appian

¹ It should be observed here that whenever possible the Loeb version of ancient texts will be cited, mainly for ease of access and for consistency in pagination.

² Dexter Hoyos, *Mastering the West: Rome and Carthage at War*, (Oxford University Press: New York, 2015), 281.

³ For Polybius, Books 7-11 cover the decade after Cannae (216-206) but exist only in a fragmentary condition. Books 13-33 cover the next fifty-four years (206-152) yet few fragments survive.

as well as Polybius and Livy allows an historian to develop a more complete perspective of the Punic Wars.

1.2 Historiography: Secondary Sources

Two books, the edited volume *The Phoenicians* by Sabatino Moscati and *The Phoenicians and the West: Politics, Colonies, and Trade* by Maria Eugenia Aubet, go far in providing a view of Carthage from the beginning.⁴ As the titles of these texts indicate, the Carthaginians were originally Phoenicians, a group of people who hailed from the shores of the Levant (specifically, Tyre). The legend of the foundation of their state – the famous tale of Dido/Elissa, her flight across the Mediterranean, and her clever stratagem to acquire land from the Numidians – all point to a certain flair for sharp bargaining which lend to the Phoenicians an ancient reputation of being skilled in the art of the deal.⁵ Indeed, like their Phoenician ancestors who were cunning enough navigators to be able to sail the open seas at night with the help of astronomy, the Carthaginians were superb mariners, and were craftsmen and merchants *par excellence*.⁶ Yet these sources make clear that in some ways Carthage was also distinct from other Phoenician communities. If, as Aubet argues, the Phoenicians owed their growth and expansion to economic factors, it can be argued that their Carthaginian descendants may have “owed her growth to defensive and political rather than commercial criteria.”⁷ Carthage corresponded to a new type of Phoenician foundation, being intended not only as a refuge for fugitives from Tyre and Cyprus, but also as an obstruction to the advance of Greek trade in the west. According to Aubet, this latter motive would explain

⁴Sabatino Moscati. *The Phoenicians*. New York: Abbeville Press, 1988; Maria E. Aubet. *The Phoenicians and the West: Politics, Colonies, and Trade*. Cambridge [England: Cambridge University Press, 1993.

⁵Aubet, 163; Moscati, 57 (who notes there is a play on words associated with this story. The acropolis of Carthage was called Byrsa. The Greek version of this word, bursa, means “ox-hide”).

⁶Aubet, 166.

⁷Aubet, 228. This may even be able to be applied to the Punic Wars since the Carthaginians were able to pay off their war debt in 10 years by mining the Spanish lands for precious metals

the foundation in Ibiza, which closed the Straits of Gibraltar to any enemy ship coming from the Mediterranean.⁸ It is precisely this Greek threat that provided the impetus to develop a military policy and to lay the foundations of the Carthaginian naval empire.⁹ In fact, Carthaginian obstruction to Greek trade led to war between the two in Sicily in the sixth century, whose success led to a greatly expanded sphere of influence for the Carthaginians. It also gradually paved the way for the decline of Greek influence in the area, leaving Rome and Carthage as the remaining powers in the region. Thus, although the Romans and Carthaginians would strike up a formal treaty around 509, which was renewed and modified on three separate occasions, continued expansion by both states would eventually lead to a point that the growth of one would have to come at the expense of the other.¹⁰

As might be expected from a state with such wide-ranging interests, the Carthaginians were certainly not strangers to war for expansion or for protection. In *The Phoenicians*, Piero Bartoloni's "Ships and Navigation" chapter states that the Carthaginians were masters of the sea at the beginning of the Punic Wars.¹¹ In this regard they far outstripped the Romans, so much so that during the First Punic War the Romans resorted to constructing their fleet using a Carthaginian ship that had gone aground and been captured.¹² The Carthaginians, though they sailed their merchant vessels only during certain times of the year due to the difficult weather of the Mediterranean, may have kept warships on the sea year-round to patrol the coasts and suppress

⁸*Ibid.*

⁹*Ibid.*

¹⁰Moscatti, 62.

¹¹Piero Bartoloni, "Ships and Navigation" in Moscatti *The Phoenicians.*, 90.

¹² Polybius 1.20.16, Bartoloni, 90. An archaeological find – two Punic ships from the third century B.C.E. – has revealed that the craft were fully built of wooden components prefabricated separately and assembled later; if this is the case, it is not hard to understand how the Romans could have used the ship that went aground as a prototype for building their own ships very quickly.

piracy or, if in the midst of war, for whatever military operations were opportune.¹³ Importantly, the Carthaginian ships were manned by Carthaginian citizens.¹⁴ This was not the case with their land army (more below), and indicates the amount of importance the Carthaginians attached to naval matters.

Though the Carthaginians manned their warships with citizens, they did not typically keep a standing army. According to Piero Bartoloni in his chapter “Army, Navy, and Warfare” in *The Phoenicians*, in early Carthage the nucleus of the army was likely made up of citizens in arms, who were supplemented by tributary allies and mercenaries. However, over time, these latter contingents became the main component of the force.¹⁵ This is likely due to the fact that, in the early stages of colonization, large armies were inappropriate and unnecessary; the Phoenicians’ relationship with the peoples of the Mediterranean coast was based on trade, and Phoenician colonists did not have sufficient manpower to permit them to expand through aggression.¹⁶ The Carthaginians were more familiar with expansion through aggression than were the Phoenicians, though. During their early years, they managed to subjugate the Libyans and incorporate the Phoenician cities into their “empire”. Yet most of the Carthaginian aggression was not dedicated to acquiring more territory, but instead to maintaining control of the territory they already possessed. In this way, the Carthaginians had a different relationship with war than the more populous Roman state had.

¹³ Though Bartoloni states this with certainty, Lazenby and Hoyos have a different opinion; they both suggest that the season for war making on the sea was from March (at the earliest) to September, the other months being too dangerous for seafaring (if the weather was too difficult for seafaring, the amount of piracy would likely have been reduced as well). They then stored the ships in shipsheds during the winter. This would also have allowed the ships to dry out(CITATION)

¹⁴ Bartoloni, “Ships and Navigation” in Moscati *The Phoenicians*, 89. However, Hoyos argues that the large armaments required for 100-200 warships probably called for more crews than Carthage alone could furnish and must have drawn from the Libyphoenicians as well. Dexter Hoyos, *Mastering the West: Rome and Carthage at War*, (Oxford University Press: New York, 2015), 22.

¹⁵Piero Bartoloni, “Army, Navy, and Warfare” in Moscati, *The Phoenicians*. 161.

¹⁶Bartoloni, 160.

During the fourth century BCE, the Carthaginians maintained a standing army on Sicily. They also maintained a citizen army. This did not last for long; in 340 BCE the Carthaginian army – consisting of a large contingent of citizen troops – was ambushed by Timoleon. In the course of the battle at the Krimisos River in Sicily, according to Diodorus (page numbers), the Carthaginians encountered a thick mist which hid the enemy as they waited to ambush the unsuspecting Carthaginians. When the fog lifted and the Syracusans saw the Carthaginians crossing the river, they were determined to take out the crack battalion – the Sacred Band, Carthage’s elite citizen regiment, distinguishable by their white shields, heavy bronze and iron armor, and the ordered discipline of their march – first. Timoleon sent down his cavalry to catch them before they got out of the river. The Carthaginian line was broken; many were trampled and drowned in the river. The Sacred Band stood their ground, and the 2000 elite Carthaginians perished in the struggle. This battle represented the worst military disaster that the Carthaginians suffered in Sicily with 10,000 Carthaginian soldiers killed and 15,000 captured.¹⁷ A contingent of the army made up solely of native-born Carthaginians was afterward never one the Carthaginians wished to put in harm’s way, and it was kept in reserve except in times of great danger.

The Carthaginians became progressively more comfortable with trusting land battles to allies and mercenaries – as was discussed, their navy was crewed by citizen sailors – and the use of native troops was eventually phased out entirely in favor of recruits from areas known for the war-like character of their peoples. In the right hands, such soldiers could be devastatingly effective: Bartoloni notes that Hannibal was a master at using the particular assets of various peoples in his army, taking advantage of the wide variety of equipment, tactics, and skills to accomplish battlefield tasks in such a way that the more homogenous Roman army could not. By

¹⁷ Miles, (find page number – The Corinthian Threat)

way of illustration, Bartoloni notes that Hannibal used massed horsemen for their disruptive qualities rather than as elite troops.¹⁸ Hannibal's skill in this and in all the other arts of combat made for an extremely long and devastating war with the Romans, one whose victory could not entirely conceal the many wounds sustained by both the countryside and the people. Some of these wounds had still not completely healed even sixty years after Zama, and were still a source of pain to Italy in the late second century.

Though the previous two works provide a broad understanding of who the Carthaginians were, in order to examine the Punic Wars one must also understand the military engagements that helped established them as one of the major powers in the Mediterranean. Glenn Markoe's studies of the Phoenicians provides significant insights into Carthage's military history and its acquisition of territory, revealing that the Carthaginians were recognized for their powerful navy as early as 525 BCE. Illustrative is an episode from the sixth century, when, despite threat from the Persian ruler Cambyses, the Phoenicians at Tyre refused to lend their efforts to an attack against Carthage. Cambyses subsequently called off the attack, but as Markoe argues, the passage indicates the significant political and military position of Carthage already by the mid-sixth century.¹⁹ Indeed, on the collapse of Tyre (which was forced to submit to the Persians as a result of their refusal to fight), the sixth century saw Carthage begin an aggressive campaign of conquest and colonial expansion across the west Mediterranean, intervening militarily in both Sardinia and Sicily to attempt to safeguard Phoenician holdings there.²⁰ Sicily held the key to Carthage's Aegean trade and Sardinia was essential to the protection of Carthage's hegemony on trade with the Western Mediterranean.²¹ It was the Greek cities Syracuse and Acragas - strategic harbors in Aegean Sea

¹⁸Bartoloni, 163.

¹⁹ Glenn Markoe, *Peoples of the Past: Phoenicians*, (University of California Press: Berkley, 2000), 49.

²⁰ Markoe, 54.

²¹ Markoe, 55.

transit - that prompted an ambitious expedition in 480 BCE with the goal of incorporating all of Sicily into the Carthaginian realm.²² Unfortunately for Carthage, she was soundly defeated at Himera and was forced to pay 20,000 silver talents in war reparations. For the time being, this ended Carthage's expansive tendencies in the eastern Mediterranean and shifted her focus to her territories in the Tunisian heartland and the western Mediterranean. Even so, by 409 BCE Carthage besieged and occupied the Greek city Selinus on the behalf of the Elymian city Segesta, which was involved in a protracted struggle with Selinus and its ally Syracuse, and then took Himera. In vengeance for the earlier Carthaginian defeat there, Himera was razed to the ground and never inhabited again.²³ By 406 BCE, the Carthaginians controlled the entire Greek portion of Sicily except Syracuse itself, and though that did not last long - Syracuse began strengthening its military in preparation for a counter-attack on Motya as soon as Carthage withdrew in 405 - it led to an intermittent struggle with Syracuse over control of Sicily which lasted until territorial limits were established in 374 designating the River Halycus as a boundary. Carthage would retain this territory until the outbreak of war with Rome (see figure 1 for map of Carthage's territory at the beginning of the First Punic War).²⁴

It is at this point in the history of the Carthaginians that my thesis begins. As far as the secondary literature, I am interested in the modern historiography of the First Punic War to the extent that such texts discuss the specific domestic ramifications of the combat itself. Given the enormous amount of attention the wars have received, my thesis will not and cannot delve into the complete history of the war nor provide commentary on all the secondary sources which do so. It can, however, analyze the secondary literature on the ramifications of the war at home, a

²² Markoe, 55.

²³ Markoe, 64.

²⁴ Markoe, 65.

phenomena that I believe to be understudied. Specifically, it seeks to investigate why it is that Carthage lost these wars so badly. Although there is nothing inherent in a side by side comparison of the military resources of Carthage and Rome that clearly indicates why Carthage was doomed to lose the war to Rome, they did lose. My contention is that two significant factors in the loss of the First Punic War were the substantial casualties sustained and debt accrued during these conflicts. Lucius Marcius Censorinus, one of the Roman consuls on the eve of the Third Punic War, is reported by Appian, an historian of the second century C.E., to have said that a maritime city is “more like a ship than like solid ground ... tossed about on the waves of trouble and ... exposed to the vicissitudes of life.”²⁵ The comparison of Carthage to a ship helps provides clarity into exactly why the losses that occurred during the Punic Wars consisted of more than just the loss of land and naval battles, but affected practically all levels of Carthaginian society. Due to the nature of Carthage as a maritime empire built upon trade on the seas, losses in the Mediterranean meant major disruption. The sea was Carthage’s home.

1.3 Outline of the Argument

The central question of my thesis is: what was the short- and long-term socio-economic impact of the First Punic War on the Carthaginian state and people? I respond to this question by exploring three parts of the Carthaginian political and socio-economic system during the fourth through second centuries BCE: the personnel and labor invested in the navy; state expenditure on war-making; and the long-term ramifications of the wars on Carthage’s economic structure. These three different components of the Carthaginian socio-economic framework function as independent case-studies of how issues of state finance, the military, and social organization changed during the years 400 to 200 BCE, yet work together to provide a holistic representation

²⁵ Appian, *Pun.* 86

of the impact of the Punic Wars on Carthage itself. They also form the basis of the three substantive chapters of my thesis as outlined below.

The first chapter will focus on the Carthaginian navy. Carthage became a power in the Mediterranean as a result of her maritime excursions, both military and mercantile. The importance of the navy to the people of Carthage can be illustrated by Carthage's grief at the burning of the ships in the harbor after the Second Punic War. According to Livy, "the sight of all those vessels suddenly bursting into flames caused as much grief to the people as if Carthage itself were burning."²⁶ However, understanding the importance of the Carthaginian navy to the people of Carthage requires delving into the questions that are not always asked, specifically about the way it was crewed. According to several secondary sources, the Carthaginian navy was crewed by citizens of Carthage.²⁷ These sources do not footnote from where they obtained this information, and the primary sources do not state definitively that this is the case. This chapter will investigate the probability that the citizens of Carthage crewed the navy by examining the problems that this assertion poses, and then will assess the economic impact of this possibility on Carthage and her citizen body.²⁸ Because evidence about Carthage is limited, it will be necessary to illuminate specific elements of the navy by comparing it with other Hellenistic era navies with which Carthage shared significant similarities.

One issue that suggests that the Carthaginian navy was not composed of citizens is the amount of men required to supply rowers for the navy. Each *quinquereme* - the main ships that the Carthaginians used in their naval battles - could hold 300 rowers and 120 marines. A

²⁶ Livy 30.43

²⁷ Hoyos, Bartoloni, Gold, etc. though Lazenby states that historians cannot know exactly how the Carthaginian Navy was crewed.

²⁸ It must be addressed here that I do not mean that the Carthaginian citizens were not involved in the crewing of the Navy - the navy, unlike the Carthaginian Army, did not consist of mercenaries.

Carthaginian fleet typically consisted of 100-200 warships, and thus approximately 30,000 to 60,000 men. These men were not slaves, though slaves did work in the shipyards and harbors.²⁹ According to Strabo, by 264 BCE, the city itself housed some 200,000 citizens and foreigners.³⁰ If the numbers above are correct, this would mean that approximately a third of Carthage's citizens crewed her navy (only if the numbers include men and not women and children). W.W. Tarn suggests that Carthage limited the number of ships in her fleets to 200 per battle due to a lack of manpower to crew them, which would certainly be true if a third of the population was used to crew the ships.³¹ In fact, it is unlikely that Carthage supplied her rowers from only her citizen body. Dexter Hoyos suggests that the city relied on its Libyphoenician kin to help supply both rowers and ships.³² Yet even with Libyphoenician assistance, a crew consisting of only fifty Carthaginians (and thus numbering 5,000 to 10,000 men) would still represent a huge amount of men that would have shaped the economic structure of Carthage (and the city's surrounding subject states) in various ways. In the first five years of naval battles of the First Punic War (beginning with the Battle of the Lipari Islands in 260 BCE and ending with the Battle of Ecnomus in 256 BCE), the Carthaginians lost approximately 85,000 men -killed or captured - and 189 ships, tabulations which consider those ships lost in battles, not those lost to storms or other such natural phenomena.³³ The number represents a large loss of men – whether they were all citizens or included a mix of Carthaginians and Libyphoenicians – though accounting for how many were

²⁹ Lionel Casson, 1966. "Galley Slaves". *Transactions and Proceedings of the American Philological Association* Vol. 97, 35–44.

³⁰ Hoyos, *Mastering the West*, 15. (Tarn states 3 to 4 million people in Carthage by the battle of Ecnomus from J. Beloch, *Die Bevölkerung der griechisch-römischen Welt* and *Die Bevölkerung Italiens im Altertum in Beiträge zur Alten Geschichte*)

³¹ W.W. Tarn, 1907. "The Fleets of the First Punic War" *The Journal of Hellenic Studies* 27. The Society for the Promotion of Hellenic Studies: 48–60.

³² Hoyos, *Mastering the West*, 22.

³³ This is assuming that the Carthaginians made use of the 17 Roman ships that they captured at Lipari. If not, the number rises to 206.

killed, captured, or exchanged as prisoners of war is difficult to determine. The financial loss is clearer: the loss and replacement of 189 ships entailed significant costs, as did the repair of others that were damaged.

A navy was not a one-time investment, but was, rather an ongoing expense. Ships which were captured or sunk would have needed to be replaced, and even ships that were not damaged in battle required maintenance. The financial demands of the navy were most evident in relation to the payment of the crews. Though it is impossible to know exactly what the crews were paid, by using data from classical Athens – a state that was analogous to third century Carthage in terms of population size, territorial extent, and basic governmental principles, such as the existence of an Assembly, citizen votes, and the political leadership of an oligarchy – one can get a pretty good idea. However, war was expensive, particularly when conducted at the very large scale that was necessitated by the Punic Wars. The building of ships, their manning, the payment of their crews, and their maintenance made up only one sector of Carthaginian state expenditure during the Punic Wars; there were many others, the best documented of which are addressed in my second data chapter, “The Costs of the Punic Wars on Carthage.” This chapter specifically examines monetary costs of the war (such as supplies and mercenary payments, as well as the human capital costs). The requirements of supplies for the armies were very large: not only did the Carthaginians have to supply food and water for their soldiers, they also had to supply food for their elephants and for the servant entourages that accompanied the armies. Though many scholars do not investigate the cost of the war because it is assumed that war is expensive, it is imperative in this thesis to examine what the costs were in order to assess the enormity of the monetary impact on Carthage.

How were the Carthaginians able to afford a war of this magnitude? Ancient writers such as Aristotle, Polybius, and Diodorus suggest that the Carthaginians obtained some of their supplies

in the form of tribute from their subject states. Each state contributed a certain amount of “tribute” either in coin or kind for the benefit of Carthage (and in exchange for military protection from Carthage should they need to be defended). Carthage also likely levied revenue by means of heavy agricultural taxes on the Libyan hinterland as well as custom dues, port taxes, litanies, and loans from citizens.³⁴

In my third chapter, I examine the impact of the joint accumulation of these expenses along with the political circumstances of the Wars on the overall economic structure and health of the Carthaginian state and population. The chapter considers some of the ways by which Carthage tried to mitigate the financial burdens imposed by the war, drawing on methods as far-ranging as the seeking of foreign loans, paying soldiers on retainer, and debasement of the currency. In the wake of the First Punic War, for example, Carthage attempted to take out a loan from Egypt to help pay its mercenaries, but was denied by Ptolemy II who claimed friendship with both Carthage and Rome and did not want to offend Rome.³⁵ Carthage also attempted to short-change its mercenaries, an event that led to a mercenary revolt and the arming of the civilian population in order to put it down.

The coinage of Carthage particularly exhibits the shortage of funds. Coins minted during the First Punic and Mercenary Wars show a decrease in the electrum and gold; pure metal content fell from ninety-eight percent in the fourth century to thirty percent in the Second Punic War.³⁶ Similar patterns appear in the silver coinage as well: the silver content of Punic coins fell to thirty-three percent after the First Punic War and from fifteen to twenty-three percent after the Libyan

³⁴ Hoyos, *Mastering the West*, 142.

³⁵ Lazenby, *The First Punic War*, 29.

³⁶ Christopher Howgego, *Approaching the Ancient World: Ancient History from Coins* (Routledge: London, 1995), 113.

revolt.³⁷ It is important to note that this decrease in electrum was not applicable for the money paid to Rome because that money was not paid in coinage, but was instead paid by a talent-weight of gold or silver. As the city became more and more financially impoverished after the end of the Second Punic War, Carthage began minting huge copper coins and billons with less than twenty-five percent silver.³⁸

The scarcity of money had an especially strong impact on Carthage's ability to supply the navy, as mentioned earlier and as was most evident in the last battle of the First Punic War. Carthage required nine months between the arrival of the Romans outside Drepana and the final battle of the Aegates Islands, off the coast of Sicily. Polybius attributes the delay to Carthage's neglect of its navy after the Battle of Drepana, which had happened five years earlier.³⁹ Since, however, the ships sent to Drepana were loaded with supplies for the city under siege, it was not so much the recruitment of new sailors for the navy that necessitated the long wait, but more likely the arrangement of supplies (owing to the paucity of resources). By examining the last few battles of the First Punic War, the Carthaginian's economic situation becomes clearer.

The Carthaginian navy was devastated by the loss of the Battle of the Aegates Islands. Their situation may have improved over the course of the late third century BCE, based on Carthage's ability to build two artificial harbors that together would hold an entire fleet; even so, however, the focus of the state on domestic harbors that could be easily defended (and supplied) suggests a pressing financial motivation to keep the navy both close to home and on a smaller scale. In fact, it is reasonably clear that Carthage never fully recovered in the interim between the First and Second Punic Wars. The sources imply that a lack of ships hindered the redevelopment

³⁷ Ibid.

³⁸ Billons were alloys of gold or silver with a greater proportion of another metal, such as copper, used in making coins.

³⁹ Polybius 1.61.1-9

of Carthaginian forces until the decade after 218 at the earliest.⁴⁰ Even then, Carthaginian hegemony over the seas was never restored, and its navy was a relatively pale shadow of what it had been just two generations earlier: according to Polybius, only 17 Punic ships defended Spain from the Romans during the time of Scipio's campaign,⁴¹ and no major sea battles mark the historical narratives of the Second Punic War.

The research undertaken suggests that the socioeconomic repercussions of the First Punic War on the state and citizenry of Carthage was extensive and felt in many different sectors. Based on this research, I will argue in this thesis that the impact can be seen most clearly in the areas identified above: the Carthaginian navy, state expenditures as related to war-making, and the short- and long-term ramifications of the wars on Carthage's economic structure and the shifts in Carthaginian socioeconomic organization that resulted from these ramifications. By conducting a close examination of the historical sources for Carthage in the era of the First and Second Punic Wars, this Master's thesis aims to contribute a new dimension to the growing body of scholarship on Carthage, the ancient economy, and the role of Phoenico-Punic civilization in the historical framework of the Classical and Hellenistic Mediterranean.

⁴⁰ Hoyos, *Mastering the West*, 143.

⁴¹ *Ibid.*

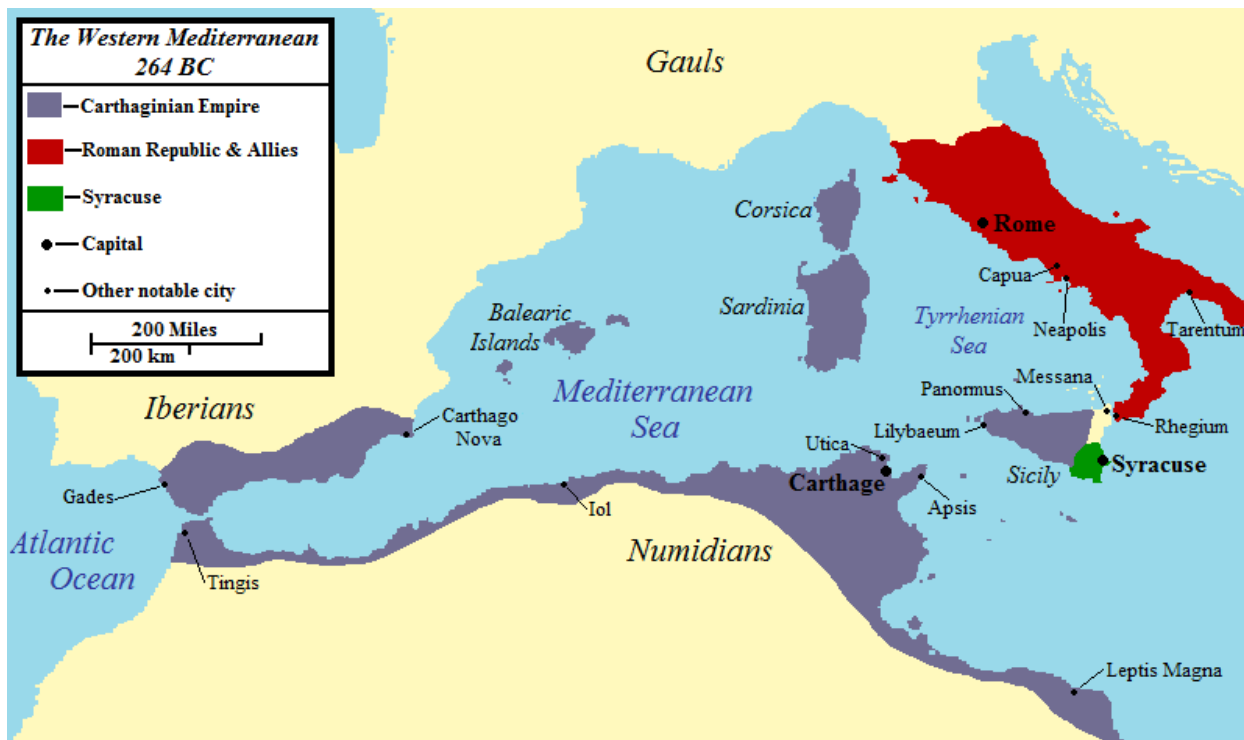


Figure 1: Carthaginian Empire before the First Punic War 264 BCE

2 THE CARTHAGINIAN NAVY AND ITS CREWS

It is something of a commonplace among ancient historians that the first war between the Romans and Carthaginians—the First Punic War—was a matter of a quintessential land power against a dominant naval one. However, the actual performance of the Carthaginian army against that of the Romans in that war does not show it as helpless before the ever-victorious legions, nor did the Roman navy entirely acquit itself all that poorly before the squadrons of the Punic fleet. A more balanced view of the battles in the First Punic War reveals that the naval supremacy of Carthage did not spare the city from profound maritime losses, a fact that much of the scholarship about the Punic Wars – which tends to be focused primarily on Rome and the outcome of battles and wars on the Empire – does not always recognize. Correcting this oversight is important, however, because, as was discussed in the Introduction, the expenses encumbered by Carthage in the upkeep of its navy and military forces during the First Punic War dramatically shaped the city-

state's broader political economy and its ability to endure further military stress in the late second and first centuries BCE.

This chapter will attempt to quantify more sharply the economic impact of the First Punic War by focusing on what the ancient sources recognize was one of Carthage's heaviest financial burdens: its navy. I concentrate on three main measures of "cost": salary payments for the naval crew members, expenses sustained in ship building and upkeep, and estimated losses of both property and life as a result of naval combat.

2.1 Manning the Navy: Composition of the Crews and Salary Payments

A navy, obviously, consists of ships. During the First Punic War, most of the vessels that composed the Carthaginian fleet were *quinqueremes*, essentially rowed torpedoed, whose crews provided the power to ram – and by this means sink – enemy vessels. Polybius observes that each *quinquereme* could hold 420 men, 300 of whom were rowers and the other 120, marines (Polybius 1.26.7). The rowers consisted of the men who were responsible for physically moving the ship, whereas the marines consisted of the men who fought on the decks during the battles at sea. Lionel Casson has suggested that these numbers should not be taken as airtight, but should rather be seen as “a loose expression” of the composition of the crew.⁴² For one thing, Carthaginian *quinqueremes* may have carried as few as 40 marines; the figure of 120 may have been a maximum number of marines applied to ships that favored boarding rather than ramming. Since ramming was the primary Carthaginian strategy during naval combat, the number of marines carried on Carthaginian ships was likely fewer than what is suggested by Polybius' account.⁴³

⁴² Lionel Casson, *Ships and Seamanship in the Ancient World*, (Baltimore and London: The Johns Hopkins University Press, 1995), 105 n 41.

⁴³ J.F. Lazenby, *The First Punic War: A military history*, (Stanford: Stanford University Press, 1996), 28.

Furthermore, the 300 “rowers” may not necessarily have been strictly oarsmen.⁴⁴ An Athenian *trireme* during the fourth century carried 16 officers, rates, deckhands, and other personnel above the 170 rowers; since a *quinquereme* had essentially the same rig, it would have needed approximately the same number of non-rowing, non-marine personnel.⁴⁵ However, according to John Morrison, the non-rowing personnel of the Athenian *trireme* can also be compared to those on a Rhodian *quadrireme*.⁴⁶ But the *quadrireme* had 45 members of the deck crew, not including the marines, where the *trireme* had only thirty – most likely because more officers were needed to improve the communication on the bigger ship.⁴⁷ Because the *quinquereme* is a bigger ship than the *quadrireme*, and because there is more information to be passed along to the crew of the *quadrireme*, it makes more sense to assume that the crew of the *quinquereme* was even more similar to a Rhodian *quadrireme* than to an Athenian *trireme*. This is important because it implies that larger numbers of skilled men would have been required to crew the *quinquereme* than were required to crew the *trireme*. Due to the level of skill required, these men, or at least the officers and skilled rowers, could not have been gathered from the streets of Carthage, but instead had to be men who had experience on the sea and, more importantly, on warships.⁴⁸

The skill of the officers and lead rowers was essential to the precise maneuvers required to conduct a successful ramming attack. Communication and coordination within the ship needed to

⁴⁴ Casson, *Ships and Seamanship*, 105 n 41.

⁴⁵ Casson, *Ships and Seamanship*, 105.

⁴⁶ Morrison, *Greek and Roman Oared Warships*, 349.

⁴⁷ The *trireme*, *quadrireme*, and *quinquereme* were warships that all fit into a larger category of ships known as polyremes. The *trireme* had three banks of oars with one man per oar. The *quadrireme*, according to Casson, had two banks of oars with two men on each oar (and most likely fewer oars), and the *quinquereme* (the Carthaginian *quinquereme*, because the early Roman *quinquereme* was designed differently), had either three banks of oars with two rowers in the first, two in the second, and one in the third row or two banks of oars with three rowers in one row and two in the other row, with the first design being more likely. Casson, *Ships and Seamanship*, 305.

⁴⁸ Though on the *quinquereme*, there were some positions that could have been filled by unskilled rowers, due to the requirement of complex maneuvers used frequently like the *diekplous* which required a knowledge sailing to complete, it is unlikely that the majority of the rowers would have consisted of subsistence farmers.

be disciplined.⁴⁹ Based on the crews of Rhodian *quadrireme*, the titles and positions of the officers were as follows: the *trierarchos*, or trierarch, who generally served as captain and could also, in a smaller unit, command a flotilla; the *epiplous*, or vice-captain, who was the officer assigned as captain when the trierarch chose not to take personal command, or was aboard the flagship of a flotilla; the *grammateus*, whose name literally means “clerk” or “secretary” was an important officer who had a close rapport with the trierarch or *epiplous*; and the *kybernetes*, or executive officer and navigating officer, who was stationed on the poop deck.⁵⁰ Other officers included the *prorates*, or bow officer, who in the Rhodian navy seems to have ranked just below the *kybernetes*, as well as the *keleustes*, or chief rowing officer, and the *pentekontarchos*, probably the assistant rowing officer. Then there were the ratings - trained technical personnel separate from the rowers - who were responsible for the well-being of the people on the ship and the ship itself. Ratings included the *hegemon ton ergon*, the chief of all activities who was responsible for the activities of the deckhands; the *naupegos*, the ship’s carpenter; the *pedaliouchos*, or quartermaster responsible for holding the steering oar; the *eliaochreistes*, who was in charge of issuing oil to the crew for rubbing down; the *kopodetes*, whose prime duty was to check the chafing gear and the straps of the oars, but who was probably responsible for the oars in general; and the *iatros*, or ship’s doctor, who in the Rhodian navy was generally a foreigner.⁵¹ The seamen (included in the non-rowing personnel, but responsible for the movement of the ship) included the *ergazomenoi en prora*, of whom there were at least five and who worked at the prow, watching over the bow deck, and handling the sails and lines. The seamen also included five *ergazomenoi en prymne*, who worked at the poop deck and were responsible for the stern deck watch and the handling of sails

⁴⁹Louis Rawlings, “The Carthaginian Navy: Questions and Assumptions” in *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle, (Brill: Leiden, 2010) 280.

⁵⁰ Casson, *Ships and Seamanship*, 307.

⁵¹ Casson, *Ships and Seamanship*, 308.

and lines. Other non-rowing personnel members were the *katapeltaphetai* or catapult operators, of whom there were at least two; the *toxotai* or archers, of whom there were at least six; and the *ephibatai* or marines, of whom there were at least 19 on the *quadrireme*. Finally, though not mentioned for all the Greek navies, at least some ships were also manned with, *toicharchoi* or side chiefs, who were the thranite (top) rowers nearest the stern on port and starboard respectively, *auletes* (flautists) or *trieraules* (pipers), responsible for piping the time after the *keleustes* had set the stroke, and *nauphylakes* or ship guards.⁵² The requirement of so many different officer positions on the *quadrireme* and *trireme* illustrates the amount of communication and skill necessary to conduct naval battles in the ancient world. A ship was not merely stocked with men who could row, but with skilled men who each had a job during battle.

All of the mariners on the *quadrireme* and *trireme* were essential for battles, even the *ergazomenoi en prora* and the *ergazomenoi en prymne* (those responsible for handling the sails). Though during a fight warships were usually moved by oars alone with the sailing gear stowed away before battle (or even left on the shore),⁵³ a battle could require the restoration of sailing gear (Polybius 1.61.7), either for direct flight to escape overwhelming odds, or to provide propulsion if too many of the oars had been damaged (and certainly ships would occasionally attempt to run a parallel course to the enemy to try and shear off his oars).⁵⁴ In these cases, either the removed sails would have to be reset or a second rig (which could have been kept on the ship at all times for emergencies) would need to be brought out, each task being accomplished swiftly and by non-rowing personnel.⁵⁵ If the *quinquereme* had the same rig as the *trireme* (and the *quadrireme*), it could not have had fewer deck crew members than that type of ship, and may have had more.

⁵² Casson, 304, 309.

⁵³ Casson, *Ships and Seamanship*, 236 n 54.

⁵⁴ J.S. Morrison, and J. F. Coates. *Greek and Roman Oared Warships* (Oxbow Books: Oxford, 1996), 368.

⁵⁵ Casson, *Ships and Seamanship*, 236.

Some of the 300 “rowers” mentioned by Polybius were more likely part of this aeolian crew. Yet, the stress on the officer positions in the Carthaginian navy should not take away from the necessity that even the rowers required a competence at sea and what this requirement meant for Carthage.

To be a sailor in the Carthaginian navy required some degree of skill; rowers had to execute intricate maneuvers, for which a measure of dexterity would have been required. These men were not slaves, though slaves did work in the shipyards and harbors.⁵⁶ Not being slaves, members of the navy were, in all probability, financially compensated in some way. Indeed, payment of ship crews is well established in the evidence for other Hellenistic-era navies. According to Louis Rawlings in *The Ancient Greeks at War*, the Athenian rowers, in good times, could receive as much as a drachma per day.⁵⁷ Carthage was renowned for paying its mercenaries high rates of pay, and it is likely that it did the same for the crews of its warships.⁵⁸ If it is assumed that there were 300 men per *quinquereme* (exclusive of marines) with a standard complement of 200 *quinqueremes* per fleet,⁵⁹ at one drachma per day per man, the fleet would cost Carthage at least 10 talents per day, 300 talents per month, and 3,600 talents per year. Of course, maintenance of a fleet during the off-season would have been particularly wasteful, and it is likely that the campaigning season only stretched from May to September, after which the crews were released.⁶⁰ If this was the case, then the cost would have been a slightly less staggering sum of 1500 talents per year instead of 3600. This already-large price-tag would not have included the marine

⁵⁶ Casson is fairly adamant that slaves were not used as rowers in the navy and has much evidence to back up his claim. Lionel Casson, 1966. “Galley Slaves”. *Transactions and Proceedings of the American Philological Association* Vol. 97, 35–44.

⁵⁷ Louis Rawlings, *The Ancient Greeks At War*, (Manchester University Press: Manchester; New York, 2007), 114.

⁵⁸ Rawlings, “The Carthaginian Navy”, 268. (Diod. 16.81.4)

⁵⁹ W. W. Tarn, “The Fleets of the First Punic War.” *The Journal of Hellenic Studies* 27, 1907: 48.

⁶⁰ Rawlings, “The Carthaginian Navy”, 268. However, the sailing season may have begun in March during the First Punic War, as the Battle of the Aegates Islands was fought in March - as soon as the weather became safe for sailing.

contingents, though; working with a minimum complement of 40 marines per ship, these would have added a minimum of 200 talents *per annum* to the upkeep.⁶¹ This figure is computed on the cost basis of marines requiring the same pay as rowers. However, their equivalence was, in reality, not valid; in Classical Athens, a marine normally had the same status as an infantryman, which was appreciably higher than that of a rower.⁶² Such differences in status suggests that the Carthaginian marine likely was paid more than one drachma per day. Also, it may have been the case that Carthaginian trierarchs paid more for good crewmen, which would help explain Polybius' citation of specific good crewmanship from particular ships. For instance, in the First Punic War, Hannibal 'the Rhodian's' ship was worthy of note (Polybius 1.46.1-13). Though the ship itself was a very fine vessel (the Romans used it as a model for the new ships that they constructed), it must have been crewed very well, because it took a specially-chosen Roman crew sailing on another previously-seized Carthaginian *quadrireme* to capture it (Polybius 1.47.8). In the same vein, rates of pay among Athenian crewmen were not flat, but depended on the status and rank of the crewman.⁶³ Some men could cost more than a drachma per day, adding to the cost. Pay could also vary from ship to ship, with the trierarchs paying over the norm to get good crewmen.⁶⁴

Based on the primary sources, rowing was a full time occupation, at least in powerful ancient city-states like Athens or Rhodes. This most likely applied to oarsmen of Carthage as well.⁶⁵ Piero Bartoloni asserts that "Warships ... travelled all the year round, to patrol the coasts and suppress piracy, or in the event of wars already being waged, for whatever military operations were opportune."⁶⁶ Given the cost involved, patrolling warships did not likely represent the whole

⁶¹ Rawlings, "The Carthaginian Navy", 268.

⁶² John F. Charles, "The Marines of Athens". *The Classical Journal* 44 (3), 1948: 181-88. <http://www.jstor.org/stable/3292569>.

⁶³ *Ibid.*

⁶⁴ *Ibid.*

⁶⁵ Rawlings, "The Carthaginian Navy", 271.

⁶⁶ Bartoloni, "Ships and Navigation" 85.

fleet. And if the crews were only on the ships during the peak season, it stands to reason that they may have had an occupation or farmstead to which to turn in the off-season. Polybius alludes to how at least some of the navy may have worked “part-time” in his account of the last naval battle of the First Punic War, that of the Aegates Islands (1.61.4-5). For that battle, he notes that that the crews were “quite untrained, and had been put on board for the emergency” because “owing to their never having expected the Romans to dispute the sea with them again, [the Carthaginians] had, in contempt for [the Romans], neglected their naval force.” This probably means less that the Carthaginians scrapped their navy and more that they dismissed its sailors during slow periods, with “untrained” probably meaning that the crews had had an insufficient period of (re)familiarization and not gotten back into shape, even if men who had more experience would reach that point faster.⁶⁷ With the exception of this battle, Polybius is always complimentary about the crews of the Carthaginian fleets and, at one point, attributes their skill to the “seamanship [which] had long been their national calling” and the fact that “they occupied themselves with the sea more than any other people.”⁶⁸ The disrepair of the navy at Aegates must therefore have been substantial to draw such a commentary from the otherwise laudatory author.

Yet even if seamanship was the national calling of the Carthaginians, the question remains: from where did the Carthaginians recruit the crews for their navy? Most secondary sources suggest that the Carthaginian navy was crewed by citizens, while the army, as is well known, was composed of mercenaries.⁶⁹ Ancient Greek and Latin sources such as Polybius, Diodorus, and Cicero do not explicitly mention the hiring of rowers for Carthaginian ships (as they do the hiring

⁶⁷ Rawlings, “The Carthaginian Navy”, 271

⁶⁸ Polybius, 6.52.1

⁶⁹ B. D. Hoyos, *Mastering the West: Rome and Carthage at War*. (New York: Oxford University Press, 2015). Piero Bartoloni, “Ships and Navigation” in *The Phoenicians*, ed. Sabatino Moscati (New York: Abbeville Press, 1988), 85. Adrian Keith, Goldsworthy, *The Fall of Carthage: The Punic Wars, 265-146 BC*, (London: Cassell, 2003), 32.

of mercenaries for the army), thus implying that like other ancient city-states of the Classical and Hellenistic eras, Carthage drafted its citizens into military service during times of war. In the city-state model, the defense of the state almost always fell to the citizens, with military service/divisions made according to socio-economic status. Carthage, being the only city-state in the western part of North Africa, rarely had to recruit its citizens for territorial expansion or attack, at least up to the 3rd century BCE. It did, however, need to levy a military for engagements abroad, which meant the involvement of and participation on ships. It is probable that the primary sources do not mention from where the navy's members come because Carthage was simply doing what all other city-states did, with the modification that most of their military efforts took place overseas and thus were naval in scope.⁷⁰ John Lazenby, however, believes that it is impossible to know how the Carthaginian navy was crewed because the primary sources do not specifically say one way or the other. They do, however, refer to the size of the fleet and the number of men required to crew it.

The standard strength of the Carthaginian Fleet was about 100-200 warships, not all of which were *quinqueremes*, though a good many of them would have been (Polybius 3.33).⁷¹ The fleet typically, therefore, consisted of approximately 30,000 to 60,000 men, not including the marine contingent.⁷² According to Strabo, by 264 BCE, Carthage maintained a population of some

⁷⁰ It may be that this was not always the case, however, and one might ask whether this policy was instituted after the destruction of Carthage's "Sacred Band" (a group of Carthaginian hoplites from wealthy families in use until the fourth century when they were wiped out at the Battle of Krimissus in Sicily in 341 BCE). Because, after this point, Carthage did not use citizen soldiers; they preferred to hire mercenaries to do their job instead.

⁷¹ Polybius reveals that in 219 BCE when Hannibal set out on his march, he handed over his fleet to his brother. At this time, the fleet consisted of 50 *quinqueremes*, 2 *quadriremes*, and 5 *triremes*. Thus, approximately 88% of the fleet consisted of *quinqueremes*.

⁷² The number of citizens who made up the navy of Carthage is important simply to be able to calculate the tremendous losses of men in the naval battles during the Punic Wars. If the fleets were not composed of large numbers of Carthaginian citizens, then the losses sustained during the naval battles (in terms of human capital) would not have been significant, but if the fleets contained a large number of Carthaginian citizens, then the losses would have been much more significant to the city, and by extension to the economic situation of Carthage. Yet, Rawlings holds that the population of Carthage and its hinterland in the third and second centuries numbered between 250,000 and one

200,000 citizens and foreigners.⁷³ If this number consisted of only men (which, following demographic practices in the ancient world, is almost certain), and half of this population consisted of foreigners (because Carthage was a port city and thus many foreigners resided there), then one is left with 100,000 Carthaginian men all told. From these men, approximately half would have been both able-bodied and over the age of eighteen giving Carthage 50,000 men available to man the fleet. Given these numbers of available mariners, it is highly improbable that the Carthaginians could have manned their fleet without help: a fleet of 100 ships would have required 30,000 men, which would have been 60% of the adult, able-bodied male members of population, and a fleet of 200 ships would have required 60,000 men, an impossible 120% of the population. For these reasons, the crews of Carthage's ships must have included a number of allies (such as the Libyphoenicians), subjects, and/or mercenaries, although in what proportion is unclear.

A comparison to other contemporary Mediterranean naval powers is instructive here. In the early fourth century Athenian navy, according to Moshe Amit, the core of the crew and the basis of the existence of the fleet were permanent free residents of Athens, citizens, and *metics*.⁷⁴ Even later in the fourth century, when the Athenians could no longer afford the volunteer sailors, conscription was drawn from the *thetes*—the lowest-class citizens-- and *metics*—resident foreigners.⁷⁵ Alternative crew profiles, however, are apparent in the extant data on warships manned by the Hellenistic city of Rhodes. Rhodian ships were crewed solely by citizens, including prominent men of their day and members of aristocratic families who were distinguished by their

million individuals. Assuming a population of one million individuals, and normal demographic distribution, 500,000 of these would have been men. 250,000 would have been able-bodied men.

⁷³ Hoyos, *Mastering the West*, 15. (Tarn states 3 to 4 million people in Carthage by the battle of Ecnomus from J. Beloch, *Die Bevölkerung der griechisch-römischen Welt* and *Die Bevölkerung Italiens im Altertum in Beiträge zur Alten Geschichte*).

⁷⁴ Moshe Amit, "The Sailors of the Athenian Fleet", *Athenaeum* 40 (1962), 177.

⁷⁵ *Ibid.*

wealth and active participation in public life.⁷⁶ Many of the rowers in the Rhodian navy consisted of boys of aristocratic families who needed to obtain military experience.⁷⁷ It is tempting to infer from these facts that Carthage followed suit, and that prominent members of Carthaginian aristocratic families and regular citizens of Carthage composed the crews of the Carthaginian fleet; however, as mentioned above, Carthage's population was not large enough to have supplied the crews of the fleet in their entirety.

Carthage must have obtained the men to crew her fleet from somewhere, and since they were not mercenary (given that, as mentioned above, the ancient sources which otherwise comment extensively on Carthaginian dependence on mercenaries for their land army are silent about their naval crews), one can assume they were made up of some combination of citizens and allies. Did the citizen element consist of aristocrats (like Rhodes) or lower class individuals (like Athens)? I suggest that it was some combination of both.⁷⁸ Based on the behavior of the surviving Carthaginian crewmen after they arrived in Sardinia when they arrested and crucified Hannibal the Carthaginian admiral (not to be confused with Hannibal the Rhodian; Polybius 1.24.5-7), Carthage's crewmen - or at least the officers - likely consisted of aristocratic citizens. Because the Carthaginians did not maintain an army, their young aristocrats must have obtained some military training from somewhere. This being the case, it is likely that the Rhodian technique of training the young aristocrats in their navy by letting them work their way up in the ranks was also a strategy Carthage employed. However, given that rowers were paid (and likely paid well), the rowers (if only the unskilled portion) were more probably from Carthage's lower class citizens.⁷⁹

⁷⁶ Vincent Gabrielsen, *The Naval Aristocracy of Hellenistic Rhodes*, (Aarhus University Press: Aarhus, 1997), 95.

⁷⁷ citation!

⁷⁸ Rome also crewed her ships with men from the lower classes.

⁷⁹ Like in Athens, where they recruited the lower class members of society for the fleet, it would have been logical for Carthage to do the same than for them to require the Libyphoenician allies to fill those positions.

Even so, the population estimates suggest that there would have been a dearth of sailors to crew the large Carthaginian navy, necessitating sailors from elsewhere. The logical conclusion - since the crews were not mercenary - is that the rest of the crews were filled by Carthage's Libyphoenician allies.⁸⁰ On the other hand, evidence from Athens demonstrates that many of Athens' allies (besides Samos, Chios and the cities of Lesbos) did not provide men and ships but tribute instead,⁸¹ suggesting that the Libyphoenician allies may have had a choice in the contribution of men and ships to the Carthaginian cause. Perhaps the higher class Libyphoenicians contributed money and the lower class Libyphoenicians - those equivalent to the *thetes and metics* of Athens - became rowers by choice.

As is probably clear from the discussion so far, it is impossible to know exactly how many men in the crews of the navy were actually Carthaginian citizens. My point in engaging in these estimates of the navy's size and composition has thus not been to create precise statistics, but rather to add greater substance to answering the larger question of this thesis: what was the economic impact of the Punic Wars? To answer that question, I have to demonstrate the overall cost of human, and especially citizen, lives, and a good way of doing that is to think about the implications of a "minimal" population estimate: that is, what would be the loss of citizen life if *only* the officers of Carthage's fleets were citizens? If this had, in fact, been the historical reality at Carthage at the time of the Punic Wars, the percentage of the population serving in the fleet would still have been fairly substantial: at any given time, using the aforementioned number of 45 officers per ship, nine to eighteen percent of the population (of 264 BCE) would have been serving in the navy.⁸² Though

⁸⁰ Because the Libyan subjects were used for men in the army and the Libyphoenicians had sailing skills, it makes sense for the Libyphoenician allies to have been required to supply men for the ships of Carthage (also, there is no mention of Libyphoenicians serving in the army).

⁸¹ Matthew Trundle, "Coinage and the Transformation of Greek Warfare" in *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle, (Brill: Leiden, 2010), 238.

⁸² That is 4,500 to 9,000 out of the 50,000 able-bodied, adult male citizens, as discussed above.

this portion of the population is less than the proportion of hoplites to citizens in other city states, it is important note that the casualties of naval warfare were much higher than those of hoplite warfare, in typical battles, and that this represents the very minimum amount of Carthaginian men on the fleet; the actual number might have been much higher, and the number of losses correspondingly greater on the citizen body.

2.2 Building and Maintaining the Fleet

Tarn suggests that Carthage limited the number of ships in her fleets to 200 per battle due to a lack of manpower to crew them.⁸³ The numbers recorded by the ancient sources add support to Tarn's claim. For example, in the first six years of naval combat (beginning with the Battle of the Lipari Islands in 260 BCE and ending with the Battle of Hermaea in 255 BCE), the Carthaginians lost 373 ships, a number that refers only to the number of ships lost in active combat and not those lost to storms or other natural phenomena.⁸⁴ Polybius says that 500 ships were lost over the course of the war, though he, too, reckons only those lost in combat.⁸⁵

Large navies required enormous initial investment and their maintenance constant manual, material, and financial support.⁸⁶ The Greek writer Isocrates (*Areopagus* 7.66) states that the Athenian ship sheds cost 1000 talents each.⁸⁷ Approximately 170 ship sheds have been uncovered in Carthage, dated to the 2nd, or possibly 3rd century BCE.⁸⁸ Constructing and outfitting a *trireme* could cost around one and a half to two talents, with 1000 drachmas being the cost for only the

⁸³ Tarn, "The Fleets of the First Punic War", 54.

⁸⁴ This is assuming that the Carthaginians made use of the 17 Roman ships that they captured at Lipari. If not, the number rises to 206.

⁸⁵ Bartoloni, "Ships and Navigation" 85. Piero Bartoloni puts this number at 700, but he includes ships lost to storms and other natural disasters, as well.

⁸⁶ Matthew Trundle, "Coinage and the Transformation of Greek Warfare" in *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle, (Brill: Leiden, 2010), 236.

⁸⁷ *Ibid.*

⁸⁸ Louis Rawlings, "The Carthaginian Navy", 262.

oars. Larger ships, such as the *quinquereme*, would have been more expensive.⁸⁹ A fleet of two hundred *triremes* would have cost 300-400 talents, and by extension, a fleet of two hundred *quinqueremes* would cost significantly more than that.⁹⁰ Part of this cost was managed by fleet refurbishment, with modifications and repairs being made (according to Polybius) to ships captured in battle.⁹¹ However, the loss of 500-700 ships, despite being spread over 24 years, still drained state resources during the First Punic War, and provides evidence that the costs of naval warfare could exhaust even the most prosperous of states.⁹²

As mentioned above, some scholars suggest that Carthage relied on Libyphoenician groups to help supply both rowers and ships.⁹³ But unless the Libyphoenicians supplied almost all of the crewmen, which is unlikely, then it is probably the case that the Carthaginians contributed many thousands of men to their fleet. These men who served on the fleet would not have been available during the main agricultural season - May through September. So, not only would they be consuming large amounts of grain, they would not be contributing to helping grow it, causing Carthage to increase the demands for tribute on the Libyans and other groups. (See below).

2.3 Loss of Property, Loss of Life

In calculating the loss of these ships in terms of the total men lost with them as well, the overwhelming impact the First Punic War had on Carthage becomes apparent, at least on the population itself. Because it is more likely that the marines who were on the ships were mercenaries rather than Carthaginian citizens, it makes sense to limit the casualties of the

⁸⁹ Louis Rawlings, "The Carthaginian Navy", 268; Casson, *Ships and Seamanship*, 101 n 24.

⁹⁰ *Ibid.*

⁹¹ Polybius 1.29.1

⁹² Rawlings, "The Carthaginian Navy", 268.

⁹³ See Lazenby above; see also Hoyos, *Mastering the West*, 22.

Carthaginians to 300 per ship. Using this estimate, the casualties of Carthage and its allied crews over the first six years of naval battles amount to 111,900 men.⁹⁴ Even if the Carthaginians only supplied the officers for the ships, the resulting number would have been 16,785 men. Given that the population of Carthage was approximately 200,000 people, the loss of almost 17,000 able-bodied men in six years would have been hard to replace. It would have been even harder if the Carthaginians supplied more men than just officers (which is likely). Polybius says that 500 ships were lost over the course of the war, though he, too, reckons only those lost in combat (1.63.6). Assuming 300 men per ship for all but the last battle - and approximately 140 men per ship for the last battle (Polybius asserts that the ships during the Battle of the Aegates Islands were drastically under-crewed),⁹⁵ the resulting Carthaginian naval casualties during the entirety of the First Punic War possibly amounted to 128,700 men. Piero Bartoloni asserts that the Carthaginians lost at least 200 more ships through shipwrecks and other non-battle sinkings, bringing his total for the First Punic War to 700 total ships lost.⁹⁶ If he is correct, this brings the total loss of men to 188,700 (an astonishing number considering that it does not include the loss of the mercenary-marines on the ships). It seems reasonable to assume that it was not only the prohibitive cost of rebuilding those ships that had been lost, nor just that and the payment of the crews, but also an increasing shortage of manpower to crew the ships which contributed to the economic impact of the war.

Carthaginian citizens suffered because of Carthage's dedication to war with Rome. Though the war was not fought in Carthage itself, the loss of 111,900 men to naval warfare in six years- many of whom were citizens - would have touched everyone in the state. Though Carthage

⁹⁴ This number represents men taken as prisoners as well as those who sunk with their ships.

⁹⁵ This number is based upon the number of men taken prisoner in the 50 ships that the Romans captured. Polybius states that they captured 10,000 men. If we assume that all the men on these 50 ships were taken prisoner, this equals approximately 142 men per ship. I have rounded down to 140 to make the math easier.

⁹⁶ Bartoloni, "Ships and Navigation", 85.

was able to call on her subject states for tribute, it was not enough to keep her citizens from feeling the effects of the war. During the 24 years over which the First Punic War stretched, the finances of Carthage changed from prosperous nation to impoverished one. The cost of the navy, both monetarily and through loss of life, serves to demonstrate, in a visible way, the devastating ramifications of the First Punic War on the people of Carthage, and in fact may go far to explain that city's performance in – and eventual loss of – its second go-round with Rome.

3 COSTS OF WAR

In order to compose a thesis that examines the ramifications of the First Punic War on the city of Carthage, the expenditures of Carthage to conduct this war must be investigated. This kind of investigation typically falls under the umbrella of logistics. Unfortunately, though the ancients knew the value of logistics, none of the ancient sources actually wrote about them, and thus it is left to modern scholars to put together the pieces and figure out the logistics of ancient wars. With that in mind, in this chapter, I examine the logistical costs of war activity during the First Punic War, focusing on evidence supplied by Polybius and Diodorus Siculus. While Chapter one focused on the economic effects of the Carthaginian navy and its crews and Chapter three focuses on the ramifications the expenditures of the First Punic War had on Carthage, the goal for this chapter is to provide a broad idea of the expenditures mentioned in Chapter three. I first consider issues of pay and rations for parts of the army beyond the naval crews. This means a principal focus on the various mercenary contingents hired by Carthage over the course of the war. I then look at other hidden but necessary costs, namely the overall expenditure on food, equipment, and animals. I conclude that though it is not possible to know exactly how much Carthage spent on the First Punic War, it was enough to have an economic draining effect on the city.

3.1 *Manpower Costs*

As discussed briefly in the previous chapter, a large part of the Carthaginian army was made up of mercenary groups. These mercenaries were very diverse and consisted of Iberians, Celts, Balearic Islanders, Libyans, Phoenicians, Ligurians, and various Greek slaves (Diodorus 25.2.2). They also included the Numidian cavalry (Polybius 1.19.2). Of these different contingents, the Libyans were the largest group (Polybius 1.67.7). Polybius provides some indications that these groups, in addition to being ethnically distinguished (1.67.3), were also functionally differentiated in terms of the types of fighting they conducted when he describes Xanthippus' organization for the Battle of Tunis. He places the "most active mercenaries together with the cavalry in front of both wings (1.33.6-7.) For instance, in the Carthaginian army, the infantry was composed of the Libyan and Iberian mercenaries (and probably the Greek slaves that Diodorus mentions), though Libyans could also make up the cavalry as well (Polybius 3.33.15). The mercenaries from the Balearic Islands were slingers - men who essentially hurled missiles into the enemy troops by means of a sling (Polybius 3.33.11).⁹⁷ There were also various cavalry groups made up of Numidians, Libyans, and cavalry from Spain (3., along with mahouts for the elephants (1.40.15).⁹⁸

Pay for mercenaries likely varied depending on the particular job that the mercenaries held. These amounts can be inferred by examining Hellenistic sources that record the payments supplied to Greek mercenaries and soldiers, which would have been contemporary and thus analogous to what Carthaginian mercenaries were paid. Typically, rates of pay for mercenaries ranged from

⁹⁷ These descriptions come from Polybius' narration of the Second Punic War, but it seems logical that the same descriptions would hold true for the First Punic War as well.

⁹⁸ Nigel Bagnall, *The Punic Wars 264-146*, 8-9.

three obols a day to two drachmai per day for a standard hoplite (infantryman); from four obols to five drachmai per day for cavalrymen; and from two or three obols to one drachma per day for a sailor.⁹⁹ However, an inscription from Epidauros in 302 BCE stipulates the fines to be paid by cities for failing to provide the levy of soldiers for which they were responsible. According to David Pritchett, it has been maintained that the fine represents ten times the pay of the soldiers in question. This allows the historian to reconstruct the pay of hoplites, cavalry, and sailors at this time period as two drachmai per day for the hoplite, five drachmai per day for the cavalry and one drachma per day for the sailors.¹⁰⁰ Carthage probably offered its mercenaries payments that were comparable to these rates, particularly given the competition among different states for mercenaries across the Mediterranean during the Hellenistic period. However, several fragments of papyrus dated 280-240 BCE reveal that Greek mercenary pay varied according to the political and economic climate.¹⁰¹ If the climate was good, the pay would be good. The pay would decrease if the political and economic climate was bad or uncertain. Indeed, Polybius reports that Carthage attempted to negotiate the amount of money owed to the mercenaries at the end of the First Punic War due to the “heavy taxation and general distress of Carthage,” lending support to the notion that the rate that mercenaries were paid varied with the economic conditions of the state they were serving (1.67.1). Carthage’s economic state at the time of the Mercenary Wars was so bad that they felt it necessary to attempt to rescind their previous agreement and renegotiate another one, a less economically devastating one.

David Pritchett has shown that different types of mercenary pay are mentioned in the Greek sources. These different types of pay were *misthos* and *sitos*. *Misthos* was payment by wage or

⁹⁹ W. Pritchett, *The Greek State at War*, 21. Though the daily wage for Athenian navy members in the classical period was a drachma a day.

¹⁰⁰ *Ibid.*

¹⁰¹ *Ibid.*

salary and was paid by the month; according to Pritchett, it represented the soldier's pay for the entire month and included rations. *Sitos*, by comparison, was payment only by rations, and specifically of grain. The question of how the Carthaginians paid their mercenaries— whether they paid them a salary that included rations, whether they were given rations separately, or whether they were provided with grain— helps determine how much the Carthaginians really paid for their mercenaries. If they paid their mercenaries a salary that included rations, they would necessarily have paid the mercenaries more than if they had provided them with only grain or with ration money. Wartime makes food-costs go up. If Carthage was responsible for providing for the mercenaries, they would have had to eat some of those costs. In other words, providing all of the mercenaries' food would have cost Carthage more than providing only ration money. Polybius' use of the word *opsonion* does not really help to find an answer as *opsonion* can mean salary, but can also mean rations. Matthew Trundle states that the word *opson* from which *opsonion* comes was seen as a rich food group which accompanies wine or grain.¹⁰² That Polybius used this word suggests that the money that the mercenaries received was meant to be spent on rations. In fact, supporting evidence can be found throughout Polybius' narrative of the last battle and the complaints of the mercenaries during the Mercenary War. For example, when the Carthaginians heard that the Roman navy was stationed in Lilybaeum, they hastened to send supplies to their mercenaries so that they could be well fed (1.60.2). Another example comes from earlier in the war during the siege of Lilybaeum (250 BCE) when the Carthaginians sent their Admiral Adherbal with a large number of ships carrying grain and money to the besieged Lilybaeum (Zonarus 8.15).

How, though, did the Carthaginians distribute this food that they brought? Pritchett suggests that there were three ways that Greek mercenaries obtained provisions: first, that they

¹⁰² Matthew Trundle, *Greek Mercenaries: From the Late Archaic Period to Alexander*, 87.

were provided rations in kind, when the soldiers' initial supply (which they were required to bring) was exhausted and the needs of the expeditionary force could not be satisfied by foraging; second, that soldiers were advanced their money at the beginning of the month with which they purchased their food. When on campaign, the hegemon might provide a temporary or permanent market where soldiers could buy their own provisions; or third, that no payment was made and the army and navy would be expected to live off the land or by depredation.¹⁰³ Though the last option was a common practice in ancient Greece (based on what Polybius writes), it seems to have been unexpected, and in the few cases mentioned, often caused mercenaries to revolt or desert to the other side.

Evidence from right before the Mercenary War supports the theory that the Carthaginian mercenaries were supposed to be supplied with food or at least with money to buy food. Polybius states that the Carthaginians provided "lavish supplies" that the mercenaries could buy "at any price they were willing to pay" during the time that they were waiting idly for the pay owed them after the First Punic War (1.68.5). Yet other evidence suggests that the Carthaginians must have provided the mercenaries with rations of grain as well. Polybius reveals that [the mercenaries] maintained that they ought to get the value of the rations of corn due to them for a considerable time at the highest price grain had stood at during the war (1.68.9). In other words, if they were not going to get the grain ration owed to them, then they should receive pay money in its place, at the inflated rate of the cost of grain during the war.

An important issue in estimating the overall costs of manpower for the army is thus the question of how much food was required for the mercenary contingents of the Carthaginian army. This question can be assessed first on the micro-scale level by estimating the food requirements

¹⁰³ Pritchett, 35-36

for an individual soldier. Jonathan Roth extrapolated the daily caloric need for an ancient Roman soldier to be approximately 3000 calories. He based this assumption off of the U.S. Army standards for a soldier who is approximately 170 cm tall, of medium build, weighing 66kg, and 30 years old. This is because men in the Roman army would likely have been older, and men in the ancient world were, for the most part, shorter - somewhere between 5'4" and 5'7" tall.¹⁰⁴ If the Carthaginian mercenaries were taller, approximately 5'9",¹⁰⁵ then, based on U.S. Army calculations, they would have needed approximately 3200 calories per day.¹⁰⁶ These caloric needs would have varied depending on whether the men were on the move or stationary. They also would have been greater immediately preceding a battle, as even the ancients knew that the physical demands of marches and hand-to-hand combat were substantial and soldiers were said to fight less effectively having skipped a meal before battle.¹⁰⁷

Roth states that soldiers in the Roman army received approximately 1.75 -2 pounds of wheat per day (they did not receive barley because that was reserved for the animals).¹⁰⁸ If approximately the same amount is assumed for Carthaginian soldiers, then each soldier would have required approximately 52.5 to 60 pounds of grain per month. Yet the Roman military diet was known for being diverse. Frontinus notes that the Roman army "consumed foods of all kind" (2.5.14). Plutarch mentions the inclusion of lentils and salt in the Roman military diet when he is relating bad omens before M. Licinius Crassus' defeat at Carrhae in 53 BCE, and Appian extols

¹⁰⁴ Jonathan P. Roth, *The Logistics of the Roman Army at War (264 B.C.-A.D. 235)* (Leiden: Brill, 1999), 12.

¹⁰⁵ John Mackintosh, *The History of Civilization in Scotland Volume 1*, 44.

¹⁰⁶ Roth, 12.

¹⁰⁷ Onasander states that "soldiers who have eaten moderately, so as not to put too great a load into their stomachs, are more vigorous in battle, armies have often been overpowered for just this reason, their strength failing for lack of food." Roth, 12.

¹⁰⁸ Roth refers to the amount of wheat in Roman *sextarii* but provides the equivalent measurement of between 1.1 liters and 1.08 liters, by converting that to pounds, one comes to the sum of approximately 1.85 pounds per person. In order to simplify the math and to account for differences in the diet of cavalry and infantrymen, I have given the total for both 1.75 pounds and 2 pounds per day. Roth, 22.

the value of a mixed diet when he reveals that living on grain alone, without wine, salt and oil, was detrimental to the health of Roman soldiers (*App. Hisp.* 9,54). The Roman army was also provided with salt-pork as a non-grain portion of their ration. In sum, based on the previous sources, the Romans provided their soldiers with grain, salt pork, wine, salt, lentils, and likely vegetables for variety. It is likely that the mercenaries were responsible for the variety in their diet. Like the Romans they could not have lived on bread alone. Thus, they either gathered it or bought it from the merchants who followed the army on campaign,¹⁰⁹ or they were provided these rations from the Carthaginians themselves. Whether the Carthaginians provided these sorts of rations free of cost to their men can only be imagined, but, as mentioned above, after the war the Carthaginians provided them with “lavish provisions” that they could purchase (Polybius 1.68.5). Carthage also provided the men – as they were waiting on their pay – “a gold stater for pressing expenses” (Polybius 1.68.6). Yet the mercenaries were not happy with only this arrangement. Polybius provides evidence of a grain ration provided by the Carthaginians when he reveals that the mercenaries “maintained that they ought to get the value of the rations of corn due to them for a considerable time at the highest price corn had stood at during the war” (Polybius 1.68.9), The mercenaries were aware that the price of grain varied throughout the war. It must have dropped after the war, leading the mercenaries to request compensation in a total that was equivalent to what they could have gotten when they were owed. Thus, Carthage may have saved money by not providing grain to the soldiers during the war, but they were not going to get away with giving the mercenaries less than what they were owed. It was not the rations themselves that the mercenaries wanted, but the value of the rations. This would have meant a higher cost for Carthage.

¹⁰⁹ Roth, 16.

Another major cost for Carthage that was entailed in the maintenance of the mercenaries and army was in supplying the army camp followers. Using evidence from Alexander the Great's armies after he allowed his men to marry (Justin 12.4), Donald Engel has argued that there was at least one camp follower for every three soldiers.¹¹⁰ Polybius, when describing the period right before the Mercenary War, suggests that a similar situation may have applied to the Carthaginian army, including its mercenary branches:

The troops readily consented to leave the capital, but wished to leave their baggage there, as they had formerly done, thinking that they would be soon returning to be paid off. The Carthaginians, however, were afraid lest, longing to be with their wives or children after their recent protracted absence, they might in many cases refuse to leave Carthage, or, if they did, would come back again to their families, so that there would be no decrease of outrages in the city. In anticipation then of this, they compelled the men, much against their will and in a manner calculated to cause much offence, to take their baggage with them (1.66.9).

That the wives and children of the mercenaries were with them when they were forced to leave Carthage whilst waiting on their pay after the war suggests that they had likely been with them the entire time.

3.2 *Equipment for War*

Along with food for the mercenaries (and their families), another public expense were the weapons needed by the mercenaries to conduct war. Polybius states that the Carthaginians spent a portion of their tribute and tax money on armaments.

The Carthaginians had ever been accustomed to depend for their private supplies on the produce of the country, [and] their public expenses for armaments and commissariat had been met by the revenue they derived from Libya (1.71.1)

¹¹⁰ Donald Engels, *Alexander the Great and the Logistics of the Macedonian Army*, 14.

In this passage, Polybius does not specify whether the expenditure on armaments included actual weapons and armor for soldiers/mercenaries, and the evidence for Carthage's approach to armature is mixed. One position is that the states that hired mercenaries to work for them provided their equipment.¹¹¹ If this was the case, the expense for Carthage would have drastically increased. Another position, however, is that the broad diversity of mercenary groups hired by Carthage would have prevented them from adequately equipping all parts of the army and all mercenary contingents equally. A compromise between these two positions might be along the lines of what has been suggested by Lazenby, which is that at least part of the mercenaries were homogenized upon entering Carthaginian service. In this instance, Lazenby means that all the different infantrymen would have been provided with the same weapons and armor so that Carthage could easily equip them. However, this would have only been the case for the infantrymen, and not for the others, as it is known that the Numidian cavalrymen carried a light, round, bossless, leather shield which was slightly convex with a narrow rim.¹¹² These shields certainly would not have been the same as those carried by the infantry. There is no evidence in the sources suggesting that the Carthaginians actually provided the armor and weapons for their mercenaries; in fact, there is evidence from the Second Punic War which suggests the opposite. Hannibal outfitted his Libyan troops "with the choicest of the arms captured in the last battle" (Polybius 3.114.1); however, the Spanish and the Celts were armed differently:

The shields of the Spaniards and Celts were very similar, but their swords were entirely different, those of the Spaniards thrusting with as deadly effect as they cut, but the Gaulish sword being only able to slash and requiring a long sweep to do so. As they were drawn up in alternate companies, the Gauls naked and the Spaniards in short tunics bordered with purple, their national dress, they presented a strange and impressive appearance (Polybius 3.114.1).

¹¹¹ Paul McKechnie, "Greek Mercenary Troops and their Equipment" in *Zeitschrift für Alte Geschichte*, Bd. 43, H. 3 (3rd Qtr., 1994), pp. 297-305

¹¹² Gregory Daly, *Cannae: The Experience of Battle in the Second Punic War* (London: Routledge, 2002), 93.

It is not beyond imagination that Carthage would have been able to replace javelins or other weapons of that sort if necessary, and in that sense did provide arms to their men. It is also possible that the arms Carthage provided to its mercenaries consisted of a variety of materiel that would have been needed to support the battle and the men. For instance, the Roman army took clothing, armor, edged weapons, missiles, tents, portable fortifications, cooking gear, medical supplies, writing materials, and much more.¹¹³ Only a portion of these would technically be considered arms. If Carthage also took such items into the field, these sorts of items would also likely be funded by the armaments allowance. However, this still does not cover all the equipment costs.

A final but major category of equipment cost, beyond the weapons for the army and the naval costs that were described in the previous chapter, was the material for siege warfare. These would have consisted of catapults (and the stones which were thrown), siege towers, battering rams, *ballistae*, and *scorpions*. The number of these weapons can be estimated by the number of weapons found in 209 BCE when Scipio seized New Carthage. He confiscated 120 very large *catapults*, 281 smaller *catapults*, 23 large and 52 smaller *ballistae*, as well as large and small *scorpions*.¹¹⁴ Even if cities during the First Punic War did not have as many weapons, the ones that they did have would have required material from which to construct them. These weapons were not only constructed from wood. They also were made from metal. For instance, the front of the siege engines were lined with iron plating to prevent them from burning. So, the cost for these weapons included the materials, pay for the men who built them, and pay for the men to repair them. The Roman army required 1600 smiths and craftsmen to maintain its equipment for battle.

¹¹³ Roth, 3.

¹¹⁴ Konstantin Nosov, *Ancient and Medieval Siege Weapons: A Fully Illustrated Guide to Siege Weapons*, 154.

It is likely that the Carthaginian army required similar numbers. If this is the case, then the cost for Carthage to retain these men must have been considerable.

3.3 *Animal Costs*

The expenses of war did not consist only of pay for mercenaries, food for mercenaries, and equipment costs, it also included the costs of the animals which were used in the army. The category of animal costs encompasses both the initial cost of the animal, the technology required to use the animal, and the cost to maintain the animal. Animals used during the First Punic War include horses, elephants, and pack animals.

3.3.1 *Pack animals*

Pack animals were one of the most important features of ancient armies due to the need of the army to carry provisions for their men. They also had to carry siege equipment such as ropes, picks, levers, scaling ladders, shovels for tunneling, and covered battering rams had to move with the army. Though the siege machines could be disassembled, they required pack animals and wagons to carry the parts.¹¹⁵ Wagons needed animals to pull them. Pack animals were main means of moving supplies in ancient armies and could consist of donkeys, mules, horses, oxen, camels, and elephants.¹¹⁶ Though elephants were included in the Carthaginian army's supply of animals, camels were not. Donkeys and mules were the most common transport animals in the ancient period, though oxen were used for Hannibal's army in the Second Punic War. A donkey could carry a 220-pound load if properly equipped, whereas a mule could carry 450 pounds. Ox drawn

¹¹⁵ Richard Gabriel, *Hannibal: The Military Biography of Rome's Greatest Enemy*, (Washington, D.C.: Potomac Books, 2011), 51.

¹¹⁶ Gabriel, 53.

wagons could move thousand-pound loads, but could not move very far per day or very quickly. Oxen also required twice the amount of food that the horses would require to pull the same weight.

According to Richard Gabriel, Scipio's army of 28,000 men and 1,000 cavalry who marched on New Carthage required 61,000 pounds of grain and rations per day to feed the troops, another 33,600 pounds of hard fodder for the mules, and another 11,000 pounds of fodder for the horses.¹¹⁷ The horses were fed a higher quality fodder than the mules.¹¹⁸ The 8,400 mules in the army required 201,600 pounds of green pasturage a day and the horses another 44,000 pounds.¹¹⁹ That Scipio's army required that many pack animals and that much fodder gives one an idea of how many pack animals could have been required for the Carthaginian army in the First Punic War. Though a better idea could be gained through Jonathan Roth's analysis of the number of pack animals required. He states that a Roman legion during the Second Punic War had 1,400 mules, or 1 animal for every 3.4 men. According to Richard Gabriel, 1,400 mules could carry 175 tons of food.¹²⁰ Much of this food would have been fodder for the animals, as this was the largest logistical requirement of an ancient army. To get an idea of the extent of this need, 10,000 animals required 247 acres of land per day to obtain sufficient fodder. During the Battle of Tunis, the Carthaginians had twelve thousand foot, four thousand horse, and almost one hundred elephants. By employing Roth's calculations of 1 animal for every 3.4 men, the infantry alone would have required approximately 3,500 mules to transport their supplies. The cavalry would have required another 2,000 mules to carry their supplies.¹²¹ By including the mules that would have been needed to carry supplies for the horses, with Roth's calculations of 1 pack animal for every two cavalymen.

¹¹⁷ Gabriel, 51.

¹¹⁸ Roth, 85.

¹¹⁹ Gabriel, 51.

¹²⁰ Gabriel, 52.

¹²¹ Roth states that the cavalry required 1 pack animal for every 2 cavalymen to carry the food for the men and for the horses. Roth, 85.

That means that for this battle, the Carthaginians would have had approximately 9,600 animals with them. This includes the elephants, but not the food for the elephants. Elephants would also require fodder and thus the Carthaginians would likely have required other animals to carry their food as well. An African Bush elephant consumes 400 pounds of food per day, and though they are larger than the elephants that the Carthaginians used (the African Forest Elephant), they provide an idea of the type of food consumption that the Carthaginians would have experienced while using elephants. Gabriel states that the Carthaginian armies, while in Spain during the Second Punic War, had to transport their forage.¹²² One can assume that they had to transport forage for the elephants during the First Punic War as well.

3.3.2 *Elephants*

The Carthaginians likely became acquainted with elephants through interactions with Pyrrhus of Epirus, in approximately 278 BCE. They then paid professionals to capture elephants for them throughout north Africa from around the Atlas Mountains, Morocco, and Algeria.¹²³ The elephants caught here were the forest variety, like those captured by the Ptolemies' in East Africa; smaller than African Bush Elephants. Carthage built stables in the walls of the city which would house 300 elephants. They also hired "Indian" mahouts. These mahouts may have actually been from India, and if so were obtained through the Ptolemies' who hired mahout from India to train their own men. Carthage must have taken the same approach because coinage found there sometimes shows elephant riders with African features. Numidians were among mahouts riding elephants during the Second Punic War.¹²⁴

¹²² Gabriel, 56.

¹²³ John M. Kistler, *War Elephants*, (Westport, CT: Praeger, 2006), 98.

¹²⁴ Kistler, 97.

Along with the price that Carthage paid to the men who caught the elephants - which we do not know - and the cost to feed elephants (approximately 400 pounds of fodder per day), other expenses that Carthage would have had to front in order to use elephants would have revolved around the equipment that was required to use them in battle and the training for the elephants. Scholars disagree whether the Carthaginian elephants that were used in the First and Second Punic Wars carried towers. These towers would have sat on the back of the elephants and would have been big enough to carry four men (Livy 37.40.4). It is believed that the Carthaginians used African Forest Elephants for their wars.¹²⁵ These elephants are smaller than both Indian and African Bush elephants, and thus some scholars believe that they would not have been large enough to carry towers, and the mahouts would have simply ridden these elephants with their legs on either side of their necks. However, Zonaras, when narrating the Second Punic War, relates that, at least during this war, soldiers fought from towers on the backs of elephants (VIII.13). If this was the case during the First Punic War as well, then the towers would have added to Carthage's elephant cost. Further evidence suggesting the Carthaginian use of towers for their elephants comes from Lucretius, who states, "In the process of time the Carthaginians taught fierce elephants, with towers on their backs, and with snake-like proboscis, to endure the wounds of war, and to throw vast martial battalions into confusion."¹²⁶

Other elephant gear would have consisted of the *ankhus*, carried by the mahouts and involving a sharp hook on a pole with which they steered the elephant, a small shield, and a quiver of javelins used against enemies on the ground.¹²⁷ A mahout would have also worn a bronze helmet which had a brim in the back to guard against sunburn and a cloth wrapped around the helmet to

¹²⁵ *Ibid.*

¹²⁶ Titus Lucretius Carus, J. S. Watson, and John Mason Good, *Lucretius On the Nature of Things. A Philosophical Poem, in Six Books* (London: H.G. Bohn, 1851).

¹²⁷ Kistler, 22-23.

reduce heat.¹²⁸ In addition, the elephants themselves also wore sets of armor. According to Appian, the elephants wore dyed leather armor with which they attempted to frighten the Romans (App. *Punic Wars* 43), and they may have worn iron armor on their heads, as the elephants in Antiochus III's army did (Livy 37.40.4).¹²⁹

It is important to understand that the Carthaginian elephants did not come to them battle ready, and time was needed to train them (and during this time, the Carthaginians would have needed to feed them). At least some of this time must have been spent in the battlefield. Polybius states that Hasdrubal spent time in Sicily, before the Battle of Panormus drilling his elephants. This must have entailed getting the elephants used to military noises. The easiest way was to repeat the sounds over and over again until the elephants became accustomed to the noise. The mahouts had drums and other instruments beaten nearby, while men practiced their combat skills. The sounds of swords clashing against shields, lance striking armor, arrows flying into targets, and frightened horses neighing were all practiced within earshot of the elephants so they would not become confused and frightened during the real battle.¹³⁰

3.3.3 *Horses*

Though the Carthaginians purchased their elephants (or at least hired someone to catch them), the question must be asked whether they provided the horses for the cavalry. As illustrated above, the Carthaginians had a large number of cavalymen and they came from different locations. The Numidians made up one location, but there were Libyan cavalymen as well. Based on an excerpt from Polybius when he is describing the time leading up to the Mercenary War: “When,

¹²⁸ *Ibid*

¹²⁹ Kistler, 27

¹³⁰ Kistler, 12.

therefore, the Carthaginians had agreed to their claims for pay, they went a step further and asked for the value of the horses they had lost. This also was conceded ...” it can be assumed that the cavalrymen provided their own horses, and normally would not have gotten pay for their losses, but given the situation - the Carthaginians were conceding to every request to keep them pacified - they asked for pay for their lost horses, and the Carthaginians conceded. Even though the Carthaginians did not provide the horses for the cavalry, they still had to provide the food for these horses throughout the war, and given that Carthage had a large number of cavalrymen, it would have made up a significant cost during the war.

3.4 Conclusion

The purpose of this chapter was not to give specifics about the amount of money that Carthage would have paid to conduct the First Punic War, but to provide an idea of the things on which Carthage would have had to spend money. The compilation of the costs of supplies, equipment, manpower, and animals required for this war provide a background for understanding why the war affected Carthage in the way it did. The Carthaginians did not only have to provide ships and the men to go with them, but the many other components of war which have been covered in this chapter.

4 THE ECONOMIC RAMIFICATIONS OF THE PUNIC WARS ON CARTHAGE

At the beginning of the Punic Wars, the city of Carthage was a well-established trading and naval power in the Mediterranean, one with control over numerous subject states. These subject states provided tribute to support the citizens of Carthage in the form of agricultural

produce.¹³¹ This was over and above what the Carthaginians themselves could produce by way of foodstuffs: benefitting from the robust agricultural production of their own hinterland, the Carthaginians were able to contribute substantial amounts of grain to the trading market.¹³² Furthermore, the location of the city made it an ideal distribution center for trade from all over the Mediterranean.¹³³ As such, Carthage derived significant profit from harbor fees and taxes, and was able to become immensely wealthy. Yet despite these assets at its command, by the end of the First Punic War, Carthage was scrambling from lack of resources. As might be anticipated, the needs of twenty-four years of warfare had taken a toll on Carthaginian food supplies, to the extent that the Carthage had been compelled to squeeze as much agricultural produce from its subject states as was possible. It was not only agricultural produce that was lacking, however; it was also funds, as the aftermath of the war - a messy war with their own mercenaries, who rebelled due to lack of payment - makes clear.¹³⁴ The expenditures which led to these straitened circumstances, and the distress which they created, are worth a more thorough investigation. It will be the aim of the chapter to conduct such an investigation, which it will accomplish by an examination of the broader economic ramifications of war costs for Carthage, the climate of its economic system, resource scarcity, and currency debasement seen in the numismatic evidence from the period of the First Punic War.

¹³¹ Walter Ameling, "The Rise of Carthage to 264 BC," in *A Companion to the Punic Wars*, ed. Dexter Hoyos, Blackwell Companions to the Ancient World (Malden, MA: John Wiley & Sons, Ltd., 2011), 49.

¹³² Nathan Pilkington, "An Archaeological History of Carthaginian Imperialism" PhD diss., Columbia University, New York City, 2013, 190.

¹³³ *ibid*

¹³⁴ The events of the so-called Mercenary War are a separate historical episode which do not really have a place in this thesis. Of significance for the present project is the cause of this War, which Polybius directly states was the lack of payment by the Carthaginians to their hired soldiers. Admittedly, this shortfall might have been occasioned by the first payment of reparations to the Romans, which had occurred a short time earlier, but evidence presented below will illustrate that the Carthaginians had already been in dire financial straits even before this new outlay.

4.1 Tribute: An Essential Contribution

One of the fundamental features of the ancient Carthaginian economic system was its reliance on tribute payments. The collection of tribute from dependent states was common in the ancient world. Precedents of this sort of collection could certainly be found in earlier imperial models like that of the Lydians (Hdt. 1.6.2, 27.1) and their successors the Persians (Hdt. 3.89-96, 6.42.2). The Persians, for their part, funded their wars by requiring each of their subject states to pay an annual tax (*phoros*) which was based on an assessment of what it could afford.¹³⁵ This model is one with which the Phoenicians, the parent people of the Carthaginians, would have experienced first-hand, and certainly one with which the Carthaginians would have been familiar. By the Classical period, an additional model for tribute collection was devised by the Athenians in their formation of the Delian League in the aftermath of the Greek defeat of the Persians in 479 BCE. Initially the Athenians did not collect “tribute” from dependent states *per se*. Rather, those states who wished to join a defensive alliance - the aforementioned Delian League - but did not wish to contribute men and ships to Athens could pay tribute (or *phoros*) to Athens instead, providing the funds that kept the Athenian fleet afloat. During the Peloponnesian War, the Athenians could count on receiving 600 talents per year from tribute and were able to borrow money from sacred treasuries.¹³⁶ Despite the enormity of this income, the Athenians eventually came to struggle with shortage of funds the longer the war continued. To put it another way: even the large amounts of tribute that Athens collected from the other members of the league was not enough for extended periods of warfare,

Throughout its history, Carthage also required a certain amount of tribute from most of its subject states. This tribute often took the form of agricultural produce, which was used to help feed

¹³⁵ David M. Pritchard, "Public Finance And War In Ancient Greece," *Greece & Rome* 62, no. 01 (2015); 50.

¹³⁶ *Ibid*

the Carthaginian population in times of peace and was crucial for maintaining food supplies in times of war.¹³⁷ Though treaties established the level of tribute for some subject states, the Carthaginians varied and altered their assessments upon others according to choice or necessity.¹³⁸ For example, some places, such as Sardinia and Corsica, may not have been obliged to pay tribute at all, or if they were, there is no extant record of it (more below).¹³⁹ The same appears to have been the case for western Sicily, which the Carthaginians did not value for its grain production but for rather for the ports of Panormus and Lilybaeum.¹⁴⁰ But other states did pay, specifically by agricultural tithe, and principal among the latter were the Libyans. They were required to pay and in quantities that could be quite extensive: even before the war, the Libyans were obligated by their treaty to send one quarter of their crops to Carthage. As the war stretched on, the demand for agricultural supplies from the Libyans increased.¹⁴¹ Libya had become Carthage's main supplier, and by war's end they were compelled to increase their tribute payment by 100 percent.¹⁴² Notice of this increase comes from Polybius (1.72.2-6), who also records that the Carthaginians were relentless in their collection, disallowing any exemption on grounds of poverty and arresting men who could not pay. The Carthaginians apparently found their overwhelming dependence on the

¹³⁷ *Ameling*, 49.

¹³⁸ *Ibid.*

¹³⁹ Peter Garnsey and C. R. Whittaker, *Imperialism in the Ancient World: The Cambridge University Research Seminar in Ancient History* (Cambridge: Cambridge University Press, 1978), 72.

¹⁴⁰ To be sure, Carthage was aware of the potential of obtaining large amounts of grain from Syracuse, though their possessions did not include the eastern portion of the island (which included Syracuse), where the major grain production was located (Christa Steinby, *Rome versus Carthage: The War at Sea*). When King Hiero decided he would support the Romans instead, Carthage was aware of the substantial portion of potential supplies lost to them; in fact, Polybius specifically mentions that the Romans accepted the transfer of allegiance because of the abundance of Syracusan provisions (1.16.). The western portion, which was controlled by Carthage, was much less well-endowed; this can be seen in the difficulties encountered by towns which were able to support the small garrisons that had been in Sicily before the war, but could not sustain their own citizens and the large armies required to fight the Romans during the war itself

¹⁴¹ "They had exacted from the peasantry, without exception, half of their crops, and had doubled the taxation of the townsmen without allowing exemption from any tax or even a partial abatement to the poor. They had applauded and honoured ... those governors who ... procured for Carthage the largest amount of supplies and stores". (Polybius 1.72.2-4).

¹⁴² Gregory Daly, *Cannae: The Experience of Battle in the Second Punic War* (London: Routledge, 2002), 85.

Libyans somewhat distressing, as the expedition against the Numidians launched around 254 BCE illustrates. During this episode, as originally recounted by Orosius (4.9.9), the Carthaginians sent an army under their general Hamilcar against Numidia and Mauretania to punish them for their attack on Carthage in 256 BCE. Hamilcar accused the Numidians of having attacked Carthage on behalf of the Romans, and as punishment, he crucified the alleged ringleaders. He additionally, however, seized a thousand talents of silver and twenty thousand heads of cattle, a confiscation likely motivated as much by a desire to punish as by concern for overburdening the Libyans to the point that they would be completely useless to the Carthaginians.¹⁴³

Despite the evidence for increased tribute demands and payments, Carthage still suffered from grain shortages throughout the First Punic War, shortages that had an impact on both the military and the citizenry.¹⁴⁴ It became increasingly difficult to support both the civilian population and the mercenaries hired to fight against Rome. The question of why the Carthaginians did not extract grain from other territories under their sway, such as Sardinia, Corsica, and Sicily, must thus be considered.

That Carthage did, in fact, control these islands is glimpsed by the treaties they had with the Romans. One of these – the second mentioned by him as having been struck between the two powers, dated to “at a later date” than their first, which was established in 509 (3.22.1-13) – specified that the Romans could not traffic or found a city in Sardinia, and went so far as to say that if a merchant wound up on the shores of either Sardinia or Libya because of bad weather, he could stay no longer than five days (Polybius 3.24.11). It is also directly stated by Polybius, who suggests that Carthaginian possession of these islands motivated the Romans to aid the

¹⁴³ This is the opinion of Hoyos, 2015, 52.

¹⁴⁴ The emphasis here is on grain shortage and not crop shortage mostly because it is likely that it was grain specifically, as opposed to other crops, which was diverted away from the main population to the military, due to the fact that grain kept for longer periods of time.

Mamertines, so as to keep the Carthaginians from taking control of Sicily as well (1.10.7-9). Sardinia and Corsica were therefore almost certainly under Carthaginian control (1.10.6). That they could produce grain can be seen by the fact that when Romans obtained control of Sardinia in 237 BCE, they made use of Sardinian grain to supply their army.¹⁴⁵ Furthermore, besides the exploitation of metal ores, Ameling, in a passage for which he does not cite primary sources, claims that Carthage's aim in Sardinia was an expansion of agricultural production.¹⁴⁶ Yet Carthage did not utilize either of these islands for their grain production.

Two main factors may have prevented Carthage from turning to taxation of Sardinia when they were confronted with various economic pressures during the First Punic War. First, archaeological studies of the Sardinian interior suggest that parts of the island were still "native" possessions late in the third century BCE. Like their Phoenician predecessors, Carthage maintained its strongest presence along the coast-- and more specifically in the towns that had originally been Phoenician — and coastal hinterlands, a situation that was similarly followed in Corsica. Archaeological evidence suggests that even if Sardinia *was* being used for agricultural production, it was not prepared for being suddenly tasked with mass grain production in the middle of the third century BCE as most of the Punic farms that have been identified in the most grain-productive areas of Sardinia date to the third century. These farms were fairly small – not like the plantations which existed in Libya – and would have, by the time of the First Punic War, been in place for only a generation or two.

The second factor that likely prevented Carthage from imposing a harder tax burden on Sardinia is that Carthage maintained a different political treaty and legal relationship with the

¹⁴⁵ Jonathan P. Roth, *The Logistics of the Roman Army at War: (264 B.C. - A.D. 235)* (Leiden: Brill, 1999), 160-162.

¹⁴⁶ Ameling, 49.

Sardinian city-states than they did with the Libyans. Sardinian cities such as Tharros, Sulcis, Bithia, and Karalis were all founded by the Phoenicians, just as Carthage was. As such, they both shared closer ethnic ties with Carthage, ones that stressed a joint ancestral relationship with Tyre, and were correlatively granted certain legal, sociopolitical, and economic privileges. We know that this is the case largely based on the analogous evidence from Libyphoenician communities, cities that were also Phoenician in origin. As discussed by Walter Ameling, Libyphoenicians had the same rights as the Carthaginians themselves, with the possible exception that they were required to pay taxes to Carthage.¹⁴⁷ It is unknown whether Carthaginian citizens themselves had to pay taxes, though it is likely that they had to pay a tax on their land - *eisphora* - like the Athenians and the Macedonians.¹⁴⁸ If the Sardinians had the same status as the Libyphoenicians (and by extension, the same rights as Carthaginians), they were also likely excluded from levies of tribute.

Carthage did, of course, sometimes obtain grain from Sardinia during military crises, as they did during the Mercenary War.¹⁴⁹ After all, it is quite possible that the Carthaginians purchased this grain instead of obtaining it through their tribute system.¹⁵⁰ However, there is no definitive evidence that the Sardinians supplied grain to Carthage under any circumstances during the First Punic War, a situation that at first glance appears puzzling given the proximity of Sardinia to Sicily, the main setting for the First Punic War. The literary record, however, provides some explanation for why this was the case. Polybius scarcely mentions Sardinia during his narrative of the First Punic War, but other primary sources make mention of battles fought on Sardinia and triumphs awarded. The *Fasti Triumphales* (which documents triumphs given to Roman consuls and proconsuls by year) mention two instances in 258 and 259 BCE when the Romans won battles

¹⁴⁷ Ameling, 49.

¹⁴⁸ Matthew Trundle, *Coinage and the Transformation of Greek Warfare*, 241.

¹⁴⁹ Ameling, 49.

¹⁵⁰ Garnsey, 72-73.

against the Sardinians and the Carthaginians in Sardinia.¹⁵¹ Eutropius also underscores the notice of the *Fasti*, stating outright that the Romans destroyed Sardinia's excess grain when they "laid waste to Corsica and Sardinia, [and] carried away several thousand captives" (Eutropius 2.20.3). This evidence provides a reason that Carthage did not obtain grain from Sardinia – Sardinia did not have grain to spare. In any case, though the Carthaginians obtained grain from the Numidians, Mauretanians, and other groups in Libya, they were not able to take advantage of their wide range of territories when faced with broader economic pressure during the First Punic War.¹⁵²

4.2 Economic Stress during the First Punic War

Though the First Punic War put stress on the economy of Carthage from the beginning, as wars are apt to do, major economic damage is not apparent in the sources until the last six years of the conflict.¹⁵³ In order to understand the reasons behind this, it is necessary to explain the events that contributed to this economic state. Critical to such an explanation is the year 255.¹⁵⁴ In that year, the Carthaginians suffered a crushing loss at the battle of Hermaeum, as was discussed in Chapter 1. Under other circumstances, such sustained losses might have led them to sue for peace. Yet in this instance peace was not sought, because other events from 255 - one earlier than Hermaeum, and one later - led the Carthaginians to believe that victory in the war was still possible. Fifteen years of war then ensued, and their costs eventually proved to be more than Carthage could

¹⁵¹ *Fasti Triumphales*, 100.

¹⁵² Archaeological evidence from the fifth and fourth century suggests that Sardinian imports far surpassed the Sicilian imports. Richard Miles, *Carthage Must be Destroyed, ?- before the corinthian threat*

¹⁵³ Not only did naval warfare cost money, but the hiring of mercenaries required an initial outflow of money if the Carthaginians conducted their mercenary hiring like the Persians did and they paid them a portion of their money up front and the remaining when the service was finished.

¹⁵⁴ There is some debate about whether these events actually happened in 255 or whether they happened later, though Polybius seems to indicate that they happened in 255, yet some sources list them as happening in later years. For instance, Zonarus states that the siege and capture of Panormus happened in the "five-hundredth year from the founding of Rome" or 253.

pay. For these reasons, 255 was a vitally important year for the Carthaginian war effort, and as such, a brief discussion of that year's events seems appropriate here.

4.2.1 *Tunis and Hermaeum*

Just before the summer of 255 a Romans army under Marcus Atilius Regulus suffered a beating in Africa at the hands of the Carthaginians near modern-day Tunis. According to Polybius (1.33-35), the Carthaginians were well served by the Spartan Xanthippus, who was given command of the army, and by their elephants, who broke the Roman line at the battle. Roman losses were truly staggering: Polybius reports that after battle of Aspis, which had been in the previous year, Regulus was left with 15,000 infantry and 500 cavalry to press the offensive in Africa (1.29.9).¹⁵⁵ Of these, only 2500 escaped destruction on the field, and 500 of these were soon captured along with Regulus himself. Furthermore, Polybius reports that the legions were so afraid of the Carthaginian elephants that they avoided fighting on open ground for the next two years (1.39.12).¹⁵⁶

¹⁵⁵ Appian (*Pun.* 3) and Orosius (4.9.3) observe that Regulus commanded 30,000 men, not 16,000. This may have been an error, or it may have been that additional 15,000 came from some of the marines serving on board the vessels which were taken home after the battle of Aspis. The whole expedition numbered 330 ships, and if the Romans had a complement of 140 marines, they might have left as many as half of them to continue to serve as land soldiers under Regulus.

¹⁵⁶ This remark of Polybius has occasioned some controversy. Clearly Polybius must not have meant that the Romans withdrew from the field entirely between 255 and 253, as the capture of Panormus occurred in 254. Lazenby points out that he must be referring to the years between 252 and 250. On the other hand, there was no recorded Carthaginian activity on Sicily after Panormus from 254 until 251 (Lazenby, 113 and 118). Perhaps what Polybius meant is that once the legions had heard what had happened in 255 and the role of the elephants in the disaster, they gave over fighting in the open; they may not have heard what had transpired until after Panormus in 254. It should also be observed that Polybius describes Panormus as being something of an amphibious operation, and thus not perhaps not conducted in the open at all.

The Carthaginians, for their part, were elated by their victory, and Polybius describes the extravagance of their celebrations and religious observances (1.36.1), and were apparently not dampened by their failure to dislodge the survivors of the battle of Tunis from Aspis, which they held against a Carthaginian siege (1.36.5-6). He also describes the buoyancy with which they repaired and refitted their fleet of 200 ships (1.36.9). However, fortune seemingly turned against them in the next engagement, when they ran into 250 ships under the command of Marcus Aemilius Paullus and Servius Fulvius Nobilior that were rounding the African side of the Sicilian coast.¹⁵⁷ The Romans attacked the Carthaginian fleet near Hermaeum, and were able to capture 114 ships with their crews.

Even this enormous setback did not dampen Carthaginian spirits, due to a catastrophe which directly befell the triumphant Roman fleet: after picking up their remaining survivors from Aspis, they set sail again for Sicily and home. On their way, they were overcome by a terrible storm near Camarina, in southeastern Sicily: out of 364 ships, only 80 were saved.¹⁵⁸ Even better, at least for the Carthaginians, was the fact that this disaster could have been prevented: Paullus and Nobilior were warned that storms were probable and that safe harbors were few in southern Sicily. They chose to sail anyway, and thus the loss was entirely due to their bungling (1.37.4-6). The elation of the Carthaginians at the misfortune of the Romans might be seen in what Polybius

¹⁵⁷ Though Polybius says that this number is 350, his total number of ships - Roman and captured Carthaginian vessels - are given as 364 in 1.37.2. at the end are 364. Given the rest of the battles, the number is more likely to be 250 than 350.

¹⁵⁸ "In the early summer the Romans, having launched three hundred and fifty ships, sent them off under the command of Marcus Aemilius and Servius Fulvius, who proceeded along the coast of Sicily making for Libya. Encountering the Carthaginian fleet near the Hermaeum promontory they fell on them and easily routed them, capturing one hundred and fourteen ships with their crews. Then having taken on board at Aspis the lads who remained in Libya they set sail again for Sicily. They had crossed the strait in safety and were off the territory of Camarina when they were overtaken by so fierce a storm and so terrible a disaster that it is difficult adequately to describe it owing to its surpassing magnitude. For of their three hundred and sixty-four ships only eighty were saved; the rest either foundered or were dashed by the waves against the rocks and headlands and broken to pieces, covering the shore with corpses and wreckage." (Polybius 1.36.10-37.3).

(1.38.1) says was the attitude of the Carthaginians; that is, that the devastation of the Roman ships and the win in Africa convinced them that they were equal to Rome on both land and sea. In the same passage, Polybius also relates that the Carthaginians began making additional military and naval preparations. They sent Hasdrubal, 140 elephants, the troops from the previous engagement in Africa, and a force that had joined them from Heraclea towards Sicily. They also began to make preparations for a naval expedition, preparing a force of 200 ships (1.38.2-5). Optimism, it can be imagined, must have run high.

4.2.2 *Timing Issues and Economic Concerns*

A sober estimation of the events of 255 BCE reveals that the Romans had suffered colossal losses: at least 13,000 infantry and cavalry had been killed or captured at Tunis, and over 280 ships had been lost with all hands aboard¹⁵⁹. That the Carthaginians became encouraged is understandable, though misplaced. While the land victory at Tunis was impressive, it was won by the Spartan general Xanthippus, who soon left Carthage for Sparta, purportedly fearing the jealousy that might accompany his famous exploit (1.36.2).¹⁶⁰ Furthermore, the Carthaginians had proven themselves unable to dislodge the survivors from Tunis, who had retreated to Aspis and successfully held out against a Carthaginian siege (1.36.6-7). Additionally, the fact that the Romans had lost so many ships in 255 did not mean the Carthaginians had sunk them. As noted above, the Romans lost their fleet because their commanders had chosen to ignore the storm warnings. As a famous passage in Polybius (1.37.7) makes clear, they had chosen to rely upon force rather than prudence, and attempted to muscle their way through the storm, destroying their

¹⁵⁹ It may well have been that the number killed at Tunis was much greater; see earlier note.

¹⁶⁰ Polybius also hints that there is more to the story of his departure. Cassius Dio (in Zonaras 8.13), Appian (*Pun.* 4), Silius Italicus (*Pun.* 6.680-683), and Diodorus Siculus (23.16) all indicate that Xanthippus was murdered by the Carthaginians, who gave him a ship they knew to unseaworthy to take him back to Greece.

own fleet in the process. The Carthaginians benefitted from Roman stubbornness, but relying upon enemies to defeat themselves rather than actively defeating them is a dangerous strategy, since there was always the chance that the enemy might always elect to stop their self-destructive behaviors.

Furthermore, the Carthaginians had themselves hardly emerged from 255 unscathed. Although Polybius reports fairly low Carthaginian casualties at Tunis (a mere 800 mercenaries; 1.34.9), the Carthaginians proved unable to take the survivors, who had retreated to Aspis (1.36.6-7). This was not from want of trying. Polybius states that the Carthaginians had put Aspis under siege soon after Tunis, but the courage of the Romans proved too much for them, and they were forced to abandon the siege at length. Polybius does not mention how long “at length” (*télos*) was. He does assert that Hermaeum happened within the same year. Polybius does not explain why the Carthaginians were unable to outwait the Romans and take Aspis, but the literary record indicates that the Carthaginians were beginning to suffer from shortages of manpower. At issue is the timing of Hasdrubal’s dispatch to Sicily. Polybius states that the Carthaginians sent Hasdrubal and his elephants to Sicily immediately after the Romans suffered the destruction of their ships in 255, but some modern scholars have suggested that this was not the case.¹⁶¹ The argument hinges on the fact that the Romans took Panormus without strenuous effort in 254, left the town with what appears to be a small garrison, and held it unopposed for over four years until the counterattack came in 250 BCE.¹⁶² Polybius does indicate that Hasdrubal took some time to train his forces, but that Hasdrubal simply let the assault and seizure take place without challenging the Romans is

¹⁶¹ Lazenby, 113.

¹⁶² Polybius (1.38.7-10) and Zonaras (8.14, quoting Cassius Dio) cite its capture by Gnaeus Cornelius Scipio and Aulus Atilius, with Polybius explicitly stating that the two were consuls at the time, hence 254. The counterattack came when Hasdrubal moved on Lucius Caecilius Metellus, who is indicated as proconsul in Polybius (because the counterattack on Panormus - 1.40.1-16 - is mentioned after the election of consuls Gaius Atilius Regulus and Lucius Manlius Vulso, which occurs in 1.39.15), and thus 250.

unlikely given Polybius' stress on the importance of Panormus (1.38.7), and especially when it is taken into consideration that Hasdrubal was not immediately called back to Carthage and put to death, as was Carthage's policy for generals who failed. Inactivity on Hasdrubal's part could be explained if there was a delay between the sinking at Camarina in 255 and the counterattack on Panormus in 250.

That Polybius was mistaken in his timing of when Hasdrubal was sent to Sicily is suggested in the pages of Polybius himself and Orosius. The former notes that at roughly the same time as the battle at Adys, the Carthaginians encountered another military challenge in the form of an attack by the Numidians on Libya (1.31.2). The Numidians had caused more damage than the Romans, he says, and Orosius notes that the Carthaginians got around to punishing the Numidians after. According that author, at some point after Camarina the Carthaginians sent an army to deal with the invaders (4.9.4). Hamilcar, the man chosen for the command, apparently had little trouble with the Numidians, as was discussed above. The apparent ease of his victory may have been helped by the fact that the men that he took with him to Numidia were the same men who had fought with Xanthippus. They were also likely the men that Hasdrubal took to Sicily as some of men, Polybius says, were not new recruits, but men who had previously fought for Carthage (1.38.2). It could have been that Hasdrubal may have had to wait until the Numidian campaign had been concluded. If it is indeed the case that Hasdrubal was not sent immediately, but after the Carthaginians had taken care of the Numidians, it would explain the lack of Carthaginian activity on Sicily during the years 254-250. It would also explain the ability of the Romans to capture Panormus; Hasdrubal was not there to come to the rescue, and only the garrison that was stationed there could defend it (more below). Carthage could not leave large garrisons in every city they possessed on Sicily. The Carthaginians had a limited amount of men, including the tributary

soldiers from their subject states (approximately 200,000 that they could field at any one time).¹⁶³ If this includes the men lost to naval activity, and assuming the highest number 128,700 lost, then there were approximately 21,300 men left for naval activity or to supplement their mercenary troops.

This lack of men was not Carthage's only concern, as the loss of 114 more ships at Hermaeum would have been devastating as well. The cost to replace those ships - again - would have been staggering. It also would have taken quite a bit of time to rebuild the fleet. This helps to explain the fairly substantial period of time between the battle of Hermaeum and the battle of Drepana. The Carthaginians were unable to rebuild their navy in a three month period, as Polybius states that the Romans were able to do (1.38.6). Polybius stated that the Carthaginians "*began to get ready for sea two hundred ships and to make all other preparations for a naval expedition*" (emphasis mine)(Polybius 1.38.3), thus implying that it took at least some time for the Carthaginians to prepare their fleet.

Preparing their fleet this time would have been more difficult than it had been before. As mentioned in Chapter one, by the end of the Battle of Hermaeum, the Carthaginians had lost a total of 373 ships. They had lost 114 only in the Battle of Hermaeum. One cannot assume that they had an inexhaustible supply of ship building supplies at the ready. Certain parts of the ships needed to be constructed wood consisting of varying degrees of dryness: the sides needed to be dry to a certain degree or the ship would not be waterproof.¹⁶⁴ That the Carthaginians had just finished constructing quite a few ships after the battle of Ecnomus suggests that their supply of wood which was already prepared could have been depleted and would have needed to be replenished thus leading to a longer preparation time for the Carthaginian fleet than for the Roman fleet. . The

¹⁶³ Pilkington, 345.

¹⁶⁴ Casson, 205.

Carthaginians would not have constructed an entire fleet out of new wood – new wood was heavier and would have compromised their rowing ability and speed, something about which Polybius was consistently complimentary.

4.2.3 *The Loss of Panormus*

Upon hearing of the devastation of their fleet, the Romans constructed 220 new ships and conducted an amphibious mission against Panormus, the most important Carthaginian city on Sicily. Polybius (1.38.5-10) states that the Romans undertook the siege of Panormus complete with siege works and battering rams. They knocked down the towers of Panormus on the sea and managed to storm the New Town and convince the Old Town to surrender, after which the Consuls sailed back to Rome and left a garrison in the town.¹⁶⁵

Though the Carthaginians had lost Panormus, they managed to take back Agrigentum (a Carthaginian city which had been taken by the Romans), but they did not feel that they could hold it and so they razed it to the ground. Then, in the early summer of 253 BCE, the Romans lost another 150 ships sailing across open seas on their way back to Rome. Polybius (1.39) states that, under such conditions, the Romans abandoned the idea of constructing another fleet, (see also Polybius 1.59). They turned their reliance fully on their ground troops who were, it seems, (as mentioned above) afraid to fight the Carthaginians because of their elephants.

The loss of Panormus was major, and would have cost the Carthaginians in terms of their economy; Richard Miles states that the Carthaginians would have faced the risk of economic

¹⁶⁵ Descending with their total fleet of three hundred sail on Panormus, the most important city in the Carthaginian province, they undertook its siege. They threw up works in two places and after making the other necessary preparations brought up their battering-rams. The tower on the sea shore was easily knocked down, and, the soldiers pressing in through this breach, the so-called New Town was stormed, and the part known as the Old Town being now in imminent danger, its inhabitants soon surrendered it. Having taken possession of it the Consuls sailed back to Rome leaving a garrison in the town. (Polybius 1.38.7-10)

disaster if they lost the ports of Lilybaeum and Panormus, and even Polybius states that Panormus was “the most important city in the Carthaginian province”. It was also an extended affair. Though the Romans controlled the port after 254 BCE, the Carthaginians did not give it up for lost until Hasdrubal and his army were stomped by the Romans in 250 BCE. During this battle, the Romans managed to capture all of the Carthaginian elephants - ten with their mahouts and the rest who had thrown their mahouts (Polybius 1.40.15). The battle represented a turning point in the war in that after it occurred, the Carthaginians devoted all their efforts to defending Lilybaeum (Polybius 1.41.6). Polybius attributes this change in strategy to the fact that the Carthaginians would not have any ports on Sicily if they lost Lilybaeum. Richard Miles depicts the situation a little more starkly; he specifically emphasizes the importance of Lilybaeum and Panormus, making it clear that it was not just the loss of any port on Sicily, but the loss of a port essential to the Carthaginian economy that caused the Carthaginians to rethink their strategy. Losing one was bad, but losing both would be devastating, which is exactly why Carthage focused solely on Lilybaeum for the next nine years.

4.2.4 *The Siege at Lilybaeum*

Though the loss of Panormus was to make itself felt in the following years, it was not apparent initially (likely because the Carthaginians could still profit from Lilybaeum). After the win at the Battle of Panormus (250 BCE),¹⁶⁶ the Romans decided to take to the sea again and conduct a siege on Lilybaeum, which was practically the last Carthaginian stronghold in Sicily.

Surrounding the city, the Romans began attacking the towers with their siege works, gradually expanding their area of control one tower at a time. By the time they had knocked down

¹⁶⁶ By this point, it had been four years since the horrible losses in the storms following the capture of Panormus.

six, they were able to use the battering rams on the others all at once. Though the siege was coming closer and the population of the city was terrified, the general, Himilco, caused the Romans great difficulty by counter-building and counter-mining with the 10,000 mercenaries that he had inside the city. Every day, he would advance to try to set the siege works on fire and suffered much loss of life (Polybius 1.42.8-13).¹⁶⁷

The Carthaginians sent fifty ships with troops - new mercenaries - to relieve their men under siege in Lilybaeum under the command of Hannibal (the son of Hamilcar and friend of Adherbal, the other Carthaginian Admiral). After coming to anchor at the Aegates Islands, Hannibal awaited a favorable breeze and was able to sail straight into the mouth of the harbor; the Romans made no effort to stop them (Polybius 1.44.1-4). Himilco, the Carthaginian commander, decided to make use of the fresh troops and the spirit these men had brought with them (as they were not aware of the situation) and make another attempt to fire the enemy's siege works. Due to promises of reward for those who distinguished themselves, the men showed great bravery, but Himilco saw that too many were falling and called for the retreat (Polybius 1.45.1-14). The Carthaginian commander Hannibal managed to get his fleet out of the harbor while it was still night and make anchor at Drepana (about 21 kilometers from Lilybaeum). The Romans maintained control of their siege works and the city until a storm allowed the Carthaginians to burn them and the Romans gave up the attempt to conduct the siege by works, and left the result to time.

¹⁶⁷ The Romans encamped by this city on either side, fortifying the space between their camps with a trench, a stockade, and a wall. They then began to throw up works against the tower that lay nearest the sea on the Libyan side, and, gradually advancing from the base thus acquired and extending their works, they succeeded at last in knocking down the six adjacent towers, and attacked all the others at once with battering rams. The siege was now so vigorously pursued and so terrifying, each day seeing some of the towers shaken or demolished and the enemy's works advancing further and further into the city, that the besieged were thrown into a state of utter confusion and panic, although, besides the civil population, there were nearly ten thousand mercenaries in the town. Their general, Himilco, however, omitted no means of resistance in his power, and by counter-building and counter-mining caused the enemy no little difficulty. Every day he would advance and make attempts on the siege works, trying to succeed in setting them on fire, and with this object was indeed engaged by night and day in combats of so desperate a character, that at times more men fell in these encounters than usually fell in a pitched battle. (Polybius 1.42.8-13).

4.2.5 *The Battle of Drepana*

In 249 BCE, after the storm had allowed the Carthaginians to burn the siege works, the Romans sent extra troops to replace those who had been lost in the fires. At this point, the Roman Consul, Publius Claudius Pulcher, called a meeting of the Tribunes and told them that it was time to attack Drepana with the whole fleet reasoning the Carthaginian admiral Adherbal would not suspect an attack because he was unaware of the arrival of the new crews. After obtaining the Tribunes' consent, he chose the best men and prepared to sail at midnight. At dawn, when the ships came into view, they were unorganized as they had gotten out of formation during the night. Though Adherbal was taken by surprise, he nevertheless quickly regained his composure and got his ships together. Taking the lead, he exited the harbor on the opposite side from the Romans. The Roman commander, upon seeing this, ordered his own fleet to sail out of the harbor, causing much confusion. Though the ships, once lined up for battle, were evenly matched for a time (Polybius says that the marines of both contingents were the best men of their land forces), the Carthaginians began to pull ahead "owing to the superior build of their ships and the better training of their rowers". Finally, the Carthaginians captured 93 of the Roman ships along with their crews and the rest fled back to Lilybaeum with their commander.¹⁶⁸

¹⁶⁸ The Carthaginian general Adherbal who commanded there was, he said, unprepared for such a contingency, as he was ignorant of the arrival of the crews, and convinced that their fleet was unable to take the sea owing to the heavy loss of men in the siege. On the Tribunes readily consenting, he at once embarked the former crews and the new arrivals, and chose for marines the best men in the whole army, who readily volunteered as the voyage was but a short one and the prospect of booty seemed certain. After making these preparations he put to sea about midnight unobserved by the enemy, and at first sailed in close order with the land on his right. At daybreak when the leading ships came into view sailing on Drepana, Adherbal was at first taken by surprise at the unexpected sight, but soon recovering his composure and understanding that the enemy had come to attack, he decided to make every effort and incur every sacrifice rather than expose himself to the certitude of a blockade ... he quickly got under weigh and took the lead, making his exit close under the rocks on the opposite side of the harbour from that on which the Romans were entering. Publius, the Roman commander, had expected that the enemy would give way and would be intimidated by his attack, but when he saw that on the contrary they intended to fight him, and that his own fleet was partly inside the harbour, partly at the very mouth, and partly still sailing up to enter, he gave orders for them all to

After the Carthaginian win at the Battle of Drepana, the Carthaginian Admiral Carthalo was sent by Adherbal to attack the remaining Roman ships. After setting fire to the Roman ships moored in the harbor at Lilybaeum, he carried off as many as he was able and sailed off to keep watch for ships coming from Rome. When the Consul came into sight with his fleet around Cape Pachynus the Carthaginians sailed toward him as quickly as possible. Junius (the other Consul serving opposite Publius Claudius Pulcher) did not wish to engage the Carthaginians and thus changed his course to a rugged portion of the coastline and anchored there. While he was anchored, a storm approached and shattered the Roman fleet, thus destroying the Romans' second attempt at a navy.

The narrative of Battle of Drepana and the preceding seven years are essential to an understanding of the Carthaginian strategy, economic situation, and mindset going into the Battle of the Aegates Islands. As mentioned above, the Battle of Drepana followed several years during which the Romans had lost multitudes of ships; in 255 BCE, they lost all but 80 of their ships (including the 114 Carthaginian ships taken at the Battle of Hermaeum), and in the early summer of 254 BCE, they lost another 150 ships sailing across open seas on their way back to Rome. Then, following their losses at the Battle of Drepana, they lost another fleet to weather.

put about and sail out again ... When the two fleets approached each other, the signals for battle were raised on both the admirals, and they closed. At first the battle was equally balanced, as the marines in both fleets were the very best men of their land forces; but the Carthaginians gradually began to get the best of it as they had many advantages throughout the whole struggle. They much surpassed the Romans in speed, owing to the superior build of their ships and the better training of the rowers, as they had freely developed their line in the open sea. For if any ships found themselves hard pressed by the enemy it was easy for them owing to their speed to retreat safely to the open water and from thence, fetching round on the ships that pursued and fell on them, they either got in their rear or attacked them on the flank, and as the enemy then had to turn round and found themselves in difficulty owing to the weight of the hulls and the poor oarsmanship of the crews, they rammed them repeatedly and sunk many. ... Such being their difficult position in every part of the battle, and some of the ships grounding on the shallows while others ran ashore, the Roman commander, when he saw what was happening, took to flight, slipping out on the left along shore, accompanied by about thirty of the ships nearest to him. The remainder, ninety-three in number, were captured by the Carthaginians, including their crews, with the exception of those men who ran their ships ashore and made off (Polybius 1.49-51).

The literary sources suggest that after the loss of Panormus and the siege of Lilybaeum to the Romans - ultimately negating any Carthaginian profit from the ports - the Carthaginians began to feel the pinch in their economy. They requested a loan of 2000 talents from Ptolemy, ruler of Hellenistic Egypt, in 247 BCE, demonstrating that the war was taking its toll on them. Given that the Romans had decided not to rebuild their fleet again after the destruction of the ships by storm, the Carthaginians, in the next few years, allowed many of their crewmen to return to their homes believing “that the Romans would never again challenge their naval supremacy” (Polybius 1.61.6).¹⁶⁹ Carthage’s knowledge of Rome’s losses (a total of 426 ships with their men in 255 and 254, on top of the 93 lost at Drepana and the 120+ to the storm in 249), the huge cost of rebuilding, and Rome’s decision to at least temporarily abandon naval strategy make Carthage’s assumption seem natural.¹⁷⁰ There was little reason to anticipate Rome’s transition back to naval combat, and thus no reason to retain their naval crews.

Their request for a loan in 247 BCE suggests that the decision to send the crewmen of the navy home was a decision made with an eye on finances as well. However, disbanding the fleet came at a cost. The rate of piracy increased. By 243 BCE the Carthaginians had ceased sending either money or supplies to Sicily to support Hamilcar and his men. Dexter Hoyos postulates that this was because it was unsafe to send supplies and money over sea when it would almost certainly be intercepted by pirates. Though this may have been a partial reason, the final naval battle of the war suggests that the unwillingness of the Carthaginians to send supplies stemmed from economic problems, not fear of piracy; and, it was likely inability rather than unwillingness.

¹⁶⁹ This would have been at some point after 245 or a gradual process as up until that year Hamilcar was still using the fleet to ravage the Italian coasts.

¹⁷⁰ Some scholars speculate that because some of the ships lost were Carthaginian ships captured in the Battle of Ecnomus, they may have been crewed by Carthaginian sailors. If they were not, then the ships were likely crewed with the minimum amount of sailors possible.

4.3 The Neglect of the Navy

Evidence for economic stress within Carthage is particularly apparent towards the end of the First Punic War, specifically in regards to the Battle of the Aegates Islands and onwards. Polybius provides a description of the battle that is worth quoting extensively here (1.59-61). Having mentioned that the Romans had come to the conclusion that the only way to end the war with the Carthaginians was once more to take to the sea, he describes their construction of a fleet of warships. In response:

Hanno, who they had appointed to command the naval force, set sail and reached the so-called Holy Isle from whence he designed to cross as soon as possible to Eryx, unobserved by the enemy, and after lightening the ships by disembarking the supplies, to take on board as marines the best qualified mercenaries together with Barcas himself and then engage the enemy. Lutatius, learning of Hanno's arrival and divining his intentions, took on board a picked force from the army and sailed to the island of Aegusa which lies off Lilybaeum. ... In the early morning, just as day was breaking, he saw that a brisk breeze was coming down favorable to the enemy, but that it had become difficult for himself to sail up against the wind, the sea too being heavy and rough. At first he hesitated much what to do under the circumstances, but reflected that if he risked an attack now that the weather was stormy, he would be fighting against Hanno and the naval forces alone and also against heavily laden ships, whereas if he waited for calm weather and by his delay allowed the enemy to cross and join the army, he would have to face ships now lightened and manageable as well as the pick of the land forces and above all the bravery of Hamilcar which was what they dreaded most at that time. He therefore decided not to let the present opportunity slip. ... The Carthaginians seeing that the Romans were intercepting their crossing, lowered their masts and cheering each other on in each ship closed with the enemy. As the outfit of each force was just the reverse of what it had been at the battle of Drepana, the result also was naturally the reverse for each. The Romans had reformed their system of shipbuilding and had also put ashore all heavy material except what was required for the battle; their crews rendered excellent service, as their training had got them well together, and the marines they had were men selected from the army for their steadfastness. With the Carthaginians it was just the opposite. Their ships, being loaded, were not in a serviceable condition for battle, *while the crews were quite*

untrained, and had been put on board for the emergency, and their marines were recent levies whose first experience of the least hardship and danger this was. The fact is that, owing to them never having expected the Romans to dispute the sea with them again, they had, in contempt for them, neglected their naval force. [emphasis added]. So that immediately on engaging they had the worst in many parts of the battle and were soon routed, fifty ships being sunk and seventy captured with their crews. The remainder raising their masts and finding a fair wind having unexpectedly gone round and helping them just when they required it. As for the Roman Consul he sailed away to Lilybaeum and the legions, and there occupied himself with the disposal of the captured ships and men, a business of some magnitude, as the prisoners made in the battle numbered very near ten thousand. (Polybius 1.60-61)

Polybius's account of the Battle of the Aegates Islands is interesting for a variety of reasons, but one of the greatest is that he places a large part of blame for Carthage's inattention to its navy: This "neglect" is all the more striking since Polybius juxtaposes it to the major naval win at Drepana in 249 BCE. What exactly did Polybius mean by the "neglect" of the navy? In Greek, the work Polybius uses is a form of *leipo* a verb that can mean "leave" in the sense of "leave standing," "leave aside," or "leave at home," which can be interpreted in various ways. On the one hand, it is clear from other parts of Polybius's narrative that the neglect was not equal to complete abandonment. During Hamilcar's land battle against the Romans, for example, Hamilcar sent Carthaginian ships to ravage the Italian coasts as far as Cumae in hopes that it would distract the Romans from their attack on Sicily indicating that the navy was still active (Polyb. 1.59.6). On the other hand, the neglect was significant enough to force a lengthy delay in terms of Carthage's ability to send ships to Lilybaeum after hearing of Rome's sudden re-appearance off the west coast of Sicily under Gaius Lutatius at the beginning of the summer of 242 BCE (Polyb. 1.59). According to John Lazenby, it took the Carthaginians nine long months to stock ships and arrive to face the Romans.¹⁷¹

¹⁷¹ Lazenby, 113.

Sicily is approximately 3-4 days away from Carthage against the wind in an ancient vessel and ancient sailing patterns meant that Carthage would have had roughly three months for safe passage. Thus it must have taken longer than three months to get the supplies and ships ready to head out to Drepana. What was the cause of such a delay? Unlike the Romans, whose fleets had been destroyed, Carthage did not have to build a new fleet in order to take on the Romans at the Aegates Islands: in addition to the more than 90 ships they captured from Rome seven years earlier, they also still had the original Drepana fleet (120 ships) and other flotillas.¹⁷² The age of the boats was also not a major factor, as ships usually remained in service for approximately 25 years.¹⁷³ Polybius instead suggests that the delay was due to problems in the supply chain. As discussed above, the immediate reason for the fleet's dispatching was the need for resupplying the Carthaginian land forces led by Hamilcar that were based at Eryx (1.60). If the ships were ready, it must have been the supplies that caused - or at the very least contributed to - the nine-month delay in the navy's departure.

Polybius also makes reasonably clear that it was not the supplies alone that the Carthaginians had difficulty acquiring (1.61.5); he makes two allusions to the state of the crews in particular. First he suggests that the crews were generally under-manned. When Hanno departed from Carthage for Sicily, he did so with approximately 250 supply-laden ships (Diodorus 24.11.1). Of these, the Romans would ultimately sink 50 and capture 70 (along with their crews), yet Polybius specifically mentions that the total number of captives amount to 10,000. As discussed previously, the demographic estimates of ancient authors always have been examined critically, but here Polybius's number of captured sailors is less than what would have been normal for the captured 70 ships. Such a discrepancy implies that, at the time of naval engagement, the

¹⁷² *Ibid*

¹⁷³ Casson, *Ships and Seamanship*, 120.

Carthaginian ships had been “neglected” in the sense that they were not adequately supported with military manpower.¹⁷⁴

The second allusion that Polybius makes to the state of the crews is that they were “untrained” (*anasketa*) a term that can equally refer to either a temporary lack of preparation (and thus relevant to veteran mariners) or to inexperience (and thus relevant to new recruits). Indeed, as mentioned above, after the success of the earlier battle of Drepana, due to the high costs of paying the crew members, many sailors were likely allowed to go home. Men kept aboard ship would not have lost their conditioning so totally. Though the crews may have technically remained in the navy, they clearly spent their time doing something other than practicing their maneuvers. When the call for men went out seven years later, for men to fill 250 ships instead of 200, the Carthaginians were not able to obtain all of the same men who sailed for them previously, resulting in grossly under-crewed ships with sailors that were not trained as well as they could have been because they had not had practiced in many years, or had not practiced at all.

Polybius’ description of the “neglect of the fleet” thus likely refers to the overall poor condition of the men; the lower crew numbers and their level of preparation for naval combat, not to the state of the ships in particular. Polybius states that the ships “were not in a serviceable condition for battle” because they were loaded, not because there was actually something wrong with the ships. The particular significance of Carthage’s disastrous loss of the Battle of the Aegates Islands, however, is how it indicates the broader economic stress that Carthage faced toward the end of the war.

¹⁷⁴ Importantly, Polybius is not the only ancient source that gives numbers for prisoners taken during this battle. Eutropius, Orosius, and Diodorus all provide numbers of ships lost and prisoners captured. Of these, Polybius is the only source that implies that the ships were undermanned, and thus, maybe they were not, but even if that were the case, they were certainly new sailors. Given the lack of experienced Carthaginian men available after their losses early on in the war, it is not hard to imagine that the new recruits were less than fully trained when they were sent off on to this battle.

4.3.1 *Treating for Peace*

It was at this point that the Carthaginians capitulated and sent an embassy to treat for peace (Polybius 1.62.5). It is likely that the devastation of the fleet during this battle, was the last straw for the Carthaginians. They simply could not afford to keep fighting. The loss of these supplies would have been a devastating blow. The Carthaginians did not have a sufficient supply of arms, a proper navy, or the material left to construct one (Polybius 1.71.6). They would have known that even if they still had control of the sea, they also would not have been able to obtain more supplies to replace the ones lost and sustain an exhausted army of approximately 20,000 men.¹⁷⁵ As mentioned before, they had used the Libyans for grain until they could not be used anymore; it is likely that the Libyans had none left to give.

Given the economic state of Carthage at this point in the war - as suggested by the previous evidence - they also would not have been able to afford to replace the ships captured and sunk by the Romans or the men lost during this battle. The human casualties would have cost Carthage dearly, as it is probable that they were mostly Carthaginian citizens. Replacing the men lost during this battle (10,000 taken prisoner and using the same calculations for those ships sunk as for those captured 7,000 possibly drowned) would have been extremely difficult for a city-state whose manpower was already diminished to start.

¹⁷⁵ Hoyos, 73.

4.3.2 *Paying the Mercenaries*

After the war was over, the Carthaginians were ordered to pay war reparations to the Romans in the amount of 3,200 talents over ten years - 1,000 to be paid immediately. Due to this and the fact that Carthage was already hurting for money - as mentioned earlier, they had requested a loan from Ptolemy II in 247 which they did not receive - they were able to pay the Romans their 1,000 talents, but they were unable to pay the mercenaries they amount owed to them. Though they tried to negotiate with the mercenaries to encourage them to take less than they were owed “due to the high tax on Carthage”, the mercenaries would have none of it. During the war, while in critical situations, the mercenaries had been made great promises by their generals (Poly 1.66.12). After the war, the mercenaries expected Carthage to live up to the promises made to them, yet the Carthaginians were unable to do so.

4.4 **Further evidence of economic stress: The depreciation of money**

Other changes in the economic system are evident in the drastic reduction of electrum in the coinage of Carthage during the First Punic War. In the early fourth century BCE, the electrum in Carthaginian coinage was ninety-eight percent. Silver was similarly pure. This coinage seems to have been systematically debased, however; with gold electrum falling to thirty percent by the Second Punic War and silver electrum falling to thirty-three percent in the First Punic War.¹⁷⁶ Even with this reduction, Carthage was unable to scrape together the funds to pay the mercenaries.

According to both literary and archaeological sources, Carthage was a historically wealthy city-state. Like other non-Greek groups in the west Mediterranean, they began to use coins

¹⁷⁶ Howgego, *Ancient History from Coins*, 113-114.

relatively late, and did not actually produce their first coinage until the first half of the fifth century in Sicily.¹⁷⁷ Their money was originally coined in large quantities, and is believed to have been used principally to pay the mercenaries hired to fight for Carthage against Dionysius, Agathocles, and Pyrrhus.¹⁷⁸ Matthew Trundle has stated, however, that in Athens at least, the use of coinage can be traced back to the adoption of the trireme as the warship of choice.¹⁷⁹ Because Carthage was a thalassocracy, their coinage was more likely tied to paying crewmen of the navy rather than mercenaries, since in the fifth century, Carthaginians provided their own citizen soldiers and the balance was supplied by her subject states.¹⁸⁰ Either way, the Carthaginians had a cash economy by the early third century, as demonstrated by the $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}$ shekels that have been recovered.¹⁸¹ Yet, as the city became more and more financially impoverished, Carthage began minting huge copper coins and billons with less than twenty-five percent silver. There is also evidence of the use of a fiduciary currency of stamped leather in use during the First Punic War.¹⁸² This evidence further suggests that the economy of Carthage became so depressed during the wars that its citizens could not get their hands on actual coinage. This demonstrates that the Carthaginian economy was even more diminished than the primary sources may suggest.

4.5 Conclusion

Over the course of the twenty-four years that the First Punic War was being fought, Carthage went from being a very wealthy state that could afford to hire numerous mercenaries to

¹⁷⁷ Howgego, 2. Paulo Visona, 2010. "Unusual Carthaginian Billon of the First Punic War and of the Libyan Revolt" in *The Numismatic Chronicle (1966-)* 170. Royal Numismatic Society, 65.

¹⁷⁸ Howgego, 142.

¹⁷⁹ Matthew Trundle, "Coinage and the Transformation of Greek Warfare" in *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle. (Leiden: Brill, 2010).

¹⁸⁰ Ameling, 49.

¹⁸¹ Howgego, 141.

¹⁸² Howgego, 142.

defend it, to a state that could not procure the supplies to rebuild their ships or supply their mercenaries any longer. Interestingly enough, the sources do not state explicitly that the Carthaginians were struggling, but the evidence throughout the sources is strong enough that the state of the economy can be determined. The massive number of ships that the Carthaginians lost, and the massive number of men lost that accompanied this played a part, as did the loss of the ports of Panormus and Lilybaeum. The evidence presented in this chapter not only presents the economic ramifications of the First Punic War on Carthage, but the events behind them.

5 CONCLUSION

The First Punic War marked a turning point in the history of the ancient world. It marked the increase in power of one civilization (Rome) and the beginning of the downfall of another (Carthage). Rome up until this point had not ventured overseas, but now began to expand into Sicily, Corsica, and Sardinia. Carthage, by contrast, had controlled a great deal of territory around the Mediterranean - including all of the islands in the Sardinian and Tyrrhenian seas - and had been seen as a major sea power, but now became less powerful and controlled less territory than it had before; specifically, it lost Sardinia, Corsica, and Sicily. Despite these facts, while the Punic Wars as a whole have been investigated in detail, there is currently only one monograph devoted specifically to the First Punic War by itself: *The First Punic War: A Military History* by John Lazenby. The other monographs include both the Second and Third Punic Wars. Certainly these other wars are of great importance, and it is not hard to grasp why several scholars have chosen to study the wars as a unified phenomenon. Yet the First Punic War, while obviously connected to the other two, is different from the Second and the Third, and repays further study as its own discreet event. Thus, this thesis focuses on it in particular. Yet a full narrative of the war, and a

complete discussion of its events, its causes of the war, and even its outcome, would be an enormous undertaking. Instead, this thesis has restricted its focus to the effect of the war on Carthage, especially the economic effect. This has appeared to be a worthwhile project, because while this war has been researched extensively (especially in those works which study the Wars collectively), most scholars approach it from a Roman perspective not a Carthaginian one. Even those who attempt a Carthaginian perspective ignore the economic cost of the war. In order to get a full view of this war in antiquity, it is important to discuss the other side - even if the evidence is limited – and to ask a variety of questions. By asking different questions and analyzing different factors – especially money – the motivations for Carthage’s actions become a little clearer.

Such investigation has been attempted here. It has attempted to provide evidence that economics could be (and should be) considered as an important factor in the cause and conduct of the war by examining the different costs of war and their effects on Carthage. These costs resonate in three parts of the Carthaginian political and socio-economic system during the fourth through second centuries BCE: the personnel and labor invested in the navy; state expenditure on war-making; and the long-term ramifications of the wars on Carthage’s economic structure. These three different components of the Carthaginian socio-economic framework have been taken as independent case-studies into how issues of state finance, the military, and social organization changed during the years 400 to 200 BCE, yet work together to provide a holistic representation of the impact of the Punic Wars on Carthage itself.

At the war’s beginning, and throughout the combat, Carthage was known as a major sea power. Therefore, the obvious point of entry into the costs of the war was Carthaginian navy, and the first chapter detailed the financial burden that was required to maintain that force. It investigated the costs of the ships and the costs of the crews. It revealed that the Carthaginians

likely staffed their ships with citizens and men from their subject states, and examined what the loss of life that the naval battles entailed. Naval warfare, chapter one notes, was expensive in more ways than the casualties that losses generated. Ships needed to be built, maintained, and staffed, and though naval activity did not occur year round, the actual cost to maintain a navy was very significant.

The war was not only conducted at sea, however, nor was their navy the only source expenditure borne by Carthage. Some of these other expenditures were examined in chapter two. This chapter looked into the (largely non-naval) cost of the First Punic War and into the logistics of fighting it. It examined the manpower costs, such as the price paid for mercenaries and their weapons, their entourages, and their food and pay. It also took stock of the animal costs (pack animals, horses, and elephants with their food) and the costs of the engines of war - catapults, siege engines, and other items with which Carthage defended itself. Some of these were not known precisely, but by analogy to other wars of the period in which same costs were paid – ones which give an idea of the price tag – it shows that the sheer amount of supplies needed would have translated into expenses paid by Carthage, which would have been colossal.

The third chapter investigated the ramifications of the costs detailed in the first and second chapter on the city of Carthage. This chapter necessarily examined Carthage's method of funding the war, and went into specific events from the years from 255 BCE on which allowed an analysis of the economic effects that the war had on Carthage. These economic effects were revealed in the changes that can be seen in the Carthaginian economic system: the changes in the demand for tribute, inability to pay their soldiers, the drastic reduction in the electrum in coins as well as the lack of coins available, and the scarcity of supplies and manpower as seen in the battle of the Aegates Islands. The examination of the economic evidence available during the years 255 through

the end of the war suggests that the loss of the important port cities of Panormus and Lilybaeum played a huge role in shaping the economic situation that Carthage faced at the end of the First Punic War due to the importance of these cities in particular, and that it was this loss combined with the costs of war – both on the sea and on land – whose ramifications were evident on Carthage.

The primary aim of this thesis is to further scholarly investigations into ancient Carthage by concentrating on the economic organization of the state during the First Punic War. It sought to categorize the costs of conducting a war such as the First Punic War and to portray the effects of the costs of the war on Carthage and to provide an image of the First Punic War from a different perspective: Carthage's. This thesis does not make the claim that it was the extraordinary economic cost of a war that stretched on for twenty four years which led to Carthage's eventual capitulation to the Romans; however, it does suggest that the economic factor deserves more attention than it currently receives.

REFERENCES

Primary Sources

- Polybius. *The Histories*. Translated by William Roger Paton. Edited by F. W. Walbank and Christian Habicht. Cambridge, MA: Harvard University Press, 2010.
- Livy. *History of Rome*. Translated by B.O. Foster. Cambridge, MA: Harvard University Press, 1929.
- Diodorus Siculus. *Library of History*. Translated by Charles L. Sherman. Cambridge, MA: Harvard University Press, 1952.
- Appian. *Roman History*. Translated by Horace White. Cambridge, MA: Harvard University Press, 1912.

Secondary Sources

- Amit, Moshe. "The Sailors of the Athenian Fleet", *Athenaeum* 40 (1962): 157-178
- Archibald, Zosia H., John K. Davies, and Vincent Gabrielsen. *The Economies of Hellenistic Societies, Third to First Centuries BC*. Oxford: Oxford University Press, 2011.
- Austin, M. M., and Pierre Vidal-Naquet. *Economic and Social History of Ancient Greece: An Introduction*. Berkeley: University of California Press, 1977.
- Bagnall, Nigel. *The Punic Wars: Rome, Carthage, and the Struggle for the Mediterranean*. New York: Thomas Dunne Books, 2005.
- . *The Punic Wars, 264-146 BC*. Oxford: Osprey, 2002. 33
- Bartoloni, Piero. "Ships and Navigation" in *The Phoenicians* (Sabatino Moscati, ed.). New York: Abbeville Press, 1988.
- Carradice, Ian A., and Susan La Niece. 1988. "The Libyan War and Coinage: A New Hoard and the Evidence of Metal Analysis". *The Numismatic Chronicle (1966-)* 148. Royal Numismatic Society: 33–52. <http://www.jstor.org/stable/42668126>.
- Carus, Titus Lucretius, J. S. Watson, and John Mason Good. *Lucretius On the Nature of Things. A Philosophical Poem, in Six Books*. London: H.G. Bohn, 1851.
- Casson, Lionel. "Galley Slaves". *Transactions and Proceedings of the American Philological Association* Vol. 97 (1966), 35–44.
- . *Ships and Seamanship in the Ancient World*. Baltimore: The Johns Hopkins University Press, 1995.
- Charles, John F. "The Marines of Athens". *The Classical Journal* 44 (1948): 181–88.

- Charles-Picard, Gilbert, and Colette Charles-Picard. *Daily Life in Carthage: At the Time of Hannibal*; Transl. from the French by A.E. Foster. London: Allen Unwin, 1961.
- Cohen, Edward E. *Athenian Economy and Society: A Banking Perspective*. Princeton, NJ: Princeton University Press, 1992.
- Daly, Gregory. *Cannae: The Experience of Battle in the Second Punic War*. London: Routledge, 2002.
- Engels, Donald W. *Alexander the Great and the Logistics of the Macedonian Army*. Berkeley: University of California Press, 1978.
- Frank, Tenney. *Roman Imperialism*. New York: Macmillan, 1914.
- Gabriel, Richard A. *Hannibal: The Military Biography of Rome's Greatest Enemy*. Washington, D.C.: Potomac Books, 2011.
- Gabrielsen, Vincent. *Financing the Athenian Fleet: Public Taxation and Social Relations*. Baltimore: Johns Hopkins University Press, 1994.
- , *The Naval Aristocracy of Hellenistic Rhodes*. Aarhus: Aarhus University Press, 1997.
- Goldsworthy, Adrian Keith. *The Fall of Carthage: The Punic Wars, 265-146 BC*. London: Cassell, 2003.
- Harris, William V., K. Iara, and Pascal Arnaud. *Maritime Technology in the Ancient Economy: Ship-design and Navigation*. Portsmouth, RI: Journal of Roman Archaeology, 2011.
- Howgego, C. J. *Ancient History from Coins*. London: Routledge, 1995.
- Hoyos, B. D. *The Carthaginians*. Milton Park, Abingdon, Oxon: Routledge, 2010.
- , *Mastering the West: Rome and Carthage at War*. New York: Oxford University Press, 2015.
- Kistler, John M. *War Elephants*. Westport, CT: Praeger, 2006.
- Lancel, Serge. *Carthage: A History*. Oxford, UK: Blackwell, 1995.
- Lazenby, J.F. *The First Punic War: A military history*. Stanford: Stanford University Press, 1996.
- Mackintosh, John. *The History of Civilization in Scotland*. Paisley: Gardner, 1892.
- McKechnie, Paul. "Greek Mercenary Troops and their Equipment" in *Zeitschrift für Alte Geschichte*, Bd. 43, H. 3 (3rd Qtr., 1994).
- Meadows, Andrew, and Kirsty Shipton. *Money and Its Uses in the Ancient Greek World*. Oxford: Oxford University Press, 2001.
- Miles, Richard. *Carthage Must Be Destroyed: The Rise and Fall of an Ancient Civilization*. New York: Viking, 2011.

- Morrison, J. S., and J. F. Coates. *Greek and Roman Oared Warships*. Oxford: Oxbow Books, 1996.
- Murray, William Michael. *The Age of Titans: The Rise and Fall of the Great Hellenistic Navies*. New York: Oxford University Press, 2012.
- Nossov, Konstantin. *Ancient and Medieval Siege Weapons: A Fully Illustrated Guide to Siege Weapons and Tactics*. Guilford (Connecticut): Lyon Press, 2005.
- O'Connell, Robert L. *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*. New York: Random House, 2010.
- Rawlings, Louis. *The Ancient Greeks at War*. Manchester: Manchester University Press, 2007.
- , "The Carthaginian Navy: Questions and Assumptions" in *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle. Brill: Leiden, 2010.
- Reden, Sitta Von. *Money in Classical Antiquity*. Cambridge: Cambridge University Press, 2010.
- Robinson, E. S. G.. 1938. "Carthaginian Coins". *The British Museum Quarterly* 12 (4). British Museum: 141–43. doi:10.2307/4422105.
- , 1964. "Carthaginian and Other South Italian Coinages of the Second Punic War". *The Numismatic Chronicle and Journal of the Royal Numismatic Society* 4. Royal Numismatic Society: 37–64. <http://www.jstor.org/stable/42662581>.
- , 1956. "The Libyan Hoard (1952): Addenda, and the Libyan Coinage in General". *The Numismatic Chronicle and Journal of the Royal Numismatic Society* 16. Royal Numismatic Society: 9–14. <http://www.jstor.org/stable/42678379>.
- Roth, Jonathan P. *The Logistics of the Roman Army at War (264 B.C.-A.D. 235)*. Leiden: Brill, 1999.
- Rougé, Jean. *Ships and Fleets of the Ancient Mediterranean*. Middletown, CT: Wesleyan University Press, 1981.
- Sacks, Kenneth. *Diodorus Siculus and the First Century*. Princeton, NJ: Princeton University Press, 1990.
- Shipton, Kirsty. *Leasing and Lending: The Cash Economy in Fourth-century BC Athens*. London: Institute of Classical Studies, 2000.
- Tarn, W.W. "The Fleets of the First Punic War." *The Journal of Hellenic Studies* 27 (1907): 48-60
- Trundle, Matthew." Coinage and the Transformation of Greek Warfare" in *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle. Leiden: Brill, 2010.
- , *Greek Mercenaries: From the Late Archaic Period to Alexander*. London: Routledge, 2004.

- Visona, Paulo. 2010. "Unusual Carthaginian Billon of the First Punic War and of the Libyan Revolt". *The Numismatic Chronicle (1966-)* 170. Royal Numismatic Society: 63–71. <http://www.jstor.org/stable/42678883>.
- , 2006. "A New Wrinkle in the Mid-carthaginian Silver Series". *The Numismatic Chronicle (1966-)* 166. Royal Numismatic Society: 15–23. <http://www.jstor.org/stable/42666397>.
- Wallace, Robert W.. 1987. "The Origin of Electrum Coinage". *American Journal of Archaeology* 91 (3). Archaeological Institute of America: 385–97. doi:10.2307/505360.
- Wees, Hans Van "All Who Sail Shall Receive a Wage". In *New Perspectives on Ancient Warfare*, eds. Garrett G. Fagan, and Matthew Trundle. Brill: Leiden, 2010.