UNIVERSITY OF CALIFORNIA

Santa Barbara

Bows and Spears in Achaemenid Persia

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in History

by James White

Committee:

Professor John W.I. Lee, Chair

Professor Anthony Barbieri

Professor Elizabeth DePalma Digeser

Professor Elspeth Dusinberre, University of Colorado Boulder

September 2020

The dissertation of James White is approved.

_____

Anthony Barbieri

_____

Elizabeth DePalma Digeser

_____

Elspeth Dusinberre

_____

John W.I. Lee, Committee Chair

September, 2020

Bows and Spears in Achaemenid Persia

By

James White

ACKNOWLEDGEMENTS

It has truly been a great privilege to devote so much time to the study of ancient history. It certainly would not have been possible to have started, let alone completed, this dissertation without many people's help. Despite this assistance, all errors or omissions remain, of course, my own.

First and foremost, I would like to thank my parents for their constant support of all my academic endeavours, and for encouraging me to devote my life to something I love. I would also like to thank my sister, Kathleen, brother-in-law Jonathan, and nieces Nora and Anna, for offering distractions from work when I needed them, dog-sitting, and helping with shield building. To the Jacob clan (Archers and Kerrs), our legendary celebrations have kept me sane through this process. Also, to Peter Wijnbergen, whose generosity ensured that I did not become homeless during this process, and to Peter (the Elder) and Maup Wijnbergen, whose genuine interest in my work and all things ancient was a constant source of encouragement. To Johanna, Lars, and Monica, thank you for your hospitality and stimulating discussions. Victoria, I cannot thank you enough for your constant support and understanding. This would not have been possible without you.

Academically, I must thank my advisor, John Lee. Your initial eagerness to discuss Achaemenid history with me made choosing a graduate programme incredibly easy, as did your tireless efforts to ensure I always had funding, even as an international student. Your assistance, especially your reading and commenting upon countless drafts, made this difficult task possible. I would also like to thank my other excellent committee members, Anthony Barbieri and Elizabeth DePalma Digeser, for offering thought-provoking graduate seminars,

encouraging my development as an educator, and offering insightful comments on my writing. To Elspeth Dusinberre, I appreciate your willingness to be an external committee member, for putting me in contact with numerous scholars who shared my interests, and for your valuable comments on my work. Finally, none of this would have been possible without Dr. Jonathan Strang, formerly of Trent University, who first introduced me to the vibrant history of Achaemenid Persia in an undergraduate seminar many years ago.

I would also like to thank the numerous administrators who made this possible. As I possess no administrative skills myself, you were often solely responsible for ensuring that I could continue my studies. In particular, I must thank Darcy Ritzau and Rhiannon Parisse of the History Department at UCSB and Terry Smith of the Classics Department and Queen's University. I can say without exaggeration that, without you, I would have missed an important deadline and been kicked out of school years ago.

Last but certainly not least, I would like to thank everyone whose funding allowed me to complete this degree. The R.S. McLaughlin Fellowship allowed me to begin work as a graduate student, and the Classics Department at Queen's also generously donated travel money so that I could gain valuable archaeological experience in Jordan. As previously mentioned, John Lee's tireless efforts to secure funding for me, as well as the History Department at UCSB and the UCSB History Associates were crucial for offering the financial stability I needed to complete my studies. I would also like to thank Harold and Kathleen Drake for their generous research stipends, including the initial funding with which I reconstructed ancient shields, and to Frank Frost for the Esmé Frost Fellowship and for generously offering to support my enrolment at the American and British Schools at Athens.

CURRICULUM VITAE OF JAMES WHITE

EDUCATION
2013 – 2019 (expected): Ph. D. in History, University of California Santa Barbara
2009 – 2012: M.A. in Classical Studies, Queen's University
2006 – 2009: B.A. (Honours) in Ancient Greek and Roman Studies, Trent University
2002 – 2006: B.A. in English Literature, Trent University

PROFESSIONAL EMPLOYMENT
2013 – 2016: Teaching Assistant, Department of History, University of California Santa Barbara
2012: Field Archaeologist, Archeoworks, Inc.
2010 – 2011: Research Assistant, SSHRC Funded Project, "Akkadian Literacy in Iron Age Judah?" Prof. W. Morrow, Head of Department of Religious Studies, Queen's University
May 2010 – June 2010: Field Archaeologist, Humayma Excavation Project, Queen's University
2009 – 2012: Teaching Assistant, Department of Classics, Queen's University

PUBLICATIONS
"Espionage," "Hydarnes," "Intaphernes," "Mascames," "Megabates," "Megabazus," Megabyxus," "Mitrobates," Oroetes," "Pharnuches," "Plunder," and "Teispes." *Blackwell Encyclopaedia of Herodotus.* Edited by C. Baron. Wiley-Blackwell: Hoboken, *forthcoming.*

2017. Review of R. Stoneman, *Xerxes: A Persian Life. The Historian* 79.4: 912-913.

AWARDS AND PRIZES

November 2018: The Harold and Kathleen Drake Fund Research Stipend
September 2018: History Department Dissertation Fellowship
September 2017: History Department Graduate Fellowship
January 2017: History Department Graduate Fellowship
June 2016: Esmé Frost Fellowship
June 2015: The Harold and Kathleen Drake Fund Research Stipend
June 2015: Lawrence Badash Essay Prize, History of Science
June 2014: The Harold and Kathleen Drake Fund Research Stipend
Summer 2010: Queen's Department of Classics Travel Grant
September 2009 – April 2010: R.S. McLaughlin Fellowship
April 2003: Norma Miller Essay Prize

FIELDS OF STUDY

Ancient Greek and Achaemenid Persian History with Professor John W.I. Lee
Ancient Writing and Early Imperial China with Professor Anthony Barbieri
Roman History and Late Antiquity with Professor Elizabeth DePalma Digeser

ABSTRACT

Bows and Spears in Achaemenid Persia

by

James White

My dissertation focuses on weaponry in the Achaemenid Persian Empire (ca. 550-330 BC), with an emphasis on bows and spears. Scholars have long recognized the importance of archery in the ancient Near East generally, and the Achaemenid Empire more specifically, but no thorough study of archery has been undertaken.

In the opening chapters, I examine weapons as physical objects. Chapter one describes the shape and size of the Elamite and Scythian style bows which the Persians used. I also consider other aspects of archery tackle, in particular arrows. Arrowheads are often the only evidence for arrows that remain, and their shape, size, and weight can reveal their purpose, the type of bow from which they were fired, and the potential range they could travel.

Chapter two discusses the physical properties of Achaemenid spears. Evidence suggests that Persians used both throwing and thrusting spears. The Persians may have used a single versatile type of spear, called in Greek a *palton*, that could be used either way, and is often associated with Persian cavalry. Evidence suggests the Persians used a fairly long spear, perhaps seven feet, which contradicts Herodotus' description of short spears.

Chapter three focuses on the logistics of military archery, and to a lesser extent

spearmanship, in an Achaemenid context. The study of archery is especially relevant to this topic due to the increased logistical needs involved in the manufacture of composite bows, and the constant need to supply arrows to soldiers while on campaign. I also examine the recruitment, training, and armament of spearmen in this section. Documentary evidence describes that the state distributed arable land in exchange for military service. This practice was carried over from the earlier empires that ruled in this region. Another source of recruitment attested in Mesopotamia, but perhaps used elsewhere, were the temples. Temple dependants worked these lands for the temple, but were also liable for military service. Temples also employed weapon manufacturing specialists, including bowyers and blacksmiths, who produced the weapons that armed the conscripted soldiers.

In chapter four, I examine the *gerrhon*, a rectangular shield which the Persians are said to have used at the battle of Plataea and Mycale. The Greek term for these shields, *gerrhon*, can be translated as "wicker." Many modern historians have taken this translation literally, and suggest that a wicker shield could not have been an effective form of defense. I challenge this hypothesis, and built shields using the same techniques as the Persians, and with materials that have similar properties to those available to the ancient Achaemenids. Finally, I consider how these shields were used on the battlefield, whether they formed a solid defensive wall or were arranged in an open pattern, and how many archers could have been protected by each shield.

In the final chapter, I move away from bows and spears as weapons to discuss their symbolic value within the Achaemenid Empire. Both weapons appear as symbols of royal power on Achaemenid reliefs, coins, and seals, and in inscriptions. The bow is also used as an ethical symbol in many cultures, and may have been particularly suitable as a symbol of

Persian morality. Bows produce power through the tension of opposing forces, the limbs. This source of power may have resonated with the Achaemenids, as their cosmology was based on opposition. Finally, I consider the possibility that the Achaemenids used weapons in rituals. There is no direct evidence for this practice, but some passages in Greek literature could reflect a misunderstanding of actual Achaemenid ritual practice.

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

Almost twenty years ago, Achaemenid historian Pierre Briant mourned the continued absence of a definitive study of the empire's military institutions.[1] Ten years later, very little had changed when Christopher Tuplin made a similar observation.[2] Now, nearly a decade has passed again, and still no definitive monograph on the subject has appeared; nevertheless the field is beginning to show signs of life. Several studies on specific aspects of Achaemenid warfare have been published in peer-reviewed journals and as chapters in edited volumes. Topics that have received increased scholarly attention in the past decade include Achaemenid infantry and cavalry troops; the recruitment system, particularly in southern Mesopotamia and Egypt, due to the preservation of large bodies of evidence from these regions; taxation of troops; the role of the king as military commander; military imagery in art; and both popular and scholarly studies of specific battles, especially those fought between the Achaemenids and the Greeks in the early fifth century B.C.[3]

The difficulties involved in the study of Achaemenid military history are numerous, and an examination of these obstacles may elucidate the reasons that a comprehensive study of the empire's military institutions has been so elusive. Trends in modern scholarship have certainly played a role in the development of the secondary literature on Achaemenid history. Before the late 1970s, Achaemenid history was not often studied in its own right. Archaeological work was the exception, although it has rarely focused on the empire's

[1] Briant 1999: 107.
[2] Tuplin 2010: 101.
[3] Charles 2011, 2012a, 2012b (infantry); Nefedkin 2006, Tuplin 2010, Charles 2015 (cavalry); MacGinnis 2010, 2012 (recruitment); Stolper 1985, Jursa 2011, Kleber 2014 (taxation); Brosius 2005 (king as military commander); Tuplin unpublished (martial imagery); Buraselis and Meidani 2010, Billows 2011, Krentz 2011 (Marathon); Cartledge 2007 (Thermopylae); Konijnendijk 2012 (Plataea). See also Hyland 2011 for a discussion of Achaemenid weapons.

military. In the introduction to the second volume of the *Achaemenid History* series, Kuhrt and Sancisi-Weerdenburg wrote that, "two, often well defined, parties can be distinguished in the field of research on early Persian history, roughly corresponding with classical historians on the one side and archaeologists on the other."[4] The field of art history followed in the late 1970s, especially with the work of Carl Nylander and Margaret Cool Root.[5] When historians did study the Achaemenids, it was frequently from the perspective of Classical Greek history. The Greco-Persian Wars of the early fifth century and the campaign of Alexander in the 330s received the most attention. These works usually did not look beyond the Greek perspective, and focused only on a few years of the empire's long existence.

Greek sources on Achaemenid history can be difficult to interpret. Greek authors often understood little of Persian culture, and their own cultural biases often colour the picture. We are in no position, however, to ignore Greek sources entirely. An Achaemenid history without Greek sources would be a history without narrative. It is therefore more productive to ask, how can we use Greek sources to increase our understanding of Achaemenid military history? Thomas Harrison, in a recent work on Achaemenid historiography, deals with this question extensively.[6] Unfortunately, there is not likely to be a simple formula we can apply to separate reality from fantasy. It is necessary to examine each relevant piece of evidence from a variety of perspectives, and ask ourselves if it makes sense in a Greek or Persian context, if it is supported or contradicted by other evidence, and if it is possible or probable. This can be a long, arduous process.

[4] Kuhrt and Sancisi-Weerdenburg 1987: IX.
[5] Nylander 1979; Root 1979.
[6] Harrison 2011: 19ff.

The birth of Achaemenid studies as an academic discipline in the late 1970s and early 1980s meant that scholars often attempted to distance themselves from Greek sources, which had dominated earlier discussions of Achaemenid history. One result of this was the increased focus on topics that were not related to the campaigns of Darius, Xerxes, and Alexander.[7] While many who were trained as Greek historians began to focus on Achaemenid studies at this same time, Greek history was not particularly concerned with military studies, and so they did not bring an interest in warfare with them.[8] In the late 1980s, in the wake of Victor Davis Hanson's *Western Way of War*, an increased focus on hoplites may have led some scholars to underestimate Persian warfare. Military history is also more often the subject of popular history, and so its reputation among scholars has at times suffered. As we shall see, the only works that attempt to study Achaemenid warfare in its entirety are written for a general audience.[9]

To some degree, the self-representation of Achaemenid kings may have contributed to a lack of interest in the empire's military. Achaemenid monumental art and inscriptions are known for their peaceful portrayal of the empire. Weapons and soldiers do appear, but are not often in scenes of action. When weapons are used, they are used only against animals, and never humans.[10] The peacefulness is especially emphasized when compared to the art of the Neo-Assyrians, who had earlier ruled much of the same territory as did the Achaemenids. Neo-Assyrian reliefs frequently depict the violence of battle and the brutal treatment of

[7] While the second *Achaemenid History* workshop focused on Greek sources, it is interesting that none of the papers presented in this volume deal explicitly with the Greco-Persian wars or Alexander's campaign.
[8] Tuplin 2010: 102.
[9] Sekunda 1992; Head 1993; Farrokh 2007.
[10] A series of reliefs are repeated throughout Persepolis, which depict a hero stabbing various animals, such as a bull, a lion, or mythical composite creatures. These reliefs are found in the Throne Room (St 1953: Plates 114-117), Darius' palace (Plates 144-146), and Xerxes' Harem (Plates 155-156).

captured enemies by the victorious Assyrian forces.[11] The rich body of evidence for Assyrian warfare may also encourage young scholars who are interested in ancient Near Eastern warfare to specialize in the Assyrians rather than the Achaemenids.[12]

As we shall see, some nineteenth century historians of the Achaemenid Empire believed that the empire in general, and its military in particular, were strong at the time of Cyrus, but that they declined in the fifth century, particularly from the time of Xerxes' defeat in Greece.[13] Most of our sources for the period of Cyrus' reign are written long after his death, are frequently contradictory, and rarely provide any details about his army. The exception is Xenophon's *Cyropaedia*, which presents itself as a biography of Cyrus the Great, but is better understood as a work of philosophical fiction than a history, and certainly does not accurately reflect ancient Near Eastern warfare in the mid sixth century B.C.[14] Our sources for Persian warfare in the fifth century B.C. are much better, as Greek narrative sources can be supplemented by ample Near Eastern documentary evidence. So long as the nineteenth century description of military decline was accepted, presumably few scholars wanted to study such an army. Perhaps now that scholars no longer accept this view uncritically, we can begin to study Achaemenid warfare more seriously.

Finally, disparate types of evidence are a further difficulty for the study of many aspects of Achaemenid history, and the study of the empire's military history is no exception. These bodies of evidence make it difficult to write a comprehensive monograph on a broad

[11] Battle scenes include Lachish (ME 124906, 124907), Til Tuba (ME 124801), and an unidentified city in Egypt (ME 124928). Maltreatment of enemies includes soldiers playing with severed heads (ME 124550), impalement (ME 118903), and flaying (ME 124908-9).
[12] Dezső 2012a and b, 2016, De Backer 2011, and Melville 2016.
[13] See, e.g., Grote 1857: 4.183, 12.88, 122; Tarn 1927a: 18.
[14] Christesen 2006 argues that Xenophon invented military reforms under Cyrus as a proposal for military reforms in Sparta.

subject such as military history, and so have led to increased specialization within Achaemenid history. At its greatest extent, the empire spread over three continents, and contained diverse peoples.[15] Furthermore, the empire's administration was recorded in various languages throughout the empire.[16] As such, ancient written evidence pertaining to Achaemenid warfare exists in numerous dead languages. The texts themselves can be spread across numerous museums and libraries, and the context from which they were excavated is not always known.

Other archaeological sources, such as physical remains of weapons and armour, are important to studies of warfare, but present a specialized sub-field in ancient history whose publications can be difficult to interpret for those in other disciplines. Art history also provides much useful information for the study of Achaemenid warfare. Visual evidence for Achaemenid warfare exists in both Classical and Near Eastern art, each of which is a specialized field. Monumental art can also be separated from personal art, such as seals, coins, or tomb decorations. There are therefore numerous sub-disciplines within art history, each with separate bodies of evidence and secondary scholarship that must be mastered. Depictions of weapons and soldiers are spread across all these media.

These bodies of evidence, and the scholarship devoted to their understanding, are each difficult to master. This fact further suggests that it is more feasible to focus on specific aspects of Achaemenid warfare. Hopefully, as specific topics on Persian military history

[15] Darius describes the extent of his empire in inscriptions from Persepolis and Ecbatana, which stretched "from the Scythians who are beyond Sogdiana to Nubia, from India to Lydia" (DP, DH).
[16] Administrative texts known as the Persepolis Fortification Archive were largely written in Elamite, however this collection also includes numerous texts in Aramaic, and a single text each in Greek, Neo-Babylonian, Old Persian, possibly Phrygian, and an unknown cuneiform script (Hallock 1969: 1-2; Henkelman 2008: 80).

become better understood, a comprehensive volume on the subject becomes increasingly possible.

The following pages do not claim to be a comprehensive study of the empire's military history. Rather, I have assigned myself the much more modest task of examining, as thoroughly as possible, two of the most important weapons of the Achaemenids: the bow and the spear. The importance of the bow in the ancient Near East, and Achaemenid Persia specifically, is well known to those with even a casual knowledge of these civilizations. Famous artworks from early Mesopotamia and Egypt, such as the Naram-Sin stele, frequently depict kings, royal figures, or mythical heroes armed with a bow.[17] Neo-Assyrian kings of the ninth to seventh centuries B.C. frequently depicted themselves as archers in reliefs that decorated their palaces, and are now in the British Museum.[18] Colourful friezes from Achaemenid Susa, now in the Louvre, depict warriors often identified as royal guards, who are armed with bows and quivers slung over their shoulders. These guards are featured on the covers of many books about the Achaemenid Empire, and so are influential on the general perception of Persian warfare.[19] Achaemenid coins and seals, worn almost as jewelry by the empire's élite and used in the empire's bureaucracy, often featured archery, which suggests that the bow was important to Persian self-image.[20]

[17] Naram-Sin stele; stele fragment from Telloh, Iraq, 23rd c. B.C. (Louvre AO 2678, Hamblin Fig. 5e); Egypt: scene from Thutmose IV's chariot (Spalinger 7.3); King Ahmose's temple at Abydos (Spalinger Fig. 1.7).
[18] E.g. ME 124867; ME 124876.
[19] E.g. Briant 1999 (and the 2002 English translation); Curtis and Simpson 2010; Farrokh 2007.
[20] Tomb II at Karaburun in Turkey shows an élite man with a cord around his neck from which to hang his seal (Dusinberre 2013: 199). For military scenes on Achaemenid seals, see Tuplin unpublished.

Despite the prominence of this image, there has been very little scholarly attention paid to Achaemenid archery, and no study currently collects and examines the body of evidence pertaining to this subject as a whole. Achaemenid coinage and its symbolic use of archery has been the subject of several studies, as has martial imagery in glyptic art.[21] Erdmann and Cleuziou have created a typology of Achaemenid arrowheads, particularly from Persian war sites.[22] Calmeyer has discussed the bow in Achaemenid art.[23] Moorey wrote extensively on the material culture of the Achaemenids, including weapons, and his work on the Deve Hüyük cemetery is especially important to Achaemenid military history.[24] MacGinnis has published a book on the recruitment of archers from the Ebabbara temple in Sippar during the Achaemenid period.[25] Zutterman included a section on Achaemenid bows in his recent discussion on composite archery in the ancient Near East.[26] All of these works, however, deal with isolated bodies of evidence, with very little attention paid to Persian archery as a whole. Furthermore, I hope that the present study can challenge the traditional view, found as early as Aeschylus' *Persae*, that Persian soldiers were predominantly archers. Unfortunately, this view has persisted in much scholarship, despite recent scholarly trends to overturn erroneous views of the Achaemenids, especially those based in Greek sources.

Early in my research, it became necessary to expand the focus of this study, and I decided to include Achaemenid spears and spearmanship in addition to archery. Several factors influenced my decision to study bows and spears together in an Achaemenid context.

[21] Garrison 2010; Nimchuk 2002; Root 1989; Stronach 1989; Tuplin 2014; Tuplin unpublished.
[22] Erdmann 1973 and Cleuziou 1977.
[23] Calmeyer 1979.
[24] Moorey 1980.
[25] MacGinnis 2012.
[26] Zutterman 2003.

Perhaps most importantly, Near Eastern evidence suggests that the Achaemenids themselves frequently paired these weapons. On Darius' Bisitun relief, an archer and spearbearer in Persian dress stand behind the king, and similar figures are also portrayed on Darius' tomb at Naqsh-i Rustam. The guards from Susa, mentioned above, all hold spears in addition to their bows and quivers. Achaemenid seals also depict warriors armed with both bow and spear.[27]

The bow and spear are again paired in an inscription from Darius' tomb, copied with only the name changed by his son Xerxes at Persepolis. In these inscriptions, the kings describe their martial prowess as archers, horsemen, and spearmen, as they write, "as a horseman I am a good horseman. As a bowman I am a good bowman, both on foot and on horseback. As a spearman I am a good spearman, both on foot and on horseback."[28] The association with spears is almost entirely ignored in this context by Greek authors. Herodotus famously described Persian education as comprising riding, archery, and telling the truth, with no mention of spears. Strabo, citing Onesicritus, describes the inscription on Darius' tomb, and provides a fairly accurate translation, "I was the best horseman and archer."[29] Persian sources, therefore, frequently associate the bow and spear, while many Greek sources ignore the spear and highlight the Persian use of the bow. For this reason, a study of spears and bows together prioritizes Persian evidence over Greek.

The spear as a symbol of royal power seems to have been unique to the Achaemenids in the history of the Near East. Reliefs from earlier civilizations frequently depict spears, but they are never the weapons of kings or gods, who are often depicted with bows. Reliefs depicting a god handing a bow to the king suggest that the bow in these scenes is a symbol

[27] Tuplin unpublished.
[28] DNb, XPl.
[29] Strabo 15.3.8, *ἱππεὺς καὶ τοξότης ἄριστος ἐγενόμην*.

for kingship. The fact that the spear as a symbol for royal power is unique to the Achaemenids makes it a significant weapon in the study of Achaemenid military history. In the following pages, the study of the bow and spear together allow us to understand how the Achaemenids made use of Near Eastern tradition, but also added unique elements to their representation of kingship.

While Greek literature is surely the greatest contributor to the association between the Achaemenid Persians and archery, a careful reading of Greek historians suggests that many of them understood the importance of spears in Persian warfare. The association between Persians and archery in Greek literature can be traced back to Aeschylus' *Persae*, which characterized the Greco-Persian Wars as a conflict between bows and spears.[30] Many of the extant Greek historians who wrote about the Persians provide a more balanced view, and suggest that both the bow and the spear were common weapons for Achaemenid infantry soldiers. Herodotus does not include spears in his description of Persian education, but frequently describes Persian infantry and cavalry armed with this weapon.[31] When Darius and his co-conspirators were killing the Magi, Herodotus says that one Magus grabbed a bow and the other a spear with which to defend themselves.[32] In his description of Persian troops, he writes that the Persians were armed with a bow and a short spear.[33] According to Greek accounts of Thermopylae, the Immortals used spears, although ineffectively.[34] The verb

[30] Aesch. *Per*. 85-86 is perhaps the best example of this contrast, *ἐπάγει δουρικλύτοις ἀν-/δράσι τοξόδαμνον Ἄρη* (He leads a host of archers against men famous for their spears).
[31] Hdt. 1.136 famously states that Persians are only taught three things, to ride, to shoot, and to tell the truth (*ἱππεύειν καὶ τοξεύειν καὶ ἀληθίζεται*).
[32] Hdt. 3.78.
[33] Hdt. 7.61.
[34] Hdt. 7.211.

Herodotus uses to describe the killing of the remaining Greek troops after Leonidas' death, *ballo*, means "to throw," and suggests that the Persians used javelins.[35]

Xenophon also attests the frequent Persian use of javelins. These weapons feature prominently in his account of the battle of Cunaxa.[36] In his work on horsemanship, Xenophon recommends the use of two *palta*-type javelins, as the Persian cavalry are customarily armed.[37] Ctesias, whose Persian history is known only from later summaries, also describes the importance of spears in Achaemenid armies. For example, Cyrus gave Croesus a city near Ecbatana that included 5,000 cavalry, and 10,000 peltasts, spearmen, and archers, perhaps in reference to the local garrison or the potential conscripts settled on military fiefs in the area.[38] Likewise the Persian noblewoman Rhoxane is described as "experienced with the bow and javelin."[39]

The poetic image of bow-wielding Persians long persisted in modern scholarship, despite the clear association between Persians and spears in both Greek and Achaemenid sources. In the 1920s, for example, both How and Tarn believed that Achaemenid troops were almost exclusively archers. How writes that the Iranian troops in Xerxes' army relied "principally or exclusively on the bow."[40] Tarn similarly describes early Persian warfare as "disordering the enemy by archery fire and then charging him with cavalry."[41] Recently, scholars often recognize that Persian soldiers used spears, but often give the impression that

[35] Hdt. 7.225.
[36] Cyrus arms himself with *palta* for the battle of Cunaxa (*Anab.* 1.8.3), and was himself killed by a blow from a *palta* (*Anab.* 1.8.27).
[37] Xen. *Eq.* 12.13
[38] *FGrH* 688 F9 5.
[39] *FGrH* 688 F15 55. Strabo 15.3.18 includes the use of the javelin among the skills young Persians learn.
[40] How 1923: 123.
[41] Tarn 1927: 360.

the bow was more important or common, or that the Persians could not effectively use spears.[42]

The following study attempts to bring a new perspective to military studies of the Achaemenid Persian Empire, through a focused and comprehensive examination of the bow and spear among the Persians, i.e. the empire's ruling ethnic-class, as described by Briant.[43] When I use the term "Persian soldier," I am referring to soldiers drawn from this population, in contrast to "Achaemenid soldier," which I use to refer to imperial soldiers conscripted from other satrapies. The close association between the Persians and these weapons in a variety of sources, from Greek literature, Attic vases, the royal inscriptions and monumental art of the Great Kings, seals, and coins argues for such a focused study. Furthermore, Achaemenid kings frequently made use of the bow and the spear as symbols of rulership, and I include this use of weapons in the present study. The symbolic use of these weapons also necessitates a focus on the Persians, as they were largely responsible for the creation and dissemination of the art that made use of these symbols. Closely related groups, such as the Medes and Elamites, and the Babylonians and Assyrians are frequently discussed in order to place the Persian bow and spear within their broader Near Eastern context.

In the opening chapters, I examine weapons as physical objects. Chapter one describes the shape and size of the Elamite and Scythian style bows which the Persians used. Excavated bows, although none of Achaemenid origin, provide evidence for the types of

[42] Green 1996: 36 ignores cavalry and archery completely, and lists all equipment advantages as distinctly Greek; Drews 2004: 117 argues that Herodotus misrepresented the Persian cavalry during the Persian Wars, and that mounted archers were more common than mounted spearmen at this time; Tallis 2005: 216 argues that infantry was a mix of archers and spearmen, although archers were probably more numerous. Hyland 2011: 273 is one of the few recent authors to understand the importance of the Achaemenid spear.
[43] Briant 1988: 137.

materials and construction technique that were used by ancient bowyers in the Near East and Egypt. Some tentative remarks about the performance of ancient bows are possible, although these results are not definitive. I then consider other aspects of archery tackle, in particular arrows. Arrowheads are often the only evidence for arrows that remain, and their shape, size, and weight can reveal their purpose, the type of bow from which they were fired, and the potential range they could travel. Quivers are briefly discussed, as well as the possibility that the Achaemenids used other archery equipment such as ring with which to draw their bows and armguards to protect their forearms when shooting. These last two items are not directly attested for the Achaemenid period, but are known from earlier Near Eastern civilizations.

Chapter two discusses the physical properties of Achaemenid spears. I first discuss the terminology of spears, including a review of the terms Greek authors use to describe Achaemenid spears. Evidence suggests that Persians used both throwing and thrusting spears. Often this difference in use would indicate different weapons, as heavier lances are often used for thrusting while lighter javelins are thrown. The Persians, however, may have used a single versatile type of spear, called in Greek a *palton*, that could be used either way, and is often associated with Persian cavalry. As no complete spears have survived, we must look to artistic depictions of Persian spears to estimate their length. These sources suggest a fairly long spear, perhaps seven feet, which contradicts Herodotus' description of short spears.[44] Much like arrows, only the heads and butts of spears have been excavated. These artefacts indicate that most Achaemenid spearheads were forged iron. The shafts may have been cornel wood, but this is only attested in Greek sources. As this material was frequently used

[44] Hdt. 7.61; Hyland 2011: 273.

for Greek spear shafts, Greek historians may have simply assumed that the Persians used the same material as they did.

Chapter three focuses on the logistics of military archery, and to a lesser extent spearmanship, in an Achaemenid context. The study of archery is especially relevant to this topic due to the increased logistical needs involved in the manufacture of composite bows, and the constant need to supply arrows to soldiers while on campaign. Nevertheless, I examine the recruitment, training, and armament of spearmen in this section. Achaemenid recruitment practice is best understood in southern Mesopotamia. Documentary evidence from the cities in this region describe that the state distributed arable land in exchange for military service. This practice was carried over from the earlier empires that ruled in this region. Another source of recruitment attested in Mesopotamia, but perhaps used elsewhere, were the temples. Babylonian temples were more than religious centres, and often owned large amounts of arable land. Temple dependants worked these lands for the temple, but were also liable for military service. Herdsmen in particular seem to have been frequently conscripted as archers, perhaps due to their familiarity with ranged weapons in the protection of their flocks. Temples also employed weapon manufacturing specialists, including bowyers and blacksmiths, who produced the weapons that armed the conscripted soldiers. It is likely that state-run weapons workshops also existed. It is possible, as Greek authors suggest, that the children of the empire's élite were educated at court, and that this education often focused on military training.

In chapter four, I examine the *gerrhon*, a rectangular shield which the Persians are said to have used at the battle of Plataea and Mycale. Similar shields have a long history in the Near East, and are depicted as early as the third millennium B.C. In Neo-Assyrian reliefs,

these shields are often used to protect a spearman-archer pair, although these depictions do not seem to coincide completely with Herodotus' description of their use, or their depiction on Attic pottery. The Greek term for these shields, *gerrhon*, can be translated as "wicker." Many modern historians have taken this translation literally, and suggest that a wicker shield could not have been an effective form of defense. I challenge this hypothesis, and built shields using the same techniques as the Persians, and with materials that have similar properties to those available to the ancient Achaemenids. Excavated shields from Dura Europos and the Pazyryk tombs, while not Achaemenid, bear a striking resemblance to the *gerrha* depicted in Greek and Persian art, and served as a model for this reconstruction. The shields were in fact not wicker at all, but made from tree branches or saplings, approximately 2.5 cm in diameter. These staves were then woven through a piece of wet rawhide, which contracted as it dried and made the shield compact and rigid. The resulting shield was so effective that it could stop arrows that were fired from a range of 20 metres. Finally, I consider how these shields were used on the battlefield, whether they formed a solid defensive wall or were arranged in an open pattern, and how many archers could have been protected by each shield.

In the final chapter, I move away from bows and spears as weapons to discuss their symbolic value within the Achaemenid Empire. Both weapons appear as symbols of royal power on Achaemenid reliefs, coins, and seals, and in inscriptions. Achaemenid art is not as overtly violent as Assyrian monumental art, but the inclusion of weapons in these scenes is significant. Rather than focus on the military aggression which won them an empire, perhaps Achaemenid kings wished to highlight their ability to defend and maintain their empire, through martial force if necessary. The bow is also used as an ethical symbol in many

cultures, and may have been particularly suitable as a symbol of Persian morality. Bows produce power through the tension of opposing forces, the limbs. This source of power may have resonated with the Achaemenids, as their cosmology was based on opposition.[45] Finally, I consider the possibility that the Achaemenids used weapons in rituals. There is no direct evidence for this practice, but some passages in Greek literature could reflect a misunderstanding of actual Achaemenid ritual practice. In particular, Herodotus' description of Darius' actions as he vows revenge against the Athenians may describe such a ritual.[46] The mystery cult of Mithra at Rome, a god who was also worshipped by the later Achaemenids (if not earlier), seems to have involved archery rituals, and priests may even have shot arrows at recruits as part of their initiation ritual.

The following chapters began as a study of Achaemenid archery. As an archer and graduate student of Achaemenid history, I searched in vain for a monograph on what seemed at the time the empire's chief offensive weapon. I could scarcely believe that, given the frequent association between Persians and archery in both ancient and modern history books, no one had yet undertaken this study. Early in my research, however, I came to the realization that the spear was equally important to the Persians of the Achaemenid era, and that I had put too much faith in Greek sources by focusing solely on the bow. In no way does the inclusion of the spear detract from the study of archery, and the result has been a more complete, balanced view of Achaemenid weapons. I chose not to include several weapons which the Persians used, such as swords and daggers, axes, and maces. Of these, perhaps only the *akinakes* approaches the importance of bows and spears, but it is possible that this

[45] Lincoln 2007: 11.
[46] Hdt. 5.105.

dagger was only ceremonial; these daggers are only used in mythological scenes, never in historical combat. The other weapons are so rarely depicted or described that their inclusion would not add to the present discussion, and may in fact be a distraction.

The goal here, then, is not to fill the lamentable void that continues to haunt Achaemenid studies, a comprehensive military history of the empire (although I sincerely hope one of the many qualified experts in the field soon attempts this task, as daunting as it may be). Rather, I here wish to contribute in some small way to the discussion of specialized studies on specific aspects of Achaemenid warfare, and to uses these two weapons to discuss Achaemenid warfare from a variety of perspectives, including art historical, archaeological, logistical, and ideological.

CHAPTER 1

ACHAEMENID WEAPONS: BOWS, SPEARS, AND ARCHERY TACKLE

Weapons were crucial to the development, expansion, and maintenance of many ancient empires, and the Achaemenid Empire was no different. Despite the peaceful image which the empire's founder Cyrus the Great promotes in the Cyrus Cylinder, and which modern popular works often exaggerate, his empire was formed through military conquest and, at least according to Herodotus, he died in battle against the Massagetae.[1] Later Achaemenid rulers continued to campaign for new territory, and frequently used military force against recalcitrant subjects.[2] Achaemenid kings often used weapons as symbols of their rule. Both the Old Persian inscriptions and Greek historical sources equate martial skill, particularly archery and spearmanship, with a king's legitimacy.[3] Although Greek sources most often associate the Persians with archery, the Persian evidence suggests that spearmanship played an equally important role, both militarily and ideologically. In the following two chapters we will examine the physical characteristics of the weapons used by Achaemenid Persian armies, including imperial troops from various parts of the empire and Persian troops proper. We will also discuss how Achaemenid-era weaponry, particularly the

[1] The Cyrus Cylinder (§17-18) describes Cyrus' conquest of Babylon as "without battle" and that the Babylonians "rejoiced at his kingship." Herodotus' description of Cyrus is generally positive, but Tomyris calls him "bloodthirsty" (*ἄπληστε αἵματος*, Hdt. 1.212). Cyrus' death: Hdt. 1.214. Ctesias writes that Cyrus suffered a fatal wound in battle against the Derbices (*FGrH* 688 9 7); Xenophon (*Cyr.* 8.7), describes Cyrus' death as peaceful.

[2] Conquest – Cambyses in Egypt, Darius in Scythia, Greek campaigns; rebellions in Ionia, Egypt, possibly Central Asia, evidence somewhat limited to west.

[3] Darius, in an inscription on his tomb, lists the qualities that made him a suitable king, and includes his ability to command in battle, and to use the bow and spear (DNb §2f, 2h). Herodotus frequently associates Near Eastern kingship with archery. When Cambyses sends spies to Ethiopia, the Ethiopian king sends Cambyses his bow and advises him not to attack Ethiopia until he can draw the long bow (Hdt. 3.21). Herodotus tells a similar story about Heracles in Scythia (4.10). When Prexaspes tells Cambyses that he drinks too much, Cambyses proves that he is still fit to rule by shooting an arrow through the heart of Prexaspes' son (Hdt. 3.35).

bow and spear, fits into ancient Near Eastern military history more generally. This chapter focuses on bows, arrows, and other archery tackle. In the following chapter, we will discuss spears, javelins, and lances.

Let us begin this section with an overview of archery terminology in order to facilitate the following discussion. The simplest type of bow is called a self-bow, which is made from a single piece of wood. As the wood must contain all of the properties necessary in a bow, the type of wood used in the construction of a self-bow is important. Perhaps the most famous historical example of the self-bow is the medieval English yew longbow. Most of the bows we will discuss are composite bows, which means they were constructed by laminating different materials together in order to combine their physical properties. Composite bows should not be confused with modern compound bows, which use a system of cams or pulleys to help the archer draw the bow. Composite bows typically consist of a wooden core, to which horn and sinew are glued. The type of wood used in the construction of a composite bow is not overly important, as the sinew provides the tensile strength and the horn provides the compressive strength.[4] It is, therefore, not surprising that archaeologists have found that extant bows from the ancient Near East were made from numerous types of wood.[5] By the time of the Achaemenid Empire, composite bows had been in use for millennia across West Asia, and so were the most prominent bow-type in imperial armies.

The centre of the bow, where the archer grips, is called the riser. The sections of the bow that bend when the bow is drawn are the limbs. The string is attached to the tips of the

[4] Miller et al. 1986: 183.
[5] Numerous bows from Egypt were made of acacia (*Acacia*), as well as jujube (*Ziziphus sp.*) and tamarisk (*Tamarix sp.*). The Yrzi bow, found in a tomb near the modern city of Baghouz, Syria, contained both elm and oak. The material composition of ancient bows will be discussed in more detail below.

limbs, which are usually notched to keep the string in place. The limbs are often recurved, which means that the limb tips bend away from the direction of the bow string. The advantage of recurve bows over bows with straight limbs is that recurve bows are easier to hold at full draw, and the shape allows for a more efficient transfer of potential energy.[6] The back of the bow is the side facing away from the archer, and the belly is the side facing the archer. On most composite bows, sinew is added to the back and horn to the belly.

No bows have survived from the Achaemenid period, but depictions of Persian archers in Greek and Persian art, Greek literature, and comparative evidence from other ancient civilizations allow us to draw some conclusions about the weaponry of Achaemenid armies. Collon suggests a vase painting found in Northern Iraq dated ca. 4500 B.C. depicts a bow that may be composite, but this artefact predates definite depictions of composite bows by more than a thousand years.[7] Zutterman argues that only simple bows are depicted in the art of the Near East during the fifth and early fourth millennium, and that composite bows first appear in the second half of the fourth millennium or later.[8] It can be difficult to ascertain the material composition of bows based on artistic depictions, but Zutterman suggests that the grip with which the archer draws the bow is a good indication of the bow-type. For example, some archers are shown pinching the arrow nock between their thumb and forefinger. It is not practical to draw a heavy bow, such as a composite bow, with this grip. Zutterman suggests that depictions of archers drawing bows with their fingers hooked around the bow-string indicates a bow with a heavier draw-weight, and so are more likely to be composite bows.[9] Zutterman's dates for the introduction of various bow-types are preferable

[6] Miller et al. 1986: 187.
[7] Collon 2008: 94.
[8] Zutterman 2003: Table 1.
[9] Zutterman 2003: 129-130, Table 4.

to those of Collon, as he more fully explains his methodology. These dates are not absolute, but provide a *terminus ante quem* for the invention of bow types.

Both types of bow co-existed for several centuries, until composite bows were widely adopted during the reign of Sargon I in the late third millennium B.C.[10] The prominence of composite bows at this time may be due to the simultaneous political changes in Mesopotamia. Under Sargon (or perhaps slightly before), the Mesopotamian city-states were politically unified for the first time in what is now known as the Akkadian Empire.[11] A centralized government may have encouraged the development of military technology, as it could use its surplus to pay for specialized labour, such as weapon makers. An empire would also be more able to provide specialist craftsmen with the raw materials they require for their craft than a smaller state. The construction of composite bows requires the bowyer to wait, as each layer of material must fully cure before others are added. It is therefore most efficient to mass-produce composite bows, and so the construction of composite bows is well suited to organized state-level production.

As noted, determining the material of a bow from artistic depictions can be difficult, but another indicator is the shape of the bowcase. One such bowcase is known as the *gorytus* in Greek. The earliest instance of this word is in Homer's *Odyssey*, in which Odysseus' bow is described as being stored in a *gorytus*.[12] The *Suda* describes a *gorytus* as a bowcase, but adds that it could also hold arrows, and sometimes javelins may have been attached to it.[13] The *gorytus* is

[10] Zutterman 2003: 123.
[11] Kuhrt 1995: 44.
[12] Hom. *Od.* 21.53-54, *ἔνθεν ὀρεξαμένη ἀπὸ πασσάλου αἴνυτο τόξον/αὐτῷ γωρυτῷ, ὅς οἱ περίκειτο φαεινός.*
[13] Suda, s.v. γωρυτός, *θήκη τόξων. καὶ κατὰ γωρυτοῦ παρηρτημέναι τρεῖς ἢ πλείους ἄκοντες, πλατεῖς μὲν αἰχμάς, οὐκ ἀποδέοντες δὲ δοράτων μέγεθος. καὶ αὖθις· καὶ γωρυτοὺς πλήρεις ὀϊστῶν.*

frequently depicted on the reliefs at Persepolis, where it is associated with the Persians, Medes, and the Scythians.[14] The shape of these bowcases suggests that they were designed to store strung bows. If self-bows are left strung when not in use, the limbs will gradually lose strength.[15] It is therefore likely that any bow that was left strung while stored in its case was a composite bow.[16]

Many of the early Near Eastern composite bows were also recurved, as the limbs of the unstrung bow curved forward. Herodotus does not describe the Persian bows as being recurved, but says only that they used "great (*megala*) bows."[17] The term *megala* can mean "great" in both size and strength. Jackson understands the term to refer to the bows' "stoutness."[18] Many translators of Herodotus suggest that he is here referring to the length of Persian bows.[19] Persian bows were only ca. 100 cm from tip to tip when unstrung, and were considerably shorter than the Elamite bows on which their shape is based.[20] Persian bows, however, seem to have been much longer than most Greek bows. Xenophon, for example, writes that the Persian bows were large, and for this reason most Greek archers were unable

[14] *Gorytus*-style bowcases are worn by Persians (Schmidt 1953: Plates 67-70), Medes (Schmidt 1953: Plates 64, 65c, 66, 72), and Scythians (Schmidt 1953: Plate 37) at Persepolis. See Shahbazi 1992 for the ethnic identification of the *gorytus*-bearers based on their clothing. Tallis 2005: fig. 61 shows a soldier in Median dress with a *gorytus* on his back. A Greek amphora in Berlin depicts a Persian soldier with a quiver on his hip in the shape of a half bow (Bovon 1963: fig. 10). There is no bow in this image, but the shape of the quiver suggests that it doubled as a bowcase.
[15] Miller et al. 1986: 181.
[16] Miller et al. 1986: 185.
[17] Hdt. 7.61, *τόξα δὲ μεγάλα.*
[18] Jackson 1894: 100.
[19] E.g., Rawlinson writes, "a bow of unusual size;" Godley translates this phrase as "long bows," as does Purvis in a recent translation.
[20] Zutterman 2003: Fig. 8 lists the Persian bow as 100 cm, and the Elamite bow as 140 cm. The length of bows is determined by measuring the distance between the nock points when the bow is strung, which is effectively the length of the string.

to use Persian arrows.[21] It is likely, therefore, that Herodotus describes Persian bows as large by Greek standards.

Herodotus later describes the Arabian contingent in the Persian army as having recurve bows.[22] The term Herodotus uses, *palintona,* is the same term Homer uses to describe the bows of Teucer and Odysseus, and this word is frequently used to describe bows in fifth century literature.[23] It is curious that Herodotus does not explicitly describe the Persian bows as recurved, as depictions of their bows in Persian and Greek art indicate that they used this type of bow exclusively.[24] In general, Herodotus is not known for military accuracy, but in these passages he is describing the arms of the Persian army in detail. The distinction Herodotus makes may be due to the extent to which each type of bow is recurved. The Arabian contingent may have had bows whose limbs nearly touched when unstrung. Such bows are known from East Asia, Turkey and India.[25] In contrast, the Persian bows, like the later Yrzi bow, a Parthian-era bow excavated near Baghouz, Syria, may have had only recurved tips, and so were not described as "recurved."[26]

By the time of the Achaemenid Empire, the bow had been the primary weapon in Iran for millennia. In the late fourth millennium B.C., Iranian artists began to depict bows that were likely composite judging from their extreme limb curvature. Archaeologists have

---

[21] Xen. *Anab.* 3.4.17. Only the Cretans are able to use Persian arrows, which suggests they used bows larger than those of other Greeks.
[22] The Arabian bows are also described as long; Hdt. 7.69, *τόξα δέ παλίντονα εἶχον πρὸς δεξιὰ μακρά*.
[23] Hom. *Il.* 8.266, 10.459; *Od.* 21.11. See also Aesch. *Ch.* 161, Soph. *Tr.* 511. Much later, Philo and Hero use the neuter plural of this adjective as a noun to mean a stone-throwing siege-engine (Ph. *Bel.* 91.36; Hero *Bel.* 74, 104).
[24] Zutterman 2003: 138-139; Blyth 1977: 57.
[25] Grayson 2007: 16-17 (19th or 20th c. China); 19 and 22 (19th-20th c. Korea); 64 (18th-19th c. Turkey); 70 and 72 (18th-19th c. India).
[26] Brown 1937: Fig. 1 shows a drawing of the Yrzi bow, and a Medieval Turkestani bow. The latter bow has a much greater curve when unstrung. The limb tips of the Medieval bow, when strung, do not resemble any of the bows depicted in Achaemenid art.

excavated numerous cylinder seals from sites in Iran that date to the Protoliterate Period, in the late fourth millennium B.C. At Susa, an important Elamite city before it was rebuilt during the Achaemenid period, a seal dating to ca. 3300 B.C. depicts a figure identified as a "priest-king" drawing a bow at his opponent, while two figures on the ground seem to have been shot already.[27] The seal is similar to contemporary art from Uruk, but the nature of the relationship between the two civilizations is debated. The priest-king archer can be variously interpreted as the king of Uruk overcoming local adversaries, an Iranian vassal portraying himself in the style of his overlords, or an independent ruler asserting authority.[28]

Contemporary with this seal from Susa are numerous seal impressions from Chogha Mish in western Iran. Many of the protoliterate seals from Chogha Mish contain martial imagery, and the bow is the most commonly depicted weapon on these impressions.[29] These bows have extremely recurved tips, so that when they are strung but not drawn, the string crosses in front of the bow at either end. This shape is similar to that of the bow depicted on a plaque from Mari.[30] The extreme curvature of the limbs of bows from Chogha Mish suggested to the excavators that they were composite recurve bows, the earliest depiction of this weapon currently known.[31] In one example, the bow is larger than the archer, but this is exceptional. In the majority of these seal impressions, the bow extends from the archer's mid-thigh to his eye-level.

[27] Carter et al. 1992: fig. 28, Sb 2125.
[28] Carter et al. 1992: 52.
[29] Delougaz and Kantor 1996b: Plates 150-151.
[30] Parrot 1971: Pl. 14.
[31] Delougaz and Kantor 1996a: 146. Collon 1983: 53 also suggests that overly recurved limb tips could be indicative of composite bows.

In the early third millennium B.C., mythological archers are first depicted in proto-Elamite seals.[32] An early Elamite seal impression from Susa, dated ca. 2350 B.C., shows a deity with a bow.[33] This seal shows a strong Mesopotamian influence, and even includes a Sumerian inscription. In Mesopotamian art from the third millennium B.C. through the Neo-Assyrian period, deities are often depicted with bows.[34] In inscriptions, the gods often give the bow as a gift to the king, thus the bow becomes a symbol of divinely sanctioned rulership.[35] The association of deities with archery, common in early Mesopotamia and Iran, does not continue into the Achaemenid period, where deities are never described or depicted as archers, but seems to have ended with the Neo-Assyrians.

By the early second millennium B.C., the quality of Elamite bows was well-known outside of Iran. An inscribed tablet from Mesopotamia, dated to the eighteenth century B.C. or earlier, records part of the Epic of Gilgamesh, a story based on much earlier traditions.[36] In this text, Gilgamesh's weapons are described, and his bow is called a "bow of Anshan," one of the important Elamite cities.[37] While the text could be rooted in a much older tradition, by the eighteenth century B.C. at the latest, Elamite bows were known in Mesopotamia, and the fact that it is a great hero's weapon suggests that Elamite bows were considered superior to Mesopotamian bows. According to George, one of the editors of the Gilgamesh texts, "what was special about bows in the Elamite style is unknown."[38] There are too many factors that influence a bow's performance to suggest any specific improvement that may have been first

[32] Collon 2008: Fig. 6.
[33] Carter et al. 1992: Fig. 6.
[34] Szudy 2015: 27 specifically mentions that the bow was often associated with Marduk, Ninurta, and Assur.
[35] Llop 2016: 213.
[36] George 2003: 161.
[37] Yale Tablet/OB Tablet III: ll. 238-242.
[38] George 2003: 214.

discovered by Elamite bowyers, but it is clear that the association between Iranians and archery had a long history in the ancient Near East by the time of the Achaemenid Empire.

Very little can be said about Elamite archery for almost a thousand years following the reference to the bow of Anshan in the Gilgamesh Epic. Bows continued to be depicted on seals, but they do not have sufficient detail to add to this discussion. In Northwestern Iran, in the late second millennium B.C., artistic depictions of bows begin to include bands wrapped around the limbs. These additions were most likely to prevent the limbs from breaking when the bow was drawn.[39] One of these bows may also be the first depiction of a bow with duck-head shaped limb tips, a decorative element that was later used in Assyrian and Achaemenid bows.[40]

In the early first millennium B.C., two pieces of art from Iran contribute to our understanding of Elamite archery: the reliefs at Kul-e Farah, and a bronze relief excavated on the acropolis of Susa, both dated to the ninth or eighth centuries B.C.[41] In both of these cases, the bows are much shorter than earlier and later representations of Iranian bows, and are approximately the length of the archer's arm. These bows all have heavily recurved limb tips, and those from the bronze relief somewhat resemble the duck-head style known from later bows, although the carvings are not detailed enough to say with certainty. One interesting detail is preserved on the bronze relief from Susa. The archers all hold their bows in their left hand, and their left forearms are incised with a pattern that wraps around the wrist, covers the inside of the forearm, and is wrapped again just above the elbow.[42] This is most likely an

[39] Zutterman 2003: 138.
[40] Muscarella 1980: fig. 175.
[41] Álvarez-Mon 2013: 223, 227; 2015: 252.
[42] Álvarez-Mon 2015: Plate 10.

armguard, often worn by archers to protect their forearms. As a bow is released, the string can rub along the inside of the forearm that holds the bow, which can be very painful. This piece of equipment is known from Assyrian reliefs, and a few excavated artefacts that have been plausibly identified as such, but this Elamite relief is the only evidence of their existence in ancient Iran.[43]

Beginning in the eight century B.C., and particularly during the reign of Assurbanipal in the mid-seventh century B.C., the Elamites came into contact with the Assyrians more frequently, and so Assyrian reliefs and inscriptions are our best source for the study of late Elamite archery practices. Assyrian sources suggest to Dezső that the Elamite army consisted only of archers.[44] This is likely an exaggeration, as archers without the support of other troops would have limited impact on the battlefield, but it is likely that the Elamites were best known as archers.

All of the Elamite bows on Assyrian reliefs have the duck-head finials that may have begun in the late second millennium B.C., which the Assyrians, and later the Achaemenids, also adopted. The Neo-Assyrian king Assurbanipal is depicted drawing bows with duck and lion head tips.[45] During the Achaemenid era, the Elamite delegation on the Apadana relief at Persepolis are shown carrying this same type of bow.[46] By the early eighth century B.C., the Assyrians viewed Elamite archery equipment as so superior to their own that Elamite bows

[43] Two reliefs from the reign of Assurbanipal show the king wearing an armguard: ME 124875 (inside of the arm); ME 124867 (outside of the arm).
[44] Dezső 2012a: 30.
[45] ME 124867 (lion), ME 124876 (duck).
[46] Schmidt 1953: Plate 28 (called Susians). Schmidt 1953: 85 suggests that the duck-head bows are part of their tribute.

were manufactured in the Assyrian city of Nimrud.[47] It is possible that Elamite bowyers were relocated to the city to meet these demands, or to train Assyrian bowyers to manufacture Elamite-style bows. Alternatively, Assyrian bowyers may have attempted to replicate the superior Elamite bow after facing the Elamites in battle.

It is also from Assyrian sources that we know about the Elamite position "chief of archers."[48] This seems to have been a high-ranking military position in the Elamite, contrary to the Neo-Babylonian position of the same name, which seems to have been that of a local commander. The Elamite official Imbappi, who was captured and deported during Assurbanipal's fifth campaign against Elam in the mid-seventh c. B.C., is said to have held this position.[49]

Assyrian reliefs and inscriptions also attest to the Elamite practice of breaking one's bow as a sign of submission. After the battle of Til Tuba, the Elamite officer Ituni ritualistically cut his bow in half to signal his submission to Assurbanipal.[50] Dumanu, who was later paraded back to Assyria with the Elamite king Teuman's head around his neck, also broke his bow as a symbol of submission.[51] This suggests that the Elamites, as the Achaemenids later, saw the bow as a symbol of rulership, and the destruction of a bow could symbolize a change of allegiance from one sovereign to another. The booty from these successful campaigns may have included Elamite-style bows, as well as Elamite archers, as the Assyrians often conscripted recently conquered groups into their army.

---

[47] Brinkman 1986: 203; Zadok 1994: 47; CTN 3, 145. According to Tavernier 2010: 215, most of the cultural exchange between Elamites and Mesopotamians moved west to east; the adoption of the Elamite bow in Mesopotamia is one of the few instances of movement the opposite way.
[48] Dezső 2012a: 88-89.
[49] Dubovský 2013: 454.
[50] Weidner 1932-1933: 183.
[51] Weidner 1932-1933: 185.

Persian recurve bows often have tips that are carved into the shape of duck heads. These tips appear to have been made of ivory or bone, and were then attached to the wooden core of the bow. The Achaemenid Persians seem to have adopted the Elamite style of bow, including the duck head limb tips, but decreased the bow's overall length.[52] One advantage of a shorter bow is that it is easier to use while on horseback. Although recent scholarship suggests that the popular image of Achaemenid mounted archery is exaggerated, Some Neo-Elamite and Achaemenid seals depict mounted archers, even if recent scholarship shows that Persian armies were not primarily reliant on such troops.[53] If all other components remained the same, the shorter bow would be less powerful than the longer bow. It does not seem likely, however, that Achaemenid bowyers would intentionally make an inferior weapon, and so it is possible that the shorter bow was the result of a technological innovation. Stiffer materials or a more efficient design, for example, could decrease the overall length of the bow, without compromising its power. As we shall see below, the introduction of Scythian-style arrowheads may have facilitated the transition to a shorter bow.

The Elamite style of bow can be seen on Darius' Bisitun relief, the glazed brick reliefs at Susa, the Tatarli tomb painting, and occasionally on Greek pottery. While it is possible that the Achaemenids adopted the Elamite-style bow from the Assyrians, it is more likely that they adopted it directly from the Elamites. Recently, scholars have argued that the

[52] Zutterman 2003: fig. 8 suggests that the Elamite bow was ca. 140 cm, the Achaemenid version of the Elamite bow was ca. 100 cm.

[53] See especially Tuplin 2010: 181, who concludes that the evidence, "does not reveal the king's horsemen to be particularly remarkable in their achievements." The Tatarli tomb painting from Turkey depicts mounted archers that are commonly identified as Persian (Summerer 2007a: 134; Dusinberre 2013: 178-179, fig. 101). In glyptic art, mounted soldiers most frequently use the spear, but Tuplin unpublished: 37 notes one instance of a mounted archer in this medium (no. 62). Herodotus (9.49) describes mounted archers in the Persian army at the battle of Plataea. Darius, in one of his inscriptions (DNb), boasts that "as a bowman I am a good bowman, both on foot and on horseback." Xerxes copied this inscription at Persepolis (XPl).

Elamite civilization was not completely destroyed by the campaigns of Assurbanipal in the mid-seventh century B.C., and that Elamite culture continued until ca. 520 B.C.[54] According to Henkelman, Elamite and Iranian pastoralists co-habited the Iranian highlands around the modern province of Fars for 500-1000 years by the time of the Achaemenid Empire.[55] As we shall see later, Achaemenid-era documents from Babylonia indicate that herdsmen were often recruited as archers, most likely due to their familiarity with ranged weapons in protecting their flocks. The close association of these two groups for such an extended period of time is a likely opportunity for Iranians to learn about Elamite bow technology.[56]

A second type of bow that was used by Achaemenid archers is what many scholars call the Scythian bow. Zutterman classifies this type of bow as a double convex composite bow. It is called a double convex bow because when it is unstrung, each limb curves towards the back of the bow. It is also called a B or Sigma-shaped bow, because in its unstrung state it resembles these letters. Scythians depicted in Greek art frequently carry this type of bow, as do the mounted archers on the Tatarli tomb painting.[57] Despite the name, not only the Scythians, but also Cimmerians, Medes, and later Persians used bows of this shape.[58]

---

[54] Henkelman 2008: 5.
[55] Henkelman 2008: 41, 47.
[56] It is certainly possible that the Persians learned about the Elamite bow from the Assyrians. Two fragmentary reliefs, likely from Assurbanipal's North palace, show Assyrian spearmen leading warriors that have been identified as Elamite (Barnett 1976: 55). Others wear the fluted hat and carry upside down spear, similar to Herodotus' description of Persian troops. It may be that Persian troops were conscripted into the Assyrian army during the reign of Assurbanipal (Barnett 1976: 55). Tallis suggests that the identification of certain troops as Persians is unfounded (Tallis 2010: 310). In any case, it seems more logical to assume that the Persians were more influenced by the closer civilization, the Elamites.
[57] The Tatarli tomb depicts a conflict between two sides, possibly Persian and Scythian. The mounted archers on both sides use the Scythian-style double convex bow; the infantry on the Persian side uses the Elamite-style bow. Summerer 2007b: 17-18. Blyth 1977: 56, citing Ghirshman, states that the Sacae and the Medes in the reliefs at Persepolis carry this type of bow. I have found no examples of this in Schmidt's publications, nor could I locate the passage in Ghirshman.
[58] Zutterman 2003: 141.

Achaemenid art rarely depicts this type of bow, as Zutterman counts only 10 archers who wield a double-convex bow.[59] Much like the Elamite bow, it is impossible to say from whom the Persians borrowed it. The closest precursors to the shape of the Scythian bow are those depicted on the plaque from Mari and seal impressions from Chogha Mish, discussed above. As this style of bow does not continue to be depicted in Near Eastern art, it is not likely that the Achaemenids learned of the "Scythian" bow from Mesopotamia. According to Herodotus, the Medes hired Scythians to teach them archery. Despite the overt folk motifs in this story, some scholars have suggested that Herodotus is recording an accurate tradition regarding the introduction of Scythian archery equipment and techniques to Media.[60] Moorey believes that the effective use of the composite bow from horseback was introduced to the Near East from the Steppes, and a new style of composite bow may also have been introduced at this time.[61] It is reasonable to assume that, directly or indirectly, the Assyrians, Scythians, Elamites, and Medes influenced Achaemenid archery equipment, and these various influences help explain why archers in Achaemenid armies are depicted with two distinct bow-types.[62]

Blyth was able to estimate the energy of arrows fired from Scythian and Elamite style bows. These results should be treated with some caution, however, as the draw weight of ancient Persian bows is not known.[63] In his work, Blyth estimates the bracing height of the

[59] Zutterman 2003: Table 6.
[60] Barkworth 1993: 160 suggests that the Achaemenid nobility may have learned archery from the Scythians. Balfour 1921: 306 and Marsden 1969: 8 n. 4 suggest that the Scythians may have also introduced composite bows to Greece. Marsden cites Xenophon's favourable opinion of Scythian archery, *Mem.* 3.9.2. Kuhrt's Achaemenid source book, the Herodotus commentary of How and Wells, and that of Asheri et al. do not comment on this detail.
[61] Moorey 1986: 210.
[62] Potts 1999: 345.
[63] For draw weight as a factor in a bow's performance, see Kooi 1983: 56; Randall 2016: 89 ff.

two bows (the distance between the string and the bow when the bow is not drawn) as 20 and 23 cm, respectively.[64] The length of the draw of each bow can be determined by subtracting the bracing height from the length of the arrows used in each type of bow: Scythian arrows were approximately 60 cm long, Persian arrows between 66 and 76 cm.[65] Blyth then compares these figures with later bows, including English longbows, Turkish bows, and modern bows. These studies suggest that the Scythian bow was designed to shoot a light arrow, and could therefore shoot further than the Persian bow. The lighter arrow, however, also lost more energy the longer it travelled due to its weight. Blyth estimates that, at 200 metres, an arrow fired from a Scythian bow would have approximately 9 joules of energy. At the same distance, an arrow fired from a Persian bow would have approximately 20 joules of energy, similar to the energy of a hoplite spear thrust.[66] The penetrative power of an arrow is relative to its weight. Heavier arrows are able to penetrate deeper than lighter arrows, although they also fly with less speed.[67] The heavier arrows shot from a Persian bow may have been able to pierce armour, but this may have been possible only at a very short distance.[68] The Scythian bow would have very little penetrating power.

As no bow survives from the Achaemenid period, it is necessary to use comparative evidence to study the materials the ancient Persians used to manufacture their bows. Archaeological evidence from Egypt allows us to comment upon the specific materials used in Achaemenid composite bows. The climate of Egypt is well known for preserving ancient

[64] Blyth 1977: 60.
[65] The difference is whether the arrow was drawn almost to the arrowhead (Blyth 1977: 76) or to the wooden foreshaft (Blyth 1977: 66).
[66] Blyth 1977: 62-63.
[67] Tomka 2013: Fig. 2 (arrow speed based on weight), Fig. 3 (arrow penetration based on weight).
[68] Aldrete et al. 2013: 98. Persian bows may only have been able to pierce armour at a range less than 50 m.

material that would not survive in many other places. As a result, numerous bows, arrows, bowcases, and quivers in remarkable condition have been excavated in Egypt. Western and McLeod undertook a scientific study of the wood used in a sample of Egyptian self-bows and arrows. This study is not an exact parallel for our study of Achaemenid bows, as the Egyptian bows in question were all self-bows. Self-bows are the simplest type of bow, as they are constructed from a single piece of wood only. Because self-bows rely solely on the properties of the wood to propel the arrow, the bowyer must select wood with the appropriate properties when making such a bow. In a composite bow, such as the bows of the Achaemenid Persians, the wooden core is largely a frame; it is the horn and sinew that give the bow the strength and elasticity to fire an arrow, and so the type of wood used is less important.[69] Nevertheless, this study is relevant as it is direct evidence for the types of wood used in the construction of ancient bows. Western and McLeod found that the most common wood used by Egyptian bowyers were those of the acacia genus, although several imported woods were also occasionally used. The use of imported wood is particularly significant. We know that material and labour were transported across the Achaemenid Empire, and the same could have been true for the materials needed for bows.[70]

Another excavated bow is perhaps more relevant to the study of Achaemenid archery. The so-called Yrzi bow was excavated in the necropolis of Baghouz, ca. 40 km. southeast of Dura Europos, in the early twentieth century. The necropolis is later than the Achaemenid period, and associated finds at this site suggest that it was in use between the second century B.C. and the third century A.D., when the region was in the control of the Parthian Empire.[71]

[69] Miller et al. 1986: 183; Collon 2008: 93. Composite bows can be made of any non-resinous wood.
[70] The inscriptions DSf and DSz provide evidence for the importation of natural resources.
[71] Brown 1937: 1.

This bow is chronologically much closer to the Achaemenid period than the bows from Egypt, and the bow itself more closely resembles the bows depicted in Achaemenid art than the self-bows described above.[72] The excavated bow is not complete, but the riser and one entire limb are extant. The bow is composite, and consists of a wooden core, horn, sinew backing, and bone limb tips. Interestingly, the wooden core is not a single piece of wood, but is four pieces of wood glued together. Brown identifies the woods used in the riser as oak and elm, although unfortunately the type of wood used for the remaining limb is unidentifiable.[73]

Near Eastern texts provide some evidence for the woods used in the manufacture of bows, but it can often be difficult to determine with any certainty the words for specific types of trees. One example of this is the Canaanite myth of Aqhat, the extant text of which is archaeologically dated to the mid-second millennium B.C.[74] In this text, the eponymous hero describes the materials of a composite bow.[75] Albright and Mendenhall, in an article on the composite bow in this text, translate the wood as "yew," although their footnote indicates that the species of tree in the text is not clear.[76] This identification is due primarily to the presence of yew in the area, and the tree's later use in the famous English longbow.[77] Collon, perhaps following these earlier scholars, likewise mentions an Ugaritic/Canaanite myth that describes a composite bow made of yew wood.[78] Gibson translates the wood mentioned in this same passage as "ash," although in his glossary he says the word *tqbm* can mean any sort of

[72] Brown 1937: 6-7; Zutterman 2003: 139. While the shape is very similar, the Achaemenid bows seem to be much shorter than the Yrzi bow.
[73] Brown 1937: 2.
[74] Gibson 1977: 1.
[75] Gibson provides a full transliteration, translation, and commentary of the extant text.
[76] Albright and Mendenhall 1942: 228.
[77] Albright and Mendenhall 1942: 229.
[78] Collon 2008: 93.

wood.[79] Unfortunately, this source does not provide conclusive evidence for the type of wood used in the construction of composite bows.

Potts suggests that yew wood was likely used for Elamite bows, as the species *taxus baccata* is present around the Caspian Sea, specifically in the modern Iranian province of Gilan.[80] If the Achaemenids adopted their bows from the Elamites, as we suspect, they may also have adopted the materials used in the construction of these bows, particularly in the empire's formative years. Nonetheless, suggestions that ancient bowyers used yew wood seem anachronistically based on the use of yew in medieval English longbows. English longbows are perhaps the most famous bows in the western world, and yew wood is certainly an excellent choice for the construction of a self-longbow. It does not necessarily follow, however, that the presence of yew in the ancient Near East made it the obvious choice for all bowyers. As we have seen, the choice of wood is much more important in self-bows, such as the English longbows, than in composite bows, such as the bows used in the Achaemenid Empire. While the number of extant bows from the ancient world is few, none that have been analyzed were found to contain yew wood. We should, therefore, favour the archaeological evidence over comparative evidence from medieval Europe.

Ancient bowyers often used water buffalo or gazelle horn in their bows. Collon suggests that water buffalo were introduced to Mesopotamia from India around the same time as the invention of the composite bow, and that the buffalo may have been imported specifically to use their horns for bows.[81] Strips of horn, perhaps a few millimeters thick,

[79] Gibson 1977: 108 (translation); 160 (glossary).
[80] Potts 1999: Table 2.9.
[81] Collon 2008: 96.

were attached to the belly of the bow, which is the side facing the archer when shooting.[82] Bronze Age mythological sources mention wild goat horn being used for composite bows in the Near East. The myth of Aqhat, described above, mentions, in addition to the wood, other materials used in the construction of composite bows. Aqhat describes a bow made with wild goat horn and bull sinew.[83] In the *Iliad*, Homer describes the bow of Pandarus, a Lycian archer, who is said to have harvested the horns of a wild goat with which to build his bow.[84] On the Yrzi bow, Brown identifies the horn used on the belly as gazelle.[85] There is, therefore, evidence for a variety of wood and horn from various animals being used by ancient bowyers in the Near East.

Sinew of a large animal is then glued to the back, which is the side facing away from the archer when the bow is drawn. Bull sinew is often used in modern traditional composite bows.[86] Similarly, Brown hypothesizes that the sinew of the Yrzi bow was from the neck of a large animal such as an ox. A document from Mesopotamia describes an allotment of ox sinew given to a bowyer, presumably to be used for the backing of a bow.[87]

Artistic depictions and excavated bows indicate that ancient bowyers often made limb tips from hard materials, such as bone, and then attached these to the bow, probably with glue (below). The addition of hard tips is beneficial for two reasons. As the limbs taper, the tips are the most fragile part of the bow. Using a hard material thus strengthens the bow at

---

[82] Miller et al. 1986: 184.
[83] Gibson 1977: 108. These materials seem more securely identified than the type of wood discussed above.
[84] Hom. *Il.* 4.104-106. Balfour 1921: 290 suggests it may have been the horns of *Capra hircus aegagrus.*
[85] Brown 1937: 2. Interestingly, insects have eaten much of the horn. Cf. Hom. *Od.* 21.394, where the returning Odysseus checks if insects (ἴπες) have eaten his bow. Balfour (1921: 304) notes that insects have frequently eaten the horn on excavated composite bows from Egypt.
[86] Zutterman 2003: 127.
[87] CAD s.v. *qaštu* 1a.

one of its weakest points. Stiff limb tips also improve the performance of a bow, as the bow is able to store more potential energy and is easier for the archer to hold at full draw.[88] Brown unfortunately does not indicate the provenance of the bone tips on the Yrzi bow.[89] Presumably, any bone from a large mammal would have properties suitable to this purpose.

Finally, an adhesive is needed to bind the wood, sinew, and horn together. Traditional glues are either animal- or plant-based. Animal hides can be boiled down to form an adhesive, as can the skins and swim bladders of fish. Aldrete et al., for their reconstruction of the ancient linen armour known as the linothorax, tested both rabbit-hide and flax-seed glue, both of which were used in the ancient Mediterranean.[90] We have no direct evidence regarding the glues of the Achaemenid Persians, but comparative evidence suggests that fish swim bladder made the most suitable adhesive for composite bows.

Additional comparative evidence comes from an ancient Chinese text, *The Examination of the Crafts.* This document was probably written in the first century A.D., but may contain information that is much older.[91] The section on bow making describes the various materials recommended for the manufacture of bows, and mentions swim bladder glue.[92] Pliny the Elder, who wrote his *Natural History* in the first century A.D., describes both fish glue and hide glue. The best glue, says Pliny, is made from the skin of a bull's ears and genitals. If the glue manufacturer has not added impurities, the glue should be white, and Pliny writes that the Rhodians were particularly skilled at its manufacture.[93] The second type

[88] McLeod 1958: 398 n. 18.
[89] Brown 1937: 2.
[90] Aldrete et al. 2013: 78.
[91] Selby 2000: 90-91.
[92] Selby 2000: 92-99 provides the original text and a translation.
[93] Pliny *NH* 28.71.

of glue Pliny describes is made from a fish he calls the *ichthyocolla*, probably the beluga sturgeon which still lives in the Caspian and Black Seas.[94] Glue could be made from the skin or the "belly" (*venter*) of the fish. Lewis and Short understand the belly in this instance to mean that the glue was made from the fish's swim bladder.[95]

Traditional Persian woodworking often used adhesives made from swim bladder.[96] Modern traditional bowyers also suggest that a glue made from swim bladder is the best adhesive for binding the materials of a composite bow.[97] The advantages of a swim bladder-based adhesive over other types of natural adhesive, such as those made from sinew or hide, is that the swim bladder produces a more flexible adhesive, and the adhesive is less likely to granulate with age.[98] Obviously, the property would be crucial for an adhesive used on the limbs of a bow, which generate power from their flexibility. The Persians then would have had access to sturgeon swim bladder and, by the time of Pliny at least, it was known to make excellent glue. It seems likely, although speculative, that the Persians used this glue in the construction of their composite bows.

One drawback of the composite bow is the amount of time required to produce a single bow. It is necessary first to dry the wood, and as each composite layer is added, the bowyer must allow the adhesive to cure before adding more material. For this reason, the construction of a composite bow takes approximately one year, and requires considerably

[94] Pliny *NH* 32.24.
[95] Lewis and Short, s.v. *ichthyocolla*.
[96] Miller et al 1986: 184.
[97] Baker 2000: 201. Selby 2000: 93 n. 10 recounts the story of a traditional Mongolian bowyer who tested numerous synthetic glues, but was unable to find a suitable replacement for fish-bladder adhesive.
[98] Wulff 1966: 86 notes that fish-bladder glue is still used by traditional Persian craftsmen, and is a by-product of the caviar trade in the Caspian region.

more skill than the construction of a self-bow. With the introduction of the composite bow, it was logical for bowyers to make hundreds of bows at a time, so that they could remain busy while their bows were curing. A bowyer would then need storage space for many bows as they cured. As bowmaking became a more intensive process with the introduction of composite bows, the state seems to have taken a greater role in the production of these weapons through the temple complexes located in the major city-centres. Numerous documents from Mesopotamia, many dated to the period of the Achaemenid Empire, attest to the fact that bowyers were often employed by the temples, which controlled the resources these weapon-makers required to practice their craft. The state often used temple officials as intermediaries to distribute bows to archers.[99] The state would have had the resources to hire specialist bowyers, provide them with the best materials, and give them the time and space to practice their craft. In return, the state would be supplied weapons with which to equip its soldiers.

It is difficult to know with certainty how long ancient bows would last. Modern composite bows made using traditional methods, can last many years, although it is unlikely that many of these bows experience the same abuse as a bow taken on a military campaign. The amount of time and specialized labour required to make each bow suggests that they were valuable items, as does the fact that they were occasionally placed in high status tombs.[100] As we have seen, many Near Eastern civilizations frequently depict bowcases in

[99] Llop 2016: 212-213 describes specialist bowyers who were working under contract during the Middle Assyrian period. Storehouses also existed in which to store the raw materials needed, and the finished bows. MacGinnis 2012: 4 writes that, during the Achaemenid period, at least seven bowyers were employed by the temple at Sippar. The logistical side of this process is described in more detail in Chapter 3.

[100] The numerous bows excavated from the tomb of Tutankhamen are perhaps the best known. See McLeod 1970 for images and descriptions of these bows.

their art, which thus suggests that ancient archers were interested in protecting their weapons. Mesopotamian documents detail the care that should be given to bows, such as wrapping the limbs when the bow is not in use.[101]

As further evidence for their value, it does not seem as though defeated or routed armies frequently left their bows on the battlefield. At the battle of Plataea in 479 B.C., Herodotus writes that the Persians "let go" of their bows.[102] What Herodotus means here is not entirely clear. Macan's commentary on this passage suggests the translation, they "put away their bows" in order to use other weapons, although he admits that "perhaps they actually flung them away."[103] Herodotus does not describe the Persians using their bows, or any other specific weapon, for the remainder of the battle, and bows are not listed among the booty that the Greek collect after the battle.[104] What happened to the Persian bows during and after the battle of Plataea is unknown. After the battle of Cunaxa, Xenophon says that the Greeks plundered the battlefield for fuel with which to cook, and found numerous arrows that had been discarded, various types of wooden and wicker shields, and even wagons, but does not mention bows.[105]

The Assyrians took weapons as plunder during some of their campaigns, but they were often taken from temples or other storehouses, not from the battlefield. In the description of Sargon II's eighth campaign, for example, the king writes that his troops took

[101] CAD, s.v. *qaštu.*
[102] Hdt. 9.62, *οἱ Πέρσαι ἀντίοι τὰ τόξα μετέντες*.
[103] Macan 1908: ad loc.
[104] In the close fighting, the Persians are said to have grabbed the Greek spears, but do not seem to have had weapons of their own. Once the Persians retreated to their fortified position, they fought off the Spartans for a long time, so were presumably armed, but Herodotus does not mention specific weapons (Hdt. 9.70). For the description of the Greek booty, see Hdt. 9.80-83.
[105] Xen. *Anab.* 2.1.6-7.

over 300,000 weapons, including bows, from a temple at Musasir.[106] Another Assyrian text reports on the inspection of 36,242 bows.[107] Dezső believes that the large number of bows indicates that they were taken as booty, possibly during a campaign against the Elamites or another army known for its archery. [108] These Assyrian documents suggest that bows were not often plundered from the battlefield, but were occasionally taken from temples or other storehouses. It does not seem as though ancient Near Eastern archers viewed their bows as expendable, perhaps due to their value.

Much like bows, ancient arrowshafts were made of organic materials, and so rarely survive from antiquity. Our best evidence for ancient arrowshafts again comes from Egypt. Western and McLeod studied numerous extant arrowshafts from ancient Egypt, and found that Acacia was commonly used, as well as the reed *Phragmites sp.*[109] Herodotus also confirms the use of reed for arrowshafts, as he states that some contingents who supplied archers to Xerxes' army used reed arrows.[110] According to an unidentified later Persian source quoted by Miller et al., reeds continued to be the material of choice for arrow-makers in post-Achaemenid Persia. The text provides some details regarding the preparation of reed for use as arrowshafts. Although this text is later, the technology it describes was probably similar to that used during the Achaemenid Empire. The text stresses that, in order to be used as arrows, reeds must first be aged.[111] This process would give the reed the rigidity and

[106] Thureau-Dangin 1912: line 394.
[107] CTN 3.117.
[108] Dezső 2016: 140.
[109] Western and McLeod 1995: 81, 87.
[110] Hdt 7.61, *εἶχον...ὀιστοὺς δὲ καλαμίνους*. Herodotus explicitly states that the Persians and Indians used reed arrows, and we can assume the Medes and Cissians did as well, as they were "armed in the same way (as the Persians)" (Hdt. 7.61, 62, 65). Herodotus does not mention any other material used for arrowshafts.
[111] Miller et al. 1986: 188.

elasticity required of an arrowshaft. As an arrow is shot, it must be able to bend around the bow, and then become straight as it leaves the bow and moves toward the target. In order to fly straight, the arrowshaft must be as straight as possible.

Arrows can be made from a number of hardwood species, and these arrows are referred to as "split-timber" shafts. The bowyer should first age the wood, and then split it into smaller sections slightly larger than the diameter of the finished arrow. The split wood is likely to have a square profile, so it is necessary to use hand tools in order to round the shaft. Modern arrow-makers use a template, often a hole drilled into a hard material such as wood or bone, to ensure that the diameter of the arrow is consistent throughout the length of the shaft.[112]

Another common method of arrow construction uses shoots or saplings. These are known as "natural shaft" arrows.[113] The reed arrows excavated in Egypt and described by Herodotus belong to this category, as well as arrows made from osiers, the flexible twigs of willow or dogwood. One should select shoots that are slightly thicker than the desired diameter of the arrowshaft. While the shoots are still green, they are bundled together and allowed to dry. This process straightens the shafts as much as possible. Once they have been dried for two or three months, the craftsman removes the bark. These shafts will not be perfectly straight, so they often need to be straightened. One method for straightening arrowshafts is to use a grooved stone. The groove corresponds to the diameter of the arrowshaft. The stone is heated, and the arrowshaft is passed through it repeatedly. The heat

[112] Massey 2000: 310.
[113] Massey 2000: 304.

of the stone loosens the fibres of the reed, thus making it more malleable, and the shaft takes on the shape of the groove. Once the reed is straight, it cools and hardens into shape.[114]

Western and McLeod's study of archery tackle in Egypt suggests that reed arrows were often fitted with a hardwood foreshaft.[115] Because the reed is hollow, a foreshaft is necessary in order to attach an arrowhead. Based on the artistic depictions of archers at Susa, Blyth estimates the length of Persian arrow as ca. 76 cm.[116] The diameter of the socket on Achaemenid-era arrowheads suggests that the shaft diameter was 4.2 - 6 mm, and their weight was approximately 15-20 grams.[117] The foreshaft added weight to the otherwise light reed arrowshaft, which gave the arrow additional power in flight. These hardwood foreshafts could be fitted with a metal arrowhead, or sharpened into a point, as the Egyptian evidence confirms. Herodotus also writes that the Lybians in Xerxes' army used javelins with a fire-hardened wooden tip.[118] It is rare to find wooden artefacts from the ancient world, with sites in Egypt being the exception, so it is difficult to say how common the wooden arrowhead was in the time of the Achaemenid Empire, but it was probably more common than the archaeological record suggests.

In the early first millennium B.C., new types of arrowhead appear in the Near East, and quickly spread to Mesopotamia, the Levant, Egypt, Anatolia, Greece, and even France. These new arrowheads were socketed, rather than tanged, and were most often made of bronze, although a few iron examples have been excavated. The first type has a triangular

[114] Massey 2000: 308.
[115] Western and McLeod 1995: 78.
[116] Blyth 1977: 46.
[117] Blyth 1977: 38 gives the smaller diameter. Goff 1978: 64 and Waldbaum 1983: 32-33 give socket diameters between 5.5 and 6 mm. For the weight, see Blyth 1977: 52.
[118] Hdt. 7.71, *ἀκοντίοισι δὲ ἐπικαύτοισι χρεώμενοι*.

cross-section and three blades, and is often called trilobal. The second type is leaf-shaped, and has two blades.[119] Their earliest appearance is in Transcaucasian graves in the eighth century B.C., which has led to the supposition that the Scythians first introduced these arrowheads to the Near East.[120] Once they were introduced, other armies quickly adopted them, and archaeologists have excavated them from numerous sites in contexts dated to the mid-seventh century B.C.

In further support of their Scythian origin, Sulimirski notes that their appearance in the Near Eastern archaeological record corresponds to the earliest reference to Scythians in Assyrian documents.[121] Herodotus agrees with the Assyrian records in this respect, as he reports that the Scythians invaded and ruled parts of the Near East at around this time.[122] He also writes that these Scythians trained Median youth as archers, and so it is feasible that the Medes also adopted archery equipment from the Scythians at this time.[123] The archaeological, documentary, and literary sources all seem to be in agreement that, in the early to mid seventh century B.C., Scythians moved out of the steppes and into the Near East, and that subsequently many people adopted their archery equipment.

Of particular interest to us here is the fact that the Achaemenid Persians seem to have adopted these Scythian-style arrowheads, and archaeological evidence suggests that the socketed bronze trilobal arrowheads were the most common type in Achaemenid armies.[124] Thousands of these arrowheads, mostly bronze but a few made of iron, were excavated from

[119] For a good overview of the distribution of these arrowheads, see Sulimirski 1954, Nicholls 1958-59, and Muscarella 1988.
[120] Sulimirski 1954: 308.
[121] Sulimirski 1954: 283.
[122] Hdt. 1.103-104.
[123] Hdt. 1.73.
[124] Muscarella 1988: 107.

Persepolis, where they were often deposited along with other military equipment.[125] These deposits likely date to the early fifth century B.C., and so attest to the Achaemenid use of such heads by the reign of Darius. Trilobal arrowheads continued to be popular in Iran long after the end of the Achaemenid Empire, as examples have been found from Parthian contexts as late as the second century A.D.[126]

Leaf-shaped, two-edged arrowheads also may have come to the Persians via the Scythians. These types are also socketed, and usually bronze. Many of these arrowheads were found at Sardis, where they have been dated to the mid sixth century B.C., when the Persian army of Cyrus the Great first took the city.[127] The Persian armies that invaded Greece in 490 and again in 480-479 B.C., brought both types of arrowhead with them, and archaeologists have excavated examples from Marathon, Thermopylae, and Athens. Others have been found at Olynthus, Olympia, and Delphi, and, in the latter two cases, they may have been deposited in temples as dedications.[128]

It is perhaps tempting to assume that the different types of arrowheads used by the Achaemenid army indicates that different ethnic contingents used their own arrowheads, but this does not seem to have been the case. An arrowhead mould now in the British Museum could cast three arrowheads at a time, two of which were trilobal and one of which was leaf-shaped.[129] The Museum bought the mould from a private collector, so there is no certain

[125] Schmidt 1957: Plate 76.
[126] Muscarella 1988: 107
[127] Waldbaum 1983: 10; Hdt. 1.79-81, 84.
[128] Sulimirski 1954: 304. The artefacts from Olympia in particular were found near temples.
[129] Trustees of the British Museum 2017. https://www.britishmuseum.org/research/collection_online/collection_object_details/collection_image_gallery.aspx?assetId=321604001&objectId=366764&partId=1#more-views (accessed January 20th, 2019).

providence, but it is thought to have come from Mosul. Coghlan arbitrarily dates the mould to the eighth or seventh century B.C., as he assumes it is Assyrian.[130] The British Museum's website currently lists the date as the seventh or sixth century B.C.[131] This item likely predates the Achaemenid period, but as the Achaemenids continued to use the arrowhead types which the mould produces, it is feasible that similar moulds were used by arrow-makers of the Persian Empire. As the mould suggests that a single craftsman could make arrowheads in two distinct shapes at the same time, it is likely that a single archer would carry different types of arrowheads.

If we are correct to assume that individual soldiers could use both types of arrowhead, it was probably because each arrowhead type performed differently. The trilobal arrowhead, for example, may have been able to penetrate some armour, and so may have been used primarily against heavily armoured opponents.[132] Sulimirski briefly mentions that the trilobal arrowhead appears later in regions which developed heavy armour later.[133] This characteristic may explain why these arrowheads were numerous on the battlefields from the Greco-Persian wars. Both types of Scythian arrowhead were also lighter than the earlier Near Eastern arrowheads, which may have led to their widespread use for almost a millennium. These lighter heads could be fired from shorter bows, and this may be the reason that the Achaemenids used a shortened version of the Elamite bow.[134] Shorter bows are generally easier to use, especially for mounted archers. A heavy arrowhead, by contrast, would

[130] Coghlan 1952: 163.
[131] Trustees of the British Museum 2017. https://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=366764&partId=1 (accessed January 20th, 2019).
[132] Muscarella 1988: 107.
[133] Sulimirski 1954: 312.
[134] Zutterman 2003: 140.

increase the power of the arrow, and could increase the chance of piercing the opponent's armour, but such arrowheads would have a shorter range than one equipped with a lighter head.[135] It is likely, therefore, that archers often carried different arrows equipped with different types of heads, which they could use in different circumstances.

The efficiency of these Scythian arrowheads is evident from the long period during which they were used, and how quickly the technology spread once it was introduced. They first appear in the Transcaucasus in the eighth century B.C., and are found throughout the Near East by the mid seventh century. The people of the Near East continued to use them through various regime changes for nearly a thousand years, as the latest known examples date to the Parthian period in the second century A.D. Their geographical distribution is likewise extensive, as they are found from Iran to Anatolia, Egypt, Greece, Sicily, mainland Italy, and even France by the fifth century B.C.

Cuneiform documents from Mesopotamia shed some light on Achaemenid arrows and their manufacture. Kleber has collected and analyzed these texts in an excellent article on the weapons of Babylonian soldiers in the Neo-Babylonian and Achaemenid periods.[136] These documents distinguish between two types of arrowhead, termed "Cimmerian" and "Akkadian." These terms likely correspond to the two types of arrowhead evident in the Near Eastern archaeological record, discussed above. A text that details the purchase of arrows by the Eanna temple in Uruk during the reign of Cyrus II is particularly interesting, as it records the cost of these different arrow types.[137] According to this text, Cimmerian arrows were

[135] Miller et al. 1986: 189 suggest ancient archers would have carried separate types of arrows for long and short distances.
[136] See in particular her discussion of arrowheads, Kleber 2014: 432ff.
[137] Kleber 2014: 433; YOS 21.8.

cheaper, as the temple paid 1 shekel per 100 arrows. The Akkadian arrows, by contrast, cost 1 shekel per 70 arrows. The reason for this difference is not clear, but it is likely due to the time required to make each type, or the cost of the raw materials. We would expect, for example, hand-forged arrows to be more expensive than cast arrows, due to the time it takes to forge. It is also possible that the Akkadian arrows were made of a more costly metal, and we know that Achaemenid armies used arrows made of both bronze and iron. The arrowshafts of both types seem to have been made of reed.[138]

Another document from early in the reign of Darius II describes the owner of a bow-fief who equipped and paid for a replacement to fulfill his military duty.[139] Among the list of equipment he provides is a bow and 120 arrows. Unfortunately the Akkadian terms used to describe these arrows are not well understood, and scholars have suggested various translations.[140] One translator suggests that some of these arrows were shafts without heads.[141] It is not clear how many arrows were without heads, or why such arrows would have been supplied. Arrows with sharpened wooden tips rather than metal heads have been excavated in Egypt, and these may be what the document is referencing. It is also possible that heads were meant to be attached later. If this was the case, we might expect archers to gather arrows after a battle. Large numbers of arrows could have been recovered from most battlefields, although it is likely that the reed shafts would often be broken. If an archer was supplied with extra shafts, he may have been able to attach heads from broken arrows after a battle.

[138] Kleber 2014: 433.
[139] CANE 1481=Kuhrt 2007: 14.38.
[140] See Manning 2016 for a discussion of the various translations of this text.
[141] This is the translation offered by Kuhrt 2007 and Briant 2002: 598. Briant's translation is derived from that of Joannès and Beaulieu.

One final special type of arrowhead is said to have been used by Achaemenid archers: the incendiary arrow. In his description of the Persian siege of the Athenian Acropolis, Herodotus writes that the Persians took up their position on the Areopagus, wrapped linen around their arrows, lit them on fire, and shot them at the fence the Athenians were using to protect themselves.[142] McLeod suggest that these incendiary arrows were regular arrows, with arrowheads, and that the linen was wrapped around the shaft and lit.[143] This technique is plausible, as incendiary arrows would do more damage if they became fixed in a flammable material, such as wood. It is clear that there was flammable material on the Acropolis in 480 B.C., as Herodotus states that, once the Persians had gained possession of the citadel, they "burned the entire Acropolis."[144] Medieval English archers used special cage-type incendiary arrows. As the name suggests, the metal arrowhead was split and stretched behind the point, which created a hollow cage into which flammable material was put and ignited.[145] Herodotus' description, and the absence of cage incendiary arrows from the archaeological record suggests that the Persians were using regular arrowheads that were wrapped with flammable material. Herodotus' description suggests that the Persians were firing only incendiary arrows.[146] It is therefore most probable that the Persian arrowheads excavated on the Acropolis were from these incendiary arrows, and their shape thus suggests that the Persians used regular arrowheads for their incendiary arrows.[147]

---

[142] Hdt. 8.52. Herodotus here uses the term *φράγμα* to describe this structure. It is not clear exactly what Herodotus is describing, but it is likely a type of fence or screen. Presumably it was made of wood or some other flammable material.
[143] McLeod 1970: 197.
[144] Hdt. 8.53, *ἐνέπρησαν πᾶσαν τὴν ἀκρόπολιν*.
[145] See illustration in Loades and Dennis 2013: 23.
[146] Macan ad loc.
[147] Broneer 1933: 342; 1935: 115. Broneer dates these find to the early fifth century B.C. based on ceramic sherds found in the same deposit.

Very little can be said regarding the other end of Achaemenid arrows. They were surely nocked and fletched. The nock is the wedge at the back of an arrow into which the string is placed. Nocks of modern arrows are often a separate material, usually plastic, that is inserted into a hollow arrowshaft. It is likely that the nocks of ancient arrows were cut directly into the arrowshaft. Such was the technique used on the extant arrows from ancient Egypt.[148] Fletches are the feathers or similar material added to the rear of the arrow. Most arrows have three or four feathers along the nock end of the arrow. These feathers stabilize the arrow in flight, and can compensate for an arrowshaft that is not perfectly straight. A few examples of arrows from Egypt were unfletched, but the majority were.[149] In some instances, the dry climate of Egypt has preserved traces of the fletching, although it is more common to find arrowshafts with grooves at the nock end which are surely where the fletching once was.[150] Although Persian archers are often depicted with a closed quiver, when the nock end of their arrows is visible, they are fletched.[151]

Malandra suggests that ancient Persians used vulture or eagle feathers to fletch their arrows, but the organic nature of the materials make this hypothesis difficult to prove archaeologically.[152] Vulture feathers are possible, but it is unlikely that all Persian arrows were fletched with eagle feathers. A geographical region will support a relatively small population of eagles, certainly not enough to fletch the many thousand arrows that each archer would need while on campaign. It is possible that eagle feathers were used on some

[148] Western and McLeod 1995: 78.
[149] Western and McLeod 1995: 79.
[150] Western and McLeod 1995: 82-85.
[151] For example, the Persian archer on the Berlin Amphora has an open quiver hanging from his waist, and his arrows are clearly fletched (Bovon 1963: Fig. 10). According to Herodotus, the Lycian archers in Xerxes' army used unfletched reed arrows (Hdt. 7.92, *εἶχον...ὀιστούς καλαμίνους ἀπτέρους*).
[152] Malandra 1973: 265.

arrows for their symbolic value, such as those of the king or high-ranking officers, but it would have been unnecessarily difficult to use only the feather from such a rare bird to produce the large number of arrows that would have been necessary to supply the whole Persian army. For the fletching of a large number of arrows, feathers from a domesticated species of bird would have been the simplest material to use. In North America, turkey and goose feathers are commonly used for fletching, but these species would not have been available to the Achaemenid Persians.[153]

Other than bows and arrows, there are several other pieces of equipment that archers used, such as quivers, bow cases, arm guards, and occasionally thumb rings. Much like bows and arrows, much of this equipment was made of organic material and so does not survive from antiquity in most conditions. A few bowcases and quivers have been excavated from Egypt. Whole quivers would not survive in most environments, but bronze decorative quiver plaques have been excavated from Luristan and Urartu.[154] Quivers are frequently depicted in art, such as palace reliefs of the Neo-Assyrians, Achaemenid sealstones, and Greek pottery depicting Persians. Neo-Assyrian reliefs frequently depict Assyrian soldiers wearing their quivers on their backs.[155] Neo-Assyrian reliefs also show Elamite quivers, particularly on Assurbanipal's reliefs depicting his campaign against the Elamites, and these quivers are always worn on the back.[156] Likewise, many Neo-Elamite seals depict archers who wear their

[153] Massey 2000: 317.
[154] Moorey 1975a discusses one example from Luristan; see Derin and Çilingiroğlu 2001: 158 ff. and Barnett 1972: 168 ff. on Urartian quivers.
[155] A particularly clear example, ME 124825, shows two archers walking in front of Sennacherib's chariot.
[156] ME 124801. The Til Tuba relief depicts numerous Elamite quivers, often strewn on the ground following the battle. Although they are not worn, the position of the strap indicates that they were worn on the back

quivers on their backs.[157] Majidzadeh sees a similarity between these Elamite quivers and the quivers depicted on the Late Elamite Arjan Bowl, which may suggest that the Assyrians were accurately depicting the equipment of their enemies.[158] In both instances, the Elamite quivers are fastened to the archer's back with shoulder straps. Tuplin's unpublished study of military scenes on Achaemenid sealstones gathers and analyzes the depictions of quivers in this medium.[159] An amphora in Berlin is perhaps the clearest depiction of a Persian quiver in Greek art. This scene shows a Persian wearing patterned trousers, his quiver hangs from his hip, and the nock end of several arrows can be seen protruding from the quiver.[160]

The reliefs at Persepolis and Susa show two different styles of quiver being used by Iranian archers. Those in Median dress, distinguishable chiefly by the trousers and head covering, wear their quiver at the hip.[161] Greek depictions of Persians typically show them in Median-style dress, so Persian quivers always hang from their left hip in Attic pottery.[162] This style of quiver may have been adopted from Central Asian archers, as similar quivers are worn by the Sogdians on the Apadana relief at Persepolis.[163] As both the Median dress

[157] Amiet 1973: Fig. 32; 60; 66. While archers are frequently depicted on Neo-Elamite seals, they are only rarely shown with quivers.
[158] Majidzadeh 1992: 138. For an excellent reading of the symbolism on the Arjan bowl, see Álvarez-Mon 2004.
[159] Tuplin unpublished: passim.
[160] Bovon 1963: fig. 10. Greek art also depicts Amazons with this quiver style, e.g. Zimmermann-Elseify 2015: 30-31; Plate 7.
[161] Schmidt 1953: Plate 64C.
[162] Bovon 1963: 596. Some examples include the Basseggio vase, the Oxford Brygos Cup, and the Berlin Amphora, mentioned above. Although Greek art only rarely depicts Greek soldiers wearing a quiver, when they do it is often worn on the hip. Some examples include an Athenian black figure amphora, ca. 550-500 B.C. (Vase No. 249); an Athenian black figure lekythos, ca. 525-475 B.C. (Vase No. 23663); and an Athenian red figure Cup, ca. 450-400 B.C. (Vase No. 30960). The most frequently depicted Greek archer, Heracles, does not often wear his quiver, but instead his archery tackle hangs from a nearby tree. Therefore, these images do not provide evidence for how Greeks wore their quivers.
[163] Schmidt 1953: Plate 43.

and the Central Asians are often associated with cavalry, it may be that the hip-mounted quiver was originally designed to be used by mounted archers.[164]

Archers dressed in the Persian court robe are occasionally shown wearing a bowcase, that may have included a quiver, at the hip, but are often shown with their quiver on the back. This style of quiver is perhaps best known from the archer reliefs at Susa. When the archers are depicted wearing the quiver on their back, they do not use a bowcase, but instead hang their bow (when not in use) upon their shoulder. Quivers are often decorated with tassels.[165] Collon suggests that these may have been used to clean arrows, although it is possible that they were merely decorative and served no practical purpose.

One final piece of archery tackle cannot be directly linked to the Achaemenids, but there is evidence that other ancient civilizations used this equipment. Arm guards are still used by archers around the world. They are often made of leather, and strap to the inside forearm of the hand that holds the bow. As the string is released, it can rub along the inside of the archer's forearm and can be painful. Armguards can be best seen on the reliefs of Assurbanipal which depict the king on horseback with his bow drawn.[166] The guard begins under the sleeve on the king's left bicep, covers the inside of the forearm, and wraps around the thumb. Tassels hanging from the guard and the incised pattern suggest that it was ornate, as well as functional. Elamite archers are also depicted with armguards.[167] Persian archers are usually depicted with long sleeves, so no arm guard is visible. One exception is the Tatarli tomb painting, in which the main figure wears short sleeves. This painting is not well

[164] This hypothesis is strengthened by the depiction of cavalry wearing the hip-mounted quiver, the *gorytus*, on some Achaemenid seals, Tuplin unpublished: 46.
[165] Tuplin unpublished: 68.
[166] ME 124867; ME 124876.
[167] Álvarez-Mon 2015: Plate 10.

preserved, and so it is difficult to be certain, but it does not appear that this figure wears an armguard. It is possible that Persian archers wore armguards under their sleeves, or that their sleeves were designed to protect their forearms.

The invention of the composite bow was an important advancement in Near Eastern military technology. Composite bows were more powerful than the earlier self-bows, and were more easily used on horseback due to their shorter length. Artistic evidence suggests that this invention took place by the late fourth millennium B.C., after which the technology spread throughout the area. By the time of the Achaemenid Empire, nearly all Near Eastern bows were of composite construction. As composite bows were made of perishable materials, ancient bows have survived only in exceptional circumstances. Modern analysis of extant bows from Egypt and the Yrzi tomb suggest that ancient bowyers used various species of hardwood to construct the bow's core. The belly of the bow was reinforced with horn, which textual and archaeological sources indicate came from gazelle or wild goat, and ox sinew seems to have been common for the backing.

Ancient Near Eastern armies used a variety of bow types. Visual evidence suggests that, in the Achaemenid Empire, two types of bow were commonly used. The Elamite bow was a recurve composite bow whose limb tips were often in the form of duck heads. This bow is depicted in Elamite and Assyrian art, where it is first associated with Elamite armies and is later adopted by the Assyrians. Textual sources also indicate that the Assyrians began to manufacture Elamite-style bows by the early eighth century B.C. The Achaemenids may have learned of this bow-type from either the Elamites or the Assyrians. The second type of bow common in the Achaemenid period is the Scythian bow. This bow is also composite, and the unstrung bow resembles a B or four-barred sigma. As its name suggests, this bow is

often associated with the Scythians, from whom the Achaemenids may have borrowed the design. The Scythian bow may also have reached Persia through the Medes. Likewise, the Achaemenid archers used a variety of arrowhead types, and it seems likely that individual archers would have carried different arrows, perhaps some for longer distances and others for close-range targets.

CHAPTER 2

ACHAEMENID WEAPONS: SPEARS AND JAVELINS

Both modern scholars and popular audiences commonly associate Achaemenid armies with archery, and indeed evidence from Persia itself supports the idea that the bow was a significant weapon and symbol to Achaemenid rulers and soldiers.[1] This chapter, however, argues that the spear was just as important, and in some contexts was actually the preferred weapon of the Achaemenid Persians. Miller suggests that Greek poetry of the fifth century B.C. emphasized the Persian use of the bow, in contrast to the hoplite spear.[2] This contrast first appears in Aeschylus' *Persae*, but is also found in Herodotus.[3] In the early fifth century, Greek artists occasionally depicted Persian soldiers armed with spears, while in later art they are almost exclusively armed with bows.[4] Although numerous sources provide evidence for the Achaemenid use of the spear, the depiction of Persian archers known primarily from Aeschylus, Herodotus, and Attic pottery have continued to influence modern perceptions of Achaemenid weapons.

Greek sources use a variety of terms to describe the spears of the Persians. They often suggest that the Persian spear was mostly used as a javelin (i.e. it was thrown). Xenophon in particular seems to have preferred the Persian-style javelin known as a *palton* to the heavy spear, as it was easier to use on horseback. Visual evidence from Greece and the Near East

[1] While some scholars have begun to acknowledge the Persians' use of the spear, others continue to emphasize the Achaemenid forces as "archers." E.g. Görkay 2002: 58 describes Persian archers as "the main component of the Asiatic infantry forces." Krentz 2010: 159 and Billows 2010: 224-225, in recent books on Marathon, describe Persian forces' reliance on archery; see also Hyland 2011: 272 for a criticism of this view.
[2] Miller 2006/7: 113.
[3] Wardman 1959: 49.
[4] Miller 1995: 39.

presents a different picture, as spears are almost always thrust, not thrown. Archaeological evidence from Achaemenid and related contexts allows us to comment upon the material composition of ancient spears. This chapter concludes with a discussion of the ways in which the Persians used their spears to fight and to hunt.

TERMINOLOGY

Before we proceed to the ancient evidence, it is necessary to say a few things about the terminology we will be using to describe the weapons in this chapter. We will use the term "spear" to denote a weapon that consists of a long shaft, usually of wood, to which is affixed a sharp head, usually of metal. We will use the term, "thrusting spear" to denote a heavy weapon that was meant to be thrust. We will use the terms "throwing spear" and "javelin" interchangeably to refer to light weapons that were meant to be thrown. Evidence suggests that Persian soldiers used both types of weapon, as well as a versatile weapon, called in Greek a *palton*, that could be used both ways.

The description of bows and arrows required a greater technical vocabulary than does the current discussion of spears. Nevertheless, a brief note will facilitate the discussion that follows. The parts of a spear are similar to those of arrows. The spearhead is the killing end of the weapon, and is made of metal sharpened into blades. By the sixth century B.C., spearheads in the Near East were often made of iron, although in earlier periods they were made from bronze. These heads were often leaf-shaped, and had two cutting surfaces along either side. This section was often reinforced by a thicker band of metal running down the centre of the head. This feature is called a mid-rib.

Achaemenid-era spearheads were socketed, much like many Achaemenid arrowheads. The wooden shaft of the spear or arrow is attached to the head through the socket. Spearheads often have a small hole in the socket, through which a metal rivet can be placed to provide a solid connection between shaft and head.[5] The other end of the spear is called the butt. A metal butt was frequently attached to both thrusting and throwing spears. Greek authors suggest that the Persians used rounded butts in the shape of fruit, and it is possible that the type of fruit and the colour or material of it could distinguish rank.[6] On thrusting spears, a metal butt-spike could be dug into the ground, and in this way the weapon would be more effective against a charge of heavy infantry or cavalry. On a javelin, a metal butt would counterbalance the head, helping the weapon to fly level. Harris suggests that soldiers also threw javelins without spin to allow the weapon to fly level, while ancient athletes spun javelins to ensure the point became affixed in the ground.[7]

NEAR EASTERN SOURCES

In the Achaemenid royal inscriptions, the Old Persian word for spear is *aršti-*. As this is the only Old Persian term for spear that is attested, it appears that they did not distinguish between throwing spears and thrusting spears. The term *aršti-* appears in the inscriptions on Darius I's tomb at Naqsh-i Rustam. In these inscriptions, Darius writes, "the spear of the

[5] Derin and Çilingiroğlu 2001: 155.
[6] Herodotus (7.41) describes Persian spearmen whose spears had gold or silver pomegranates instead of a butt-spike, *καὶ τούτων χίλιοι μὲν ἐπὶ τοῖσι δόρασι ἀντὶ τῶν σαυρωτήρων ῥοιὰς εἶχον χρυσέας...οἱ δὲ εἰνακισχίλιοι ἐντὸς τούτων ἐόντες ἀργυρέας ῥοιὰς εἶχον*. Several later authors also refer to a Persian unit called the Apple-bearers (*οἱ μηλοφόροι*), presumably because their spear-butts were in the shape of apples (Ael. *VH* 9.3; Arr. *Anab*. 3.11.5; Hesychius *s.v. μηλοφόροι*). For a recent discussion of these troops, see Charles 2011.
[7] Harris 1963: 35.

Persian man has gone forth far,"[8] and "as a spearman, I am a good spearman, both on foot and on horseback."[9] This same term occurs in Avestan Persian.[10] The compound form, *aršṭibara*, which means "spear-bearer," is also found on Darius' tomb. Gobryas,[11] one of Darius' co-conspirators according to the Bisitun inscription and Herodotus' *Histories,*[12] is depicted on the tomb relief, and underneath his image is an inscription that reads, "Gobryas, the Patischorian, King Darius' spear-bearer."[13] The fact that such a prominent figure is labeled as a "spear-bearer" suggests that this was a prestigious position among the Achaemenids, perhaps the commander of the elite unit that served as the king's bodyguard, and evidence which we will examine below supports this conclusion.

The Akkadian language had many terms for spears, some of which seem to have distinguished between thrusting spears and javelins. We will focus here on the terms that are relevant to our study of spears during the Achaemenid era. Darius' inscriptions on his tomb were trilingual. In addition to the Old Persian version, discussed above, there are also versions in Akkadian and Elamite. In the Akkadian version, the Old Persian term *aršti-* is translated by the term *azmarû*.[14] This word is attested as early as the Middle Babylonian period, and continued in use into the Neo-Babylonian and Persian periods. In Persian inscriptions, this word is used in the Akkadian version of the phrase, "the spear of the Persian man has gone forth far."[15] In the Gadalyama document, Rimut-Ninurta equips his military

[8] DNa lines 43-45, *Pārsahyā martiyahyā dūraiy aršṭiš parāgmatā*. Text from Kent 1950.
[9] DNb lines 44-45, *ārštika amiy uvārštika utā pastiš utā asabāra*. Text from Kent 1950.
[10] Malandra 1973: 270; *Yt*. 10.20; 13.72.
[11] For the sake of clarity, we will use his Latinized Greek name, which will be the most familiar to readers. In Old Persian, his name is Latinized as Gaubaruva, in Akkadian as Kubarru.
[12] DB 4.84; Hdt. 3.70.
[13] DNc, *Gaubaruva Pātišuvariš Dārayavahauš xšāyaθiyahyā aršṭibara*. Text from Kent 1950.
[14] This term is also spelled *ismarû* and *asmarû*. See CAD s.v. *azmarû*.
[15] *Ša amēlu Parsaja GIŠ az-ma-ru-šu rūqu illik*. Text from CAD.

replacement, Gadalyama, with two *azmarû* spears.[16] The term spear-bearer is translated into Akkadian as *nāš azmarē*.

Although the Akkadian term *azmarû* signifies a heavy thrusting spear or lance, it does not necessarily follow that its Old Persian equivalent in Darius' inscriptions, *aršti-*, also refers to a heavy thrusting spear. Henkelman notes that, in the Persepolis Fortification texts, Old Persian *aršti-* is often synonymous with Akkadian *šukurrum*, which is a light throwing spear or javelin.[17] It is possible that the Persians did not distinguish between thrusting spears and javelins in their vocabulary because the *aršti-* was a versatile weapon that could be used both ways. As we shall see in the following section, Greek authors such as Xenophon describe such a spear used by the Persian cavalry.

Finally, Akkadian documentary sources of the Persian period also use the term *aštabarru* to describe spearman. This term is a transliteration of the Old Persian term for spearbearer, *arštibara*.[18] In texts from the Murašu archive, which provide evidence for the recruitment and armament of soldiers from military fiefs in southern Mesopotamia during the fifth century B.C., this term describes a type of soldier.[19] The transliterated Persian term does not seem to have been used in monumental Akkadian inscriptions of the Achaemenid period.

[16] 2 {giš}aš-ma-ru-ú AN.BAR, text according to Manning 2016.
[17] Henkelman 2002: 19 n. 39; CAD s.v. *šukurru*. .
[18] CAD s.v. *aštabarru*.
[19] Stolper 1985; BE 10 76.

GREEK SOURCES

As our written sources for Achaemenid military equipment are predominantly Greek, it is worthwhile to examine the vocabulary Greek historians use to describe spears in descriptions of both Persian and Greek warriors. We note here that the majority of our evidence for spears during the Achaemenid period comes from the empire's heartland, and so we are able to discuss Iranian troops in detail.[20] We will include troops from elsewhere in the empire when evidence permits.

Aikhmē

The first Greek term we shall discuss is *aikhmē*. Early Greek poets, such as Homer, Hesiod, Pindar, and Theognis, frequently use this term. In its strictest sense, this word means the point of a spear or, less commonly, of an arrow.[21] This usage is frequently found in the *Iliad*. Homer frequently describes bronze spears, *aikhmē khalkheiē*, which must refer specifically to the spear-head, and not the entire spear, as the shaft was wooden. Homer also uses the related term, *aikhmētēs*, to describe spearmen, particularly in contrast to archers.[22] Hesiod uses *aikhmē* in his poem, *The Shield,* to describe Ares' spear.[23] Pindar often uses

[20] Herodotus' description of the Greco-Persian wars suggests that, despite his description of the numerous contingents in Xerxes' army, the Iranian troops did most of the fighting. In other Greek sources, it is not always clear who is meant by "Persian," i.e. were these always ethnic Persians, or were they subjected peoples who fought in the imperial army. The armed warriors depicted at Persepolis and Susa are frequently identified as Persians, Medes, and Elamites, based on their dress.
[21] LSJ s.v. *αἰχμή*. See, e.g., Hom. *Il.* 4.503, 5.282, 6.320.
[22] Hom. *Il.* 1.152, 290, 543, 2.543.
[23] Hes. *Sc.* 193.

aikhmē and *aikhmētēs*, and the *aikhmē* is again associated with Ares in his thirteenth Olympian ode.[24] In all these poets, the *aikhmē* is often a Greek weapon, though not always.

In the early fifth century B.C., Aeschylus is the first Greek author to use *aikhmē* in the context of the Achaemenid army. In *Persae*, when the ghost of Darius appears, Atossa tells him that he "acquired wealth with [his] *aikhmē*."[25] Aeschylus again uses *aikhmē* to describe an eastern weapon in his *Prometheus Bound*, as he writes of, "those who inhabit the high-cragged city near the Caucasus, a warlike army, clamouring amidst sharp-pointed spears."[26] Later in the same play, Poseidon's trident is called an *aikhmē*.[27] In *Seven against Thebes*, the Arcadian Parthenopaeus makes an oath on his spears, and Eteocles arms himself against spears and stones.[28]

Herodotus only uses the term *aikhmē* to describe a non-Greek weapon.[29] The first instance of this word in Herodotus' *Histories* is found in the story of Croesus and his son Atys. Croesus dreams that his son will be killed by an iron spear.[30] The phrase "iron spearpoint," *aikhmē sidērē*, is likely a deliberate reference to the Homeric phrase, *aikhmē khalkheiē*, described above.

Herodotus only twice describes the *aikhmē* in use. Once it is thrown, and once it is used in close quarters. When the Nile overflowed one season, the Egyptian king Pheros

[24] Pind. *O.* 13.23. Cf. 6.86, 7.19, 9.79; *P.* 1.66.
[25] Aesch. *Per.* 755, *πλοῦτον ἐκτήσω ξὺν αἰχμῇ*.
[26] Aesch. *Pro.* 421-24, *ὑψίκρημνον οἳ πόλισμα / Καυκάσου πέλας νέμονται / δάιος στρατός ὀξυπρώ- / ροισι βρέμων ἐν αἰχμαῖς*.
[27] Aesch. *Pro.* 924-25, *θαλασσίαν τε γῆς τινάκτειραν νόσον / τρίαιναν, αἰχμὴν τὴν Ποσειδῶνος, σκεδᾷ*.
[28] Aesch. *Sep.* 529, 676.
[29] Powell 1938 s.v. *αἰχμή*.
[30] Hdt. 1.34, *τοῦτον δὴ ὦν τὸν Ἄτυν σημαίνει τῷ Κροίσῳ ὁ ὄνειρος, ὡς ἀπολέει μιν αἰχμῇ σιδηρέῃ βληθέντα*.

grabbed a spear and threw it into the river.[31] Leaving the question of this scene's historicity aside, it does provide evidence that Herodotus thought the weapon he terms an *aikhmē* could be thrown. The only other Herodotean passage in which an *aikhmē* is used occurs during the fight between Darius and his co-conspirators and the two Magi who have usurped the Persian throne. When the Magi realize they are being attacked, one grabs a bow and the other grabs a spear.[32] It is clear in this instance the *aikhmē* is used as a short-range weapon, as Herodotus states that bows were of no use, due to the proximity of the assailants. The spear proves much more useful, as the spear-wielding Magus injured two of the conspirators before he was overcome. These passages suggest that the spears used by Achaemenid and other Near Eastern armies could be described by the Greek word, *aikhmē,* and that they could be thrown or thrust.

Throughout the *Histories,* the *aikhmē* is not a Greek weapon. Herodotus twice uses the term in the context of Greek warfare, but neither time does it signify a literal spear. Rather, it is used as a synonym for war. The Athenian tyrant Peisistratus is said to have taken the town of Sigeum "by the spear," i.e. in war.[33] In the context of Xerxes' invasion of Greece, Herodotus records a rumour that the Argives invited the Persians into Greece, because their war (*aikhmē*) with the Spartans was not progressing well.[34]

When Herodotus describes a physical weapon as an *aikhmē,* it is always in a Near Eastern context. We have already seen the iron spearpoint of Croesus' dream in Lydia, and

[31] Hdt. 2.111, *λαβόντα αἰχμὴν βαλεῖν ἐς μέσας τὰς δίνας τοῦ ποταμοῦ*. This scene's most obvious parallel is Xerxes' whipping of the Hellespont after his first attempt to bridge Asia and Europe failed, Hdt. 7.35.
[32] Hdt. 3.78.
[33] Hdt 5.94; LSJ s.v. *αἰχμή*.
[34] Hdt. 7.152, *ὡς ἄρα Ἀργεῖοι ἦσαν οἱ ἐπικαλεσάμενοι τὸν Πέρσην ἐπὶ τὴν Ἑλλάδα ἐπειδή σφι πρὸς τοὺς Λακεδαιμονίους κακῶς ἡ αἰχμὴ ἑστήκεε*.

Pheros' casting of the weapon into the Nile in Egypt. Herodotus describes the Egyptian pharaoh Sesostris' reliefs in Ionia, which depict the king with a bow and a spear (*aikhmē*).[35] In his description of the troops in Xerxes' army, many of the contingents are said to be armed with *aikhmai*. In addition to the Persian troops, eight other ethnic contingents also use the *aikhmē*: the Assyrians, the Bactrians, the Sarangae, the Ethiopians, the Paphlagonians, the Milyae, the Moschi, and the Colchians.[36] Often these weapons are described as "short spears" (*aikhmai brakheai*).[37] The Ethiopians, says Herodotus, made their spearpoints of sharpened gazelle horn.[38] The Moschi had small spears with large spearheads.[39] No further details are given as to the physical characteristics of the other spears.

Following Herodotus, Greek historians of the late fifth and fourth centuries B.C. do not often use *aikhmē* to describe weapons. Thucydides never uses the word, although he does use two related words: *aikhmalōtos*, "captive," and *homaikhmos*, "ally."[40] Xenophon only uses *aikhmē* twice, and both instances occur in the *Cyropaedia*.[41] In the first passage, an Assyrian man complains to Cyrus that the Assyrian king killed his son during a hunt with an *aikhmē*.[42] In the second passage, Xenophon is not referring to a specific weapon, but to the fact that Cyrus' subjects willingly presented themselves under arms at his court.[43] Elsewhere, Xenophon is more precise with his use of military terminology.

---

[35] Hdt. 2.102. We should note that two figures matching Herodotus' description have been found, but they are not Egyptian.
[36] Hdt. 7.61, 63, 64, 67, 69, 72, 77, 78, 79.
[37] The spears of the Persians, the Bactrians, the Milyae, and the Colchians are described in this way.
[38] Hdt. 7.69, *πρὸς δὲ αἰχμὰς εἶχον ἐπὶ δὲ κέρας δορκάδος ἐπῆν ὀξὺ πεποιημένον τρόπον λόγχης*.
[39] Hdt. 7.78, *εἶχον ἀσπίδας δὲ καὶ αἰχμὰς σμικρὰς λόγχαι δὲ ἐπῆσαν μεγάλαι*.
[40] Thuc. 1.30, 52, 54 (*aikhmalōtos*); 1.18, 3.58 (*homaikhmos*).
[41] Xenophon uses the Homeric term *aikhmētēs* twice, but in both instances he is quoting or paraphrasing Homer (Xen. *Mem.* 3.2.2.; *Symp*. 4.6; Hom. *Il.* 3.179).
[42] Xen. *Cyr*. 4.6.4.
[43] Xen. *Cyr*. 8.1.8, *ἐφοίτων μὲν οὖν ἐπὶ τὰς θύρας Κύρου οἱ ἔντιμοι σύν τοῖς ἵπποις καὶ ταῖς αἰχμαῖς*.

The virtual absence of *aikhmē* from later historical texts, and the frequency with which Herodotus uses the term in the context of Near Eastern armies could indicate that he was being deliberately archaic with his choice of vocabulary. Homer, for example, frequently uses this term in his *Iliad*. Herodotus may have been attempting to link his work on the Persian Wars with Homer's work on the Trojan War. If Herodotus was deliberately using archaic terminology, this could explain why the word seldom appears in later Greek historical writing.

Palton

Xenophon frequently describes a Persian spear called in Greek a *palton* (pl. *palta*), although this word is not common in other authors. The word comes from the verb, *pallō*, which means to brandish. The adjectival form, *paltos/-a/-on*, means something that is brandished, and it is from the neuter form of the adjective that the noun *palton* is formed.[44]Aeschylus is the earliest extant author to describe a weapon as a *palton*, in his lost *Argives*. There is little context for the passage, as it is a single line, but Aeschylus pairs *palta* with thonged javelins and a store of missiles, so the *palta* here are certainly weapons.[45] It is the only extant use of *palton* to describe a weapon in fifth century literature.

Xenophon uses the term *palton* far more than any other extant author. According to the *Thesaurus Linguae Graecae,* the term occurs 103 times in the Greek literary corpus, and 22 of these are in Xenophon.[46] They are almost exclusively weapons used by Near Eastern

[44] LSJ s.v. *πάλλω*; *παλτός, -ή, -όν*.
[45] Aesch. fr. 16, *καὶ παλτὰ κἀγκυλητὰ καὶ χλῆδον βελῶν*.
[46] I first searched the *Thesaurus Linguae Graecae* for the term *παλτ**, and eliminated those results which did not refer to a weapon.

forces. Persians are frequently armed with *palta* in the *Cyropaedia*, as are the Chaldaeans.[47] Cyrus the Younger carries two in the *Anabasis*.[48] The Mossynoeci, whom Xenophon encountered along the southeastern shore of the Euxine Sea, also used *palta*. Xenophon here offers the only physical description of these spears, which he describes as six cubits long, with a blade at one end and a spherical butt at the other.[49] Xenophon frequenly attests to the versatility of the *palton*, as it can be both thrown and thrust, and it is for this reason that the Persians carried two.[50] Xenophon even suggests that the *palton* could be superior to the Greek *dory*. When the forces of Agesilaus met those of Pharnabazus near Dascyleium, the Greek spears broke, but the cornel-shafted *palta* of the Persians did not.[51] In his treatise, *On Horsemanship*, Xenophon writes that the two *palta* are the best weapons for mounted soldiers and hunters, since they are stronger and more versatile than the spear (*doru*).[52]

According to Ctesias, the soldier who killed Cyrus the Younger used a *palton*.[53] Arrian twice uses it of Persian weapons in his description of the battle at the Granicus River, but in both instances these weapons are used as javelins, and there is no mention of the two-*palta* system found in Xenophon.[54] It is occasionally found in other Roman-era historians, such as Dionysius of Halicarnassus, Strabo, and Josephus.[55] Lexicographers and scholiasts

[47] E.g. Xen. *Cyr*. 1.2.9, 4.1.3, 7.1.2 (Persians); 3.2.7 (Chaldaeans).
[48] Xen. *Anab.* 1.5.15, 1.8.3.
[49] Xen, *Anab.* 5.4.12, *ἐν δὲ τῇ δεξιᾷ παλτὸν ὡς ἐξάπηχυ, ἔμπροσθεν μὲν λόγχην ἔχον, ὄπισθεν δὲ αὐτοῦ τοῦ ξύλου σφαιροειδές.*
[50] Xen. *Cyrop.* 1.2.9, 4.3.9, *De re eq.* 12.13.
[51] Xen. *Hell.* 3.4.14.
[52] Xen. *De re eq.* 12.12, *ἀντί γε μὴν δόρατος καμακίνου ἐπειδὴ καὶ ἀσθενὲς καὶ δύσφορόν ἐστι, τὰ κρανέϊνα δύο παλτὰ μᾶλλον ἐπαινοῦμεν. καὶ γὰρ ἐξαφεῖνα τὸ ἕτερον δυνατὸν τῷ ἐπισταμένῳ, καὶ τῷ λειπομένῳ οἷόν τε χρῆσθαι καὶ εἰς τὸ ἀντίον καὶ εἰς τὰ πλάγια καὶ εἰς τοὔπισθεν. καὶ ἅμα ἰσχυρότερά τε τοῦ δόρατος καὶ εὐφορώτερά ἐστιν.*
[53] Diod. 14.23.2=*FGrH* 688 F 21 26.
[54] Arr. *Anab.* 1.15.2, 1.15.5.
[55] Dion. 9.11.5, 9.63.4; Strabo 10.1.3; Josephus *AJ* 14.426, 14.457; BJ 1.332.

frequently define it as a spear (*dory*), or javelin (*akontion*).[56] This further suggests that it was a versatile weapon that could be used at both mid- and close-range.

Akontion

One of the most commonly used Greek term for javelin is *akontion* (pl. *akontia*), which is found in over 700 passages. The term is the diminutive form of *akōn*, which also means javelin.[57] The term *akontion* is not found earlier than the fifth century B.C., but is frequently found in the works of Classical Greek authors such as Herodotus, Xenophon, Thucydides, and Plato, and continues into the Roman-era in the works of authors such as Pausanias, Appian, Plutarch, and others.

These weapons are only rarely found in Persian hands. In Herodotus, for example, *akontia* are never Greek weapons, but they are also never used by Persians. When Croesus dreams his son will be killed by a spearpoint, he removes all of the *akontia* and *dorata* from his palace.[58] Herodotus also uses the term twice in his description of Scythian rituals. The Scythians dip *akontia*, along with other weapons, in blood as part of their oath-taking ceremony. Herodotus also writes about Scythian human sacrifice, during which the sacrificial victim is thrown onto upright *akontia* in order to bring important messages to the gods.[59] Several contingents in Xerxes' army are said to have been armed with *akontia*, including the Libyans, Mysians, Thracians, and Mares, as well as the marines from Phoenicia, Cilicia, and

[56] Hesychius, s.v. *palton*, Lexica Segueriana, Scholia in Xen. *Anab*. 1.5.15, 1.8.3, Suda s.v. *palton*.
[57] I have found no instance of *akōn* used to describe a Persian weapon, so it is not included in this discussion.
[58] Hdt. 1.34.
[59] Hdt. 4.70, 4.94.

Lycia.[60] Interestingly, the Libyans and Mysians are said to have fire-hardened wooden tips, rather than metal javelin blades.[61]

Unlike the versatile *palton,* the *akontion* is usually described as being thrown.[62] Thucydides pairs it with arrows and sling stones, which suggests that he viewed it as a mid-range skirmishing weapon.[63] Xenophon writes that, "the blade of a boar-hunting spear should be broad and sharp, and about five handbreadths long, and sturdy teeth forged in bronze at the middle of the socket. The shaft should be made of cornel wood, and as thick as a lance shaft."[64] The teeth Xenophon describes probably relate to the spear's use in boar hunting, and may not have been included on weapons designed for military use. In both Ctesias and Xenophon's *Cyropaedia*, Persians are also said to hunt with *akontia*.[65]

Despite his praise of the *akontion* in the context of hunting, Xenophon seems to have greatly preferred the *palton* in war. In the *Cyropaedia,* Xenophon has Cyrus encourage his troops before a battle. In this speech, Cyrus tells his men that they should take courage in the fact that they have abandoned the bow and the *akontion*, and have adopted the use of the *palton*.[66] Xenophon here suggests that the *palton* was a superior weapon to the *akontion*.

[60] Hdt. 7.71-72, 74-75, 79, 89, 91-92.
[61] *ἀκοντίοισι δὲ ἐπικαύτοισι χρεώμενοι*, Hdt. 7.71. The Mysian javelins are described in almost identical terms at 7.74.
[62] *Ballō* is frequently used to describe the use of *akontia*. Some Persian examples include Plut. *Alc.* 39, *Art.* 10, Ctesias *FGrH* 688 F9 7, F14 43.
[63] Thuc. 4.32, 4.34, 7.70.
[64] *Cyn.* 10.3.
[65] Xen. *Cyr.* 1.4.10; Ctesias *FGrH* 688 F14 43.
[66] Xen. *Cyr.* 6.2.16.

Saunion

One final Greek term for javelin, *saunion* (pl. *saunia*), is rare in extant Greek literature, but Diodorus uses it to describe late Achaemenid weapons, so we include it here. According to both Chantraine and Beekes, this word has no known origin, although it may be related to the Persian word, *sani*.[67] Aside from a fragmentary line of the fourth century B.C. comic playwright Menander, the term did not become popular until the Roman period.[68] The word is most common in works of the first century B.C. and early first century A.D., such as Diodorus, Dionysius of Halicarnassus, and Strabo. Of these authors, only Diodorus mentions *saunia* in the context of Achaemenid armies. At the Granicus River, the Persian Spithrobates hurls a *saunion* at Alexander.[69] At Gaugamela, Diodorus describes the initial volley of arrows, stones, and javelins.[70] Later authors gloss it as a "barbarian javelin" (*akontion barbarikon*).[71]

These references suggest that Greek authors contemporary to the Achaemenid Empire did not describe Near Eastern javelins as *saunia*. The few references to *saunia* in fifth and fourth century comedy suggest that the term existed, but was not sufficiently popular at the time to survive in other Classical sources. The term became more popular in the first century B.C., and authors of this period then used it in their descriptions of Persian warfare during the Achaemenid period. It is possible that the term became popular through Roman-Parthian

[67] Chantraine 1977, s.v. *σαυνίον*; Beekes and van Beek 2010: s.v. *σαυνίον*; Estienne 1854: s.v. *σαυνίον*.
[68] *ὥστ' ἐγωγ' ἂν εἰλόμην που σαυνίῳ πεπληγμένος*, (fragment 508, Play Phi fragment 2, fragment 441 – all same line). Cratinus also uses it, but not in a sense that is pertinent to the present study (fragment 443).
[69] Diod. 17.20.
[70] Diod. 17.59.
[71] Hesychius, Photius s.v. *saunion*.

interactions, and so represents an authentic Persian word. Like the *akontion*, the *saunion* was a mid-range weapon, and no source describes its use in hand-to-hand combat.

Aikhmophoroi and Doryphoroi

Greek authors also use the terms *doryphoroi* and *aikhmophoroi*, literally spear-bearers, to describe infantry soldiers in general, but also for the personal bodyguard of kings, tyrants, and other nobles. This term may correspond to the Elamite *ka$_4$-ši-ik-ki ba-ak-ki-ra*.[72] Here we are particularly interested in elite units of spearmen who were selected from larger Persian levies, and whose primary duty seems to have been the protection of the king or other nobility. The term *aikhmophoroi* is rare in extant Greek literature. It occurs 18 times, seven of which are found in Herodotus' *Histories*. The poet Bacchylides is the only other Classical Greek author to use the term; all other instances are Roman and Byzantine. The term *doryphoroi* is much more common, and so we must limit our discussion here to evidence for these troops in the Achaemenid Empire. The Greek term is an accurate translation of the Old Persian term for spear-bearer, *aršťibara*, used in the inscription on Darius I's tomb to describe Gobryas mentioned above.[73]

According to the *Cyropaedia*, Cyrus the Great was the first Persian king to appoint *doryphoroi* as bodyguards. Xenophon describes that, after numerous conquests, Cyrus began to focus on the management of his empire. One of his first decisions was to select 10,000 *doryphoroi* from the Persians to guard the palace and his person.[74] Herodotus suggests that

[72] Henkelman 2002: 2.
[73] DNc; Kent 1950: 172.
[74] Xen. *Cyr*. 7.5.68.

doryphoroi protected the Median kings, and so in his view their use by the Persians was inherited from the Medes rather than an invention of Cyrus.[75] Royal bodyguards predate the Achaemenids, and are attested throughout the history of the ancient Near East. Egyptian artistic depictions of the battle of Kadesh, for example, portray the pharaoh's royal guards.[76] Neo-Assyrian reliefs frequently depict shielded spearmen who protect the king in battle.[77] The evidence suggests, therefore, that the Persian kings were not the first to use bodyguards, but that they continued a much older tradition.

In his description of Xerxes' army, Herodotus describes two groups of *aikhmophoroi*, both comprised of 1,000 men. The first group consisted of select Persians who marched in front of Xerxes with their spear-tips pointing down.[78] These troops had golden pomegranates instead of butt-spikes.[79] Another group of 1,000 *aikmophoroi* marched just behind Xerxes, and these were the "best and noblest" Persians. These troops carried their spears upright, and had golden apples instead of spikes on their spear-butt.[80]

Charles has convincingly argued that the *aikhmophoroi* with golden apples (later Greek authors called them the Apple-Bearers) were not part of the 10,000 strong unit known as the Immortals.[81] Their close proximity to the king suggests they were an elite unit, and were perhaps the king's personal bodyguard. Gobryas' title, *arštibara*, may indicate that he

[75] Hdt. 1.114.
[76] Spalinger 217, 256
[77] Dezső 2012a: 115.
[78] Hdt. 7.40, *μετὰ δὲ αἰχμοφόροι χίλιοι καὶ οὗτοι ἐκ Περσέων πάντων ἀπολελεγμένοι, τὰς λόγχας κάτω ἐς τὴν γῆν τρέψαντες*.
[79] Hdt. 7.41, *εἶχον δὲ χρυσέας ῥοιὰς καὶ οἱ ἐς τὴν γῆν τρέποντες τὰς λόγχας*.
[80] Hdt. 7.41, *αὐτοῦ δὲ ὄπισθε αἰχμοφόροι Περσέων οἱ ἄριστοί τε καὶ γενναιότατοι χίλιοι, κατὰ νόμον τὰς λόγχας ἔχοντες...καὶ μῆλα [εἶχον] οἱ ἄγχιστα ἑπόμενοι Ξέρξῃ*.
[81] Charles 2011: 120. The identity of the first group of *aikhmophoroi* is less secure. They have the same golden pomegranates as some of the Immortals, but seem to be a separate group. Sekunda 1992: 6-7 suggests that each group was half of the Apple-Bearers, and Herodotus erroneously wrote that they numbered 1,000 each instead of 1,000 total, but this explanation is not entirely satisfactory.

was the commander of this elite unit, and was therefore the chief officer of the Achaemenid army.[82] It is likely satraps and many nobles had their own personal bodyguard similar to that of the king.[83] The members of these units may have been selected from the training camps which Greek authors describe in their accounts of Persian education.[84] These units would have been professional, full-time soldiers, who were supplemented with conscripted troops for large campaigns.

Greek accounts suggest that one of the primary duties of the *doryphoroi* was the protection of the king. When the Spartans send two men to atone for their killing of a Persian herald, the *doryphoroi* initially deny them access to the king.[85] According to Plutarch, when Teribazus failed to assassinate a sleeping Artaxerxes II, the *doryphoroi* prevented his escape. This story suggests that they were guarding, or at least stationed near, the king's sleeping quarters.[86] Similarly, the leader of the *doryphoroi* in 465 B.C., Artabanus, was able to assassinate Xerxes, which was likely facilitated by his proximity to the king.[87] In other instances, the king uses his *doryphoroi* to transfer prisoners. When the Persians capture Greek spies who were gathering information on Xerxes' army, Xerxes sent his *doryphoroi* to bring the prisoners to him.[88] Evidence from the Persepolis Fortification Archive also suggests that units called spear-bearers could be armed, high-status escorts.[89]

[82] Sekunda 1988: 71.
[83] While Herodotus most frequently describes *doryphoroi* in the King's retinue, other nobility seem to have had a personal bodyguard. Examples include: Harpagus (1.113), Oroetes (3.128), Megabates (5.33), and Masistes (9.107).
[84] Strabo, Hdt.
[85] Hdt. 7.136.
[86] Plut. *Art.* 29.4.
[87] Diod. 11.69.
[88] Hdt. 7.146.
[89] Henkelman 2002: 2.

At the end of the *Histories*, Herodotus describes a violent feud between Xerxes and his brother Masistes, which began when Xerxes became infatuated first with Masistes' wife, and then his daughter. In this story, Xerxes' wife Amestris uses Xerxes' *doryphoroi* to torture Masistes' wife.[90] Amestris' use of Xerxes' *doryphoroi*, however, is perhaps best viewed with some skepticism. The association of Persian women and torture is a common trope in Greek literature. Ctesias' description of Darius II's wife, Parysatis, is perhaps the most extreme example.[91] Furthermore, it does not seem likely that Amestris would have had the authority to use the king's personal *doryphoroi* in this way, particularly against the king's wishes.[92] Finally, in no other instance are *doryphoroi* associated with acts of torture, and are almost exclusively employed in matters directly related to the king's safety.

VISUAL SOURCES

Monumental Art

Despite the emphasis ancient and modern historians place on the Achaemenid use of the bow, there is ample evidence that the spear was an equally important weapon in Persian warfare and hunting. In the Persian heartland, reliefs which decorated the palace centres at Susa and Persepolis frequently depict spearbearers. The glazed brick reliefs at Susa depict soldiers armed with both bow and spear, whom scholars have variously identified as

[90] Hdt. 9.112, *Ἄμεστρις μεταπεμψαμένη τοὺς δορυφόρους τοῦ Ξέρξεω διαλυμαίνεται τὴν γυναῖκα τοῦ Μασίστεω*.
[91] *FGrH* 688 F16 66-67.
[92] See, for example, Herodotus' story of the satrap Oroetes' death. In this instance, the satrap's own bodyguards showed that their ultimate loyalty was to the king. See also Brosius 1996: 116, who concludes that Parysatis would not have had the authority to pass a death sentence on Persian nobility.

Immortals, royal guards, and common soldiers.[93] These guards are dressed in colourful Persian robes, wear a quiver on their back, a bow over their shoulder, and hold a long spear with both hands. Although Herodotus describes the Persian spears as "short," Hyland estimates the spears depicted in the Susa reliefs to be nearly equal in length to the hoplite spear.[94] These spears have a leaf-shaped blade with a distinct mid-rib, a long socket, and a spherical butt, perhaps corresponding to Herodotus' description of Persian spear-butts in the shape of fruit.[95]

Persian troops with bow and spear, similar to those depicted at Susa except for their fluted caps, line the stairways of the Apadana.[96] Similar troops are commonly depicted throughout Persepolis. They are found, for example, in the so-called Council Hall, the Throne Hall, and the Treasury.[97] The spearbearers depicted in the Treasury relief are shown in groups of two, and are positioned both behind the king and behind the figure with whom the king is conversing. Their weaponry and proximity to the king suggest that these figures may be the royal bodyguard known as the *aikhmophoroi* or *doryphoroi* in the Greek sources.

At Persepolis and Susa, the spear appears in many of the same contexts as the bow, and is a commonly depicted weapon in the extant reliefs from these sites. The relief and inscriptions at Bisitun commemorate Darius' defeat of the 'liar kings' that led to his accession as Achaemenid monarch. The focal point of the relief is Darius, who steps on the false Gaumata. The other rebels stand behind Gaumata, and are bound. Two Persian soldiers stand behind Darius, one of whom is armed with a bow, the other with a spear. Darius

[93] Caubet and Daucé 2013: 314.
[94] Hdt. 7.61; Hyland 2011: 273.
[95] Hdt. 7.41.
[96] Schmidt 1953: Plates 23 50 51 55 56 59.
[97] Schmidt 1953: Plate 63 (Council Hall), Plates 94-95, 100 (Throne Hall), Plate 121 (Treasury).

himself holds only a bow. As the king's only weapon, the bow is clearly more important than the spear in this instance. Nevertheless, the inclusion of the spear on the Bisitun relief, the reliefs of Persepolis and Susa, and inscriptions at Naqsh-i Rustam suggest that the spear was an important royal symbol for the Achaemenid kings.

Non-Monumental Art

Achaemenid non-monumental art also frequently depicts spears. In an unpublished study of combat scenes on Achaemenid glyptic art, Christopher Tuplin found that Persian infantry with spears are slightly more common than infantry archers in this medium. In scenes of infantry combat, only nine Persians wield a bow, while 27 Persians carry a spear.[98] In cavalry scenes, the spear is even more prominent, and seals only rarely depict mounted archers.[99] Some Neo-Elamite seals, which were still in use during the Achaemenid period, depict mounted spearmen. The most famous of these is perhaps PFS 93*, which features the inscription "Cyrus the Anshanite, son of Teispes." On this seal, a mounted spearman rides towards a fleeing human, who holds in his right hand a broken bow and quiver.[100] According to Garrison, this seal is stylistically related to another Neo-Elamite seal used at Persepolis, PFS 51. This seal also features a mounted spearman, who hunts fleeing animals.[101] A seal used by Arshama, satrap of Egypt in the fourth century B.C., but carved perhaps in the early fifth century B.C., also depicts a spearman overcoming archers.[102] While warfare is not a

[98] Tuplin unpublished: 62-91. When the soldiers carried more than one type of weapon, I counted each weapon separately.
[99] Tuplin unpublished: 37.
[100] Garrison 2011: Fig. 1.
[101] Garrison 2011: 383; Fig. 14.
[102] Ma et al. 2013: 18. Garrison and Kaptan will provide a more detailed study of this seal in a forthcoming volume, *Arshama and Egypt: The Bodleian Letters in Context*.

very popular theme in Achaemenid-era glyptic art, and a very low percentage of Achaemenid seals bear martial imagery, the fact that the majority of those who did use seals with combat scenes chose to depict Persians armed with spears further supports the supposition that the spear was an important weapon of Persian cavalry and infantry.

Several artefacts from Central Asia also attest to the Achaemenid cavalry's use of spears. A gold scabbard cover of an *akinakes*, part of the Oxus Treasure, depicts cavalry armed with long spears engaged in a lion hunt.[103] In two nearly identical scenes, a lion is flanked by two mounted spearmen. The spearmen hold their spear with one hand, and thrust down and at an angle to stab the lion. The way in which these hunters use their spears is identical to the technique used by mounted spearmen on Achaemenid glyptic art. On another gold *akinakes* sheath found in a Scythian burial at Chertomlyk, a Persian cavalryman is shown armed with a long spear.[104] Nefedkin estimates the length of this spear as 3.5 m., and suggests that this unusually long weapon may have been instituted as a response to the Macedonian invasion under Alexander the Great.[105]

Greek Depictions of Persian Spearmen

Greek art occasionally depicts Persian warriors and hunters with spears. Attic vases are decorated with combat scenes between Greeks and Persians, Persian hunts, and even court scenes that include armed attendants. Persians are not always easily discernible in the medium, as they share many attributes with Scythians and the mythological Amazons. Miller

[103] Moorey 1985: Fig. 4.
[104] Nefedkin 2006: Fig. 11.
[105] Nefedkin 2006: 15.

lists four features that can be used to identify Persians: a patterned, full body covering; a bushy or straggly beard; soft shoes, often tied on the top of the arch; and the *kidaris* head cover.[106] These attributes do not provide absolute proof of the ethnic identity of those depicted, but they provide useful guidelines with which to identify Persians on Greek pottery. We will begin with an examination of scenes that depict combat between Greeks and Persian spearmen.

In the first half of the fifth century B.C., Attic painters began to decorate pottery with scenes of combat between Greeks and Persians. These painters likely drew their inspiration from the Greco-Persian wars of 490 and 480-79 B.C. The Oxford Brygos Cup is an early depiction of this conflict.[107] The inclusion of the *gerrhon* shield may indicate that this scene is meant to portray the battle of Plataea, one of the few battles in which the Persians are said to have used these shields.[108] In the best-preserved scene on the cup, a Persian and Greek duel with a *gerrhon* between them. The Persian's legs face away from the Greek, but his torso is turned back. The Persian holds a spear with an overhand grip, and is thrusting it at his opponent.

At the end of the fifth century, an Attic oinochoe features a combat scene between Greeks and Persians.[109] Muth dates this piece to 410-400 B.C.[110] In one scene, a Greek hoplite battles a Persian. The Greek is nude except for a Corinthian helmet, which sits on top of his head. He carries a large, round shield in his left hand. His right hand holds a spear with an under-hand grip, which he is thrusting at the Persian. The Persian is armed with a

[106] Miller 2004: 168.
[107] Herford 1914. This is vase 204329 in the Beazley Archive.
[108] Barrett and Vickers 1978: 21.
[109] Beazley Vase 725.
[110] Muth 2008: 259.

crescent-shaped shield, and holds a spear, which he thrusts at the Greek, in an under-hand grip.[111] The Persian shield is similar to the Greek *peltē,* and may have been adopted by Persian skirmishers later in the fifth century. It is not mentioned in Herodotus' description of Persian weapons, nor is it depicted in Achaemenid monumental art.

A fragmentary Attic red-figure pelike that was recently excavated in Pella depicts a struggle between Persians and Greeks.[112] Akamatis dates the item to ca. 380-70 B.C., but believes the inspiration may have been the Greco-Persian wars that occurred a century earlier.[113] In the scene, a Persian cavalryman fights with Greek youths in *piloi*. The Persian holds a spear near the butt-spike, and extends the spear downwards at an angle. This pose is similar to that found in other depictions of mounted Persian spearmen, such as the Çan sarcophagus and various Achaemenid seals.

Hunt scenes on Greek ceramics occasionally feature Persians armed with spears. One example is found on a white-figure lekythos, dated ca. 380 B.C., now in the State Hermitage Museum in St. Petersburg, and sometimes referred to as the Xenophantos lekythos after the painter.[114] The lekythos depicts three men engaged in a boar hunt. The ethnicity of the figures is not apparent from their dress, but the names Cyrus, Darius, and Abrocomas written beside each figure indicate that they are meant to be Persians. Darius and Abrocomas are hunting a boar and an unidentifiable animal with spears. Darius is on horseback, and holds his spear with an overhand grip in his right hand. The spear extends downward at an angle, and although the spear stops where it crosses behind his head and does not continue, the way

[111] See Muth 2008: Fig. 170.
[112] Beazley Vase 9027504.
[113] Akamatis 2012: 150. See figs. 1-3 for pictures of the pelike.
[114] Franks 2009: Figs. 1 and 2.

in which he holds the spear is reminiscent of the technique depicted on seals of cavalry spearmen. Abrocomas rides on a two-wheeled platform drawn by two horses. He is prepared to spear a boar using an underhand thrust. Unlike that of Darius, his spear is clearly shown, and has a socketed leaf-shaped head and butt-spike.

Two Attic vases show Persians armed with a sickle-spear, called in Greek a *dorydrepanon*.[115] These spears are taller than a man, and have a large, socketed head. Unlike other spears, these weapons have a curved, sickle-like blade that extends from the socket and curves towards the butt. These spears are not described as a Persian weapon in Greek historical sources, nor are they depicted in Persian art. The closest parallel to this weapon is Near Eastern sickle-sword, which first appeared on Near Eastern seals in the third millennium B.C., and continued into the Achaemenid era. Given the very limited evidence for this weapon, which is confined to two examples in one artistic medium, it does not seem likely that the Achaemenid Persians ever used this weapon, but rather that Greek artists viewed them as iconic of the East.[116]

Shielded Spear-bearers

Our evidence suggests that at least some Persian soldiers were armed with shields. The rectangular shields, called in Greek *gerrha,* are perhaps the best known Persian shield type.[117] Monumental Persian art from Persepolis occasionally depicts Persian soldiers armed with two types of round shield. These soldiers armed with round shields always carry spears.

[115] Beazley Vase Nos. 434 and 215238.
[116] Miller 2004: 171.
[117] The Achaemenid use of *gerrha* shields is a complex topic, and so is the focus of Chapter 4.

Greek art most often depicts Persians with a small, crescent-shaped shield which Charles suggests is similar to the Thracian *peltē*.[118]

Achaemenid art very rarely depicts Persian soldiers armed with shields. In Achaemenid glyptic art, Greek opponents frequently carry shields, and so glyptic artists were certainly capable of carving shields. It was, therefore, a deliberate choice not to depict Persians with shields in this medium.[119] It may be that, iconographically, the shield represented Greek soldiers, and so was considered unsuitable for depictions of Persians. Likewise, Achaemenid coins all depict a royal figure armed with a bow, spear, or dagger, but he never carries a shield. These absences suggest that the Achaemenid Persians did not consider the shield to be symbolic of being Persian.[120] This is not to say that Persian soldiers did not use shields, as there is evidence that they did, but rather that they viewed the shield as more symbolic of other cultures, in particular that of the Greeks, than their own.

On the Apadana at Persepolis, the central scene on the staircase depicts two groups of four warriors that face each other.[121] These figures are clad alternately in Persian and Median dress. In the group facing left, the two Persian spearmen also carry round, bossed shields with a small round shape cut out from either side. These are similar in shape to dipylon shields, or Boeotian shields, due to their appearance on Boeotian coins.[122] The dress of these figures, however, securely identifies them as Persian, and not foreign mercenaries. Elsewhere at Persepolis, groups of soldiers in Persian dress carry these shields. On the eastern stairway

[118] Charles 2012a: 257.
[119] Tuplin unpublished.
[120] Unlike bows and spears, shields are never mentioned in Achaemenid royal inscriptions.
[121] Schmidt 1953: Plate 22.
[122] Snodgrass 1999: 55

of the Apadana, two groups of six Persians carrying shields and spears face each other.[123] As the shields are always carried in the left hand, the group which faces right shows the inside of their shields. The soldier grips the shield near its outer rim. The middle of the shield is blocked by his body, but the position of the visible grip suggests that these shields had two grips. A single grip near the shield's rim would make the shield awkward to hold, and ineffective against most blows. It is likely that these shields had a loop near the centre, which went around the forearm near the elbow, and a second loop near the rim, which the soldier grabbed with his hand. Schmidt suggests that these shields were probably made of leather, and featured a metal boss and rim.[124] Barkworth believes that these troops may be the *aikhmophoroi* mentioned by Herodotus, while Head describes them as "Guardsmen in Persian dress."[125] Unfortunately, we lack sufficient detail about Persian troop-types to correlate these depictions with troops mentioned in our written sources.[126]

Two other types of rounded shield are also shown in the Persepolis reliefs. On the Apadana, the delegation which Schmidt identifies as the Skudrians carry a round shield. This shield does not have the rounded cut-outs of the shields described above.[127] Although the inside of the shield is visible, it does not show the method used to grip the shield. The artist has marked inside of the shield with vertical incisions, which suggests that it was not constructed from a single piece of wood. The long, narrow strips suggest that this shield was constructed like a *gerrha*, but was round rather than rectangular. Another delegation,

---

[123] Schmidt 1953: Plate 25a.
[124] Schmidt 1953: n. 95.
[125] Barkworth 1993: 154; Head 1992: Plate 1.
[126] These shields have some importance in modern Iranian history, as they were carried by the "Immortals" during Mohammad Reza Shah's celebration of Iranian monarchy in 1971, and are depicted on the insignia of the 55th Airborne Brigade and the 65th Airborne Special Forces Brigade in the modern Iranian armed forces.
[127] Schmidt 1953: Plate 45b.

possibly the Drangianians, also carry a round shield, although in this instance, the face of the shield is visible.[128] This shield appears to have a rim, possibly made of metal. It is possible, given their similar size and shape, that these two reliefs depict the same type of shield, but viewed from a different angle.

In Greek art of the later fifth and fourth centuries B.C., Persians are occasionally armed with crescent-shaped shields.[129] These shields have a similar shape to the Thracian *peltae,* from which the Greek name *peltast* derives.[130] This shield shape is not depicted in art from the Persian heartland. These shields are approximately the height of the soldier's torso, and their width is greater than their height. Their bottom and sides are round, and they have a crescent-shaped cutout at the top. Several figures on the Alexander sarcophagus use these shields, and while their weapons are often not extant, the posture of some suggests that they were spearmen. This relief also shows the back of these shields, and it seems as though they used a double-grip similar to that found on the Persepolis reliefs, described above. On an amphora from the early fifth century B.C., now in Berlin, a Persian soldier carries a crescent shield and a *sagaris*-axe.[131] The front of the shield is incised with a cross-hatch pattern, and seems to have a rim. Depictions of these shields are not common, but they suggest that these shields were used by a variety of infantrymen, and are not consistently associated with specific types of infantry troops.

[128] Schmidt 1953: Plate 47b.
[129] E.g., Berlin Amphora 2331; the Alexander Sarcophagus; Head 1993: figs. 27, 29.
[130] For *peltasts*, see Best 1969; Hunt 2007: 119ff.
[131] See Bovon 1963: fig. 10.

ARCHAEOLOGICAL SOURCES

Archaeologically, spears are less commonly attested than arrows. Textual sources indicate that soldiers were often issued 40 or more arrows, but only had two spears. It would therefore require far more arrows to equip an army than it would to arm the same number of people with spears. Arrowheads are also more likely to remain where they land, whereas spears would be easier to recover and re-use, or were not thrown at all. Furthermore, it can be difficult to distinguish between small spearheads and arrowheads. Moorey suggests that any head weighing over 10 grams is not likely to be an arrowhead.[132] By way of comparison, many modern arrowheads weigh 150 grains, or approximately 10 grams, although it is possible to shoot heavier arrows.

Moorey also argues that spear- and arrowheads in the Achaemenid period were often made of different materials. In the mid-first millennium B.C., iron working was practiced throughout the Mediterranean and Near East. According to Moorey, arrowheads continued to be made from bronze during this period because it was necessary to produce large numbers in order to supply an army.[133] Iron at this time, says Moorey, had to be hand forged, and so could not be mass produced. Bronze, however, could be cast, and extant molds indicate that several arrowheads could be cast at once. On the other hand, the Assyrian sources suggest that Near Eastern empires could supply large armies with iron arrowheads in the first millennium B.C.[134] Herodotus also writes that the Indians had iron-tipped arrows.[135] In fact, Herodotus may have imagined that iron was the most common material used for arrowheads,

[132] Moorey 1980: 60.
[133] Blyth 1977; Moorey 1980.
[134] Dezső 2016: 45 n. 216.
[135] Hdt. 7.65

as he finds it worth mentioning that the Ethiopians used "stone tips instead of iron."[136] Schmidt has also identified several iron arrowheads from his excavation at Persepolis, although they were not as common as those made of bronze.[137] Moorey must have known about the iron points from Persepolis, but does not mention them in this context. The iron points which Schmidt identified seem too small to be javelin heads, and so must be arrowheads. It is, therefore, not possible to distinguish between arrow- and spearheads based solely on material.

Few spearheads have been excavated from Achaemenid contexts. Schmidt describes one iron spearhead from Persepolis.[138] The spearhead is socketed, has two blades, and although it is corroded, the mid-rib is still visible. It is a similar shape to those depicted on reliefs at Persepolis and Susa. Schmidt also found two iron trilobate javelin heads at Persepolis. Their shape resembles the trilobate arrowheads, also from Persepolis, although the javelin heads are significantly larger.[139]

T.E. Lawrence and C.L. Woolley recovered a number of objects from Deve Hüyük in eastern Turkey in the early twentieth century, including spearheads. The majority of these objects are dated to the fifth century B.C., when the region was under the control of the Achaemenid Empire.[140] Among these finds are 16 iron spearheads, heavy enough to be classified as thrusting spearheads, although Moorey does not give exact weights, and 11 javelin heads.[141] Where the weight of the latter are noted, they are ca. 15 grams, although

[136] Hdt. 7.69, *ἀντὶ δὲ σιδήρου ἐπῆν λίθος ὀξὺς πεποιημένον*.
[137] Schmidt 1957: 99.
[138] Schmidt 1957: Plate 76.1.
[139] Schmidt 1957: Plate 76.2-3 (javelin heads); 7-8 (arrowheads).
[140] Moorey 1980: i-ii.
[141] Moorey 1980: 60-61.

oxidization increases the weight of iron so they were originally lighter. These artefacts are similar to the spear and javelin heads from Persepolis, described above.[142]

The Tli Cemetery in Georgia also contained similar spearheads to those from Deve Hüyük, and these burials are associated with the Persians due to the presence of *akinakai*.[143] Moorey notes that the iron spearheads copy the early Iranian bronze spearheads, although the iron heads are often smaller and have a shorter socket.[144] Some bronze orbs found in conjunction with spearheads may have been the spear butts mentioned by Herodotus, although none bears a resemblance to specific fruit beyond its spherical shape.[145] It is possible that only elite soldiers had fruit-shaped butts, as the Greek sources suggest, and that lower ranking troops had unadorned, spherical butts.

Numerous spearheads have been excavated from sites that are not directly related to the Achaemenids. Many of these artefacts date to the early first millennium B.C., although many of these examples are similar in shape to spearheads of the Achaemenid era. Due to their similarity, and the geographical and chronological proximity of the Assyrians to the Achaemenids, these artefacts can contribute to our understanding of Achaemenid military history. The Neo-Assyrian cities of Nimrud and Nineveh have both produced numerous spearheads, especially the area of Nimrud known as Fort Shalmaneser.[146] Much like the Achaemenid artefacts, the Assyrian spearheads are all iron and socketed. Stronach has classified the Assyrian spearheads into three types, based on the shape of the blade. The first type is the thin, lanceolate blade; the second is the leaf-shaped blade, familiar from the

[142] Schmidt 1957: Plate 76.1-3.
[143] Tekhov 1972: Plate 1.
[144] Moorey 1980: 62.
[145] Moorey 1980: 64; Hdt. 7.62.
[146] Barron 2010: 80.

Achaemenid evidence; and the third is the triangular blade.[147] There are few excavated Elamite spearheads from the early first millennium, but these do not seem to be related to those of the Achaemenids. The examples from the Louvre are all bronze and tanged, and so do not correspond to the Assyrian and Achaemenid iron and socketed spearheads.[148] The Achaemenids, therefore, appear to be using a type of spearhead that was borrowed from or influenced by Assyrian types.

After the fall of the Achaemenid Empire, spears continued to be a popular weapon in the Near East. At the site of Dura Europos, for example, archaeologists have excavated weapons that include javelin and heavy spearheads.[149] Visual evidence from the Parthian and Sasanian periods, however, suggests that later Persian infantry and cavalry used much heavier spears than the Achaemenids. As there is no evidence that the Achaemenid armies ever used such heavy spears, this later evidence does not help us understand Achaemenid warfare.

MATERIAL COMPOSITION

Composite bows, as the name suggests, were constructed using a variety of materials. Spears, by comparison, use only metal for the head and butt, and wood for the shaft. Some spearheads were evidently riveted to the shaft, but no rivets have been found *in situ,* and so we cannot comment on their composition. By the time of the Achaemenid Empire, iron was the most common metal used in the manufacture of spearheads.

[147] Stronach 1958: 170.
[148] AO 22981=AO 13899; AO 13897; AO 18723.
[149] See, e.g., James 2004.

Numerous excavated artefacts attest to the use of iron in the manufacture of spearheads during the first millennium B.C., and this evidence is supplemented by occasional textual references. One text, for example, details a weapon smith active during the reign of Nebuchadnezzar, who was supplied iron with which to make spearheads.[150] The Gadalyama contract, discussed earlier, also describes a cavalry soldier armed with two iron spears.[151] These two cavalry spears likely correspond to the weapons Xenophon calls *palta*, the preferred spears of Achaemenid cavalry soldiers.

As spearshafts were wooden, few have survived from the ancient Near East. A few excavated spearheads contained a small piece of wood from the broken shaft in the socket, but they have not been analyzed. Literary sources do not frequently describe Persian spears, but Xenophon mentions that Persian cavalry under Pharnabazus used *palta* made of cornel wood.[152] This passage is somewhat strange, as it is one of the few descriptions in Greek literature in which Persian military equipment is superior to that of the Greeks. Numerous species in the family *Cornaceae* are referred to as cornel, including *Cornus sericea*, the common dogwood that was likely used in *gerrhon* shields, but Xenophon here is most likely referring to the cornelian cherry, *C. mas*. The cornelian cherry grows in northern Greece, Macedonia, Thrace, and into Syria. Cornel wood is dense and strong, but also flexible. Its flexibility makes it particular suitable for spear shafts, as a rigid material is more likely to break upon impact.[153]

[150] Zawadzki and Jursa 2001: 348.
[151] Kuhrt 2007: 14.38; Manning 2016.
[152] Xen. *Hell.* 3.4.14, *οἱ δὲ Πέρσαι κρανέϊνα παλτὰ ἔχοντες*.
[153] Markle 1977: 324, Meiggs 1982: 110.

Finally, many spears also had a butt attached to the shaft opposite the head. According to Herodotus, these butts were occasionally gold or silver, and the use of different metals possibly represented different rank. Furthermore, Herodotus also describes Persian spear butts in the shape of various fruits, possibly also a means of differentiating various types of troops. For example, Herodotus mentions gold and silver pomegranate, and gold apple-shaped spear butts.[154] Examples of round bronze artefacts have been plausibly identified as spear butts, but these examples lack the detail to be identified as specific types of fruit.

USE/TECHNIQUE

Finally, we must discuss the ways in which the Persians used their spears. Literary and glyptic evidence suggests that the Persians often threw their spears as javelins, particularly from horseback. Herodotus says that the Persian cavalry frequently threw their spears, as he writes of the battle of Plataea, that the Persians "harmed the whole Greek army, throwing javelins and shooting arrows."[155] Earlier, Herodotus describes a Persian cavalry attack against a band of Phocians with the somewhat vague phrase, "they prepared to discharge their missiles."[156] The verb Herodotus uses here, *diateino,* literally means to stretch, and can be used to describe drawing a bow, but in this instance we would expect the bow to be the direct object, not the missile. This is the interpretation offered by Macan, who inserts the term "bows" after the verb.[157] How and Wells probably correctly understand this

[154] Hdt. 7.41.
[155] Hdt. 9.49, *ἐσίνοντο πάσαν τὴν στρατιὴν τὴν Ἑλλνικὴν ἐσακοντίζοντές τε καὶ τοξεύοντες*.
[156] Hdt. 9.18, *διετείνοντο τὰ βέλεα ὡς ἀπήσοντες*.
[157] Macan, ad loc., writes, "*καὶ ἤδη δ. τὰ τόξα ὡς ἀπήσοντες τὰ βέλεα* would be more correct."

to mean "stretch forth their javelins," while the LSJ translates the phrase as "to have their lances poised as if they were about to throw."[158]

Xenophon frequently references the use of javelins in the Persian army. In particular, he uses the verb *akontizo* to describe Persian military activities. The primary meaning of this verb is "to hurl a javelin," and is related to a Greek noun for the javelin, *akon.*[159] In his *Cyropaedia*, Xenophon describes the training of young Persians, and says that the youths, until the age of sixteen or seventeen, learn archery and to throw the javelin.[160] Xenophon again links the importance of archery and javelin among the Persians in his encomium of Cyrus the Younger, as he writes that Cyrus was "the most eager to learn and most diligent to practice archery and javelin."[161] Furthermore, Xenophon clearly preferred the Persian javelin known as the *palton* to a traditional Greek spear, the *dory*, for mounted hunters and warriors. His work, *On Horsemanship*, concludes with an overview of cavalry weapons. Xenophon writes that it is better to carry two *palta* than one *dory*, as the *palta* are stronger, easier to manage, and one can be used from a greater range while the other is kept for close-quarter combat.[162] Xenophon describes the same technique of throwing one javelin and holding the other in his description of Persian hunts.[163]

---

[158] How and Wells, ad loc. LSJ s.v. *διατείνω* B.II.2, with reference to Hdt. 9.18; Nefedkin 2006: 9.
[159] LSJ s.v. *ἀκοντίζω*. The related noun, *ἄκων*, does not seem to have been used in descriptions of Persian weapons.
[160] Xen. *Cyr*. 1.2.8, *μανθάνουσι καὶ τοξεύειν καὶ ἀκοντίζειν*.
[161] Xen. *Anab*. 1.9.5, *ἔκρινον δ'αὐτὸν καὶ τῶν εἰς τὸν πόλεμον ἔργων, τοξικῆς τε καὶ ἀκοντίσεως, φιλομαθέστατον εἶναι καὶ μελετηρότατον*.
[162] Xen. *Eq*. 12.12, *ἀντὶ γε μὴν δόρατος καμακίνου, ἐπειδὴ καὶ ἀσθενὲς καὶ δύσφορόν ἐστι, τὰ κρανέϊνα δύο παλτὰ μᾶλλον ἐπαινοῦμεν. καὶ γὰρ ἐξαφεῖναι τὸ ἕτερον δυνατὸν τῷ λειπομένῳ οἷόν τε χρῆσθαι καὶ εἰς τὸ ἀντίον καὶ εἰς τὰ πλάγια καὶ εἰς τοὔπισθεν: καὶ ἅμα ἰσχυρότερά τε τοῦ δόρατος καὶ εὐφορώτερά ἐστιν*.
[163] Xen. *Cyr*. 1.2.9, *ἔχειν δὲ δεῖ τοὺς ἐξιόντας τόξα καὶ παρὰ τὴν φαρέτραν ἐν κολεῷ κοπίδα ἢ σάγαριν, ἔτι δὲ γέρρον καὶ παλτὰ δύο, ὥστε τὸ μὲν ἀφεῖναι, τῷ δ', ἂν δέῃ, ἐκ χειρὸς χρῆσθαι*.

Arrian offers a similar description of the Persians' use of javelins at the battle of the Granicus River. At the beginning of the battle, the Persians are said to have thrown their *palta* as the Macedonians attempted to cross the river.[164] Once the two sides had closed, the Macedonians gained the advantage, as they were fighting with cornel spears against *palta.*[165] This description seems to mirror those of Xenophon, and further suggests that Persians armed with two *palta* would throw one, then use the other in close combat, although it should be noted that, in this instance, the *palta* could not hold up against the Macedonian *dorata.*

Visual sources provide very little evidence for thrown spears in the ancient Near East, but given the prominence of javelins in Greek descriptions of Persian warfare, this absence is likely due to the difficulty of depicting thrown items. In Assyrian reliefs from the reign of Tiglath-Pileser III, for example, soldiers never throw their spears.[166] Despite the prominence of spears in Achaemenid glyptic art, Tuplin notes only one example of a thrown spear in this medium.[167]

The most common method of wielding a spear in ancient art was the overhand grip, i.e. a grip in which the spear-bearer's thumb is towards the spear's butt, and the spear itself is usually poised over the shoulder. Achaemenid soldiers use this grip on the Oxford Brygos cup, one of the rare occurrences of a Persian armed with a spear in Greek art, on the gold *akinakes* scabbard from the so-called Oxus Treasure, and the majority of Achaemenid

[164] Arr. *An.* 1.15.1-2, *ἐς τὸν ποταμὸν ἐσακοντίζοντες*; *παλτῶν ἀπὸ μὲν τῶν Περσῶν πολλὴ ἄφεσις*.
[165] Arr. *An.* 1.15.5, *ἐπλεονέκτουν ἤδη οἱ σὺν Ἀλεξάνδρῳ τῇ τε ἄλλῃ ῥώμῃ καὶ ἐμπειρίᾳ καὶ ὅτι ξυστοῖς κρανείνοις* (described as *δόρατα* in the following line) *πρὸς παλτὰ ἐμάχοντο*.
[166] Dubovský 2004/5: 62.
[167] Seal 53, which may also be the only seal that depicts a mounted soldier armed with more than one spear. Tuplin unpublished: 20.

seals.[168] Achaemenid mounted spearmen frequently use the overhand grip, for example on both scenes from the Çan sarcophagus.[169] Although the spear is not about to be used, the lead spearmen on the parade scene from the Tatarli tomb painting also marches with his spear held in an overhand grip.[170] Assyrian reliefs also most frequently depict spearmen using the overhand grip.[171]

The underarm grip, i.e. the grip in which the spearmen holds the shaft with his thumb facing the blade, is far less common in art. In glyptic art, this grip is only used by those who hunt on foot.[172] On Assyrian reliefs, this grip is occasionally used by soldiers who are ascending a siege ladder in the reigns of Sennacherib and Assurbanipal.[173] In one relief, dating to the reign of Assurbanipal, an Assyrian holds a spear with an underarm grip in one hand, and a leashed dog in the other.[174] The figure is part of a larger hunt scene, and so the use of the underarm grip in this context is similar to depictions of the underarm grip in Achaemenid glyptic art.

CONCLUSION

As we have seen, Achaemenid Persians frequently used spears in combat and while hunting, and evidence suggests that this was the preferred weapon among the cavalry. It is likely that Greek authors, beginning with Aeschylus, deliberately chose to emphasize the

[168] Barrett and Vickers 1978 (Brygos Cup); Moorey 1985 (Oxus scabbard); Tuplin unpublished (glyptic).
[169] Ma 2008: Figs. 1 and 2. Figs. 3-5 feature similar spearbearers from tomb reliefs and glyptic art.
[170] Summerer 2011: Fig. 8.
[171] Dubovský 2004-2005: 62.
[172] Tuplin unpublished.
[173] Dubovský 2004-2005: 62. ME 124906 (Sennacherib); ME 124928 (Assurbanipal).
[174] ME 120863.

Persian use of the bow in order to contrast their armies with those of the Greeks. This bias has in turn been adopted in both scholarly and popular treatments of Achaemenid warfare. Nevertheless, numerous Greek sources provide valuable information regarding the Achaemenid spear. Xenophon is particularly lucid in his descriptions of Achaemenid spears, and writes that cavalry often carried two spears, so that they could throw one and keep the other to use as a thrusting spear. These sources only rarely, and often indirectly, describe Persians using their spear to thrust. In contrast, visual depictions from a variety of civilizations frequently show Persians thrusting their spears, and very rarely show them throwing javelins. It is likely that Persian soldiers would both throw and thrust their spears. Persian cavalry troops in particular are often associated with spears in both literary and artistic sources.

Spears are quite common in the archaeological record, and have been found in great numbers at sites both directly and indirectly related to the Achaemenids. Excavated spearheads allow us to comment upon the material composition of ancient spearheads, which information would not be available to us from other sources. By the time of the Achaemenid Empire, nearly all spearheads were made of iron, although a few examples in bronze have been found. The latter are most likely religious offerings, and this aspect of spears is discussed extensively in another chapter. Very little information is available regarding the materials used for spear shafts, but Xenophon does state that the Persians used cornel wood javelins. He is probably here referring to the cornelian cherry, which was also a popular wood used in ancient Greek spearshafts, and continues to be a prized material for tool handles. Despite what many modern scholars and ancient authors believe, Persian spears

were not much smaller or weaker than those of the Greeks, and generally it does not seem as though the Persian defeat at the hands of the Greeks was due to their inferior technology.

CHAPTER 3

RECRUITMENT AND SUPPLY IN THE ACHAEMENID ARMY

The following section examines the logistics of the Achaemenid army, with special emphasis on the archers and spearmen who would have comprised the majority of the infantry. We will begin with a study of the recruitment and training systems of the empire. The sources suggest that a small percentage of the empire's armed forces were full-time, professional soldiers. These troops served in units such as the Immortals and the king's bodyguard. Satraps also controlled local defense forces, some of them professional soldiers or at least soldier-settlers. Many of these professional soldiers were likely trained at the royal or satrapal courts.

The professional soldiers were bolstered by conscripts during campaigns, and these conscripts may also have been required to serve seasonally, for example in garrisons. The king gave many of these conscripts land in exchange for service obligations. The details of this system are best understood in southern Mesopotamia, due to the preservation of written evidence excavated from the area. The evidence for recruitment from places such as Egypt and western Asia Minor, although not as abundant as that from Mesopotamia, suggests that practices were broadly similar throughout the empire. These conscripts do not seem to have received any formal military training.

The second section of this chapter deals with the supply of troops. This includes food and other supplies given to soldiers during campaign, but also how weapons were manufactured and distributed to the soldiers. The case of archery is unique in this question, as an archer on campaign would require frequent re-supply of arrows, a type of supply that many other troops did not need. This section ends with a discussion of bowyers, arrow-

makers, and other manufacturers of weapons as craftsmen, the social organization of these professionals, and how they practiced their craft in the Achaemenid Empire.

MILITARY RECRUITMENT IN MESOPOTAMIA

We begin with an overview of military fiefs as a method of recruitment in Mesopotamia. This system has a long history in Mesopotamia from the second millennium B.C. onward. A document from Sippar, BM 96964, details the distribution of land to soldiers in the region of Sippar-Amnānum, which has allowed for a reconstruction of the recruitment system used in the mid second millennium B.C. As the state acquired new land through military conquest, it turned this land over to soldiers. These land grants paid the wages of the soldiers, and also ensured that new land became productive. The soldiers did not own the fields, but they could leave them to an adult son if the heir was willing to fulfill the required duties.[1] If the land-holder died without an heir, the land would return to the state, who could then give it to another in exchange for service. De Graef suggests that these were full-time professional soldiers, rather than conscript troops.[2] In some cases, if a soldier was relocated, the land returned to the state. Presumably, the soldier was then given a new plot of land near his new post. These occurrences support the hypothesis that these were full-time soldiers, since we would expect troops who were conscripted seasonally or for a campaign to return home when their service was finished.

We are much better informed of the military situation in the Assyrian Empire, which has been the subject of numerous recent studies. In particular, J.N. Postgate and Tamás

[1] De Graef 2002: 143.
[2] De Graef 2002: 148.

Dezső have illuminated Assyrian recruitment practices in the early first millennium B.C. Dezső identifies three tiers of soldier in the Neo-Assyrian army, which he terms professional, semi-professional, and non-professional.[3] In order to reduce costs, only the professional soldiers were employed year-round, while the other two groups were called up as needed. The élite served as chariotry or cavalry; these units were composed entirely of Assyrians.[4] Professional infantry units consisted of Assyrians and people from two Aramaean tribes, the Ituaeans and the Qurraeans.[5] Much like in the Old Babylonian period, these soldiers received land in exchange for their service, although in the Neo-Assyrian period land-owners could make a payment in lieu of performing their service.[6] The state provided all soldiers with rations during their time of service.

The method in which the Assyrians conscripted other types of troops is less clear. Royal inscriptions indicate that Assyrian kings frequently enlisted the soldiers from territories they conquered.[7] It is not clear if these soldiers were paid for their service, and so were in effect mercenaries, or if military service was a form of taxation. The Assyrian Empire also likely hired mercenaries from outside of the empire. These troops had no obligation to serve Assyria, but were professional soldiers who willingly enlisted, and were compensated for their service. In the sixth century B.C. the Greek poet Alcaeus writes that his brother served in a Babylonian army, likely during Nebuchadnezzar's campaign against

[3] Dezső 2016: 10.
[4] Nadali 2005: 224.
[5] Nimrud Letter 89; Postgate 2000 : 101, 103.
[6] Postgate 1982 : 305.
[7] Postgate 1979: 210; Dezső 2012: 23.

Ashkelon.[8] While this evidence is later than the Assyrian Empire, it is likely that the Assyrians also hired mercenaries from outside their empire.

The early Achaemenids seem to have continued the Neo-Babylonian system of recruitment in southern Mesopotamia, and so we will deal with these two empires together.[9] Numerous documents from Achaemenid Babylonia clarify many details regarding the recruitment system used in this area. The basis of this recruitment system was land distribution in exchange for service. This system had a long history in the region by the time of the Achaemenid Empire. This obligation is known as *ilku*-service.[10] The plots of land given to those who owe *ilku*-service are referred to as "bow fiefs," "chariot fiefs," and "horse fiefs," depending on the type of troop the land-holder was expected to supply. The service was not always military, and often it took the form of corvée labour. The names of the fiefs suggest, however, that the system originated in order to field armies.[11]

Jursa emphasizes that this process would help integrate foreigners into Neo-Babylonian, and later Persian, society.[12] From a military perspective, this integration could have been beneficial. Scholars have often observed the logistical problems the Persian commanders might have faced when fielding the multi-ethnic army that Herodotus describes in his *Histories*, and cultural integration may have alleviated some of these problems.[13] On the other hand, we know that foreign troops stationed in a city could cause tensions with the local populations. Babylonian evidence suggests that Carian mercenaries were settled in

[8] Strab. 13.2.3 = Alcaeus Fragment 350; West 2004: 6.
[9] Jursa 2011: 437 emphasizes the continuity in the land-based recruitment system in Mesopotamia from the Neo-Babylonian to the Achaemenid period.
[10] MacGinnis 2012: 27.
[11] MacGinnis 2012: 23.
[12] Jursa 2011: 435.
[13] Briant 1999: 117; Hdt. 7.61.

southern Mesopotamia, and private citizens were expected to support these troops.[14] During the Hellenistic period, we can see the tensions that forced billeting of troops caused. A series of inscriptions, collected as the Ptolemaios Dossier, record letters between a general, Ptolemaios, and the Seleucid king, and detail the tensions between the citizens of Skythopolis and the foreign troops they were required to billet.[15] It is likely that the settlement of Carian mercenaries in Babylonia caused some tensions between foreign troops and locals, similar to that which is recorded from the Hellenistic period.

The presence of foreign soldiers in Babylonia, and other regions of the Achaemenid Empire raises the questions, what type of equipment these troops carried, and where they acquired their weapons and armour. Some troops may have armed themselves in the local fashion, rather than the equipment from their place of origin. A soldier stationed in southern Mesopotamia, for example, may have armed himself in Babylonian fashion, regardless of his ethnicity, due to the availability of this equipment. This change of equipment is most likely to have occurred when the arms of the two cultures were similar, or if the use of the adopted arms did not require extensive training.

Troops with specialist equipment would have been less likely to have adopted local weapons. The Carian mercenaries of Borsippa, for example, were likely armed as hoplites.[16]

---

[14] Waerzeggers 2006: 1, 5. These documents do not explicitly describe these Carians as mercenaries, but Plutarch *Art*. 10.11 describes Carians fighting with the king at the battle of Cunaxa. The billeting of these Carians by the local population is also paralleled in Hellenistic Skythopolis, discussed above, and in this instance it is clear that citizens were billeting mercenaries.

[15] Aperghis 2004: 318ff. provides the texts and translations of these documents.

[16] Herodotus 2.152, for example, describes the arrival of bronze-clad Carians and Ionians to Egypt, which suggests they were armed as hoplites. Likewise, in his description of Xerxes' troops, Herodotus writes that the Carians were "equipped as Greeks" (Hdt. 7.90, *τὰ δὲ ἄλλα κατά περ Ἕλληνες ἐσταλμένοι*), which presumably means they were heavily armoured. Ancient authors frequently write that the Carians were responsible for the invention of various arms and armour. Snodgrass 1964 discredits these traditions, but admits nonetheless that they had adopted hoplite equipment at an early date.

They were therefore hired as heavy infantry, and perhaps paid better than light-armed mercenaries.[17] The Persians would have expected them to remain armed as hoplites. The soldiers themselves probably also preferred to keep the equipment with which they were familiar and well-trained. These soldiers, as well as other specialist troops, would have damaged their equipment during their service, and so must have been able to repair or replace their arms. Local smiths likely would not have been able to replicate the diverse styles of weapon and armour from the empire.[18] They would, however, have been able to repair damaged equipment in many circumstances. Furthermore, hoplite armour would have been expensive enough that many soldiers could not have replaced it, regardless of their location. For these reasons, it is likely that equipment was repaired, rather than replaced, as much as possible.[19]

The Achaemenid army also conscripted infantry from Babylonian temples. Babylonian temples had always been important centres in each Mesopotamian city, and their importance continued into the Achaemenid period.[20] The temples were more than religious centres, they also served important economic, artistic, and military functions. Temples were often granted large amounts of land by the crown, in return for which they owed taxes and service.[21] The temple's arable land was worked by temple dependants, and these dependants

[17] According to Trundle 2004: 52, the Persians mostly sought heavy infantry mercenaries, as they were able to levy archers and skirmishers from populations within the empire. Mercenary costs are difficult to ascertain, as they were dependant on time and place. Furthermore, monetary payment was often supplemented with rations, booty, and access to land. The higher cost of hoplite equipment, however, may indicate that heavy infantry could command better pay.
[18] See Herodotus description of Xerxes' troops, 7.61ff.
[19] Shefton (1969-70: 54) describes a bronze helmet that was broken and repaired in antiquity. See also Lee (2007: 128) and Aldrete et al. (2013: 138-141) for discussion of the need to repair equipment.
[20] Stolper 1994: 250; Waerzeggers 2010 (Ezida Temple at Borsippa); MacGinnis 2010, 2012 (Ebabbara in Sippar).
[21] Jursa 2011: 433.

were also liable for military service and public works projects.[22] As they were economic centres, temples kept extensive records of their transactions. These records are critical to the present study, as they provide details about ancient archery that we would not otherwise know, such as the names of bowyers, the price of equipment, and the demographics of infantry archers. Documents relating to the archers fielded by the temples, particularly the Ebabbara temple in Sippar, also provide evidence for the training and recruitment of archers, the number of archers a temple could field, and how soldiers were provisioned.

The Ebabbara temple regularly fielded fifty archers, and in extreme circumstances could field 200 archers. Shepherds seem to have made excellent archers, as documents describing the provisioning of soldiers often mention shepherds serving in this capacity.[23] These shepherds, and other conscripts, were not professional soldiers. They were probably assigned to garrison duty.[24] It was probably only under exceptional circumstances, such as the large campaigns the Persians mounted against Greece and Egypt, that conscripted, non-professional troops were needed to bolster the core of professional soldiers.

Herdsmen would have had experience using ranged weapons while protecting their flocks, and this is likely why they were frequently enrolled as archers. The temple herdsman Itti-Shamash-bilatu offers an interesting case study. This herdsman worked in Sippar during the reign of Nabonidus through Darius I, i.e. during the transition from Neo-Babylonian to

[22] MacGinnis 2010: 157.
[23] MacGinnis 2012: 5. Dezső 2016: 110 also mentions Chaldaean herdsmen as archers in Assyrian army.
[24] Achaemenid evidence does not indicate how and where conscript troops served. Comparative evidence from Assyria suggests conscript, non-professional troops frequently served in garrisons or other forms of local defense (Postgate 1971: 501).

Achaemenid rule.[25] It is likely that he was occasionally given bows and arrows by the temple. The texts that mention this herdsman indicate that temples could own weapons, and could give these weapons to temple personnel if required for official business.[26] In fact, as will be discussed below, temples were often involved in the manufacture of weapons. It is likely that a herdsman who was issued weapons was expected to use them in his work as temple herdsman, probably in order to protect his flocks from predators, or possibly bandits. The evidence concerning Itti-Shamash-bilatu suggests that herdsmen used bows to protect their livestock, and that their familiarity with this weapon made them desirable as conscripted archers, as reflected in the number of herdsmen conscripted as archers.

There is no evidence for the training of conscript troops in the Achaemenid Empire.[27] This lack of evidence has led some scholars to conclude that these levies did not receive much training.[28] As these non-professional soldiers had other jobs most of the time, they could not have devoted much time to the development of their martial skills. Presumably, during their time of service they would have participated in regular drills, which would have given them a basic level of training. This basic training would have been enough for garrison duty, but likely would not have been enough to make them effective soldiers on a battlefield. It is therefore likely that these conscript troops did not often campaign, but were rather assigned to local defense in garrisons, or policing duties.

[25] Camb. No. 93. Dandamayev 1999: 95-96 provides the text and translation. Itti-Shamash-bilatu's identity as shepherd is confirmed by CT 55 No. 69 and CT 57 No. 337.
[26] Dandamayev 1999: 98.
[27] Greek sources occasionally describe Persian education, including military training, but these passages seem to refer to the upper classes, and so they are discussed in more detail below.
[28] Head 1993: 9; Briant 1999: 115.

Despite the obligation for service that accompanied land grants, evidence indicates that, during the Neo-Babylonian and Achaemenid Empires, it was common for the land-holder to pay for a substitute to fulfill this obligation on his behalf. In the Old Babylonian period, the laws of Hammurabi state that the hiring of a substitute soldier was punishable by death.[29] By the Neo-Babylonian and Achaemenid periods, it seems as though those with service obligations frequently hired a substitute.[30] It was expensive to own and maintain the equipment needed to serve in the military. Furthermore, those who were able to bear this cost were not always willing and able to serve themselves.[31] For this reason, substitutes met the needs of both the king and the landholders. This payment could be in the form of silver given to the crown, which presumably used it to hire a soldier. In other instances, it seems that the one with the obligation found his own substitute. A tablet from Nippur, written in 421 B.C., describes such an arrangement.[32] This plot in Nippur, designated a cavalry field (*bit sisi*), was shared by several people, but a certain Rimut-Ninurta was called up for service. Rather than serve himself, Rimut-Ninurta equipped Gadalyama to serve in his stead. The equipment provided to Gadalyama suggests to Manning that the document's purpose was largely to protect Gadalyama from the financial loss that could result from his military service.[33] According to Jursa, these substitutes could be local Babylonians, who were essentially mercenaries, as they were paid by wealthy land-holders to fulfill their service obligations.[34]

[29] Hammurabi's Laws §26 (Richardson 2000: 51), "If a soldier or a trapper has not gone on a royal expedition after being commanded to do so but has hired a labourer and sent him as his substitute, that soldier or trapper shall be killed. The one who was hired by him shall take over his house."
[30] Jursa 2011: 435; MacGinnis 2010: 497, 2012: 23.
[31] Manning 2016 notes that the older, wealthier members of society were less likely to serve than those who were younger and poorer.
[32] Kuhrt 2007: 14.38.
[33] Manning 2016.
[34] Jursa 2010: 695.

In the Neo-Assyrian period, the state issued daily rations to all soldiers during their time of service.[35] In the Achaemenid Empire, documents from the Jewish garrison at Elephantine in Egypt describe rations given to soldiers from royal storehouses.[36] These soldiers were also paid a monthly wage in silver, so it is not clear if they received these rations in addition to monetary payment, or if they were expected to buy food with their salary. A document from Nippur, discussed above, details the hiring of a substitute soldier. In addition to the military equipment, the land-holder also paid his substitute one mina of silver for provisions.[37] It is not clear if the substitute was expected to use this silver to purchase food for himself, or to supplement the food rations provided by the state. According to Xenophon, the mercenaries who followed Cyrus the Younger to Cunaxa were expected to buy provisions from the markets that followed the army.[38]

A text from Babylon, dated to 513 B.C., describes the provisioning of soldiers, possibly valets who accompany cavalry soldiers.[39] In addition to equipment, these soldiers are given rations of oil, salt, and cress (Akk. *saḫlû*). Stol suggests that *saḫlû* is equivalent to the cardamum (Gr. *κάρδαμον*) Greek authors describe as a staple food item for Persian soldiers.[40] In the case of conscripted temple dependants, it is likely that, as their service fulfills a requirement which the state placed on the temple, that the temple was responsible for their provisioning while they served. This evidence suggests that the state provided basic rations to various types of soldiers, although it is not clear if this was the case for all soldiers. Some soldiers certainly received silver for provisions while they served, but this may have

[35] Dezső 2016: 60.
[36] Porten 1968: 72.
[37] Kuhrt 2007: 14.38.
[38] Xen. *Anab.* 1.2.18, 1.5.6; Lee 2007: 214.
[39] Kuhrt 2007: 14.31.i.
[40] Stol 1983-4: 25; Strab. 15.3.18; Xen. *Cyr.* 1.2.8, 11; Polyaenus *Strat.* 4.3.32

been to supplement their diet or for costs not related to food. It is possible that professional soldiers received rations, whereas soldiers who owed service in exchange for a land allotment were expected to use their land to provision themselves.

Granaries and other storehouses existed throughout the empire, and these would have supplied troops while they were in Persian-held territory. These stores were maintained by the satraps, and their primary purpose was to supply the military, although other travelers may also have been able to purchase provisions at these way stations.[41] Many of these storehouses were located at way stations along the roads, and so were part of a complex communication system that connected the empire. Alexander, for example, found a large supply of grain in the Gedrosian desert, a region otherwise described as inhospitable.[42] Henkelman estimates the amount of grain stored there was in excess of 45,000 litres.[43] Numerous administrative tablets from the Persepolis Fortification Archive also mention granaries in the context of ration distribution.[44]

Temples also seem to have been responsible for providing the military equipment which the dependants required to fulfill their service obligations. The Ebabbara temple in Sippar again provides a detailed list of the equipment issued to an infantry archer: a bow, bow case, and 40-60 arrows each.[45] This list suggests that these soldiers were not expected to embark on a long campaign, but were probably serving as guards.

[41] Henkelman 2017: 77.
[42] Arr. *Anab.* 6.23.1-6.
[43] Henkelman 2017: 47.
[44] Hallock 1969: passim.
[45] MacGinnis 2010: 496. There is also evidence that temples employed specialist weapon-makers in order to supply troops who were conscripted from temple dependants.

In a pitched battle, an average archer in the ancient Near East might have fired approximately ten arrows per minute.[46] If this is correct, then archers would have used the 40-60 arrows they were issued in four to six minutes. Ten arrows per minute is probably the maximum an average archer could fire accurately, and so this number does not necessarily apply to every army or soldier. It is likely, however, that archers were most active during the early stages of most battles, when the opposing lines were still at some distance from each other. The Athenian charge at Marathon, for example, may have been to counter the effect of the Persian archers.[47] Likewise, at Plataea the Persian archers were shooting before the two sides closed.[48] Furthermore, once the battle was at close quarters, the chances of friendly fire would be too great to continue to shoot. Therefore, an archer may have required only 40-60 arrows to fire during the preliminary stage of a battle.

In combat situations, or even during training exercises, archers would lose or break a large number of arrows, and so would have required constant resupply. We can assume that garrisons had storehouses from which troops were supplied, and must have included large numbers of arrows.[49] On campaign, it would have been necessary to include arrows in supply dumps, as an army on campaign would have needed resupply after every battle.

The arrowshafts without heads, known from some documents, likely indicate that archers could resupply themselves with arrowheads by looting or scavenging battlefields.[50] Discharged arrows frequently would have had broken shafts, but the metal tips may have

[46] Miller et al. 1986: 188.
[47] Hdt. 6.112. See also How and Wells' commentary on this passage.
[48] Hdt. 9.61; the Persians are said to have discarded their bows when the two sides closed (9.62).
[49] Evidence suggests that, during the Neo-Assyrian period, garrisons of 100 archers were supplied with tens of thousands of arrows (Dezső 2016: 139).
[50] The agreement between Rimut-Shinurta and his substitute, Gandalyama, includes in the list of provisions, "120 arrows, some with heads, some without."

been undamaged or minimally damaged.[51] Heads could have been attached to new shafts quite easily. The easiest way to do so would have been to insert the shaft snugly into a heated socket. As the metal cooled, it would contract and form a tight fit. This re-fitting could have been accomplished with minimal tools and skills.

There is some evidence that access to weapons was controlled within the Achaemenid Empire. The Neo-Assyrians seem to have kept strict control of iron in order to ensure no one could stockpile weapons.[52] The case of the herdsman Itti-Shamash-bilatu mentioned earlier also suggests that he was given a bow when his occupation required it, but he likely returned the weapon when he no longer needed it. The Babylonians were occasionally hostile towards the Achaemenid rulers, and so it may have been in the Persians' best interest to keep them disarmed whenever possible.[53]

There is little Achaemenid evidence for recruitment officers and other officials involved in the recruitment process, so we must again turn to Assyrian examples in order to understand how the Persian system may have functioned. During the seventh century B.C., the major domo (Akk. *rab bēti*) was responsible for summoning troops to muster points.[54] At least one major domo recruited soldiers for the king's army, and each regional governor also employed a major domo to recruit from each province. In the Achaemenid era, each satrapy may have had a major domo in charge of satrapal levies. The major domo in particular seems to have been responsible for the levy of conscripted, non-professional troops, and brought

[51] Blyth 1977: 39-41 notes that some excavated arrowheads were damaged, but these were the exception. Those arrowheads that did not hit rock, or something equally hard, would have remained functional, particularly once they were re-sharpened.
[52] Dezső 2016: 134.
[53] Waerzaggers 2003/2004.
[54] Dezső 2016: 35.

these troops to local muster points located throughout the empire.[55] This position is attested in Achaemenid-era Babylonian documents, such as those that comprise the Murašû archive, but it is not explicitly connected with conscription in this context.[56]

Holders of land-grants were organized into *ḫaṭrus*, organizational groups that were often based on occupation.[57] A superintendent oversaw each *ḫaṭru*, and these superintendents were responsible for the collection of taxes and oversight of service obligations. During times of conscription, it was probably the superintendent who enlisted soldiers from his *ḫaṭrus*, perhaps under the direction of the major domo. It is likely that administrators had lists of those with military land holdings, perhaps at the local as well as the satrapal level. One such text is known, although it is dated to the Old Babylonian period, and is thus over a millennium earlier than the Achaemenid Empire.[58] This document lists the name and patronymic of the land holders, as well as two possible substitutes. Presumably such documents were consulted whenever troops or labourers were required.[59] Stolper suggests that the foreman of each *ḫaṭru* would have needed records for bow fiefs and other land allotments.[60] There is also evidence from Sippar that officials kept lists of those who were eligible for service.[61]

Much like the Assyrian army, the Achaemenid army probably began each campaign with a muster and review.[62] According to Herodotus, Xerxes' preparations for his campaign

[55] Dezső 2016: 47.
[56] Stolper 1985: 60-61 discusses the *rab bēti* in Achaemenid-era Babylonia.
[57] Dandamayev 1992: 17; Stolper 1994: 245-246.
[58] Harris 1975: 91.
[59] According to MacGinnis 2010: 156, the Achaemenids used similar mechanisms for gathering work forces and troops.
[60] Stolper 2001: 98.
[61] Stolper 2001: 125-126.
[62] Marriott and Radner 2015: 128.

against Greece took four years to complete.[63] The army was ordered to meet at Sardis, although the various troops must have first mustered closer to home. We know from Xenophon that the Castolus plain was an official muster point in Asia Minor.[64] Xerxes first gathered his land army at Critalla in Cappadocia, which seems to have been another muster point.[65] Sardis is also associated with the gathering and review of armed forces, during the campaigns of Xerxes against Greece and Cyrus the Younger against his brother Artaxerxes II.[66] Greek sources are mostly limited to the western satrapies, but similar muster points must have existed in each region or satrapy of the empire.

Documents from Nippur dated to the reign of Darius II indicate that Uruk served as a mustering point in southern Mesopotamia. One tablet details a loan given to tenants of a bow-fief for military equipment so that they could present themselves at Uruk.[67] In another text from the same period, a cavalry soldier is called to Uruk "in fulfillment of the royal order."[68] There he was to register with "the foreman of the scribes of the army." Kuhrt suggests that the position "foreman of the scribes of the army" indicates that there was a muster point at Uruk where reviews were held. These reviews may have been an annual occurrence.[69]

[63] Hdt. 7.20.
[64] When Darius sent Cyrus to Asia Minor, he made him ruler of all who mustered in the Castolus plain, Xen. *Anab.* 1.1.2.
[65] Hdt. 7.26; van Rookhuijzen 2017 suggests Critalla, which is found only in Herodotus, was in fact Tiralla, in Cappadocia.
[66] Hdt. 7.26; Xen. *Anab.* 1.2.1.
[67] Kuhrt 2007: 14.31.ii.
[68] Kuhrt 2007: 14.38.
[69] Kuhrt 2007: 14.38 n. 5.

MILITARY RECRUITMENT IN ASIA MINOR

The volume of evidence pertaining to the Babylonian recruitment system does not exist in other areas of the empire. It is therefore uncertain to what extent this system was universal. Aramaic papyri from Egypt and the literature of Greeks who wrote about Persia suggest that, in Egypt and western Asia Minor, a similar system of land in exchange for military service was used during the Persian period. Herodotus writes that, when the Athenians and the Ionians had besieged the Persian troops on the acropolis of Sardis, all of the Persians living to the west of the Halys River came to the aid of Sardis.[70] Kuhrt and Briant have both suggested that these Persians were obligated to aid Sardis in exchange for the land on which they lived.[71]

In the early fourth century B.C., the Spartan king Agesilaus led a campaign against the Persians in Asia Minor. After a battle near Dascylium in Phrygia, Agesilaus realized that he needed stronger cavalry in order to defeat the Persians. According to Xenophon, Agesilaus told the richest men in the area to raise horses. Furthermore, he said, anyone who provided a horse, arms, and an able man did not have to serve himself.[72] Xenophon's description here shares similarities with the Achaemenid recruitment system attested in Babylonia. From Babylonian evidence we know that, in addition to the bow fiefs discussed above, some land-holders also had cavalry fiefs, and were, at least originally, meant to provide cavalry troops much as the bow fiefs were meant to provide infantry. The contract between Gadalyama and Rimut-Ninurta, discussed above, also provides evidence that many

[70] Hdt. 5.102.
[71] Briant 1985; Kuhrt 2007: 218 n. 6.
[72] Xen. *Hell.* 3.4.15.

of these land-holders would equip a substitute rather than serve themselves. This passage in Xenophon, therefore, shares many similarities with the Babylonian recruitment system, and it is possible that Agesilaus was essentially using a Persian system of recruitment that was also in place in the western satrapies.

MILITARY RECRUITMENT IN EGYPT

Two bodies of documentary evidence illuminate some aspects of the military land-tenure system in Achaemenid Egypt. A series of Aramaic documents now in the Bodleian Library, known as the Arshama Letters, provide evidence for military land tenure in Achaemenid-era Egypt.[73] Arshama was the satrap of Egypt and member of the royal house in the late fifth century B.C. Furthermore, a collection of Aramaic documents provide evidence for the Jewish garrison in Elephantine and the Aramaean garrison at Syene.[74]

Stolper notes the similarities in the land tenure systems of Egypt and Mesopotamia.[75] For example, the Aramaic documents use the term *hlk'* to denote a service obligation, and this term is clearly related to the Akkadian term *ilku*, which is often associated with (military) service in exchange for land tenure.[76] Nevertheless, land-holding is only indirectly related to military service in these documents. Two letters written by the satrap Arshama describe the

[73] See Tuplin et al. 2013 for an overview of these documents. Taylor 2013 provides the text and translation of these letters, and Tuplin 2013 has written a historical commentary. These volumes are available online at http://arshama.bodleian.ox.ac.uk/publications/
[74] See Porten 1968: vi-xi for an overview of this evidence, and Porten et al. 1996 for translations of and commentary on the documents.
[75] Stolper 1985: 65-66.
[76] Tuplin 2013: 90.

transfer of land grants from a deceased father to his son, Petosiri.[77] In one instance, Arshama explicitly states that the son will also be responsible for the tax (Ar. *hlk'*) associated with the land.[78] The term here used to describe Petosiri's status, *mshḥn*, is elsewhere related to military colonists, although Tuplin cautions that the evidence suggests Petosiri is "merely the holder of a land-allocation that has a particular fiscal character."[79] The other letter that relates to land-tenure describes a similar process that involves a deceased father, Ankhohapi, and his son, Psamshek.[80] In another letter, Arshama writes to a military commander, and warns him that he will be punished if he does not obey this same Psamshek.[81] In these two letters, we have another land-holder who is indirectly connected to the military. While these letters do not provide definitive evidence for military service in exchange for land grants in Egypt, they do suggest that, like in Babylonia, holders of land grants had to pay taxes. Furthermore, in both instances there is at least some connection between the land-holder and the military that, given the similarities to Babylonia, make it plausible that military colonists in Egypt were also given land in exchange for their service.

A similar system is also suggested by the documents that detail the Jewish garrison at Elephantine in Upper Egypt during the fifth century B.C. These garrison soldiers were settled in the area with their families.[82] The *degel* was the basic organizational unit of the garrison, and may have been equivalent to the Greek *chiliarchy*. The *degel* was further subdivided into centuries, and the leaders of these centuries were almost always Persian or Babylonian, at

[77] TAD A6.4 and A6.11.
[78] TAD A6.11.
[79] Tuplin 2013: 90.
[80] TAD A6.4.
[81] TAD A6.8.
[82] Porten 1968: 29.

least according to their names.[83] Again we have only indirect association between military service and land-holding. Aramaic papyri mention "fields of the garrison," which suggests garrison troops had access to agricultural land.[84] At least three members of the same *degel* held land adjacent to one another.[85] These texts do not provide evidence that these land holding were directly related to military service, but taken as a whole, the Aramaic evidence from Egypt suggests a strong correlation between military service and land-holding during the Achaemenid era.

ACHAEMENID MILITARY EDUCATION

In contrast to the non-professional conscript troops discussed in the previous section, the Achaemenids also employed relatively small numbers of well-trained, full-time professional soldiers. These troops are known to us almost exclusively from Classical sources, and are nearly invisible in the Near Eastern evidence. They include the ten thousand troops known in Greek as the Immortals (*athanatoi*), the Spear-bearers (*aikhmophoroi* and *doryphoroi*), and the Apple-bearers (*melophoroi*).[86] The latter two groups seem to have been the body guards of the king or satraps, although their precise duties remain unclear. Strabo offers the most comprehensive description of their training and upbringing, while additional details are supplied by Herodotus, Xenophon, Diodorus, and Arrian. In addition to these units of professional soldiers, some members of the élite who underwent this training probably

[83] Porten et al. 1996: 83.
[84] Colburn 2014: 85.
[85] Cowley 1923: 10-18 provides the original texts, translations, and commentary. See also Porten 1968: 35.
[86] See Charles 2011 and 2016 on these troops.

served in positions of command, for example in garrisons throughout the empire. Evidence indicates that these positions were largely reserved for Persians, but other Iranians and upper-class Babylonians are also attested. We will begin with an overview of the training system, as described by Greek and Roman authors.

Herodotus, Xenophon and Strabo offer Greek accounts of Persian education, focused primarily on military training.[87] These authors describe the practice in Parsa, but the system was probably replicated at the satrapal level.[88] While this training was nominally open to all Persians, it was only the wealthy who could take advantage, as having the time for such training was considered a luxury.[89] While the training seems to have been available mostly to boys, there is some evidence that girls and young women could also have some martial training. Ctesias describes a Persian noble woman as being well-trained in archery, throwing the javelin, and horsemanship. This account mirrors the description of Herodotus and Strabo. In Herodotus' account of Xerxes' invasion of Greece, the Halicarnassian queen Artemisia commanded ships, and consulted with Xerxes regarding the war.[90]

According to Strabo, children were taken from their families at the age of five, and put into companies of 50 with other youths.[91] They were taught archery and horsemanship, and Strabo adds that they also learned to throw the javelin.[92] It is possible that the Persians used archery ranges to practice, and they may even have had competitions between the

[87] Hdt. 1.136, Xen. *Cyr.* 1.2-16 and Strabo 15.3.18. There are many similarities between these accounts, although that of Strabo is considerably more detailed. Despite the skepticism with which historians often treat Greek accounts of Persian institutions, many scholars seem to accept these descriptions as accurate. See, for example, Dandamayev 1997, Briant 2002: 329.
[88] Xen. *Cyr*. 8.6.10; Briant 1999: 116; Briant 2002: 328.
[89] Xen. *Cyr.* 1.2.15.
[90] *FGrH* 688 F15 55; Hdt. 7.99, 8.68.
[91] Strab. 15.3.18.
[92] Hdt. 1.136; Strab. 15.3.18.

youths.[93] Strabo writes that the youths competed in a pentathlon, and that the king himself presented the prizes to the winners.[94] While the Greek pentathlon did not include archery, it is conceivable that a similar Persian contest would, given the importance of the bow in ancient Iranian culture.[95]

Strabo also states that emphasis was placed on enduring hardships and developing practical skills within the Persian education system. Of particular interest is Strabo's statement that Persian soldiers learned how to make weapons (*hoplopoien*).[96] It is likely that specialized craftsmen were brought on campaign, as they would have been necessary to repair broken equipment while in the field. This passage suggests, however, that each soldier was also able to perform at least some of the required maintenance on their weapons and armour. Bow- and armour-making were both highly specialized occupations, and would have required extensive training, tools, and time. It would have been impossible to build a new bow while on campaign, but an expert craftsman could have done some repairs in the field.

On the other hand, archers had many small pieces of equipment that were liable to break in the field, such as bowstrings. Very few bowstrings survive from antiquity, none of them from the Achaemenid period. Egyptian evidence, however, suggests that archers in the Middle Kingdom carried multiple bowstrings in their bow cases.[97] It would have been

[93] Xenophon writes that Agesilaus held competitions in Asia Minor, and rewarded the best cavalry, heavy infantry, and archers (*Ages.* 1.22). Cyrus the Great set up a similar competition among his troops, again according to Xenophon (*Cyr.* 2.1.22).
[94] Strab. 15.3.18.
[95] Archery competitions are known from ancient China. See Selby 2000: 106-112 for images of recreated archery targets that were used in the Warring States Period, in the mid first millennium B.C. Selby also provides translations of the relevant ancient texts pertaining to archery targets, and provides images of reconstructed targets.
[96] Strab. 15.3.18.
[97] Hayes 1978: 281 describes a soldier's bag from Thebes, in which were three new bowstrings and two used bowstrings, all made of twisted gut.

difficult for archers to replace lost or broken arrows, as the reeds needed to dry, perhaps for as long as a month, before they could make suitable arrows. This may explain the reference in the contract between Rimut-Ninurta and Gadalyama to arrows without points.[98] Spare arrowshafts could have been fitted with new heads, and archers most likely gathered the heads from broken shafts on the battlefield to re-supply themselves with arrows.

In addition to formal military training, upper class members of the Achaemenid Empire honed their martial skills by hunting large game. Royal hunts were not an Achaemenid invention, but numerous cultures across Europe, Asia, and North Africa participated in these activities for thousands of years. Assyrian kings frequently depicted themselves hunting lions and other game.[99] In Iran, royal hunts remained popular through the Parthian and Sasanian periods.[100] In Han China, royalty and nobility would hunt with their troops, and in some instances the purpose of these hunting expeditions was explicitly to "practice maneuvers."[101] While hunts could often be important symbolic displays of power, we deal with that aspect of hunting in the fifth chapter. Here, we focus on the practical, martial skills that Persian troops learned through hunts.

Achaemenid hunting practices are mostly known to us from Greek historians. Xenophon, who was himself an avid hunter and wrote a short work on hunting, frequently

[98] There is little agreement among translators on the meaning of this passage. We have here used the translation of Briant 2002: 598 and Kuhrt 2007: 14.38. Ebeling 1952: 210 translates this line into German as, "120 Pfeilen, auflegbar (nocked), 10 Pfeilen, gimirräische (possibly the ethnonym *Gimmiraya*)." Cardascia 1951 suggests heavy and light arrows. Manning 2016 notes the difficulty of this text, and that these two terms are not elsewhere used to describe arrows, and offers the tentative translation "120 ?mounted? arrows, 10 ?campaign? arrows."
[99] For Neo-Assyrian hunt scenes, see Albenda 2008.
[100] Shahbazi 2004.
[101] Allsen 2006: 214.

describes Persian nobles' love of hunting.[102] In the *Cyropaedia*, Xenophon writes that the Persian state funded hunting expeditions in order to train troops for warfare.[103] Strabo also suggests a close association between hunting and warfare in the Achaemenid world, as he writes that Persian youths gathered each morning, "as if for a muster or a hunt."[104] Persian evidence supports these Greek descriptions, particularly glyptic art. Hunt scenes are common in this medium, and these scenes are closely related to depictions of warfare, which was also a popular theme on seal stones. In many instances, the only salient difference between depictions of warfare and hunting is whether the victim is human or animal. Funerary art from Achaemenid Anatolia frequently pairs scenes of hunting and warfare, which further suggests a close connection between these two activities in the ancient Near East.[105]

Achaemenid hunting practices would have been excellent training for warfare. As we have seen, Persian soldiers were frequently armed with a bow and two *palta*, versatile spears that were often thrown. Both of these weapons were also used to hunt, and in fact projectile weapons were first invented for hunting, and were only later adapted to warfare.[106] Glyptic art suggests that Persians frequently hunted from horseback, and depictions of cavalry warfare also appear in this medium.[107] Hunting with bow or spear from horseback would have trained men for mounted warfare, as in both instances one must fire at a moving target

[102] *Anab.* 1.9.6.
[103] *Cyrop.* 1.2.10.
[104] Strab. 15.3.18, *διεγείροντες ὡς ἐπὶ ἐξοπλισίαν ἢ θήραν*.
[105] This body of evidence is discussed in greater detail in Chapter 5. See in particular the Çan sarcophagus (Ma 2008).
[106] Strabo (15.3.18) describes the Persian hunting weapons as bows and spears. PFS 2323 depicts a Persian archer shooting a boar. See Garrison 2011b for a discussion of this seal. Allsen 2006: 21.
[107] Tuplin (unpublished). It is interesting to note, however, that mounted Persian warriors in glyptic almost always use a spear. On only one seal does a mounted Persian use a bow (Tuplin's No. 62, otherwise unpublished). These scenes may have been inspired by Neo-Elamite glyptic, which frequently depicts mounted hunting and warfare (Amiet 1977; Garrison 2011b).

while controlling a horse and moving at speed. Group hunts also would have allowed hunters to practice coordinated maneuvers, which would have been a crucial skill on a battlefield. Some scholars have seen a parallel between Strabo's description of Persian education, specifically that young men were trained to make hunting nets, and Herodotus' description of Persian troops using a human net to capture rebels after the Ionian revolt.[108]

Finally, both hunting and warfare are high-adrenaline activities. In both activities, the participants put themselves in danger, and this emotional state can influence performance. For this reason, hunting is excellent practice for warfare, and the hunter must learn to control these emotions in order to be successful. As hunts present fewer dangers than battle, they are suitable training for warfare. The dangers of the hunt release adrenaline, but do not often endanger the hunter's life.[109]

Herodotus writes that when the Scythians entered Asia, some took up residence with the king of the Medes. The king used this opportunity to have the Scythian archers teach the Median youth archery, and presumably through the Medes archery came to the Persians.[110] This tale is likely rooted in Near Eastern folklore, and bears a striking similarity to Astyages' punishment of Harpagus for disobeying his order to have the infant Cyrus exposed.[111] As we have seen, however, there is likely some truth to this story, as the Scythian bow remained a popular weapon into the Achaemenid era. Barkworth has even suggested that Herodotus' story reflects a genuine tradition of how the Scythian-style composite bow was introduced to

[108] Strab. 15.3.18; Hdt. 6.31 (cf. Hdt. 3.149); Allsen 2006: 216.
[109] See Robazza et al. 1999 for a study of the impact of emotion and heart rate on the performance of modern competitive archers.
[110] Hdt. 1.73
[111] When Cyaxares grew angry with the Scythian hunters for returning empty-handed, the Scythians tricked the king into eating human flesh (Hdt. 1.73). Astyages punishes Harpagus in the same way (Hdt. 1.119).

the ancient Near East.[112] While the methods by which the Scythians trained the Medes in archery are not described, Herodotus says that the Scythians were often out hunting. Here we have another piece of evidence that connects archery practice with hunting.

In contrast to Neo-Assyrian art, which depicts a variety of highly specialized troop types, evidence indicates that Achaemenid soldiers were often armed with a bow as well as a close-range weapon, such as a sword, spear, or occasionally a battle-axe.[113] The visual evidence is confirmed by Greek authors, such as Herodotus' description of Xerxes' army and the passage from Strabo cited earlier.[114] Darius I also boasts in his inscription at Naqsh-i Rustam that "as a bowman I am a good bowman…(and) as a spearman I am a good spearman."[115] Once recruits could use their weapons individually, they could then learn how to fight as a unit. Herodotus describes the Persians shooting "many close-packed arrows" and Miller notes that such a coordinated attack would have required training.[116] Much as heavy infantry learned to march together, so too did archers learn how to shoot together. There is no extant source that describes the training of archers. If archers trained individually, as the evidence from ancient China and comparisons with modern archery suggest, there was likely also some form of group training. Archers would have been most effective if they shot volleys of arrows in unison, and in order for any group to perform an action simultaneously, its members need to practice.

---

[112] Barkworth 1993: 160.
[113] See Dezső 2012 for descriptions of the various troop types depicted in Neo-Assyrian art. Examples of Achaemenid soldiers armed with multiple weapons include the Basseggio Vase, the Edinburgh Cup, the "Archer" friezes from Susa (who also carry spears), numerous Achaemenid seal stones, and many others.
[114] Hdt. 7.61; Strab. 15.3.18.
[115] DNb. A similar inscription, naming Xerxes, was carved near Persepolis (XPl).
[116] Hdt. 7.218; Miller et al. 1986: 182.

Some of the archers in the Achaemenid army had experience with the bow before they were recruited. Greek and Persian sources provide evidence that the Persian élite often participated in hunting, and the weapons they most frequently used were the bow and the spear. Through these hunts the young élite of the empire would have learned valuable martial skills by the time they were old enough to serve in the king's army. In Babylonia, herdsmen were frequently enlisted as archers.[117] It is likely that they were suitable archers because they used bows to protect their flocks. Many people in the ancient world would not have had the time or resources to practice archery regularly. It was therefore logical to recruit those who had previous experience with bow and arrow. Evidence suggests that élite Persians and herdsmen were both recruited, presumably due to their familiarity with archery. For a multi-ethnic army such as that of the Persians, military training would have served a greater purpose than strictly military. Common education, common military training, and frequent musters would have imbued the élite class with a sense of common culture.

We have seen that upper class Persians, and some others, received an education that focused heavily on developing martial skills from a young age. Conscript troops likely did not have access to continuous formal military training, but may have had practical experience that made them suitable soldiers, such as the shepherds who used ranged weapons to protect their flocks. Two late sources, Diodorus Siculus and Cornelius Nepos, also provide evidence that, once an Achaemenid expeditionary force was levied, they did participate in training *en masse*. At least once, the Persian army and navy spent almost a year training for a campaign against Egypt. According to Diodorus, the Egyptians revolted against the Persians shortly after the death of Xerxes. The first Persian expedition to recapture Egypt failed, so

[117] MacGinnis 2012: 5.

Artaxerxes sent a second force against Egypt, apparently numbering over three hundred thousand troops.[118] These numbers are certainly inflated, but nonetheless it seems that this force included both professional soldiers and conscripted, non-professional troops. Rather than attacking Egypt immediately, Diodorus writes that the Persian commanders spent a year in Cilicia and Phoenicia "training their soldiers and acquainting them with military practice."[119] While certainly not as extensive, Diodorus also writes that Darius III spent the days leading up to Gaugamela training his troops.[120] The Athenian general Iphicrates, who was hired by the Persians in the fourth century B.C., is also said to have trained the troops under his command.[121] We may also assume that at least some of the four year preparation which Herodotus ascribes to Xerxes' campaign against Greece was spent training his troops. These passages suggest that even conscript troops received some formal military training, especially if they were to go on campaign.

WEAPON MAKERS

In Babylonia, temples were involved in the manufacture and distribution of weapons. The Ebabbara temple at Sippar, for example, employed seven bowyers, leatherworkers who also manufactured arrowshafts, and blacksmiths who made arrowheads and spearheads.[122] As the temples were often asked to provide soldiers as a form of taxation, they also seem to have been expected to bear the cost of arming and supplying these soldiers. These weapons may

[118] Diod. 11.74-75; Ruzicka 2012: 29-34.
[119] Diod. 11.75, *γυμνασίας τῶν στρατιωτῶν ἐποιοῦντο καὶ συνείθιζον ἅπαντας ταῖς πολεμικαῖς ἐμπειρίαις*; Ruzicka 2012: 32.
[120] Diod. 17.53, 55.
[121] Nep. *Iph.* 2.4; Nep. *Dat.* 3.5; Diod. 15.43.
[122] MacGinnis 2012: 4.

also have been a source of revenue for the temples, should they sell the weapons to soldiers who had been conscripted. Two tomb paintings from fifteenth century Egypt provide rare visual evidence for the bow-making industry. Both tomb owners were employed at the temple of Amun in Thebes, and so again we have evidence for temples being involved in the manufacture of weapons. Xenophon also attests to the private manufacture and sale of weapons in Ephesus in the early fourth century B.C.[123] As Agesilaus stationed and trained his army in the city, Xenophon describes that the city resembled a "workshop of war," as the craftsmen were all engaged in the manufacture of weapons, which were then sold in the markets.[124] Aeneas Tacticus also suggests that weapons were available in the markets of many Greek cities.[125]

A Neo-Assyrian text from Nimrud is indicative of the size of the bow-making industry in the ancient Near East. This text states that over 36,000 bows were inspected in preparation for muster at Kalhu. Henshaw suggests that each archer was issued two bows for a long campaign, and so this muster may have contained ca. 20,000 archers.[126] Furthermore, if each archer was issued 40-60 arrows, as later evidence suggests, it would require approximately one million arrows to supply these troops. The large number of bows mentioned in this single document, and the even larger number of arrows that can be inferred, attests to the amount of natural resources and specialist labour that were mobilized to supply imperial armies with archery equipment.

[123] Xen. *Hell.* 3.4.16-19.
[124] Xen. *Hell.* 3.4.17, *τὴν πόλιν ὄντως οἴεσθαι πολέμου ἐργαστήριον εἶναι*.
[125] Aen. Tact. 30.
[126] Henshaw 1969: 4.

Bow manufacture necessarily began with the harvesting of raw materials, particularly wood and horn. Once lumber is cut, it is best to split it into staves immediately. It is then necessary to dry the staves, and this would take months. In the Middle Assyrian period, wooden staves used to make bows and shields were stored in warehouses.[127] The lumber for bow staves could have been imported from anywhere within the empire. Comparative evidence from Egypt suggests that bow-wood was imported from Asia, as the types of wood used in Egyptian bows are not native to the area.[128] Achaemenid inscriptions confirm that the Persian kings often imported the best materials from the empire for their construction projects, and the same may be true for the manufacture of weapons.[129]

Much like other specialist craftsmen, weapons manufacturers employed by a palace or temple were given the raw materials their occupation required. This is evident in documents related to the distribution of metal and storage of bow staves. It is also likely that the state supplied them with the tools of their trade, and rations to sustain them while they worked.[130]

There are some extant examples of contracts for the manufacture of weapons.[131] These weapon-making workshops could be quite large, as the Ebabbara temple employed at least seven bowyers at one time.[132] A land grant text from the reign of Tiglath-Pileser III mentions nine bowyers, the largest known number of bowyers employed at a single location.[133] As bowyery was such a specialized skill in the age of composite bows, it is

[127] Llop 2016: 203.
[128] McLeod 1969: 21-22.
[129] DSf.
[130] Zaccagnini 1983: 245.
[131] e.g. MARV 2, 32: 2.10
[132] MacGinnis 2012: 4.
[133] Dezső 2016: 139.

probable that, in these large workgroups, there was at least one master bowyer who acted as an overseer. Some workers may have specialized in one aspect of bowmaking. For example, factories may have had an expert carpenter for making the wooden core of the bow, and an expert glue-maker to make the adhesive. This seems to have been the case in the Neo-Assyrian period, and possibly continued into the Achaemenid era. A diverse and specialized workforce would have been beneficial in terms of the quality and efficiency of Near Eastern weapons workshops.

As craftsmen who were employed by either a palace or a temple, bowyers could be expected to move around as needed. Zaccagnini notes that craftsmen were often expected to travel, particularly when needed in another part of the empire.[134] As we have seen, once the composite bow was invented, the technology was disseminated across the Near East rather quickly. Soldiers on campaign would have ensured that the bows themselves moved around, but the craftsmen responsible for manufacturing these weapons would have moved around as well. Prior to the unification of most of the Near East by the Achaemenids, skilled bowyers may have sought employment at whatever court would pay them the most for their labour.[135] This tactic would be doubly beneficial to a king, as it would provide his army with superior weapons, while depriving potential enemies of skilled craftsmen.[136] This would have been especially true early in the history of composite bows, when the ability to build a vastly superior weapon would have been a major technological advantage for a state to have. The

[134] Zaccagnini 1983: 248.
[135] As we have discussed in Chapter 1, bowyers were producing Elamite style bows in eighth century Assyria. Elamite bowyers may have relocated to Assyria in search of higher pay. See Brinkman 1986: 203 and Zadok 1994: 47.
[136] Xen. *Hell.* 1.5.4-7. Lysander adopted a similar tactic at the end of the Peloponnesian war, as he asked Cyrus the Younger to increase the pay of soldiers in the Spartan fleet. Lysander hoped to cause mass desertion among the Athenian navy.

sudden appearance of locally made composite bows in Egypt suggests that, upon learning about the composite bow, Egyptian pharaohs imported bowyers who could make composite bows for them. During the later Neo-Assyrian period, documents confirm that the Assyrians were making Elamite style bows. These could have been constructed by captured Elamite bowyers. A parallel situation is well attested in the Achaemenid Empire, as physicians were often kept at court. Perhaps the most famous example is Democedes of Croton, who was a captive at Darius' court. The Greek historian Ctesias was also employed as a physician at Artaxerxes II's court, and an inscription from Egypt suggests that Udjahorresnet was also Darius' court physician.[137]

Visual evidence gives us some sense of how an ancient Near Eastern bow-making workshop may have looked. Two tomb paintings from fifteenth century B.C. Thebes, in Egypt, depict Egyptian bow workshops. While these depictions are much earlier than the Achaemenid period, once the composite bow was invented and disseminated across the Near East, the art of bowyery would not have changed much, nor would it have been a dramatically different process from one culture to another. Both of these tombs are located in Thebes and date to the fifteenth century B.C. Both owners of these tombs, Puimre‘ and Menkheparr‘soneb, were prophets of Amun. Their tomb paintings depict them inspecting workshops, including a bow-making workshop, of the temple of Amun.[138]

[137] Hdt. 3.129ff (Democedes); Strab. 14.2.15, Diod. 2.32.4 (Ctesias); Kuhrt 2007: 4.11 (Udjahorresnet).
[138] Porter and Moss 1960: 71; 177.

Both paintings show numerous people. The first of these depict at least three people, the second at least six.[139] Each figure in the first painting is performing a different task.[140] One person works on a wooden bow stave, while another appears to be cutting strips of horn and hanging them to dry. A third figure is manufacturing arrows. Similar tasks are depicted in the second image, but one additional figure seems to be stringing a finished bow, as he is bending the bow around his leg.[141] Today, this method is still used to string stiff bows. In both images, several finished bows hang on the wall. As we have seen, finished bows were probably stored elsewhere, so this may be the artist's attempt to capture the complete bow-making process. These tomb paintings provide evidence that in Egypt, as in Mesopotamia during the Achaemenid period, temples often housed bow-making workshops, and that temple officials were in charge of supervising these craftsmen.

A scene from the palace of Assurbanipal, now in the British Museum, also shows the inspection of bows.[142] Barnett describes these men as bowyers, but they may also be the king's attendants.[143] Bowyers likely were responsible for the inspection of their bows before they left the workshop, but would not likely have accompanied the king in the field. The king likely had special attendants whose job was to care for the king's weapons on hunting expeditions or campaigns. It is relevant that, in this scene, the king has attendants inspect his bows. We would assume that the king had access to the best weapons in the empire, but nevertheless, if a bow were to break during use, the archer could be seriously injured. Such

[139] Assyrian evidence from the reign of Tiglath-Pileser III attests to as many as nine bowyers employed in the same workshop (Dezső 2016: 139). In Achaemenid-era Sippar, as many as seven bowyers were employed simultaneously at the Ebabbara temple (MacGinnis 2012: 4, n. 8).
[140] Davies 1922: Plates 23-24.
[141] Wolf 1926: Plate 22.
[142] BM 124884.
[143] Barnett 1976: 37, Plate 5.

an injury would have been particularly catastrophic if it happened to the king, so it is logical to conclude that his weapons should be inspected before each use.[144]

One final way ancient empires could obtain bows should be mentioned, although it is not well attested in our sources. It is almost certain that, after a successful battle, ancient armies could gain weapons from their enemy as booty. In an Assyrian relief depicting the capture of Babylon in 648 B.C., during the civil war between Assurbanipal and his brother, Shamash-shumukin, scribes are shown counting and recording a large pile, presumably booty taken from the defeated Babylonians.[145] Many items in the pile appear to be bows and other weapons. Presumably some of these bows reached the hands of victorious soldiers, particularly if their own weapon broke during battle. Those that were registered by scribes were likely brought to central storehouses, whence they could be distributed to soldiers as they were needed. The account of Sargon's Eighth Campaign records that, from a single temple in Musasir, over 300,000 pieces of military equipment were plundered, including swords, bows, quivers, and arrows.[146] In light of this evidence, the importance of plunder for the supply of weapons should not be underestimated.

[144] While any injury to a king could have been devastating, archery served an important ideological function in the ancient Near East (see Chapter 5), and the king as an archer was a powerful symbol in Egypt, Assyria, Persia, and elsewhere. Therefore, if a king were to be injured while practicing archery, this could bring his right to rule into question.
[145] ME 124945
[146] Dezső 2016: 139.

SUPPLY

We have already examined the weapons Achaemenid soldiers used, as well as the recruitment and training of these soldiers. It is now necessary to turn our attention to how and by whom these weapons were made, and how they, and other supplies, were collected, stored, and distributed. With the introduction of composite bows, bowyery in the ancient Near East became a much more specialized trade. Middle Assyrian documents attest that a specialist oversaw bow-making, while in contemporary Ebla the same position was occupied by a wood-worker. Llop suggests this specialized position indicates that the Assyrians at this time were constructing composite bows.[147] This suggestion is certainly plausible. As self-bows were made of a single piece of wood, we would expect to find a wood-worker in charge of their production. Composite bows, as their name suggests, were constructed by binding different materials with a glue. Therefore, in order to construct a composite bow, the bowyer must be familiar with wood-working, as the core is almost always made of wood, but also be able to work with horn and sinew, to make a glue, and to laminate all these materials together in order to make an effective bow.

The invention of composite bows led to increased specialization of bowyery due to the time it took to complete a bow. Modern scholars' estimates of how long it took to complete construction of a composite bow in the ancient world vary greatly, from a few months to more than a year.[148] A modern manual on traditional bow making recommends that a stave should dry for at least a year. [149] Therefore, if we assume the composite bow is

[147] Llop 2016: 212.
[148] Zutterman 2003: 123 argues for a few months; Miller et al. 1986: 184 suggests a year or more.
[149] Hardcastle 2000: 37.

begun when the lumber is first cut, both scholars have greatly underestimated the time required to build a composite bow. A composite bow could take over a year to complete, but most of this time the bowyer was inactive, as it was necessary to allow materials, such as wood and glue, to dry. The large amount of downtime during the construction of composite bows made it logical for each bowyer to make many bows at a time in order to keep busy. The higher level of skill required to make a composite bow meant that fewer people possessed the ability to build one. These two factors likely combined, and the introduction of composite bows saw the increased centralization of the weapons-making process.

Dezső suggests that the Assyrians had strict control over iron, as they did not want people to be able to stockpile weapons.[150] Aeneas Tacticus, who wrote a treatise on siege warfare in the mid fourth century B.C., warns against selling weapons in the market.[151] In particular, he suggests restrictions should be put in place to prevent individuals from buying weapons in bulk, as these could be used to start a revolt. This does not seem to have been the case in the Achaemenid Empire, as conscripted soldiers were often expected to purchase their own weapons.[152] It is possible that access to weapons was restricted to those who had been conscripted. In this case, presumably the conscripts would have to go to military storehouses, with proof of conscription, where they could buy military provisions for themselves, but this process seems overly complicated and is not attested in the evidence.[153] The large number of composite bows found in Egyptian tombs from the fifteenth century B.C. suggests that

[150] Dezső 2016: 134.
[151] Aen. Tact. 30.1-2.
[152] Briant 1999: 119.
[153] Kuhrt 2007: 14.31.ii-iii suggest that soldiers could purchase their own equipment.

private individuals could own weapons in Egypt, and the same may have been true of the Achaemenid Empire.[154]

On a long campaign, however, archers would have required regular resupply of arrows. Archers, therefore, present a unique logistical challenge, as they must continually be resupplied with arrows in order to be effective. As long as troops were within the empire, they could be supplied at various way stations along the royal road and storehouses. These supply depots exited even in remote parts of the empire, as Arrian's description of Alexander in the Gedrosian desert makes clear.[155]

Our evidence for Persian campaigns outside of imperial territory is rather sparse, and largely confined to western expansion. Herodotus mentions that the Persians used supply dumps to provision the army on their march against Greece, but uses the term "food" (*sitia*) to describe them, and thus gives the impression that supplies did not include weapons or other military equipment.[156] As the infantry army followed the coast on its way to Greece, and was supported by the navy, it is likely that the ships also carried some supplies, possibly including weapons.

Diodorus describes Artaxerxes' preparations for a campaign against Egypt, and says that the king "prepared arms, missiles, and food" as well as ships to carry the supplies.[157] Diodorus' description pairs food with weapons as part of Persian supply dumps, and the same was probably true of Achaemenid armies in the early fifth century B.C. That Diodorus specifically mentions missiles lends credence to this passage, as missiles would be the one

[154] McLeod 1962: 18.
[155] Arr. *Anab.* 6.23.1-6.
[156] Hdt. 7.25.
[157] Diod. 16.40.

piece of weaponry that would need to be replaced constantly. Large bundles of arrows would have been awkward to transport on foot, and so were more likely carried on ships or animal-drawn carts. Artaxerxes' plan to use ships to drop supplies at strategic locations is the most logical solution to the problem of how to supply archers while on campaign. Although this is the only passage that explicitly connects arrows with large Persian supply dumps, it is likely that this was their normal practice while on extended campaigns.[158]

CONCLUSION

The Achaemenid Empire used various means to recruit and supply troops for its army, many of which were inherited or modified from earlier Near Eastern empires. Persian élite were given military training from a young age, and went on to serve as officers. Some of these probably joined the king's personal guard or the famed Immortals. Frequently the crown distributed land grants in exchange for military service. Often the holders of these plots paid for a replacement rather than serve themselves. Temples had a similar arrangement. The crown granted them land, which would be used for agriculture. Temple dependants worked for the temple in exchange for rations, and these dependants would also be required to provide (military) service to the crown on the temple's behalf. Both the king and individual satraps could also hire mercenaries, such as the Carians housed at Borsippa, and the Greek army of Cyrus the Younger.

[158] See Kuhrt 2007: 15.15.i-ii, 27 for documents describing Persian supply dumps.

Ration documents suggest that many soldiers were given food and supplies by the state during their time of service, although this does not always seem to have been the case. Landowners who paid for military substitutes often were responsible for provisioning their replacement. They could receive food, supplies, and weapons from storehouses located in even the most remote parts of the empire. When campaigns brought soldiers out of imperial lands, supply dumps were organized in advance. Whenever possible, the infantry travelled along the coast, and so could be supported and supplied by ships.

The majority of the evidence for weapon manufacturing indicates that temples frequently employed specialist weapon smiths. These weapons were mostly used by temple dependants when they were assigned military duty, but occasionally they were also used during the course of their work for the temple. Shepherds, for example, could be given bows and arrows in order to protect their flocks, which had the added benefit of training them in the use of these weapons. Some temples seem to have purchased weapons, rather than making their own, which suggests that a private weapon industry existed, although it is not well attested in our sources.

CHAPTER 4

GERRHON SHIELDS, ARCHERS, AND SPEARMEN

In 479 B.C., armies from various Greek city-states fought against the army of the Achaemenid Persian Empire at the battles of Plataea and Mycale. Herodotus, our main historical source for these battles, writes that the Persians used "wicker" shields, which he calls *gerrha*, and they formed these shields into a defensive barricade.[1] While the *gerrha* shields are occasionally mentioned by later Greek historians, and appear in both Greek and Persian art of the fifth century B.C., the shield-wall appears only in one other context, a description of Cyrus the Great's army by Xenophon in his *Cyropaedia*.[2]

Comparative evidence suggests that such shields had a long history in the ancient Near East, first appearing in art ca. 2500 B.C. Later Assyrian reliefs are a particularly useful source for the study of these shields, as they frequently depict large rectangular shields in scenes of combat. Some images from Greek pottery, probably produced shortly after 479 B.C., also show Persian soldiers using these shields. Finally, in a few rare instances, similar shields have been excavated, for example in the Pazyryk tombs from Siberia. Although they are not from the Achaemenid heartland, these tombs may date to the late Achaemenid period, and the artefacts found within show considerable influence from Achaemenid Persia. For this reason, these shields provide valuable evidence for the Persian *gerrha.* This variety of sources makes a study of the *gerrha* particularly fruitful, as sources for the study of Persian

[1] Hdt. 9.61 (Plataea); 9.102 (Mycale).
[2] Xen. *Cyr*. 8.5.11-12. For other references to *gerrha*, see Xen. *Anab*. 4.3.4; Paus. 8.50.1.

warfare are often hellenocentric, and it can be difficult to balance this bias with Near Eastern evidence.

We will begin with an overview of the ancient sources on *gerrhon* shields, with attention to what they tell us about the shields, and then move on to the history of large shields in the Near East. In addition, reconstruction experiments provide information regarding how these shields were constructed, how long construction might take, and how effective they were against arrows, spears, and other weapons. The evidence and experiments presented here suggest that large, rectangular shields had a long history in Near Eastern warfare, and their use extends long before and long after the era of the Achaemenid Empire. Furthermore, our experiments show that the English term "wicker" does not adequately describe these shields, and that these shields were incredibly effective, particularly against missile fire. We conclude with a discussion of how Achaemenid armies used these shields in battle, and why the shield wall tactic is not attested in our sources after 479 B.C.

HISTORY OF TALL SHIELDS

Let us begin with a history of tall shields in ancient Near Eastern warfare, and how these earlier shields influenced Achaemenid *gerrha*. Scholars have long recognized that the shield type used by the Persians at Plataea and Mycale is similar to those depicted on numerous Neo-Assyrian reliefs. One of the earliest scholars to discuss these shields was Charles Rollin, who notes that the Persians used small, light shields made of osiers, and also large bronze shields.[3] George Rawlinson compares Persian wicker shields to Assyrian

[3] Rollin 1786: 356.

"wattle" shields.[4] More recently, Barrett and Vickers suggest that the *gerrha* and the large Assyrian shields shared a similar purpose, namely to protect archers.[5]

Large, rectangular shields had a long history in the Near East by the time the Achaemenid Persians came to power in the mid sixth century B.C. An incised plaque from the ancient city of Mari, in modern Syria, dating to ca. 2500 B.C., depicts two warriors; one holds a large shield and spear, the other a bow and arrow.[6] The shield curves over the head of the shield-bearer, so it is not identical to the *gerrha*, nor was it constructed using the same technique. While *gerrha* were constructed by weaving sticks through a rectangle of rawhide, the Mari shields consists of long, thin pieces of wood held together by bands, perhaps leather or metal. The curved Mari shield is similar to a shield-type occasionally depicted in siege scenes on Neo-Assyrian reliefs. Like the Mari shield, these Assyrian shields are curved at the top. They can be held by shield-bearers, or leaned against city walls to protect sappers.[7] The Mari shield is also the earliest evidence for the combination of a shield-bearer and an archer, and this technique continues through the Assyrian period. Another relief, the Stele of the Vultures, is contemporary with the Mari plaque, and was erected by the Mesopotamian city-state Lagash.[8] Although it does not show the shields protecting archers, it does depict several soldiers carrying large, rectangular shields.

Egyptian art from the second millennium B.C. depicts large rectangular shields, or similar shields with rounded tops.[9] Many of these date to the reign of Ramses II in the

[4] Rawlinson 1867: 118-119.
[5] Barrett and Vickers 1978: 21.
[6] Parrot 1971: Pl. 14 fig. 4.
[7] ME 124906 (shield-bearers); ME 124938 (sappers).
[8] Pancritius 1908: Fig. 1.
[9] Gorelik 1993: Plate 73.47-48, 61.

thirteenth century B.C. The Egyptian reliefs show these shields with a checkerboard pattern, which Medvedskaya argues were painted onto the shields.[10] A comparison with Assyrian and Greek depictions of similar shields suggests instead that the Egyptian artists were attempting to show shields that were constructed by weaving wooden staves through rawhide, similar to the Achaemenid *gerrha*.[11] Syro-Palestinian warriors are depicted with similar shields in Egyptian art, for example on decorative leather from Thutmose IV's chariot and painted boxes from Tutankhamen's tomb, dated to the fifteenth and fourteenth centuries B.C.[12] These images provide evidence that these shields were used by various peoples in the Near East during the third and second millennia B.C.

Depictions of large, rectangular shields increase greatly during the Neo-Assyrian empire beginning in the ninth century B.C.[13] Neo-Assyrian kings often commissioned large relief sculptures, many of which are still extant, to decorate the rooms of their palaces. The Assyrians were particularly interested in scenes of warfare, and their reliefs are therefore an important source for studies of warfare in the ancient Near East.[14] Scholars have identified several Neo-Assyrian shield-types that correspond to the shape and function of the Achaemenid *gerrha,* i.e. large rectangular shields, which often protect one or more light-armoured archers. The Assyrians frequently depict a shield-bearer, usually armed with a spear. Due to the plethora of such shields in Assyrian reliefs, and the paucity of visual and

[10] Medvedskaya 2015: 161.
[11] Gorelik 1993: 178.
[12] Gorelik 1993: Plate 73.59-61.
[13] Dezső 2006: 89.
[14] It is important to remember that art is not necessarily an accurate reflection of reality, and that these images served a primarily ideological purpose. See Barron 2010: 1.

textual sources of warfare from the Achaemenid Empire, Neo-Assyrian evidence is often able to shed light on the less-documented world of Achaemenid warfare.

The Neo-Assyrian sources suggest that they used a variety of tall shields. While the shape and purpose of the shields is consistent, they were likely constructed using different materials. A shield depicted during the reign of Tiglath-Pileser III, for example, seems to be constructed from thick planks, and so would have been much stronger, but also heavier, than the *gerrha*.[15] Shields used during the siege of Lachish in 701 B.C. were made from staves, or possibly thin planks, banded together, possibly with metal, and had a slight curve at the top, likely to protect soldiers from missile fire while the enemy had a height advantage.[16] It is possible that this type of shield was similar to a *gerrhon*, as an Assyrian text mentions that willows were used to construct shields.[17]

Despite the differences in construction, all of these examples from Assyrian art are tall rectangular shields that are often, though not exclusively, shown in scenes of siege warfare. Many of these scenes show the shields being used in the same way; a shield-bearer holds the shield, and is often armed with a spear, while an archer fires from behind the protection of the shield.[18] Presumably the archers were used in sieges to fire at enemies on the battlements of besieged cities.[19] The shield in turn protected the archers, who were often

[15] ME 118904.
[16] ME 124906.
[17] CAD A^2 s.v. *arītu* (shield), "the willows which I planted along the irrigation ditch, all of them they could use for shields." Willow is a wood known for its pliability, rather than its durability. This passage suggests, therefore, that young, pliable pieces of willow were woven or banded together to make a shield, rather than a solid shield made from a large tree. See also the late antique and Byzantine sources that describe *gerrha* as shields made from a type of willow, discussed below.
[18] Examples of such shields can be seen in the reliefs of Assurnasirpal's campaign in Syria from Nimrud, Sennacherib's siege of Lachish from Nineveh, Tiglath-Pileser III's palace at Nimrud, and Assurbanipal's siege of an Egyptian city.
[19] Fagan 2010: 94.

unarmoured or lightly armoured, from enemy missile fire.[20] The shield-bearers would hold the shield, at least until the standing shields were introduced, and were armed with a spear in case an enemy got close. Archers alone would have been vulnerable to close-range attacks, so it was necessary to have spearmen defending them.

There is little agreement among scholars regarding the organization of these archer-shield bearer units. Henshaw notes that in the relief depicting the siege of Lachish, there is a ratio of five archers to two shield-bearers, while on scenes depicting mountain campaigns there are an equal number of archers and shield-bearers.[21] Other reliefs show up to three rows of soldiers behind a single shield.[22] It is unlikely, however, that reliefs can yield such accurate information about the deployment of ancient armies, and the arrangement of troops is likely to be based more on artistic convention than historical reality. Textual sources, although not as abundant as artistic depictions, shed further light on the ratio of shield-bearers to archers. A document from Tell Halaf during the Neo-Assyrian period describes an equal number of bows, short swords, spears, breastplates, quivers, and siege shields.[23] In another text describing Sennacherib's sixth campaign, the king writes that he added 30,500 bows and 30,500 shields to his army, although he could also mean archers and shield-bearers.[24] These documents suggest that, in the Neo-Assyrian army, archers and shield-bearers were employed in equal numbers, and each shield-bearer protected himself and one archer.

[20] DeBacker 2011: 10.
[21] Henshaw 1969: 4.
[22] Nadali 2010: 128.
[23] Tell Halaf 48.
[24] Luckenbill 1924: 76 has mistranslated *aritu* as "arrows," while it should in fact read shields. The editors of the CAD (s.v. *aritu*) understand this passage to refer to soldiers, not equipment.

Dezső suggests that Tiglath-Pileser III introduced new siege shields that could be formed into a "shield wall."[25] He does not cite an Assyrian source for this claim, so he may be basing this supposition on the later Achaemenid use of *gerrha.*[26] Such a shield wall could protect several rows of archers, although stationing them too deep could cause problems. For example, those in the back would need to shoot indirectly, and would receive decreased protection from the shield. If too many rows of archers were stationed behind each shield, it is likely that their arrows would often fall afoul of one another, and thus greatly diminish the number of projectiles that reach their target. If the rows fired in sequence, as early modern armies did, three rows of archers would be able to achieve continuous fire. In order to fire in sequence, it would have been beneficial for someone to give commands, such as "nock arrows," "draw," and "fire." With some training and clear commands, ancient archers would have been able to unleash a "shower of arrows," which Greek authors describe in reference to Achaemenid Persian armies. As discussed in the third chapter, if archers were equipped with the 40-60 arrows which our sources suggest, a corps of archers would have been able to sustain nearly continuous fire during the early stages of a battle.[27] Due to archers' ineffectiveness at close quarters, it was important that they use frequent fire and a wide angle of fire to keep the enemy distant.[28]

Neo-Assyrian reliefs tell us a great deal about how Assyrian armies used large rectangular shields. Unlike the Achaemenid evidence, earlier cultures constructed tall shields of various materials; some appear to be solid wood, while others clearly depict narrow pieces

[25] Dezső 2006: 105
[26] The Stele of the Vultures, although considerably earlier than the Neo-Assyrian period, shows soldiers armed with tall shields in close formation, but it resembles a hoplite phalanx more than the shield-wall described by Herodotus.
[27] See the chapter 3 for a more extensive discussion of this issue.
[28] De Backer 2011: 10.

of wood bound together. One soldier would carry the shield, and often a spear, and the shield would also protect one archer, or perhaps several. Such shields seem to have been particularly useful during sieges. There is no evidence that the Assyrians occasionally propped them up on a stand, or used the shield-wall technique.

Turning to ancient Iran, a painted vessel from the Sialk B cemetery, located between the modern cities of Tehran and Isfahan and dated to the early eight century B.C., depicts a warrior armed with a spear and a large rectangular shield. The shield is decorated with a checkerboard pattern, and this pattern was used in ancient art from Egypt, Mesopotamia, and Iran to represent a woven shield.[29] This is the only known depiction of a woven shield in the art of pre-Achaemenid Iran. As the Iranian example is slightly later than the Neo-Assyrian examples, Iranians may have adopted this shield style from Assyria before the Achaemenid period.

Herodotus, our main written source for the use of *gerrha* by the Achaemenids, writes that the Persians used these shields at the battles of Plataea and Mycale in 479 B.C. In both instances, Herodotus describes that the Persians were able to construct a defensive barrier between themselves and the Greek army with these shields, perhaps using a stand with which to hold the shield upright without a shield-bearer. Herodotus describes the Persians "making a fence" (*phraxantes*) of their shields at Plataea and a defensive wall (*herkos*) at Mycale.[30] Herodotus' vocabulary here suggests that he envisioned a solid shield wall during these battles. These passages are the most detailed source for the way in which Achaemenid soldiers used these shields in battle.

[29] Medvedskaya 2015: Plate 5.
[30] Hdt. 9.61, 99. We discuss the shield wall in greater detail below.

When Herodotus describes the various troops that comprise the Achaemenid army, emphasizing their weapons and armour, he states that the Persian troops used "*gerrha* instead of *aspides*."[31] This passage does not provide much information about the *gerrhon*, except that they are different from the traditional Greek shield, the *aspis*. The term *aspis* can be a general term for "shield," but it is often used to refer to the double-grip hoplite shield.[32] These shields were round and concave, and usually measured approximately 90 to 100 cm in diameter. They consisted of a wooden core, often covered with leather on the inside and sometimes a thin sheet of bronze on the outside.[33] It would therefore seem as though Herodotus is here making a strong distinction between the type of shield used by each civilization.

Xenophon also mentions *gerrha,* and Persian troops called *gerrhon*-bearers (*gerrhophoroi*).[34] Xenophon uses a precise vocabulary to describe military equipment such as shields, and so his evidence complements the deficiencies of Herodotus' account. In some instances it is clear that Xenophon uses the term *gerrhon* to refer to a smaller shield, but presumably with a similar construction to Herodotus' *gerrha*.[35] It is possible that these small *gerrha* were round bucklers. The reliefs detailing the siege of Lachish, commissioned by the Neo-Assyrian king Sennacherib in the late eighth or early seventh century B.C. depict such shields.[36]

[31] Hdt. 7.61, *ἀντὶ δὲ ἀσπίδων γέρρα.*
[32] Hunt 2007: 113.
[33] Schwartz 2013: 157-159.
[34] Xen. *Oec.* 4.5; *An.* 1.8.9. *Gerrhophoroi* are also mentioned by Plato (*La.* 191c) and Strabo (7.3.17).
[35] Xen. *Cyr.* 7.1.33-34.
[36] ME 124906 and 124907 show round wicker shields at the siege of Lachish. ME 124820, also dated to the reign of Sennacherib, shows Assyrian soldiers with round wicker shields guarding prisoners at a quarry. For photographs of these reliefs, see Collins et al. 2008.

When Xenophon wishes to denote large rectangular shields, he uses the phrase large *gerrha* (*makra gerrha*).[37] Xenophon also mentions *makra gerrha* in his *Cyropaedia.* Although not strictly speaking a historical text, Xenophon likely drew on his experience with Achaemenid Persian soldiers at Cunaxa and during the campaigns of Agesilaus in the early fourth century B.C. In his description of Cyrus the Great's military camp, Xenophon writes that "he arranged the hoplites and those holding *makra gerrha* in a circle around all the others" and that the peltasts and bowmen could "throw their javelins and shoot their arrows over the hoplites."[38] This use of *gerrha* is similar to Herodotus' description of the shield wall, and may explain how the Persian archers were able to attack from behind the shield wall at Plataea.

Xenophon also describes tall shields used by Egyptian troops in the mid first millennium B.C. in both his *Cyropaedia* and *Anabasis*. In the *Cyropaedia*, during a battle between Egyptians and Persians, Xenophon writes that the Egyptians had the advantage due to the superiority of their equipment, as their "shields (*aspides*) cover their bodies much better than breastplates and *gerrha*."[39] While this event is set during the reign of Cyrus the Great in the mid sixth century B.C., it is likely that Xenophon based this description on his own experience of Near Eastern weapons in the late fifth century.[40] Xenophon describes similar shields used by Egyptian troops in the army of Artaxerxes II at Cunaxa. These shields are made of wood, and reach to the feet.[41] In both of these instances, the Egyptian soldiers

[37] Xen. *Anab.* 4.3.4.
[38] Xen. *Cyr*. 8.5.11, *ὁπλίτας δὲ καὶ τοὺς τὰ μεγάλα γέρρα ἔχοντας κύκλῳ πάντων εἶχεν ὥσπερ τεῖχος*; Xen. *Cyr*. 8.5.12, *οἱ τοξόται καὶ οἱ ἀκοντισταί...ἀκοντίζοιεν καὶ τοξεύοιεν ὑπὲρ τῶν ὁπλιτῶν*.
[39] Xen. *Cyr*. 7.1.33, *αἵ τε ἀσπίδες πολὺ μᾶλλον τῶν θωράκων καὶ τῶν γέρρων καὶ στεγάζουσι τὰ σώματα.*
[40] In reference to their spears, Xenophon (*Cyr*. 7.1.33) writes that the Egyptians "still today use powerful, long spears" (*τά τε γὰρ δόρατα ἰσχυρὰ καὶ μακρὰ ἔτι καὶ νῦν ἔχουσιν*).
[41] Xen. *Anab.* 1.8.9, *σύν ποδήρεσι ξυλίναις ἀσπίσιν*.

are described as hoplites, or using the hoplite tactic of locking their shields together and pushing with their shoulders.[42] As these descriptions do not match contemporary depictions of Egyptian shields, Shannahan suggests Xenophon may have been confused regarding these soldiers' ethnicity, but it is likely that his description of the shields is accurate.[43]

The late antique lexicographer Hesychius may provide a clue as to what the Persians may have called these shields. He glosses the (presumably) Old Persian term *sparabarai* as being synonymous with *gerrhophoroi.*[44] It is, therefore, possible that the Achaemenids called these shields *spara,* but due to the lack of concrete evidence, we will here use Herodotus' term, *gerrha,* to describe large, rectangular shields made of saplings and rawhide. Whenever Greek authors use this term to describe a shield made with similar materials but of different dimensions, we will use the terms small or round *gerrha*.

There are numerous visual depictions of these (or similar) shields, but few from an Achaemenid context. Images of what appear to be *gerrhon*-style shields decorate several doorways in Darius' and Xerxes' palaces at Persepolis. Schmidt, who first published his findings at Persepolis, describes these as "guard reliefs."[45] In total, there are eight such images extant at Persepolis, although they are all nearly identical. Two reliefs, facing each other, were carved into a doorway between two "guard rooms" in the throne hall of the palace; two are in a doorway of the "Harem;" and two each are in the palaces of Darius and Xerxes.[46] In each of these reliefs, two guards are depicted, each holding a long spear. The

[42] Xen. *Anab.* 1.8.9, *ὁπλῖται...Αἰγύπτιοι δ'οὗτοι ἐλέγοντο εἶναι*; Xen. *Cyr.* 7.1.33, *πρὸς τὸ ὠθεῖσθαι συνεργάζονται πρὸς τοῖς ὤμοις οὖσαι. συγκλείσαντες οὖν τὰς ἀσπίδας ἐχώρουν καὶ ἐώθουν*.
[43] Shannahan 2014: 67-68.
[44] Hsch. s.v. *σπαραβάραι*; Malandra 1973: 285; Sekunda 1988: 69.
[45] Schmidt 1953: 132.
[46] Schmidt 1953: 132, Plates 94 and 95 (Throne Hall); 257 (Harem, not pictured); Plates 136-137, 176-177 (Palaces).

foremost of each pair also holds a large, rectangular shield. The incised pattern visible on the shield suggested to Schmidt that it represented one of the "wicker shields" mentioned by Herodotus.[47] These reliefs do not depict scenes of action, so they do not provide direct evidence for the Achaemenid use of the shields, but it is interesting that in each case, only the soldier in front holds the shield. The pairing of shield-bearer and spearman suggests that these shields were meant to protect multiple people. This conclusion is supported by Neo-Assyrian reliefs, which show shield-bearers protecting lightly armoured archers and slingers.

Two fifth century B.C. Greek vases, the Oxford Brygos Cup and a red-figure skyphos in Berlin, show *gerrha* in scenes of combat between Greeks and Persians.[48] A third vase, the Basseggio Kylix, may show the profile of a *gerrhon* propped up on a stand.[49] If this last image is in fact a *gerrhon,* it is the only other source that coincides with the Persian use of *gerrha* described by Herodotus. The Oxford Brygos Cup shows a Persian soldier armed with a spear and *gerrhon*.[50] The Berlin skyphos also depicts an Achaemenid soldier carrying a *gerrhon* who is not otherwise armed.[51] Greek depictions of these shields show a checkerboard pattern of alternating light and dark sections. This pattern is not identical to the chevron or diamond shape of the excavated shields, described below, but the same construction technique can produce both designs. As far as we know, these shields were not painted.[52] The pattern is produced by passing staves through slits in the rawhide, so that the

[47] Schmidt 1953: 132.
[48] Bovon 1963: Fig. 2 (Oxford Brygos Cup) and Fig. 14 (Berlin skyphos); Miller 2006/7: 111.
[49] Gerhard 1847: 50-52; Plate CLXVI.
[50] Bovon 1963: 581; Barrett and Vickers 1978: 21.
[51] Bovon 1963: 585.
[52] James 2004: 185, in reference to the shields from Dura Europos. Medvedskaya 2015: 160 incorrectly states that the pattern on these shields was painted.

wood and the hide are alternatingly visible. If the slits are cut in diagonal lines, they produce a chevron or diamond pattern in the finished shield.

Shields of this shape are not known from earlier examples of Greek art, and are likely an accurate representation of Achaemenid tall shields from the early fifth century B.C. Bovon convincingly argues that these depictions are based on the experiences of Greek soldiers during the Greco-Persian wars of the early fifth century B.C.[53] Another possibility is that the artists who created these images saw booty from the Greek battles against the Persians which had been dedicated in a temple. The travel writer Pausanias, writing in the second century A.D., describes such booty that had been dedicated in the temple of Athena Polias in Athens, and was still visible in his time. Although Pausanias is here describing votives that are "worthy of note," such as the *thorax* of Masistius and Mardonius' *akinakes*, it is possible that less valuable items, such as wooden shields, were also dedicated but not mentioned in our sources.[54]

Finally, archaeologists have excavated shields constructed using the same technique as *gerrha.* Unfortunately, none of these shields were found in an Achaemenid context, but the context of each find has some relationship to the Achaemenids. The earliest shield was found in one of the Pazyryk graves in Siberia. The chronology of these tombs is subject to debate. Rudenko used carbon and tree-ring analysis to date these tombs to the late fifth century B.C.[55] More recently, Hiebert has suggested that the tombs could be as late as the third century B.C., well after the fall of the Achaemenid Empire.[56] Although the tombs were

[53] Bovon 1963: 595.
[54] Paus. 1.27.1, *ἀναθήματα δὲ ὁπόσα ἄξια λόγου*. According to Herodotus (9.22), Masistius' armour was made of gold scales.
[55] Rudenko 1970: xxxvi.
[56] Hiebert 1992: 122.

outside the limits of Achaemenid imperial power, and may postdate the Empire by a century, the similarity between the excavated shields and those depicted on Greek and Achaemenid art suggests that the Pazyryk shields are a useful comparison in a study of Persian *gerrha.*

Excavations at the site of Dura Europos have also found *gerrhon*-style shields. These shields date to AD 256-7, and are therefore much later than the Achaemenids. It is not clear whether these shields were used by Sassanian soldiers or by Roman auxiliaries. The construction techniques used in the shields from Dura Europos and from the Pazyryk tombs, found in such different contexts and separated by hundreds of years, are nearly identical.[57] The similarity suggests that such shields were used by numerous ancient Near Eastern civilizations, including the Mari, the Egyptians, the Assyrians, and the Persians, and were not bound to one culture or era. Furthermore, these shields evidently remained in use long after the fall of the Achaemenid Empire. Perhaps most importantly, the excavated shields bear a striking resemblance to the *gerrha* that are depicted on Greek ceramics and earlier Near Eastern art, which further suggests that the extant shields can provide useful evidence for the Achaemenid *gerrha.*

DESIGN AND CONSTRUCTION

It is now necessary to examine the design and construction of Achaemenid *gerrha* in order to understand their physical properties and how they were used in combat. According to Liddell, Scott, and Jones' Greek lexicon, the Greek term *gerrhon* can describe "anything made of wicker-work," but in the context of military equipment, it refers to an "oblong

[57] James 2004: 185.

shield, covered with ox-hide."[58] The term wicker, when applied to these shields, is incorrect and misleading. The shields are not made of wicker, nor are they "covered with ox-hide." Many modern definitions of wicker emphasize the small diameter of the material, and the word "twig" is frequently used as a synonym.[59] The staves used in the construction of *gerrha* are considerably thicker than twigs. The term "wicker" is particularly misleading in modern scholarship, as it often evokes the thought of decorative furniture.

Various late Greek authors, particularly lexicographers, include entries on *gerrha*, and frequently include both physical descriptions of these shields and the tactics associated with them. The shields are frequently described as plaited or woven (*plektai*), and this description coincides with the excavated Pazyryk shields and those from Dura Europos.[60] These sources, and some references from historical sources, indicate that *gerrha* were made of raw ox hide, sometimes with the fur still attached. Xenophon twice describes the shields as "shaggy" (*dasea*) and further specifies that they were made of untanned ox hide (*ōmoboeia*).[61] Branches from a species of willow, called in Greek *oisua*, or similar sized staves were woven through the rawhide to form the shield.[62] Again the definition found in the Greek lexicon is incorrect, as the wooden component of the shield is not covered in hide, but rather woven through it.

---

[58] LSJ, sv. *γέρρον*.
[59] The definitions of "wicker" in the Oxford English Dictionary, the Cambridge English Dictionary, the Collins English dictionary, and Merriam-Webster's dictionary all contain the word "twig."
[60] Phrynichus, s.v. *γέρρα*; Lexica Segueriana s.v. *οἰσύϊνα γέρρα*; Athenaeus Mechanicus *De Machinis* 18.
[61] Xen. *Anab.* 4.7.22 and 5.4.12.
[62] A 12th c. Byzantine encyclopaedia, known as the *Etymologicum Magnum* (s.v. *οἰσύα*), writes that the "*oisua* is a type of willow from which they weave baskets, and also *gerrha*." The *Lexica Segueriana* (s.v. *οἰσύϊνα γέρρα*) defines the *gerrhon* as "a shield woven from willows (*πλεκτὰ σκουτὰ ἀπὸ οἰσύας*). Lucian's *Dialogi mortuorum* (12.2.) also describes willow *gerrha* (*γέρρα οἰσύϊνα*).

Comparative evidence from the Pazyryk tombs, dating perhaps to the end of the Achaemenid Empire, and from Dura Europos indicates that these shields were more substantial than the term "wicker" might suggest.[63] They were in fact constructed from staves approximately 1.5 cm thick. When staves are held together by a sheet of rawhide, the resulting shield can be incredibly durable. It is possible that the Greek term "wicker" was originally coined to disparage these shields, as they were constructed from thin staves rather than large pieces of planed lumber, as the Greek *aspis* was. The large hoplite shield was such an integral part of Greek warfare that it is easy to suppose that Greek soldiers would have disparaged troops who used another type of shield. This may have been particularly true in the context of the Greco-Persian wars, during which notions of Greek identity began to form in opposition to the Persian "other." Furthermore, compared to the Greek *aspis,* the Persian *gerrha* appear light and unimposing. It should not be surprising, therefore, that some scholars have been misled by Herodotus' term *gerrhon,* and the LSJ's description of "wicker" shields, and have consequently underestimated the efficacy of such shields, particularly against missile fire.[64]

Herodotus' description suggests that what he calls *gerrha* are large, rectangular shields of the type we see represented on Greek vase painting from the first half of the fifth century B.C., and are very similar to the standing shields depicted in Neo-Assyrian reliefs. This supposition is confirmed by Pausanias. In his description of Philopoemen's military

[63] James 2004: 185; Rudenko 1970: 219.
[64] Herodotus writes that the greatest Persian military weakness was their lack of defensive weaponry (Hdt. 9.62, *λήματι μέν νυν καὶ ῥώμῃ οὐκ ἥσσονες ἦσαν οἱ Πέρσαι ἄνοπλοι δὲ ἐόντες καὶ πρὸς ἀνεπιστήμονες ἦσαν καὶ οὐκ ὅμοιοι τοῖσι ἐναντίοισι σοφίην*). Green 1996: 36, attributes the Greek victory at Marathon to "Greek discipline, Greek tactics, Greek weapons and body-armour." He goes on to specify that the battle "was long spear against javelin, short sword against dagger or scimitar, bronze-lapped cuirasses against quilted jerkins, bronze-faced shields against wicker targets."

reforms, he writes that "while they (the Achaeans) used to carry short spears and oblong shields, similar to the Celtic 'door' or the *gerrha* of the Persians, he forced them to wear cuirasses and put on greaves, as well as to use the Argive *aspis* and long spears."[65] Reliefs from Persepolis also depict soldiers with large, rectangular shields in front of them.[66] Herodotus states that the shields formed a barrier (*herkos*) between the Greek and Persian troops. It is likely, based on Herodotus' text and the Basseggio Cup, that these shields were sometimes held upright with a stand.[67] The most likely shape for shields used for such a purpose would be square or rectangular, as this shape would have flat edges upon which to rest the shield in the ground. A rectangular shape is more likely than a square in this context for two reasons. The Basseggio Cup, the Oxford Brygos Cup, the Berlin *skyphos*, and reliefs from Persepolis suggest that the shields were likely as tall as, or nearly as tall as, the men whom they were meant to protect. Short shields would offer little protection to an archer, even if kneeling, and particularly against the ranged attacks of enemy archers.

The second reason that a rectangular shape is likely is the nature of the material used. As the shield was constructed using wood and rawhide, the size and shape is largely dependent on that of the materials. Our reconstructions of *gerrha* have shown that squaring the hide produces the best results, as the pieces of a hide that formed the animals legs are difficult to incorporate into a shield design. The resulting hide is naturally a rectangular shape. Xenophon suggests that the rawhide commonly came from an ox.[68] These hides would

[65] Paus. 8.50.1, *φοροῦντας γὰρ μικρὰ δοράτια καὶ ἐπιμηκέστερα ὅπλα κατὰ τοὺς Κελτικοὺς θυρεοὺς ἢ τὰ γέρρα τὰ Περσῶν, ἔπεισε θώρακάς τε ἐνδύεσθαι καὶ ἐπιτίθεσθαι κνημῖδας, πρὸς δὲ ἀσπίσιν Ἀργολικαῖς χρῆσθαι καὶ τοῖς δόρασι μεγάλοις*.
[66] Schmidt 1953: 132, Plates 94 and 95 (Throne Hall); 257 (Harem, not pictured); Plates 136-137, 176-177 (Palaces).
[67] Herodotus' description of the barrier suggests that these shields could be free-standing. The Basseggio Cup also shows a *gerrhon* in profile that rests on a stand.
[68] Xen. *Anab.* 4.7.22; 5.4.12.

have been larger and more durable than hides from other livestock.[69] Hides from other animals may have been used on occasion, particularly when the army was in the field. This type of shield does not require specialized skill to produce, so it is conceivable that soldiers could have made their own from materials that would be readily available in many locales. If the army employed specialist shield-makers, the greatest advantage would have been the speed at which familiar hands could have produced these items.

Finally, several ancient authors describe *gerrha* as rectangular in shape, although all of these sources are considerably later than the Achaemenid era. Strabo describes Persian soldiers who are "armed with a rhombus-shaped *gerrhon*."[70] The Byzantine *Etymologicum Magnum* writes that *gerrha* were "not circular, as are *aspides*, but quadrangular."[71] A rectangular shape is also implied by Pausanias, who compares the Persian *gerrhon* to a Celtic shield-type known as the "door."[72]

There may also have been *gerrha* that were rounded or pointed on one of the short sides. One of the Dura Europos shields and the Pazyryk shields are such a shape.[73] Both James and Rudenko publish images of these shields with the curved side on the bottom. Depictions of this shield type in Egyptian art suggest that they were held with the curved side up.[74] If the flat side was on the bottom, the shield would be more stable when rested on the

[69] The hides of domesticated cow species are too thick for most modern applications, and so are split into more manageable layers (Michel 2014: 31).
[70] Strab. 15.3.19, *ὁπλίζονται δὲ γέρρῳ ῥομβοειδεῖ.*
[71] EM s.v. *οἰσύα, οὐ κυκλοτερῆ δὲ, ὡς αἱ ἀσπίδες, ἀλλὰ τετράγωνα.*
[72] Paus. 8.50.1.
[73] James 2004: Fig. 112; Rudenko 1970: 219; Fig. 107.
[74] Gorelik 1993: Fig. 63.

ground. The Dura Europos shields also show greater wear on the flat edge, which further supports the supposition that the flat edge was the bottom.[75]

The shields from Dura Europos provide evidence that the staves were worked before the shield was made. The shield-maker stripped the staves of bark, and used a knife or other sharp tool to make the staves more even, particularly in places from which other branches grew. This process gave the shield a more uniform appearance, and also allowed the staves to be placed as closely together as possible. It would have been optimal to have the staves tight, as this decreases the likelihood that an arrow or another projectile could pass through the shield and injure the person behind it. The shield-maker attached staves horizontally to the back of the excavated shields, which increased the rigidity of the shield. He also folded over and tied the hide at the top, bottom, and edges. Remains of twine are still visible in some places on the shield excavated at Dura Europos.[76]

EXPERIMENTS

Study of the visual and literary evidence for *gerrha* shields can only take us so far. For an increased understanding of how these shields functioned, it is necessary to experiment with techniques for their construction and to conduct ballistic tests on the finished product.[77] These tests allow us to comment further upon the effectiveness of such shields on an ancient battlefield. Such reconstruction has a long history in ancient warfare studies. Recently

[75] John Lee: personal communication.
[76] John Lee provided photographs of these shields, now in the Yale Art Gallery, which show the remains of twine.
[77] These experiments took place in the summers of 2014 and 2015 in Ontario, Canada. Jonathan Cianci, P. Eng., provided invaluable assistance with reconstruction and ballistics tests.

Aldrete, Bartell, and Aldrete made use of experimental archaeology in order to study the construction and efficacy of linen body armour. They include in their study some helpful guidelines, the aim of which is to increase the reliability of the experiment. As historical experimentation is not often used among academic historians, it is worthwhile to quote their suggestions before we proceed with a discussion of our experiments. According to Aldrete et al., in order for such an experiment to be useful, it should: be based on primary sources and artefacts; follow standard experimental practices regarding methodology and replicability; provide clear and explicit information regarding materials, procedures, and assumptions; and stress that all conclusions are possibilities, not certainties.[78] With these principles in mind, we can discuss our own experiments into the construction and efficacy of *gerrha* shields.

Our first two attempts at reconstruction were misled by the Greek term, *gerrhon,* translated into English as "wicker," used to describe these shields. Nearly every scholar who discusses these shields uses the term "wicker" to describe their construction.[79] Wicker can refer to thin pieces of various pliable plant species, most commonly rattan (a variety of plants from the subfamily *Calamoideae*), willow (*salix*), and dogwood (*cornus*). For our first attempt to create a *gerrhon* shield, we obtained samples of rattan, as well as leather with which to bind or cover the wood. As these experiments were conducted in Ontario, Canada, we did not have access to wild rattan, and so we purchased thin pieces of rattan. We also purchased fully-tanned cow leather. These materials were all too thin to form an effective shield, although it should be noted that the rattan was intentionally chosen to be thin and pliable, as we still expected the shield to be made of "wicker." We first punched small holes

[78] Aldrete et al. 2013: 8.
[79] Rawlinson 1867: 118-119; How 1923: 123; Olmstead 1939: 321 n. 32; Schmidt 1953: 132; Henshaw 1969: 9; Evans 1993: 286; Green 1996: 36.

in the leather at the top and bottom of a square, and attempted to weave the material through these holes. The rattan was too flimsy, and would often break as we pushed them through the leather. As the leather was fully-tanned, it did not stretch or contract. For this reason, there were noticeable gaps between each piece of osier which compromised the integrity of the shield. This experiment showed that the term "wicker" does not adequately describe *gerrhon* shields, and so prompted us to re-evaluate our assumptions about the efficacy of these shields.

In our second attempt at reconstruction, we used a different technique. Some of the shields depicted in Neo-Assyrian art appear to have been banded together. The material of the bands is not evident, but leather or metal are possibilities. Based on this evidence, we cut thin strips of leather, and tied bundles of rattan together that were approximately 4 cm in diameter. We then attempted to attach these bundles to one another with longer leather thongs. This technique proved very difficult, as when we tightened the bundles together, they would not stay flat. We then placed a piece of wood, approximately 2 cm in diameter, along the top and bottom which acted as a frame. This method of construction was time consuming, and although the end result had the right shape, it was not a functional shield. The rattan was too thin, even when bundled, and the pattern of the leather and rattan did not resemble the artistic depictions of *gerrha.* Although we had not yet constructed a functional *gerrhon*, this experiment convinced us that the shields depicted in Persian and Greek art were not wicker, but something more substantial. Furthermore, tanned leather lacks the elasticity needed to bind a shield tightly, and so descriptions of these shields as leather and wicker are entirely incorrect.

When these two attempts had failed, we reviewed the available archaeological evidence, particularly shields of similar construction but of a later date, and came to two important conclusions. First, these shields were not constructed from "wicker," but rather thicker staves, approximately 1.5-2.5 cm in diameter. Sekunda and Medvedskaya specify that osiers were used.[80] "Osier" is not a precise term, but usually refers to willow or dogwood species. The use of willow is also attested in an Assyrian text.[81] We harvested red-osier dogwood (*Cornus sericea*) and weeping willow (*Silex babylonica*) from the wild.[82] It is possible that shield-makers used young trees or saplings, as they would be the right size and shape, and their pliability would cause them to bend and slow a projectile, rather than simply breaking. The use of green wood also replicates shields made on campaign, as soldiers would not have had time to dry staves in the field. Second, they were not tied with or woven through leather, but rawhide. The larger diameter of the staves provided greater rigidity than we had achieved in our first design, and the wet rawhide contracted as it dried, thus bringing the staves closer together than before. Shields from Dura Europos show that the staves were shaved to provide greater uniformity, which ensured that they were as close as possible to each other.

For our third experiment, we used the rawhide of a wild white-tailed deer, obtained by hunting several years earlier. As we saw earlier, ancient shields were commonly made of oxhide. While these hides are thicker than that of a deer, the shield's strength comes largely from the wood, and the rawhide's primary purpose is to hold the wood together. For this

[80] Sekunda 1988: 69; Medvedskaya 2015: 160.
[81] CAD s.v. *arītu*.
[82] The weeping willow is not native to North America, but is an introduced species found throughout Ontario. Despite its Latin name, the tree does not originate in Mesopotamia, but China (Dirr 2011: 735).

reason, we do not think using the hide of a deer, which is more readily available in our area, compromised the integrity of the experiment. The deer hide was large enough to make a sample that was half the height of a *gerrhon*, approximately 60 cm square. While this is not as large as ancient *gerrha* would have been, a small scale replica allowed us to learn a great deal about the construction and ballistic properties of these shields.

We first nailed the hide to a board, and trimmed the uneven edges to make a rectangle. After squaring the hide, we soaked it in water overnight. This process loosened the hide, and provided the needed elasticity. We stretched the hide over a board, secured it in place, and cut the slits through which we would weave the willow. For this shield, we decided not to replicate the patterns known from excavated shields and artistic representations, and cut four straight lines of slits approximately 2.5 cm long and the same distance apart. It was useful here to use a tape measure, so that the slits were evenly spaced, and the top, middle, and bottom slits were aligned. Ancient shield-makers would have used a different technique to ensure even space between each stave. We shaved any uneven sections of the staves that would have prevented them from sitting close together, and inserted them through the slits in the wet rawhide. It was necessary to complete this process before the hide dried out, and we would rub water on the hide as we worked. It was often quite difficult to pass the staves through the slits. While still wet, we folded the rawhide over the edges and secured it together with strips of rawhide cut during the trimming process. We inserted two further staves running perpendicular to the rest of the shield to ensure that it did not twist as it dried, and left it overnight. Due to the need for overnight soaking and drying of the hide, the entire process took place over three days. If one were using the hide of a recently slaughtered animal, it would be necessary for the hide to dry into rawhide for a few days before the

project could commence. The time of actual labour was less than four hours, and armies who were practiced in this process could work considerably faster. The long time it took us to build a *gerrhon* suggests that it would have been more difficult than we previously hypothesized for ancient armies to build them on campaign.

For the ballistics test, we used a modern recurve bow with a draw weight of 60 lbs, which is probably considerably heavier than that of an ancient bow. We shot the shield with both field tips and broadheads, as arrowheads similar to both types are known from ancient contexts.[83] The field tips are similar to bodkin-style arrowheads, which were occasionally used by Achaemenid archers. Modern broadheads do not have an exact parallel in the ancient world, but their cross-section is similar to two common types of Achaemenid arrowhead, those with triangular or pyramidal cross-section, and those with leaf-shaped blades.[84] The field tips penetrated the furthest, approximately 8 cm, and their shape is somewhat similar to ancient arrowheads designed to pierce armour. The broadheads only penetrated approximately 3 cm.

There is little consensus among scholars regarding the range of ancient bows, and estimates have been as low as 64 metres and as high as 600 metres.[85] McLeod, after systematic review of the ancient evidence, concludes that ancient archers were highly accurate at 50 metres, and effective at 160-175 metres.[86] We stood 30 yards away from the shield as we shot, which is considerably shorter than the estimated maximum range of

[83] Erdmann 1973: Fig 2.2.
[84] These arrowheads correspond to Erdmann's types C and D1.
[85] See McLeod 1965: 1, n. 1 for a bibliography on the range of ancient bows.
[86] McLeod 1965: 8.

Achaemenid bows. We chose this distance partly due to the limitations of the test site, but also to ensure that we hit the shield with each shot.

In many ways, the prototype shield was inferior to its ancient counterpart. A white-tailed deer hide is considerably thinner than that of a water buffalo or ox, and the end result would have been larger and thicker. Likewise our bows were considerably better than those of the ancients, with heavier draw, more sophisticated metallurgy for the arrowheads, and we were shooting from a much closer distance. Nevertheless, arrows were barely able to penetrate the shield, and certainly would not have been fatal to one standing behind such a shield. Even if the soldier's body were pressed against the shield, he would more likely be wounded than killed.

These tests allowed us to understand the ancient use of *gerrhon*-style shields in ways that would not have been possible using traditional historical methods. It is apparent that these shields were much more effective than modern perceptions of their name "wicker" might suggest. Even at close range, such shields were able to stop arrows almost completely. The materials from which these shields were constructed were readily available to an army, even in the field. The materials would also have been much cheaper than those used in other shield-types. They would have been easier to make than heavier wooden, or wood and metal shields. The only tools that are required are a sharp knife and an axe. Very little skill in woodworking or tanning is necessary, and no knowledge of metallurgy. It therefore seems as though these shields had many advantages over other shield types. Materials would have been plentiful, cheap, and easy to use, and the shields produced would protect the troops well against missile fire. Perhaps their greatest advantage was their weight, as a lighter shield

would be more manoeuvrable and less physically taxing on the user, particularly during a long battle.

TACTICAL USE

We now turn to the tactical use of *gerrhon* shields in order to understand how these shields fared in ancient battles, and why the Persians did not use the shield-wall technique in other battles against Greek armies. Herodotus elaborates upon the Persian use of *gerrhon* shields as they are an important part of the Persian army's strategy at the battles of Plataea and Mycale, both fought in 479 B.C. Since Herodotus is a crucial source for the study of Achaemenid *gerrha,* it is worthwhile to present his description of these shields in full detail.

Herodotus tells us that, immediately prior to the battle of Plataea, the Greek troops under Pausanias and the Persian troops under Mardonius encamped opposite each other.[87] While Pausanias sacrificed to receive a favourable omen for attack, the Persian troops "made a barricade of their shields, and fired arrows without mercy."[88] Herodotus' account continues,

> While he (Pausanias) was still praying, the Tegeans were the first to rouse themselves and charge the barbarians, and immediately after Pausanias' prayer, the omens turned out favourable to the Spartans who were sacrificing. And at that time, they also charged the Persians, and the Persians opposing them put down their bows.[89] At first

[87] Important studies of the battle of Plataea include Pritchett (1957) *New Light on Plataia*, Wallace (1982) *The Final Battle at Plataia*, and Konijnendijk (2012) *'Neither the Less Valorous nor the Weaker' Persian Military Might and the Battle of Plataia.*
[88] Hdt. 9.61.3, *φράξαντες γὰρ τὰ γέρρα οἱ Πέρσαι ἀπίεσαν τῶν τοξευμάτων ἀφειδέως.*
[89] Macan's commentary on this passage notes that elsewhere in Herodotus (3.128, 9.16) the verb *μεθίημι* means "to drop" or "let fall."

> the fighting occurred around the shields, but when these had fallen over there was a fierce and lengthy battle at the temple of Demeter, until it came to close quarters. The barbarians then grabbed the spears (of the Greeks) and broke them off.[90]

Herodotus also describes the Persian soldiers' use of *gerrha* at the battle of Mycale. First, the Persians built a fortified camp, and then "brought their *gerrha* together to form a defense" outside of the camp.[91] Herodotus then tells us that,

> So long as the Persian shields were upright, they defended themselves and in no way had the worse of the fight. But when the Athenian army and those next to them encouraged one another, that the achievement be theirs and not the Spartans', and fought more eagerly, then the battle changed. Forcing their way through the *gerrha*, they charged *en masse* and fell upon the Persians, who received them and defended themselves for a long time, until finally they retreated behind the wall (of the camp)."[92]

Herodotus is the only author explicitly to describe their use by Achaemenid troops in a historical setting. Both instances are pitched battles, not sieges. In Herodotus' descriptions of Persian siege warfare, there is no mention of *gerrha,* nor are tactics described that might

---

[90] Hdt. 9.62, *ταῦτα δ' ἔτι τούτου ἐπικαλεομένου προεξαναστάντες πρότεροι οἱ Τεγεῆται ἐχώρεον ἐς τοὺς βαρβάρους, καὶ τοῖσι Λακεδαιμονίοισι αὐτίκα μετὰ τὴν εὐχὴν τὴν Παυσανίεω ἐγίνετο θυομένοισι τὰ σφάγια χρηστά. Ὡς δὲ χρόνῳ κοτὲ ἐγένετο, ἐχώρεον καὶ οὗτοι ἐπὶ τοὺς Πέρσας, καὶ οἱ Πέρσαι ἀντίοι τὰ τόξα μετέντες· ἐγίνετο δὲ πρῶτον περὶ τὰ γέρρα μάχη· ὡς δὲ ταῦτα ἐπεπτώκεε, ἤδη ἐγίνετο μάχη ἰσχυρὴ παρ' αὐτὸ τὸ Δημήτριον καὶ χρόνον ἐπὶ πολλόν, ἐς ὃ ἀπίκοντο ἐς ὠθισμόν· τὰ γὰρ δόρατα ἐπιλαμβανόμενοι κατέκλων οἱ βάρβαροι.*

[91] Hdt. 9.99, *αὐτοὶ δὲ συνεφόρησαν τὰ γέρρα ἕρκος εἶναι σφίσι.*

[92] Hdt. 9.102, *ἕως μέν νυν τοῖσι Πέρσῃσι ὄρθια ἦν τὰ γέρρα, ἠμύνοντό τε καὶ οὐδὲν ἔλασσον εἶχον τῇ μάχῃ· ἐπείτε δὲ τῶν Ἀθηναίων καὶ τῶν προσεχέων ὁ στρατός, ὅκως ἑωυτῶν γένηται τὸ ἔργον καὶ μὴ Λακεδαιμονίων παρακελευσάμενοι, ἔργου εἴχοντο προθυμότερον, ἐνθεῦτεν ἤδη ἑτεροιοῦτο τὸ πρῆγμα. Διωσάμενοι γὰρ τὰ γέρρα οὗτοι φερόμενοι ἐσέπεσον ἀλέες ἐς τοὺς Πέρσας, οἱ δὲ δεξάμενοι καὶ χρόνον συχνὸν ἀμυνόμενοι τέλος ἔφευγον ἐς τὸ τεῖχος.*

allow one to suggest that *gerrha* were used. Herodotus describes several sieges undertaken by the Persians in his *Histories,* but he is frustratingly vague regarding the details of weapons and siege engines. No specific types of soldiers, such as archers or shield-bearers, are mentioned for the sieges of Sardis, Babylon, or Eretria. Only in his description of the siege of the Athenian Acropolis does Herodotus explicitly mention that archers were involved. [93] No siege engines are otherwise mentioned, and successful sieges are always due to a ruse, not superior equipment. It is therefore impossible to be certain, although Neo-Assyrian evidence suggests that the Achaemenid armies likely used such shields to protect their archers during sieges. If Herodotus failed to mention *gerrha* being used in such contexts, this can be attributed to the lack of detail in his descriptions of Persian siegecraft.

At Plataea, Herodotus writes that "the Persians made a barricade (*phraxantes)* of their shields, and fired arrows without mercy."[94] At Mycale, they "brought their shields together to form a barricade (*herkos*)."[95] It is clear from the words he uses to describe this process, *phrasso* and *herkos,* that Herodotus imagines that the Persians made a solid barrier of their shields. Herodotus' use of the verb *phrasso* in other contexts suggests that it meant to him a solid barrier. Three times he uses this word to describe a fortified position.[96] Once it is used to describe the Egyptian practice of repairing a dam every year, and the fact that the dam is meant to hold water surely implies a solid barricade.[97] One final time it is used to describe the Persian fleet's maneuver to cut off a possible escape route for the Greek ships.[98]

[93] Hdt. 1.84 (Sardis, under Cyrus II); 3.150 (Babylon, under Darius); 6.101 (Eretria); 8.52 (Athens).
[94] Hdt. 9.99, *φράξαντες γὰρ τὰ γέρρα οἱ Πέρσαι ἀπίεσαν τῶν τοξευμάτων πολλὰ ἀφειδέως*, Hdt. 9.61.
[95] *αὐτοὶ δὲ συνεφόρησαν τὰ γέρρα ἕρκος εἶναι σφίσι*.
[96] Hdt. 5.34; 7.215; and 8.51
[97] Hdt. 2.99.
[98] Hdt. 8.7.

The other term Herodotus uses, *herkos,* is most often used by him to describe a defensive fence or palisade, often used to protect beached or wrecked ships.[99] Once, the term is also used to describe the fence around a temple precinct, which must be a solid wall as it is described as having been "jumped over."[100] *Herkos* can also mean a lasso or net, which could suggest that these shields were arranged in a looser formation. This meaning is only attested in Herodotus' text once.[101] The parallel use of *phrasso* and *herkos* to describe the formation made by these shields suggests that Herodotus means to tell us that the shields formed a solid wall. If Herodotus' story is credible, and the *gerrha* were formed into a continuous wall of shields, how then did the Persian archers fire at their enemy? Two passages from Xenophon suggest an answer. In his *Cyropaedia,* Xenophon describes Persian "hoplites" armed with *gerrha* who make a circular wall around the other troops.[102] Here Xenophon uses the word *teikhos* to describe the formation, and this word suggests that Xenophon is describing an unbroken wall of shields.[103] Shortly after, Xenophon describes the tactics used by those inside the shield wall, and states that "if anyone attacked, the archers and lancers would be ready to let fly their javelins and arrows over the hoplites."[104] These descriptions by Xenophon, although in a fictional setting, suggest that he believed archers could fire over *gerrha* when they were arranged in a continuous wall. The Dura Europos shields were 1-1.5 metres tall, so if archers stood upright behind *gerrha,* they would have been able to see over the shields in order to aim. The shields could have protected the archer below the shoulders,

[99] Hdt. 7.191; 9.96.
[100] Hdt. 6.134.
[101] Hdt. 7.85.
[102] Xen. *Cyr*. 8.5.11
[103] The LSJ, s.v. *τεῖχος*, defines the term as a "wall, esp. city-wall," "fortification, castle," or a "walled, fortified town or city."
[104] Xen. *Cyr*. 8.5.12, *οἱ τοξόται καὶ οἱ ἀκοντισταί, εἴ τινες προσίοιεν, ἐξ ἑτοίμου ἀκοντίζοιεν καὶ τοξεύοιεν ὑπὲρ τῶν ὁπλιτῶν.*

and left only a small target exposed. In this instance, archers would not need to fire indirectly over the shield, but could aim and shoot directly at their target.

Herodotus' description of *gerrha* at Plataea and Mycale strongly suggests that the Persian troops used a stand to hold their shields upright. We have already examined Herodotus' description of the shields being made into a defensive barricade. This barricade suggests that he shields were able to stand on their own. At the battle of Mycale, Herodotus writes that the Persians fared well so long as their *gerrha* remained upright.[105] At the battle of Plataea, there was some fighting "around the *gerrha*," but these eventually fell over.[106] Furthermore, the Basseggio vase, which depicts a combat scene between Greek and Persian soldiers, appears to show the profile of a large rectangular shield supported by a stand. This evidence suggests that Persian *gerrha* were equipped with a stand and could be propped up to form some type of defensive structure. This conclusion suggests another difference between the Assyrian and Achaemenid use of large rectangular shields.[107]

There is little evidence to suggest that the Achaemenid army employed shield-bearers, a position known from numerous Neo-Assyrian reliefs that depict large rectangular shields. Several texts related to the Murašûs, a family of entrepreneurs active in Nippur during the late fifth century B.C., describe the *taššalīšānu.* This term literally means "third man," but may have come to mean shield-bearer.[108] The position of "third man" originally

[105] Hdt. 9.102.
[106] Hdt. 9.62.
[107] Dezső 2006: 105 suggests that the Assyrians used wooden or wicker siege-shields that could be placed tightly together to form a "siege wall," but it is unclear whether shield-bearers held the shields together, or if they were supported by a stand. No Assyrian reliefs show this formation, so he may be using Herodotus' description of *gerrha* as comparative evidence. As far as I know, there are no Assyrian images of such shields being supported by stands.
[108] Stolper 1985: 78 gives both translations.

referred to chariot warfare. Initially, chariots were operated by two men: a driver and an archer. The Assyrians added a third man to their chariot teams, who was responsible for defending the driver and archer with a shield, and so the term came to mean "shield-bearer." Tuplin notes, however, that by the Achaemenid period the term may have lost its military meaning, as *taššalīšānu* appear in late Babylonian texts outside of military contexts.[109] An Assyrian text from the reign of Assurbanipal suggests that the Elamites used shield-bearers in conjunction with archers in their armies, as the text reads, "the bowmen and shield-bearers whom I had taken from Elam I added to my standing army."[110] This text suggests that shield-bearers were used in pre-Achaemenid Iran, but there is not strong evidence to suggest that the Achaemenid armies made use of this position.

In Neo-Assyrian reliefs the shield-bearer often also carries a spear, presumably to defend the archer(s) from close-ranged attacks. The Persians seem to have used a different tactic. Herodotus writes that, when the Greeks had closed around the *gerrha*, the Persians discarded their bows and fought at close range.[111] Some Persians even grabbed Greek spears and broke them off. It would therefore seem as though the shield and spear bearers were not a separate type of troop in the Achaemenid army, as they were in the armies of the Assyrians, but that each Persian was expected to be an archer so long as the enemy was at some distance, but was required to abandon the bow in favour of a short-ranged weapon once the enemy was close. This conclusion is supported by Attic pottery, which often depicts

[109] Tuplin 1987: 224 n. 185a.
[110] CAD s.v. *arītu* 2. Streck 1916: 60 vii 2. This text could refer to bows and shields, rather than soldiers, but still suggests that the Elamite army employed both troop types.
[111] Hdt. 9.62. Herodotus uses the word *μεθίημι*, which has here been translated as "discard." The word can mean "discharge" (a ranged weapon), but we would expect the direct object in this case to be an arrow, not the bow.

Achaemenid troops with the bow and quiver of archers, while also holding the sword or battle-axe of close-ranged fighters. Persian reliefs likewise show soldiers armed with both bow and spear. Achaemenid royal ideology also emphasizes the use of both bow and spear.

It is clear from Herodotus' account that he envisioned the Persian soldiers having made a solid wall of their shields at Plataea and Mycale. What would the purpose of such a wall have been? Neo-Assyrian evidence suggests that large, rectangular shields were often used in sieges, to protect the besieging armies from enemy missile fire. Herodotus tells us that Athenian archers were stationed opposite the Persians at Plataea, and so could have been the reason for the shield wall. De Backer has suggested that Mesopotamian development of tall shields was due primarily to the fact that archers are vulnerable to missile fire, and are often lightly armoured to increase their agility.[112] Agility would have been particularly important to archers, as they would have no way to defend themselves if enemy troops were close. An archer would not likely survive a close combat situation with a heavy infantry soldier, and his best defense would be his ability to outrun his enemy.

Evidence from Neo-Assyrian reliefs suggests a ratio between two shield/spear bearers to five archers and one shield-bearer to one archer. We have argued here that the Achaemenids did not regularly use shield-bearers, but the question is still relevant to determine how many archers might conceivably be protected by a single shield. It is best to be cautious when using art as a historical source, and this is especially true when examining depictions of warfare.[113] Neo-Assyrian reliefs provide a good example of this danger. The lack of empty space in the reliefs, and the variety of action taking place in each panel gives

[112] De Backer 2011: 10.
[113] See especially Nadali 2016: 84.

the viewer a sense of how chaotic an ancient battle must have been. Nevertheless, these reliefs in no way accurately depict the scope of an ancient battlefield. Numbers of participants are greatly reduced, so instead of depicting thousands of people, there are perhaps several dozen. A small group, perhaps as few as two or three, could represent an entire division. It is therefore best not to use the numbers of individual troop-types as representative of the actual ratio of troops used in battle.

A small number of authors have examined the question of how Achaemenid troops used *gerrha* in battle, although many of these works are aimed more at general readers than scholars. Both Duncan Head and Nicholas Sekunda have argued that the Achaemenid infantry was organized in a decimal system.[114] Both believe that the shield-bearer and archer pairing known from Neo-Assyrian evidence was adopted by the Achaemenids, and that a leader of ten, known as a *dathapatis*, carried the shield, while rows of archers ten-deep fired behind him.[115] The arguments put forward by Sekunda and Head regarding the Achaemenid use of *gerrha* have been accepted by reputable, and not so reputable, scholars.[116] Despite widespread acceptance, this arrangement does not seem likely. There is little evidence to suggest that the Achaemenids borrowed the Neo-Assyrian practice of having shield- and spear-bearers to protect their archers. Herodotus tells us that, once the shield barrier was breached, the Persian soldiers discarded their bows and fought at close range. Thus it would seem as though the archers were responsible for their own defense once the fighting was at close quarters.

[114] Head 1992: 26; Sekunda 1992: 17.
[115] Sekunda 1992: 17.
[116] Reputable scholars: see Tallis 2005: 216-217; not so reputable: see Farrokh 2007: 76.

A second problem with Head's and Sekunda's hypothesis is logistical. It is not an efficient use of troops to arrange archers in rows ten-deep. Armies would have always decided between the depth and the length of their battle line. The deeper one stations troops, the shorter the length of the line. In hoplite warfare, a deep line was often desirable. Nevertheless, the most common depth of hoplite battles was eight rows deep. It does not seem likely that archers would be positioned in deeper formations than hoplites. It is ineffective to have ten rows of archers firing at the same time. It is likely that so many arrows flying through the air simultaneously would risk ricocheting off one another, thus ensuring that few arrows would reach the target. If archers fired in rounds, as early modern musketeers, it would not be necessary to have so many rows. Scholars estimate that archers could have fired at a rate of ten arrows per minute, or an arrow every six seconds.[117] If this estimate is accurate, two or three archers behind one another could maintain near continuous fire, and so stationing more archers behind them would be an ineffective use of fire power.

Finally, those in the tenth row of such an arrangement would have a difficult time. The last archer would be less able to see over the nine soldiers in front of him and the *gerrhon* to the target. It would also be necessary for him to fire indirectly, which is not impossible, but would be difficult. Finally, the archer in the back row would be stationed at some distance from the line of shields. Even at the conservative estimate of two feet between each archer, the last archer would be almost thirty feet away from the shields. At such a distance, the shield would provide no protection for the last archer in each row. A much smaller number of archers per shield is more practical, as they could all be protected, see their target, and have enough space to operate. Precise numbers are nearly impossible to

[117] Miller et al. 1986: 188.

obtain, given the state of the evidence. Even three archers per shield would likely be too crowded to maneuver effectively and remain protected by the shield. It is also possible that there were several rows of *gerrha*, with archers stationed between each shield. This would allow a deeper battle line, while ensuring that each archer was protected and had adequate room to maneuver.

CONCLUSION

The language Herodotus uses to describe the Persian use of *gerrha* at Plataea and Mycale strongly suggests that the Persians used these shields to construct an unbroken shield-wall. Xenophon describes a similar tactic in his *Cyropaedia*, and further suggests that Persian archers could fire over such a defensive structure. While the Assyrians used specialized troops known as shield-bearers to defend archers, the Achaemenid *gerrha* were probably equipped with a stand, and so could stand erect without being held by a shield-bearer. The primary purpose of these shields was to defend archers from ranged attacks, as shown by Near Eastern depictions of large rectangular shields, and numerous Greek descriptions of *gerrha*. Our experimentation shows that these shields were effective against missile attacks. Against a hoplite charge, however, these shields did not fare so well, as they could be easily pushed over or destroyed with swords and heavy spears. Their ineffectiveness against such troops may explain why we do not often hear of their use in Greek accounts of Persian warfare after 479 B.C. Nevertheless, these shields had a long history in Near Eastern warfare, are first attested nearly two millennia before the time of the Achaemenid Empire, and were also used by armies following the Achaemenid era. This continuity suggests that

they were not entirely abandoned following the Persian defeats at Plataea and Mycale, but they were likely used primarily against armies that employed large numbers of archers rather than heavy infantry. As Greek historians largely recorded details of their own interactions with the Achaemenid Persians, this may explain why they do not appear in later accounts of Persian warfare. We cannot say with certainty how the Achaemenids used *gerrha* in conjunction with archers, but suggestions that each shield defended ten archers seem erroneous. It is more likely that each shield protected one or two archers, and that when the Persians used deeper formations, troops used several rows of shields with an archer behind each shield.

CHAPTER 5

SYMBOLIC AND RITUAL WEAPONS IN THE ACHAEMENID EMPIRE

Weapons were important symbols in the art of the ancient Near East for millennia before the rise of the Achaemenid Persian Empire. As states became more complex, as happened in Egypt and Mesopotamia in the third millennium B.C., war became increasingly important to extend and protect territory. As scenes of combat were central to the ruling ideology of early rulers, weapons in the art of the period came to symbolize the ruler's power. Furthermore, hunting became a popular activity among élites, and depictions of royal hunt scenes are often ideologically related to depictions of warfare. Royal hunt scenes appear on seals from Uruk as early as the late fourth millennium B.C., and the royal figure in these early scenes wields a bow.[1] For these reasons, bows, spears, and other weapons are present in many important pieces of art from the Near East in the pre-Achaemenid period, such as the Naram-Sin stele from Mesopotamia dating to the late third millennium B.C., the reliefs of King Anubanini at Sar-i Pol, and the Elamite reliefs at Kul-e Farah in Khuzestan, Iran. These works, and presumably others no longer extant, seem to have inspired the art of the Achaemenid Empire, including the latter's use of bows and spears as symbols of royal power. The relief at Sar-i Pol in particular heavily influenced Darius Bisitun relief.[2]

In the following pages, we first provide some background on the symbolic use of weapons in the early history of the ancient Near East, especially in the kingdoms of Mesopotamia, Egypt, and Elam. We then examine the evidence for archery equipment and spears found in the monumental and private art of the Achaemenid Empire, with particular

[1] Collon 1983: Plate 19a.
[2] Root 2013: 33-35.

attention to the way in which these weapons functioned symbolically within the heartland of the empire, and what these symbols meant to the élite to whom this art was often addressed. We will then attempt to interpret the meaning of this symbolism through an analysis of Achaemenid art and, where it is useful, comparative evidence from other cultures that have used the bow symbolically. Finally, a brief discussion of the possibility that the Achaemenids used archery in ritual contexts concludes the chapter.

MODERN SCHOLARSHIP ON MARTIAL IMAGERY IN ACHAEMENID ART

Scholars who study the art of the Achaemenid Persian Empire have often commented upon the significance of martial imagery, particularly the use of bows in various visual media. Discussions of Achaemenid coinage have focused on the crowned archer. Archery is also a prominent motif in glyptic art. Scholars have questioned the identity or identities of the archers, and have variously supposed that he represents a historic king, a pre-Achaemenid or mythological king, or, most plausibly, an abstract personification of Achaemenid kingship.[3] Tuplin has convincingly argued that it is the symbolic value of the archer that matters, not his individual identity.[4] While spears are present in much art from the empire, they have drawn even less scholarly discussion than has archery. The lack of interest in spears is likely due to a general scholarly disinterest in Achaemenid weapons, as well as the ancient and modern perception that Achaemenid armies primarily employed archers.

[3] Stronach 1989: 269 (historic king); Calmeyer 1979: 310-312 (mythical king); Root 1979: 117 and Nimchuk 2002: 63 (abstract kingship).
[4] Tuplin 2014: 131.

The prevalence of the bow and the spear in Achaemenid art is clearly significant, and yet has not received a comprehensive study across all media. Many studies have focused on the various motifs found within one artistic medium. This approach has produced seminal works that have greatly illuminated our understanding of and appreciation for Achaemenid visual arts. The most comprehensive study of Achaemenid art remains Margaret Cool Root's important work, *The King and Kingship in Achaemenid Art*.[5] Although she focuses primarily on monumental, public art, Root also discusses other media pertinent to our study, such as coins and seals. Mark Garrison and Margaret Cool Root have contributed important studies on the imagery of glyptic art in the Persepolis Fortification Seal corpus, many seals of which contain images of archers.[6] Numismatic studies have focused heavily on archery, as imperially-issued Achaemenid coinage feature the image of a royal archer. David Stronach, Peter Calmeyer, Root, Nimchuk, and Tuplin have all published on the numismatic depiction of archery, and often examine comparative evidence from other media.[7]

The aim of the following pages is to collect, review, and analyze the Achaemenid depictions of archery across all media so that we may better understand how, and to what end, the Achaemenids employed military imagery. The Achaemenids used martial imagery in order to justify their imperial expansion, and to emphasize their role as defenders of the empire. Weapons were also used in hunt scenes to show the king's control of the natural world, and his ability to overcome metaphorical monsters. Élites from the empire's

[5] Root 1979.
[6] E.g. Garrison and Root 2001.
[7] Stronach 1989. "Early Achaemenid Coinage: Perspectives from the Homeland"; Calmeyer 1979. "Zur Genese altiranischer Motive. VI. Toxotai"; Root 1989. "The Persian Archer at Persepolis: Aspects of Chronology, Style and Symbolism;" Nimchuk 2002. "The 'Archers' of Darius: Coinage or Tokens of Royal Esteem?;" Tuplin 2014. "The Changing Pattern of Achaemenid Persian Royal Coinage."

periphery, in places such as Anatolia and Egypt, used these images as a way to signal their involvement in Achaemenid imperialism. Finally, symbolism of archery in particular was important to Persian religious ideas, as can be seen by the continued importance of symbolic archery in the monumental art of later Persian empires and religious texts.

WEAPONS AS SYMBOLS IN THE ANCIENT NEAR EAST

Civilizations in the ancient Near East had been using weapons as symbols in their art and inscriptions for over 2,500 years by the time of the Achaemenid Empire. As the art of these cultures, particularly those from Mesopotamia, Egypt, and Iran, was influential on Achaemenid art, we must first provide a brief history of martial imagery in the art of the Near East. By the mid fourth millennium B.C., a figure described as a "Priest King" appears in numerous images from Uruk and Elam. Often, this figure is armed, and is frequently depicted hunting and besieging cities.[8] It is not entirely clear who, or what, this figure represents. It may be a king, a mythological hero, or a personification of kingship.

The development of economic specialization in the early Mesopotamian city-states allowed some members of society to become military specialists, which eventually led to military aristocracies. The centralized power held by aristocratic warriors and priests encouraged the development of a divinely mandated martial ideology, which often presented the gods as giving military power to the ruler in order to expand and protect his territory. The

[8] Carter et al. 1992: 52, fig. 28; Hamblin 2006: 38-39.

images used to represent this ideology frequently include scenes of warfare and hunting, royal figures and deities, and, most importantly to our current study, weapons.[9]

The Akkadian kings who ruled in Mesopotamia in the late third millennium B.C. depicted themselves as great warriors. This is particularly true of Sargon I and his grandson Naram-Sin. The so-called Victory Stele of Naram Sin, now in the Louvre, offers an early use of weapons as ideological symbols. The king, who is approximately twice the height of the other figures, holds a bow turned backwards in one hand and a spear in the other. Defeated enemies lie at his feet, and one looks as though he has very recently been struck by a javelin. The backwards bow remained a symbol into the Assyrian period, over 1,000 years later, and may signify that the king has eliminated a threat to his empire.

In Akkadian texts beginning in the early second millennium B.C., we begin to see the expression "to break the weapon," as a form of curse. An inscription of the king Samši-Adad I, dated ca. 1800 B.C., ends with the line, "whoever (mistreats this inscription), may the goddess Ištar, my mistress, extinguish his sovereignty, break his weapons, cause his manhood to dwindle away, and hand him over to his enemies."[10] In the later second millennium, the Middle Assyrian king Tukulti-Ninurta, ends several of his inscriptions with a similar curse, as he writes, "As for the one who removes my inscriptions and my name: May the goddess Ištar, my mistress, break his weapon and hand him over to his enemies."[11] The Neo-Assyrian king Esarhaddon, who reigned 680-669 B.C., uses similar terminology in his inscriptions, as he writes, "the goddess Ištar, the lady of war and battle, who loves my priestly duties, stood at

[9] Hamblin 2006: 37-38.
[10] Grayson 1987: 1.99-135.
[11] Grayson 1987: 13.56ff. Cf. Grayson 1987: 11.74ff.

my side, broke their bows, and she split open their tight battle ranks."[12] In this instance, the expression the bow symbolizes an entire army, and the expression "break their bows" indicates that the king destroyed the enemy's military power.[13]

In western Iran during the late third or early second millennium B.C., a series of rock reliefs were carved at Sar-i Pol in Luristan, approximately 150 km west of Bisitun.[14] One of these reliefs depicts the investiture of Anubanini, king of the Lullubi, who lived in the Zagros mountains from the third millennium B.C. This relief inspired Darius' Bisitun monument, as can be seen through the similar composition and subject matter of the two reliefs.[15] In both scenes, the king steps on a prostrated enemy, and further enemies are bound and stand in a line. In the Anubanini relief, the goddess Ištar/Inanna offers a ring, symbolic of royal investiture, to the king.[16] Both Anubanini and Darius are armed with a bow, which is perhaps meant to symbolize the connection between their military victories and their royal power.

In Egypt during the second millennium B.C., the bow could represent the authority of the Pharaoh. The range of the bow in this instance symbolizes the extent of the Pharaoh's power.[17] This meaning is most visible in the Egyptian coronation ceremony, during which the new Pharaoh would fire four arrows at the four cardinal directions.[18] The Egyptians also used bows in their art to symbolize their enemies. These enemies are referred to as the "Nine Bows" in Egyptian inscriptions, and occasionally appear in art as bows beneath the Pharaoh's

[12] Leichty 2011: 1.74ff.
[13] Waldman 1978: 82.
[14] Schmitt 2013.
[15] Potts 1999: 318.
[16] Vanden Berghe 1983: 20.
[17] Keel 1977: 166.
[18] Wilkinson 1991: 83.

feet.[19] There is also evidence that the Egyptians used bows in ritual or ceremonial contexts, as they feature prominently in texts that describe the Sed festival, which celebrated the longevity of the Pharaoh's reign.[20]

Although the Hittites who ruled Anatolia in the second millennium B.C. frequently engaged in warfare, their monumental art did not focus on martial imagery.[21] Weapons, however, played an important symbol in Hittite art, and hunt scenes featuring weapons seem to have carried a religious significance. The Hittites depicted hunt scenes in both monumental art, such as palace reliefs, and personal art, such as seal stones and vessels. Frequently images of hunting are closely associated with ritual or religious scenes in Hittite art. On the reliefs from Alacahöyük, dated to the thirteenth century B.C., two hunters aim their bows at a boar and deer, respectively. Another scene on this relief depicts a religious procession that includes royal figures, priests, sacrificial animals, and an altar.[22] A stamp seal from Hattusa, dated to the fourteenth century B.C., depicts a central scene of worship that is surrounded by hunting imagery, including arrows and deer.[23] A silver vessel portrays an offering made to a deity captioned "stag god," and other deities are depicted with hunt-related symbols, such as stags, spears, and quivers.[24]

The Kassites, who ruled southern Mesopotamia during the second half of the second millennium B.C., occasionally used weapons as symbols of power, particularly in their glyptic art. The primary symbol of martial power in Kassite art seems to have been a curved

[19] Keel 1977: 167.
[20] Uphill 1965: passim. The Sed festival was supposed to occur during the Pharaoh's thirtieth regnal year, but some celebrated early.
[21] Bryce 2002: 98-99.
[22] Taracha 2012: 110-112.
[23] Güterbock 1956: Fig. 4.
[24] Taracha 2012: 112; Figs. 6-7.

sword, but this weapon falls outside the scope of the present study. Very rarely, however, Kassite art depicts bows. In a study of over two hundred Kassite seals and bullae, Matthews includes only six that feature archery, and none that feature spearmen. The archers are often kneeling on the ground, or occasionally in chariots.[25] Archery is only found in the context of hunting, never warfare. The animals at which the archer shoots include large game, such as deer and possibly horses, birds, and mythical creatures such as griffins.[26]

Beginning in the late second millennium B.C., the Assyrians frequently used symbolic weapons in their art. The bow in particular was the weapon of choice for both kings and gods.[27] Assyrian kings are also frequently depicted hunting lions with bows and spears. These hunt scenes may have been the inspiration for similar scenes in Achaemenid glyptic art.[28] The association between depictions of hunting and rulership appears in the art of the Assyrians, the Egyptians, the Elamites, and the Sumerians. The Achaemenids continued this tradition in their art and inscriptions, and it is to this body of evidence that we now turn our attention.

WEAPONS AS SYMBOLS IN THE ACHAEMENID EMPIRE

As we shall see, violence and warfare are not common on Achaemenid monumental reliefs, but both are popular motifs on seal stones, tomb paintings, and sarcophagi. According to a study by Garrison and Root, archers are the most common image on seal stones from the heart of the empire, and are found on nearly ten percent of all legible seals and seal

[25] Matthews 1992: 106, 120.
[26] Matthews 1992: 105 (deer), 106 (bird and griffin). 120 (horse?).
[27] Russell 1998: 686. See Szudy 2015: 27-30 for a discussion of Assyrian deities armed with the bow.
[28] Root 1989: 41.

impressions from the Persepolis Fortification Archive.[29] Boar hunt scenes are particularly popular in the glyptic art of the Western empire.[30] Achaemenid glyptic art also depicts spearmen, and the spear is a particularly common weapon for mounted hunters and warriors. These seals are a valuable corpus for Achaemenid historians, and for this study in particular, as they depict a variety of weapon-bearers in ideologically charged scenes of hunting and warfare. The key difference between hunters and warriors in this medium is the target at which they shoot: those labelled hunters are shooting at animals, and those labelled warriors are shooting at people. Symbolically, these scenes show the king's authority over his subjects, as well as the land of his empire.

The archers depicted on seals and coins are often wearing a crown, but the images do not appear to be portraits of individual kings. Rather, many scholars believe that this figure represents the abstract concept of Persian kingship.[31] The prominence of composite creatures, both semi-human archers who are committing, or are about to commit, violence, and the hybrid animals upon whom this violence is inflicted, suggests that the seals are depicting a mythological world, not one based on historical reality, and that the crowned figure in these scenes does not represent an individual monarch.[32] As a large number of seals were excavated from the Achaemenid palace at Persepolis, where they were used to seal documents related to the administration of the empire, they are a valuable resource to understand how élites in the Persian heartland used and understood archery-related symbolism.

[29] Garrison and Root 2001: 43.
[30] Garrison 2011: 17.
[31] Root 1979: 117; Garrison 2010: 339
[32] Garrison 2010: 346.

Imperially-issued Achaemenid coinage is another important medium for the study of archery imagery. At the time of the Achaemenid Empire, coinage was a relatively recent invention. The earliest coins in the Near East were those minted by Alyattes of Lydia in the late seventh and early sixth centuries B.C. Alyattes minted coins in electrum, a naturally occurring alloy of gold and silver, and the various denominations of these early coins attest to their economic importance.[33] Alyattes' son Croesus changed his coinage to pure gold and pure silver, and possibly Cyrus the Great continued to mint these coins when he gained power in Lydia. The Achaemenids seem to have begun minting their own coins during the reign of Darius I, at first only issuing silver coins (*sigloi*), and later also minting gold coins (*darics*). Despite the similarity in the names, it is unlikely that these coins were named after Darius, but rather **dari*-, the Old Persian word for gold.[34]

The fact that these coins are not often found outside of Asia Minor, and that they were only issued in two denominations, suggests that their primary purpose may have been ideological, rather than strictly economic.[35] For this reason, the symbolism used on these coins is particularly important. While all Achaemenid coins feature a crowned archer, there are four distinct types of coins. Type I coins have so far only been found in silver (*sigloi*), and depict a crowned figure from the waist up, who holds a bow in his left hand and possibly arrows in his right. Type II coins were issued both in gold (*darics*) and silver (*sigloi*), and depict a kneeling archer, his full body shown, who draws his bow and wears a quiver on his

[33] Alram 2012: 62.
[34] Herodotus writes that Darius was the first Persian king to mint coins (4.166), and later refers to coins as "Daric staters" (7.28). Schmitt 1983 has argued that the term "daric" (or the Old Persian word on which the Greek word is based) is in fact from the word for "gold" (**dari*-), and that Herodotus has wrongfully attributed the name to Darius.
[35] Tuplin 2014: 132 notes that *darics* are uncommon, although they are found throughout the Near East and Mediterranean. The more common *sigloi* are found in hoards only in Asia Minor.

back. Type III and IV were also issued in both gold and silver. In both types the archer is shown running with bent knees (*knielauf*) with a bow in his left hand and a quiver on his back. On Type III coins, the figure holds a spear in his right hand; on Type IV he holds a dagger. The reverse on all four types carries an incuse rectangular stamp, and contains no other symbols.[36]

It was long thought that these coins were minted to pay mercenaries, especially Greeks, and that the coins did not circulate in the empire's heartland. An impression of a Type II coin was used as a seal in Persepolis around 500 B.C.[37] This use of the coin suggests that darics were present in the centre of the empire, although presumably they were rare in this context. Its use as a seal further suggests a symbolic, rather than strictly economic, purpose. The similarity of the royal figure on coinage to those on glyptic art also suggests that the coins' message was aimed at Persian élite, and not foreign mercenaries. Rather than seeing them as a reminder of the king's power to those who might otherwise wish to rebel, they are better understood as a reminder of the owner's power within the Achaemenid hierarchy, and their connection to the king and other nobles through a shared artistic culture.[38] Dusinberre, in her discussion of Achaemenid-era glyptic art in Anatolia, notes that a shared iconography between local élite and élite from the Persian heartland was an important ruling strategy of the Achaemenid monarchs.[39] The same is likely true for the iconography used on imperially-issued coins. The use of coins was a local tradition in Anatolia, particularly Lydia, which is then fused with a distinctly Persian symbol, the royal

[36] Alram 1994.
[37] Root 1989: 36.
[38] Nimchuk 2002: 67; Garrison 2010: 339.
[39] Dusinberre 2013: 70.

archer. The issue of these coins can be seen as a form of "co-opting local élites" to form loyalty with their new imperial power, the Achaemenid Persians.[40]

The monumental reliefs of the Achaemenid Persians do not contain scenes of warfare or other violence.[41] The Achaemenid monarchs chose instead to portray the empire at peace in their monumental architecture, and this is likely due to the intended audience of these reliefs. Unlike seals and possibly coins, the monumental reliefs of Achaemenid Persia had a much broader audience than the empire's élite. The Achaemenids were not hoping to scare their subjects into submission through constant reminders of their military strength. Instead, Persian art sought to display the voluntary submission of its subject, and the king as the ruler of a peaceful world order. Nevertheless, these scenes often include weapons, in particular bows and spears, although the use of these weapons is never imminent. Rather, the inclusion of these weapons on otherwise peaceful scenes suggests that they retained an important symbolic value in Achaemenid monumental art.

On Darius' relief at Bisitun, the king himself holds the top of a bow in his left hand, the bottom of the bow may be resting on the ground behind his left foot, which tramples upon the prostrate false Bardiya. The two figures behind Darius, who are clearly important due to their size (taller than all the prisoners, and shorter only than the king himself) and their proximity to the king, are both armed: one with a bow and quiver, the other with a spear. On his tomb relief at Naqsh-i Rustam, Darius again holds the top of a bow in his left hand, and rests the bottom on his left foot.

[40] Dusinberre 2013: 179 suggests a similar strategy was used in some Anatolian tombs. The Tatarli tomb, for example, features a local tomb shape, but is decorated with distinctly Achaemenid imagery.
[41] Root 1979: 2.

Darius' pose on these two reliefs follows the style of Neo-Assyrian reliefs, in which the king frequently appears holding the top of a bow. Artists depicted Assurnasirpal II (r. 883-859 B.C.) pouring a libation over a dead lion, presumably after a successful lion hunt, and holding a bow by the upper limb.[42] Sennacherib (r. 704-681 B.C.) is also depicted holding his bow the same way while seated on a throne.[43] In these two scenes, however, the Assyrian kings hold their bows backwards, with the string facing outwards. In a relief dated to the reign of Assurnasirpal II, the god Assur also holds his bow backwards.[44] Root suggests that the gesture of holding the bow backwards, which the Achaemenids do not depict, was an Assyrian court ceremony that the Achaemenids did not adopt.[45] Wilkinson, who has studied this gesture extensively, concludes that it demonstrates the king's dominance and his neutralization of a threat.[46] Collon similarly interprets this gesture as one of peace, because the bow is not ready for immediate use.[47] As only kings and gods adopt this pose in Assyrian art, it likely signifies power and authority, and the backwards bow suggests that the archer has eliminated all immediate threats to the empire.

By the reign of the Assyrian king Assurbanipal, the way the king holds the bow in these scenes has changed. In one of his reliefs, Assurbanipal pours a libation over a dead lion.[48] The scene is very similar to that of Assurnasirpal II described above, as both kings hold a bow and a libation bowl, dead lions lay at their feet, and their attendants include musicians and armed guards. There is one important difference in these two images:

[42] ME 124535.
[43] ME 124911.
[44] ME 124551
[45] Root 1979: 167.
[46] Wilkinson 1991: 84-85. See also Wilkinson 1988.
[47] Collon 2008: 98.
[48] ME 124886.

Assurbanipal holds the bow with the string facing him. On the reliefs of Darius, the king holds the bow in the same way. It seems, therefore, that Darius was influenced not by the art of early Neo-Assyrian kings, but by that of the late kings such as Assurbanipal. De Jong suggests a strong connection in the kings' perceptions of the relationship between the concept of kingship and their chief deities, Assur and Ahura Mazda.[49] Cyrus II also associates himself with Assurbanipal in his role as temple restorer.[50] Root and Kuhrt both suggest that Cyrus modeled his royal image after Assurbanipal, particularly in Babylon.[51] Possibly early Persian monarchs were more familiar with Assurbanipal's reliefs than those of earlier Assyrian kings. If Root is correct to argue that the backwards bow was an Assyrian court protocol, it seems to have changed by the time of Assurbanipal.

Perhaps the most famous image of Achaemenid weapon-bearers are those depicted in glazed bricks at Darius' palace at Susa.[52] These figures have been called Susian guards, or Susian archers, but Briant warns that the similarities between Persian and Elamite dress make such a distinction difficult.[53] Although the details vary, all of these figures share many characteristics. All wear brightly coloured, elaborately patterned robes, green twisted headbands, and yellow shoes.[54] Their arms are bent at the elbow, both hands are in front of them and hold a spear-shaft. The round butt of each spear rests on the forward foot of the weapon-bearer, the tip of the spear reaches above their head. Tasseled quivers hang from their backs, although the artist has not depicted how these quivers were attached to the body. In all cases, no arrows are visible in the quivers. This type of quiver may have had a lid that

[49] DeJong 2010.
[50] Cyrus Cylinder = Kuhrt 2007 3.E.21 line 43
[51] Root 1979: 38; Kuhrt 2007: 74 n. 23
[52] Caubet and Daucé 2013: 313-314.
[53] Briant 2013: 10.
[54] Shahbazi 1992.

hid the arrows from view, although the archer on the Type III coins has a similar back quiver with several arrows clearly visible. On the left shoulder, each guard carries a recurve bow, probably composite. The bow is strung, and has the duck-head limb tips common for Achaemenid and Assyrian bows.

Two types of weapon-bearers are depicted in the reliefs of Persepolis. The first type is similar to those at Susa, described above. The other type is dressed in Median dress and carries a *gorytus* on his hip. The *gorytus* is a large bow case and quiver, the shape of which suggests that the bow was stored strung. The Sogdian delegates on the Apadana reliefs wear the same type of bowcase.[55] This bowcase is often associated with Scythians. As we have seen in an earlier chapter, the use of Scythian archery equipment seems to have spread across the Near East and Mediterranean in the seventh century B.C., and Scythian-style arrowheads are particularly visible in the archaeological record. Scythian bows, and their distinctive bow cases, also seem to have become popular at this time.[56]

Although the Achaemenids did not produce many public texts, the inscriptions which they did compose frequently use martial images, particularly the bow and the spear, as symbols for their rulership. From the empire's heartland, three inscriptions mention the bow and the spear. The majority of the original Achaemenid inscriptions were composed during the reign of Darius I, and many of the inscriptions carved by subsequent kings are almost verbatim replicas of Darius' inscriptions, often changing only the name and genealogy of the king. Such is the case for an inscription on Darius' tomb at Naqsh-i Rustam, which his son

[55] Schmidt 1953: Plate 97.
[56] The Scythian influence on Near Eastern archery of the early first millennium B.C. is discussed in more detail in Chapter 1.

Xerxes copied at Persepolis.[57] In this inscription, Darius and Xerxes highlight the qualities that make them suitable rulers. Both state that, "as a bowman, I am a good bowman, both on foot and on horseback. As a spearman I am a good spearman, both on foot and on horseback."[58] This passage makes clear that the early Achaemenid kings, and quite possibly those who followed, saw martial valour as one of the most important attributes of the Achaemenid monarch. This association was so prevalent in Achaemenid Persia that numerous Greek authors, in their descriptions of Persian kings, also emphasized the importance of their martial valour. This theme is particularly evident in Greek descriptions of the conflict between Cyrus the Younger and Artaxerxes II. Xenophon describes Cyrus as "the most worthy to rule," due in part to his skill with the bow and spear, and his love of hunting.[59] Plutarch echoes this passage of Xenophon in his life of Artaxerxes, as Cyrus says that his brother was "too cowardly and soft to sit upon his horse during the hunt, or his throne in time of danger."[60] This idea of the king's military prowess may be related to an idea commonly expressed in the inscriptions, that the king's primary duty was the protection of his subjects. The correlation between military symbols and the king as protector will be explored in more detail below.

In another inscription from Darius' tomb at Naqsh-i Rustam, Darius uses the spear as a symbol for military conquest as he writes that, "the spear of the Persian man has gone forth

[57] DNb (Darius); XPl (Xerxes).
[58] This inscription bears a striking resemblance to Herodotus' description of Persian education, according to which young Persians are taught archery, horsemanship, and to tell the truth (1.136). See Briant 2002: 924-25 for a discussion of modern scholarship on this passage.
[59] Xen. *Anab.* 1.9.1-5, *ἔκρινον δ'αὐτον καὶ τῶν εἰς τὸν πόλεμον ἔργων, τοξικῆς τε καὶ ἀκοντίσεως, φιλομαθέστατον εἶναι καὶ μελετηρότατον. ἐπεὶ δὲ τῇ ἡλικίᾳ ἔτρεπε, καὶ φιλοθηρότατος ἦν καὶ πρὸς τὰ θηρία μέντοι φιλοκινδυνότατος.*
[60] Plut. *Art.* 6.3, *ἐκεῖνον δὲ ὑπὸ δειλίας καὶ μαλακίας ἐν μὲν τοῖς κυνηγεσίοις μηδὲ ἐφ' ἵππου, ἐν δὲ τοῖς κινδύνοις μηδὲ ἐπὶ τοῦ θρόνου καθῆσθαι*.

far."[61] In this instance, the spear symbolizes, first and foremost, the Persian army and its campaigns. On another level, the spear also represents the result of the army's campaigns, the subjugation of distant lands to the Persian king. The symbolic use of the spear in this inscription shows its importance to Achaemenid royal ideology. There is no mention of a bow here; the spear alone symbolizes Persian conquest. The absence of the bow in this inscription is particularly interesting, as the spear has "gone forth far." As the bow has a greater range than the spear, we might expect the bow to be more symbolic of far-reaching power. Perhaps in this instance, the use of the far-reaching spear emphasizes the "Persian man," who carries the spear into distant lands.

Outside the Persian heartland, the bow was also used as a symbol for royal power. A statue of Darius, found in Susa, contains a mixture of elements from both Persian and Egyptian cultures.[62] The statue is the figure of a man dressed in a Persian robe, and has an Elamite dagger in his belt. The figures on the statue base are "in Egyptian style but with Persian influence."[63] The statue was carved from an Egyptian stone, and contains a long hieroglyphic inscription.[64] The statue was almost certainly carved for the temple of Atum at Heliopolis.[65] Part of this inscription states that, "the goddess Neith (Egyptian goddess of hunting and war) has given him (sc. Darius) the bow she holds, to throw back all his enemies...so that he may be effective in repelling those who rebel against him."[66] The inscription later refers to Darius as, "he who crushes the Nine Bows." In Egyptian inscriptions, the term "Nine Bows" refers to Egypt's enemies. Darius is called, "he who

[61] DNa.
[62] For recent studies of this statue, see Razmjou 2002 and Yoyotte 2013.
[63] Kuhrt 2007: 479 n. 1.
[64] Razmjou 2002: 84-85.
[65] Razmjou 2002: 86.
[66] DSab

rushes into battle, shooting precisely, his arrow never missing his goal." Here, the bow is the tool with which the king brings order, as it is used "to reduce those who rebel against him." Darius is referred to as "King of Upper and Lower Egypt," "lord of the two lands," and "the perfect god." The hieroglyphic section of this inscription mentions only Egyptian gods, such as Re, Neith, and Atum.[67]

In spite of its Egyptian character, this inscription bears a distinctly Persian message. Like the inscriptions found at Persepolis and Naqsh-i Rustam, the bow here symbolizes royal power, particularly the power to bring order through the elimination of rebels is reminiscent of Darius' Bisitun inscription, among others. The symbol of the bow, in ancient Egypt, most often represented the enemies of Egypt. In Egyptian texts, Egypt's enemies were frequently referred to as the "Nine Bows," the same phrase that appears in this inscription. Traditionally, Egypt's enemies could be depicted as nine bows, or as nine captives, each with a distinct marker of his ethnicity. In some instances, the Nine Bows were depicted under the Pharaoh's foot, which symbolizes the Pharaoh's conquest of his enemies.[68] The posture here described has a striking resemblance to Darius' relief of Bisitun, and the nearby relief at Sar-i Pol, which is probably the most direct inspiration for Bisitun.[69] Darius' hieroglyphic inscription can therefore be read as an Egyptian goddess giving the weapon of Egypt's enemies to a foreign king, who then uses this weapon to subjugate Egypt and to put down any rebellions the Egyptians may mount against the Persians. As Darius has co-opted symbolism from subjected cultures for this inscription, his message takes on an added dimension of imperialism.

[67] The cuneiform inscription names only Ahura Mazda.
[68] Wilkinson 1991: 83.
[69] Vanden Berghe 1983: Fig. 1; Potts 1999: 318.

Both the bow and the spear were important symbols in Achaemenid monumental art and royal inscriptions. At a literal level, these were the weapons Achaemenid armies used to establish their empire and maintain order in recalcitrant areas. At the same time, weapons in these media symbolized the power and authority of the king and members of the élite. The symbolic use of weapons was not an Achaemenid invention, as it is found in Near Eastern art as early as the fourth millennium B.C., but the Achaemenids certainly added some unique elements to this symbolism.

WEAPONS IN THE ART OF ACHAEMENID ANATOLIA

We will now look at how themes of Achaemenid imperial art were adapted and used by élite members of subject populations. The funerary art of Achaemenid Anatolia provides an interesting case study of how non-Persians used hunting and warfare to signal their involvement in Achaemenid culture. A further type of art from the Achaemenid Empire frequently employs weapons in its imagery. Local élite throughout Achaemenid Anatolia frequently decorated their tombs with scenes of hunting and warfare. Many of the themes and details of this funerary art are similar to imperial Persian art, such as the seals used on administrative documents from the Persian heartland. It is likely that, by choosing to decorate their tombs with motifs from Persian imperial art, Anatolian élite were signaling their connection to, and participation in, Achaemenid imperialism.[70] It is also possible that these scenes were biographical, and that their occupants hunted, perhaps in satrapal *paradeisoi*, or

[70] Dusinberre 2013: 141; Baughan 2010: 30.

campaigned with the Achaemenid army.[71] The Çan sarcophagus, for example, features scenes of mounted hunting and warfare, and Rose argues that the similarities between the two scenes suggest that it is the same man involved in both activities.[72] Analysis of the skeleton found inside the sarcophagus suggests that the man died from injuries sustained during an accident, likely a fall from his horse.[73] If this supposition is correct, then it is likely that these scenes are biographical. This is not to say, however, that the scenes do not contain ideological significance.

Scenes of hunting and warfare are found in funerary art throughout Anatolia, and were particularly popular in the early years of the Achaemenid control in the region. In the sixth century B.C., several tombs in Lydia and Lycia feature such images.[74] The Lion Tomb in Xanthos, dated ca. 540 B.C., includes reliefs of warriors in crested helmets with shields, and horsemen. The soldier's crested helmet and round shield suggest he might be Greek. On the opposite side of the tomb, a figure stabbing an upright lion has numerous parallels in Near Eastern art, including the reliefs and seals from Persepolis.[75] Similar warriors, with crested helmets and round shields, are found on other sixth century tombs, such as the pillar tombs at Isinda, Trysa, and Gürges.[76] The last of these also features a hunt scene in which two kneeling archers aim at fleeing ibexes.[77]

In northern Lycia, ca. 470 B.C., a tomb in Karaburun shows a mounted warrior in Persian dress, probably the tomb owner, spearing Greek hoplites, and supported by local

[71] Baughan 2010: 30; Rose 2013: 138.
[72] Rose 2013: 138.
[73] Sevinç et al. 2001: 408; Ma 2008: 243; Rose 2013: 140.
[74] Roosevelt 2014: 161ff.
[75] Draycott 2007: Fig. 2; Schmidt 1953.
[76] Draycott 2007: 109-112.
[77] Draycott 2007: Fig. 6.

Lycian troops. These different troops suggest a cultural hierarchy in Achaemenid Anatolia, which places the imperial Persians above local Lycians. The Persian in this instance is mounted, while the Lycians are on foot, which indicates that the Persian holds a higher status.[78]

Elsewhere in Anatolia, such as Lydia and Hellespontine Phrygia, funerary art shows an even greater synthesis of Hellenic and Near Eastern motifs. One of the earliest of these scenes, from the last quarter of the sixth century, is the Aktepe tomb from eastern Lydia.[79] One frieze on this tomb depicts two lions and a bull, and the features of the bull suggest parallels with east Greek and Lydian depictions of this animal. A scene depicting horsemen shows a stronger Persian influence, as the riders are dressed in Persian clothing.[80] One rider seems to be holding a spear which he thrusts diagonally, a common posture in Achaemenid Anatolian art.[81] A broken stele now in the museum of Uşak shows a fragmentary horseman wearing the typical Persian *anaxyrides*.[82] Polat suggests the rider may have been armed with a bow or spear, no longer extant. An arm holding a spear can be seen below the rider, and some sort of animal can be seen on the right, which indicates that this was a fragment of a hunt scene.

The Çan sarcophagus from the Granicus river valley in northwestern Anatolia depicts both hunting and warfare. The sarcophagus is much later than the images described above, and Ma dates it to the fourth century B.C. on stylistic grounds.[83] On one side of the

[78] Draycott 2010: 15; Fig. 6.
[79] Roosevelt 2014: 172.
[80] Although it should be noted that it is possible, perhaps even likely, that some local élite had adopted Persian dress by this period (Baughan 2010: 26, 29).
[81] See, for example, a satrapal issued stater, the stele from Bursa, and the Nereid monument.
[82] Polat 1994: 62-63.
[83] Ma 2008: 243.

sarcophagus, two hunt scenes are depicted. Although badly damaged, one scene shows a mounted figure hunting a stag, the second scene shows a mounted hunter spearing a boar.[84] The boar hunter wears a *kandys*, *anaxyrides*, common Persian items of clothing, and has an *akinakes*. He thrusts his spear diagonally at the boar, in a posture similar to that depicted on the Aktepe tomb described above. The battle scene, depicted on one of the short sides of the sarcophagus, includes three figures. The central figure is again mounted an in Persian dress, and Rose suggests that this is the same figure as the boar hunter.[85] To the left of the horseman is a figure sometimes called his "henchman," with a sword, two spears, and a double-grip shield. Their opponent may be a Greek, but Ma argues that he is more likely a Mysian or western Anatolian. He wears a tunic and fillet, and is armed with a round shield and sword.[86] As previously mentioned, the damage to the skeleton of the deceased in the Çan sarcophagus is consistent with a horse-related injury, and suggests that the scenes on his tomb were biographical. Furthermore, the battle scene shows a cultural hierarchy similar to that in the Karaburun tomb described above. The horseman is clearly the most important figure in the scene, and his henchman is of lesser importance. Both, however, are shown as superior to their opponent, who lies on the ground and is being stabbed.

The funerary art of Achaemenid Anatolia is a synthesis of styles and themes, and draws most notably on art from the Near East, including Persia, and Greece. For this reason it is sometimes called Graeco-Persian, although here we have opted for the term Achaemenid Anatolian. Scenes of hunting and warfare are heavily influenced by Achaemenid art, particularly glyptic art from the Persian heartland. This art is best understood as a statement

[84] Ma 2008: Fig. 2.
[85] Rose 2013: 138.
[86] Ma 2008: 243, 248.

made by local élite who have been co-opted into Achaemenid imperial culture, while also expressing their identity as local Anatolians. Their geographical proximity to the eastern Greeks can also be seen in some of these works. Many of these reliefs may be biographical, and so indicate that local élites were participating in the activities of the Achaemenid élite, such as mounted hunting and warfare. Many of these local dynasts were likely trained and educated at satrapal courts, and so these images may reflect their upbringing, which would have been similar to that of the Persian élite.[87] Although many of these tomb owners may have practiced the activities depicted on their tombs, these tomb decorations are highly symbolic. These Anatolians were signaling their own commitment to, and participation in, Achaemenid imperialism. [88] The intended audiences of these works may have been the Persian authorities, the families of the deceased, and other local Anatolians. In many cases, these men chose to depict themselves dressed as Persians, and emphasized their participation in the élite male activities of the Persian world. Other artistic details reveal, however, that they continued to consider their Anatolian background an important part of their identity.

SCENES OF WAR

At the most literal level, the representation of weapons has a clear military meaning. Visual evidence and military histories, mostly written by the ancient Greeks, make it clear that Achaemenid soldiers often used bows and spears in battle.[89] Therefore, the inclusion of these weapons in their artistic programme, to some extent, reflects the historical reality. The

[87] Rose 2013: 73.
[88] Dusinberre 2013: 141.
[89] Hdt. 7.55; Xen. *Anab.* 1.8.8.

Persian élite who were likely the intended audience for many of these works, particularly the coins and seals, would have been familiar with the weapons used by Achaemenid soldiers, and many likely had some first-hand military experience themselves. For these viewers, the familiar arms would have signaled their involvement in a shared military culture, and would have strengthened their commitment to the empire. As the audience already belonged to the empire's ruling class, the purpose of this art was not to persuade the viewer to accept Persian hegemony, but rather to remind the viewer of the benefits of their position within the empire.[90]

Subject people who viewed these images, in particular the monumental reliefs and occasionally coins, also would have recognized the Persian arms. Some would have been subjected through military conquest, and so may have faced soldiers like those depicted on reliefs in battle. To this audience, the weapons would have been a subtle reminder of Achaemenid military supremacy, and may have dissuaded some from rebellion. Many subjects also would have served alongside Persian soldiers, and these subjects may have been armed in Persian fashion.[91] To these subjects, Persian-style weapons may have reminded them that, through military service, they could become more "Persian," and the weapons thus represented the possibility of social advancement. Although she does not focus on the military *per se*, Dusinberre has convincingly shown that local élite in Achaemenid Anatolia frequently adopted elements of Persian culture, and concludes that "when individuals signaled membership in the Achaemenid élite , this was their primary identity."[92] This

[90] Garrison 2010: 339.
[91] Herodotus suggests that many subject people equipped themselves in their own culture's weapons and armour, but this suggestion would have created logistical difficulties.
[92] Dusinberre 2013: 259.

evidence suggests that the Persian military could have served as a "Persianizing" force for conscripted troops, and the presence of Persian garrisons in major cities could have had a similar effect on the local population. The presence of weapons was not as significant, then, as the context in which they appeared and the audience to whom the art or inscription was addressed, as the weapons had a unique meaning to different peoples.

All imperial-issue Achaemenid coins feature the image of an archer, and archers also frequently appear on seals.[93] Therefore, many of the artistic items that featured archers in the Achaemenid world were incredibly mobile. The presence of an archer coin used as a seal at Persepolis suggests that, much like seals, these items could be used as a visual token of royal favour.[94] As the élite moved throughout the empire, so too did the small objects that were so important to their identity. Through these symbolic items, the king is symbolically present throughout the empire. The use of the archer imagery in this context reminds the viewer that, just as the bow can kill from afar, so too can the king's power touch the far reaches of the empire to keep order.[95] The bow as a symbol of distance is even transferred to the spear, not usually a long-range weapon, as Darius writes, "the spear of the Persian man has gone forth far."[96]

[93] Archers are found on nearly 10% of the seals from the Persepolis Fortification Archive (Garrison and Root 2001: 43).
[94] Root 1989: 38.
[95] Nimchuk 2002: 66; Allen 2005: 39.
[96] DNa.

SCENES OF HUNTING

Weapons are also used in hunt scenes, where they serve a similar symbolic meaning to the depiction of weapons in scenes of warfare.[97] Hunting scenes have a long history in the ancient Near East prior to the Achaemenid era, and the lion hunting reliefs of the Neo-Assyrian kings are particularly well known.[98] Just as Achaemenid monumental art avoided the depiction of violent warfare, hunt scenes are conspicuously absent from the reliefs that decorated the Achaemenid palaces. Rather, hunting was a popular motif in Achaemenid glyptic art, particularly from the Western empire, and also features in funerary art from Anatolia, such as the Çan sarcophagus, and Greek art that depicts Persians.[99]

Hunt scenes have a similar iconography and ideological message to military scenes. Both types of scene commonly feature weapons, especially the bow and spear. In fact, Root suggests that the bow in monumental art was a symbol of Darius' prowess as both a warrior and hunter.[100] Many hunters and warriors are mounted on horses or chariots. Hunting and warfare required many similar skills, including bravery, physical fitness, and the ability to make decisions quickly while under pressure, and so literary sources frequently describe Persians who hunt in order to ready themselves for battle. Xenophon, who was himself an avid hunter and professional soldier, explicitly states that the Achaemenid Persians used hunting in order to train for warfare.[101] In other instances, Classical authors pair hunting and

[97] Keel 1977: 141; Nimchuk 2002: 65; Brosius 2005: 137
[98] See, e.g., Albenda 1972, 2008; Allsen 2006.
[99] Ma 2008 (Çan sarcophagus); Franks 2009 (Xenophantos lekythos).
[100] Root 1979: 164.
[101] Xen. *Cyr*. 1.2.10.

warfare in their descriptions of Achaemenid culture.[102] As discussed earlier, funerary art from Achaemenid Anatolia frequently features imagery of hunting and warfare, often on the same monument, and both themes were popular images on Achaemenid glyptic art.

In imperial art, depictions of both activities are intended to show that the king is the protector of his empire. The "king as protector" motif can be seen most clearly in glyptic art, where a crowned figure frequently fights composite animals, but exists more subtly in other media.[103] Reliefs that decorate the Palace of Darius at Persepolis show a royal figure fighting a lion-headed creature, and bull, but in these scenes the hero holds a small dagger.[104] Achaemenid glyptic art makes frequent use of the "master of beasts" motif, which had been previously used by numerous other Near Eastern empires. According to Root, this motif represents a king who "extends, presses, and maintains the territorial limits of empire outwards."[105] In reality, the empire is extended and maintained through martial violence, which suggests a strong connection between violence against animals and violence against humans, i.e. between hunting and war. In these scenes a central figure is shown struggling with two beasts. In many of these images the figure is not armed, but subdues the creatures with his bare hands. When the figure is armed, it is most often with a dagger.[106] In several seals, however, he is armed with a bow, or carries a bow and quiver over his shoulder.[107]

[102] Xenophon describes Cyrus the Younger's military prowess and his love of hunting in support of his claim that Cyrus was "most worthy to rule" (*Anab.* 1.9.1-6). Strabo also describes Persian youth during their training, who gather each morning "as if for a muster or hunt" (15.3.18).
[103] Bonfiglio 2012: 519.
[104] Schmidt 1953: Plates 144-146 (Main Hall); 147 (Rooms 5 and 16).
[105] Root 1989: 41.
[106] PFS 584*, 853, 1181. The dagger may be an *akinakes*, or an Elamite dagger. The lack of detail makes it difficult to distinguish between the two.
[107] PFS 49, 266*, 301, 859*. On PFS 1204, a composite creature is armed with a bow.

These scenes likely represent the king's protective duties, as he subdues the (metaphorical) monsters that threaten his domain.

Greek authors frequently describe the *paradeisoi* and hunting excursions of the Achaemenid royalty, and these activities are closely related to the "master of beasts" motif. Cyrus the Younger enjoyed hunting dangerous game, and used hunts to exercise his horses.[108] When Alexander the Great campaigned through the empire, he found *paradeisoi* full of wild animals where he would hunt.[109] The walled *paradeisoi* have been excavated at many of the major sites of the empire.[110] Neo-Assyrian reliefs frequently depict the king engaged in lion hunts, and these scenes likely influenced the Achaemenid monarchs.[111] The practice of gardening likewise has a long tradition in the Near East, and continued into the Achaemenid era.[112] Royal gardens can be seen as a microcosm of the empire, as plants and animals from throughout the empire are gathered, arranged, and bounded by the king.[113] Hunting is closely related to gardening, both spatially and ideologically. Both activities took place in the king's *paradeisoi*, and both emphasized the king's role as the establisher of order in his empire.

The symbolism of hunting was not strictly confined to artistic depictions. Achaemenid royalty and nobility participated in hunts, and so royal hunts were real events that occurred both in the Persian Empire, and in many empires that came before them.[114]

---

[108] Xen. *Anab.* 1.2.8, 1.9.6.
[109] QC 8.1.11-12.
[110] Kuhrt 2007: Fig. 3.5 (Pasargadae); fig. 9.5 (Susa). Dusinberre 2013: 54-56 (Anatolia).
[111] E.g. ME 124863, 124864, 124868.
[112] The Neo-Assyrian king Sennacherib frequently mentions himself as gardener in his inscriptions. E.g. Luckenbill 1927: sections 333, 403, 416, 437. Kuhrt 2007: 16.41, 43-47 for documents from Persepolis that detail the administration of these parks.
[113] Novák 2002: 452. For archery's relationship to boundaries, see below.
[114] See Allsen 2006 for a study of royal hunting in Eurasia.

Evidence suggests that these hunts could also be an occasion for a symbolic display of power. Hunting excursions seem to have been events that were governed by court protocol, and so would serve to reinforce the court hierarchy. The Persian Megabyzus, for example, was punished for breaking this protocol. While on a royal hunt with Artaxerxes I, a lion lunged at the king. Megabyzus killed the lion before it could reach the king, but this act angered Artaxerxes, as Megabyzus dared to kill a lion without giving the king his right to shoot first.[115] This anecdote highlights another important function of hunting, namely to allow the king to display his bravery, and thus prove to his subjects that he is fit to rule. Alexander also seems to have adopted Achaemenid hunting rituals, or perhaps fused them with Macedonian traditions. Spawforth argues that Alexander may often have been visible to his army dressed in the traditional hunting apparel of the Achaemenid kings.[116] If Alexander made a display of himself on his way to royal hunts, the act of hunting itself was symbolic. On a practical level, hunting also formed bonds between members of the élite, and helped prepare both men and horses for war. In these ways, hunting's ideological purpose went far beyond its popularity in art.

ARCHERY AND THE GODS

Tuplin has suggested that the shooting archer of some coin types also represents the king as protector, and connects these coin types to shooting archers who are depicted on seals.[117] The Achaemenid use of the bow to symbolize the king's responsibility to establish

[115] *FGrH* 688 F14 43. Artaxerxes initially wished to behead Megabyzus, but eventually punished him with exile.
[116] Spawforth 2012: 182.
[117] Nimchuk 2002: 65; Tuplin 2014: 142.

and maintain order resulted in the king often being depicted with a bow, while Ahura Mazda never holds the weapon. Szudy notes that the bow was used as a divine attribute in Mesopotamian art from the third millennium B.C.[118] In the Neo-Assyrian period, numerous deities are depicted with a bow, including Ninurta, Marduk, Assur, and Adad.[119] While the scenes of the king and the winged disk thought to represent the god found in Achaemenid art, most notably at Bisitun, have clear precedents in Mesopotamian art, there is one crucial difference. Assur often holds a bow, while Ahura Mazda does not. Possibly this represents Ahura Mazda's appointing Darius to keep order within his realm. The protection of the realm was, therefore, not the god's duty, but the king's. In this instance, the bow both symbolizes the king's duty to impose order, as well as the means by which he imposes order.[120]

The Avestan *Hymn to Mithra* (*Mihr Yasht*) was first written down in the sixth or seventh century A.D., but is based on an oral tradition that became fixed in the early to mid first millennium B.C., and so would have been known during the time of the Achaemenids.[121] In this text, Mithra is frequently described as a warrior, and is armed with a variety of weapons, including the bow and the spear.[122] In this text, Mithra also has a great influence on the outcome of battles. In particular, Mithra causes the weapons of those who do not worship him to fail in battle, as "even their eagle-feathered arrows, propelled by the bowstring, flying from a well-drawn bow, strike no wounds, since Mithra of wide pastures, angered (at) having been treated with enmity, is hostile (at) not having been acknowledged."[123] This passage

[118] Szudy 2015: 27.
[119] Szudy 2015: Figs. 3.5-9.
[120] Nimchuk 2002: 65.
[121] Rose 2011: 9, 243.
[122] 26.102; translation in Malandra 1983: 71.
[123] 9.39. This line repeats, with only slight variations, to describe the ineffectiveness of spears, slings, daggers, and maces (9.39-40).

bears a similarity to the Neo-Assyrian inscriptions we have previously discussed, in which kings invoke Ishtar to "break the weapons" of their enemies.

Elsewhere in this hymn, Mithra causes the ineffectiveness of the weapons of "covenant-breakers, as the text states,

> Even the horses of the breakers of a covenant become loath to be mounted; running they do not get away, being ridden they do not take their rider forward, drawing the chariot they do not make progress. Back flies the spear which the covenant-breaker throws, in spite of the evil spells which the covenant-breaker performs. Even when his throw is a good one, even when he hits the body, even then they do not hurt him (the opponent) in spite of the evil spells which the covenant-breaker performs. The wind carries (away) the spear which the covenant-breaker throws, in spite of the evil spells which the covenant-breaker performs.[124]

This passage echoes Herodotus' description of Persian values, as he famously wrote that Persian youths are taught only three things, "to ride, to shoot, and to speak the truth."[125] The hymn suggests that the liar, or covenant-breaker, cannot effectively control his horse or use his weapons, and so suggests a cosmological connection between the three virtues which Herodotus describes.[126]

The *Hymn to Mithra* therefore suggests that, rather than Ahura Mazda, it was Mithra who was most associated with archery in the Persian pantheon. The deity depicted in

---

[124] 5.20-21.
[125] Hdt. 1.136.
[126] Unfortunately, commentators on this passage do not mention the possible connections to Achaemenid Persia, nor is our understanding of Avestan scholarship sufficient to push this analysis further.

Achaemenid art is most likely Ahura Mazda, and this fact may explain why depictions of bow-wielding deities, which were common in Mesopotamian art, did not continue into the Achaemenid period.[127]

WEAPONS AS SYMBOLS FOR MORALITY

Many cultures associate archery symbolism with morality. In ancient Greek, the word for error or mistake, often with a moral connotation, *hamartia*, derives from the verb *hamartano*, which literally means "to miss the mark" and often describes a spear or arrow that has gone astray.[128] Aeschylus uses archery metaphors in a similar way.[129] Often Aeschylus uses the expression "to hit the mark" in reference to correct thought or action. In his *Agamemnon,* Aeschylus has the herald respond to the chorus, who have just guessed that Menelaus was separated from the army by storm, that "you have hit the mark, just as the highest archer."[130] Later in the play, after expounding her knowledge of the "ancient sins (*hamartiai)* of the household (of Agamemnon)," Cassandra says, "have I missed the mark, or, as an archer, have I hit my quarry?"[131]

The Greek Stoics, beginning with Antipater in the third century B.C., used archery as a metaphor for morality.[132] The original passage from Antipater is no longer extant, but Cicero paraphrases his words as follows, "just as a man whose task it is to throw a spear or

---

[127] See Root 2013: 52-54 for a review of scholarship on the identity of the figure in the winged disc at Bisitun. Root herself convincingly argues it is Ahura Mazda.
[128] E.g. *Il.* 5.287.
[129] Garson 1983: 38.
[130] Aesch. *Ag.* 628, *ἔκυρσας ὥστε τοξότης ἄρκος σκοποῦ.*
[131] Aesch. *Ag.* 1194, *ἥμαρτον, ἢ θηρῶ τι τοξότης τις ὥς*;
[132] Blecher 2006: 160.

shoot an arrow at something has, as its ultimate end, to do everything in his power to shoot straight, so it is with what we call the ultimate end in life."[133]

There is some physiological basis for the association of archery and morality. It is difficult to shoot accurately under stress. A study on emotions and performance in archery examined a world class archer, and the effects her emotional state had on her competitive performance. The study found that a correlation existed between the archer's emotional state prior to practice or competition and her performance.[134] Both hunting and warfare are emotionally charged experiences, and participants often deal with feelings of exertion and, particularly in the latter, fear. Archers are also likely to experience high levels of adrenaline in both cases. All of these factors can negatively affect the archer's performance, and the best archers are the ones who are able to clear their mind of these emotions and focus on their shot. For this reason, an archer hitting a target is an apt metaphor for correct thought and action.[135]

One final moral aspect to archery imagery is particularly suited to its use by the Achaemenid Empire. The bow relies on the tension created by its limbs to produce the power with which it propels the arrow. The concept of opposing forces was central to Achaemenid cosmology, and, since Achaemenid kings believed their right to rule was granted by the god Ahura Mazda, it was equally central to their ruling ideology. Some of the most prominent opposites found in Achaemenid inscription are Truth and the Lie; Earth and Sky; loyal and

[133] Cic. *De Fin.* 3.22, Etenim, si cui propositum sit conliniare hastam aliquot aut sagittam, sicut nos ultimum in bonis dicimus, sic illi facere omnia, quae posit, ut conliniet huic in eius modi similitudine omnia sint facienda, ut conliniet, et tamen, ut omnia faciat, quo propositum adsequatur, sit hoc quasi ultimum, quale nos summum in vita bonum dicimus, illud autem, ut feriat, quasi seligendum, non expetendum.
[134] Robaza, Bortoli, and Nougier 1999: 175.
[135] Harrod 1981: 428.

faithless; and reward and punishment.[136] The emphasis on opposing tensions continues in later Persian religious texts. This concept is best exemplified in the story of the primordial twins, who "are what is good and evil."[137] Furthermore, Zoroastrian literature divides the world into two parts, the world of thought and the world of living (lit. the world of bones).[138] This dualism continues to be an important facet of Zoroastrian belief.[139]

A similar idea exists in Indian mythology, in which the bow limbs are thought to "consort" when the bow is drawn, and give birth to the arrow. This image is related to the birth of the god Agni, here represented by the arrow, who was born through the separation of his parents, Earth and Sky, here represented by the limbs of the bow.[140] Interestingly, in the *Atharva Veda*, there is a close connection between Agni and Mitra, and the Vedic Mitra is closely associated with the Persian Mithra.[141] The imagery of a bow's tension is somewhat reminiscent of a passage from Heraclitus, who, it should be noted, lived within the Achaemenid Empire, and so conceivably understood the Persian nature of his metaphor. According to Heraclitus, "(men) do not know that what is in opposition agrees with itself; it is a harmony of opposing tension, like that of the bow or lyre."[142] In this passage, the tension between opposites is reminiscent of the duality inherent in the Persian world view, as is the

[136] DSf; DB.
[137] Yasna 30.3.
[138] Skjærvø 2005: 14.
[139] Rose 2011: 6; Fig. 3. The concept of dualism is so prominent in Persian beliefs that it has its own entry in the *Encyclopaedia Iranica* (Gnoli 2011).
[140] Coomaraswamy 1943: 107.
[141] AV 13.3. For the association between Mithra and Mitra, see Malandra 1983: 55. The full implications of this connection are far beyond our area of expertise.
[142] *οὐ ξυνιᾶσιν ὅκως διαφερόμενον ἑωυτῶι ὁμολογέει. παλίντροπος ἁρμονίη ὅκωσπερ τόξου καὶ λύρης*, Heraclitus fragment 51.

emphasis on the ordered world, since in Achaemenid inscriptions one of the king's most important duties is to provide order to his empire.

The Achaemenid Persians did not leave us a document that outlines their artistic programme, and so we must infer the meaning of the symbolism which they used. We know that they frequently depicted weapons in their art, and the bow and spear were particularly popular. These weapons frequently appear in conjunction with royal figures, and so they likely represent power or authority. Achaemenid inscriptions suggest that their cosmology was one of opposing tensions. Indian mythology and Greek philosophy occasionally used the bow as a symbol for opposing tensions. It is therefore plausible, although not certain, that the importance of the bow in Achaemenid ideology was related to their dualistic world view.

We have so far traced the history of archery imagery in the history of the ancient Near East, and examined how such imagery influenced the Achaemenid use of this motif. We have also seen how symbolic archery continued in the religious beliefs of Persian following the Achaemenid period. We should note that this imagery was also influential on the religious texts of a non-Persian people who lived within the Achaemenid Empire, namely the ancient Hebrews. Archery imagery, and martial imagery more generally, has a long history in the Hebrew bible, and cannot always be traced back to Achaemenid influence. For example, in Jeremiah we find the phrases, "I will break the bow of Elam," and, "her mighty men are taken, their bows are shattered."[143] Elsewhere, we find, "I will break the bow of Israel."[144]

[143] Jer. 49.35, 51.56.
[144] Hos. 1.5.

Waldman traces these passages to various Akkadian expressions, which we have discussed above.[145]

Bonfiglio argues that, as *Zechariah* describes Yahweh as a "divine warrior," this imagery may have been influenced by Achaemenid depictions of the royal archer. In this instance, Yahweh's bow and arrow are representative of Judah and Ephraim, respectively.[146] As Bonfiglio notes, this imagery is found elsewhere in the Hebrew bible, but the way in which it is used is unique to Zechariah. Here, the bow and arrow are meant to protect the Hebrews, while in other passages, archery equipment is symbolic of Israel's enemies, or even of Yahweh's vengeance against them.[147] Bonfiglio suggests that the image of an archer as a protecting force was borrowed from the Achaemenid Persians, in particular the visual depictions of royal archers found on coins and seals.[148] The Achaemenid idea of the royal archer who protects his realm has therefore been co-opted by the author(s) of *Zechariah*, and transferred to Yahweh.

WEAPONS IN RITUAL

Thus far, we have examined the symbolic role archery played in the art and inscriptions of the Achaemenid Empire. It is plausible that the Persians also used this symbolism in the real world by using bows, arrows, and spears in ritual contexts. Unfortunately, Achaemenid ritual activity is not well attested in our sources, so it will be

[145] Waldman 1978: 82-83.
[146] Bonfiglio 2012: 509.
[147] Bonfiglio 2012: 510.
[148] Bonfiglio 2012: 520.

necessary to extrapolate from the little information we do have, and to use comparative evidence from other cultures to gain a more complete picture. Before we continue, it is worth noting the value of using weapons in religious or ritual settings. The association between violence and religion, as expressed through the ritual use of weapons, may have served to rationalize or legitimize the trauma soldiers had experienced in combat.[149] The Greek practice of dedicating weapons in temples and decorating temples with scenes of mythological battles may also have rationalized combat trauma.[150]

Although the Achaemenid evidence is sparse, other ancient cultures often used weapons in ritual contexts. In ancient Egypt, the bow was evidently an important symbol during the Sed festival, a celebration of the Pharaoh's reign.[151] Reliefs from Abu Gurob and Bubastis show that the Pharaoh and religious figures carried bows as part of this ritual.[152] During this same festival, and also during his ascension ceremony, the Pharaoh would fire arrows at the four cardinal directions.[153] This act may have symbolized the establishment of the kingdom's boundaries, represented by the flight of the arrow. A similar connection between archery and boundaries exists in Iranian mythology.[154]

In Athens, spears and other weapons had symbolic meaning in rituals. Demosthenes records an Athenian tradition, perhaps even a law (*nomima*), according to which a kinsman

[149] Grossman 1996: 214; Molloy 2012: 118.
[150] Molloy 2012: 113.
[151] The Sed festival was supposed to be celebrated during the thirtieth year of a Pharaoh's reign. Kozloff 2012: 182.
[152] Uphill 1965: 370, 380.
[153] Keel 1977: 169.
[154] See the discussion of the story of Arash below.

of a murdered woman was advised to guard her tomb with a spear for three days.[155] Cary and Nock suggest that the spear may have been driven into the tomb, and the purpose of this act may have been to prevent the potentially vengeful spirit of the victim from leaving the tomb.[156] The Athenians also participated in an ancient ritual involving weapons, the Buphonia.[157] During this festival, a herd of oxen were driven to the Acropolis, and were made to run around the altar. A grain offering was laid on the altar. The first ox to eat the grain was killed with an axe, and the person who struck the blow then dropped the axe and fled. The remaining people used a knife to skin the ox, and then cooked and ate the meat. When the feast was over, various people and objects that were responsible for the death of the ox were put on trial, including the knife and the axe. The axe was acquitted, but the knife was found guilty and thrown into the sea. The evidence for the Buphonia interests us here particularly because it shows that the Athenians used weapons in rituals whose purpose seems to be the absolution of blood guilt. Although in this instance the victim is an animal, we can imagine that a similar ritual would be useful to atone for killing in battle.

The Romans used spears in many rituals, and seem to have viewed spears as magic.[158] In his *Roman Questions*, a work devoted to the exploration of Roman customs, Plutarch asks, "for what reason do they part their wives' hair with the head of a spear?"[159] Plutarch speculates that this ritual symbolizes the Sabine women being taken by force, or marriage's connection to the spear-wielding Juno. Rose interprets this custom as indicative of the

[155] Dem. 47.69, *ἡμεῖς τοίνυν σοι τὰ νόμιμα ἐξηγησόμεθα, τὰ δὲ σύμφορα παραινέσομεν. πρῶτον μὲν ἐπενεγκεῖν δόρυ ἐπὶ τῇ ἐκφορᾷ, καὶ προαγορεύειν ἐπὶ τῷ μνήματι, εἴ τις προσήκων ἐστὶν τῆς ἀνθρώπου, ἔπειτα τὸ μνῆμα φυλάττειν ἐπὶ τρεῖς ἡμέρας*.
[156] Cary and Nock 1927: 123.
[157] We know of this ritual from Porphyry (*Abst*. 2.28-30), who probably based his account on Theophrastus. See also Burkert 1983: 136-140.
[158] See, e.g., Cary and Nock 1927.
[159] Plut. *Quest. Rom.* 87 (285), *διὰ τί τῶν γαμουμένων αἰχμῇ δορατίου τὴν κόμην διακρίνουσιν;*

Roman belief in a spear's magic.[160] According to Pliny, iron spears had medicinal value. Pliny describes apotropaic rituals such as carrying pointed weapons in order to protect people against poisons, and pricking someone with a spear used to wound a man in order to prevent chest pains.[161] This passage suggests that the Romans would have considered a weapon used in battle to be ritually more powerful than one that had not been used, and so ritual and practical use are not entirely separate in this instance.

Another ritual use of a weapon that may have occurred in ancient Rome likely had its basis in the Achaemenid world. When the Romans adopted the eastern god Mithra(s) from the Near East, it was implemented as a mystery cult. Mystery cults were popular in ancient Greece and Rome, although by their nature not much is certain about the details, which are known only to the initiates.[162] There is no evidence for their existence in the ancient Near East, although this may be due to the different sources available for the study of each region. Much of our knowledge of Greek and Roman mystery cults comes from literature, and so for cultures without a large corpus of literature, it may be difficult to surmise their existence. From what we know, the initiation ceremonies, during which new members were brought in to the group, and meetings were highly ritualized events.

The god Mithra was originally part of the Persian pantheon during the Achaemenid period. Although the earliest inscriptions, written during the reign of Darius I, mention only Ahura Mazda by name, they do suggest that other, unnamed (and therefore less important)

---

[160] Rose 1924: 205.
[161] Pl. *NH* 34.44, Terve circumlato mucrone et adultis et infantibus prodest contra noxia medicamenta…pungique leviter mucrone, quo percussus homo sit, contra dolores laterum pectorumque subitos, qui punctionem adferant.
[162] For a good introduction to ancient mystery cults, see Burkert 1987. Beck 2000 and Beck 2006 are both excellent sources on the Roman cult of Mithras specifically.

gods were recognized.[163] It is only in one inscription dated to the reign of Artaxerxes II that the god Mithra and goddess Anahita are named.[164] Achaemenid religious practices are not well represented in our sources, and so there is little we can say about Mithra worship in the Achaemenid and Hellenistic periods.[165] The mystery elements, which we know from the Roman cult of Mithras, were almost certainly a western invention, and were not part of the Persian worship of Mithra.[166] Rather, the creation of the cult of Mithras probably occurred in western Anatolia, perhaps as late as the first century A.D., and represents a mixture of Iranian religious traditions and Graeco-Roman practices.

There is no evidence that Mithra worship in Persia was a mystery cult, but it is almost certain that it involved some sort of rituals, some of which may have been imported to Rome along with the god. Initiates were sworn to secrecy regarding the rites of mystery religions, but scholars have been able to piece together an understanding of some of these rites through a careful analysis of various evidence. Beck has suggested that an archery scene on a Roman vessel depicts an initiation ceremony into the Mithraic cult, during which the head of the cult shoots an arrow at the initiate.[167] This may have been related to Mithras' water miracle. In this legend, Mithras shoots his arrow at a rock, and draws water from the rock. This myth presents archery as a life giving force, as represented by the water. There is some evidence of Mithra worship among the Achaemenid Persians, and it is likely that this worship continued in some form following the fall of the Achaemenid Empire, although we have no specific

[163] See, for example, Darius' inscription at Persepolis (DPg), which reads, "A great god is Auramazda, who is the greatest among all the gods," and concludes, "May Auramazda, together with all the gods, protect me, me and all I love."
[164] "By the favour of Auramazda, Anahita and Mithra, I built this apadana," A^2Ha.
[165] Beck 1998: 117.
[166] Beck 1998: 119.
[167] Beck 2000: 149.

details from the Hellenistic period. It is likely that many of the ritualistic elements of the Roman cult of Mithras were created much later, perhaps even in the first century A.D. Nevertheless, it is interesting that, in Rome at least, we have evidence for rituals that involve archery in the cult of a god who, at least indirectly, has ties to the Achaemenid Persians.

Perhaps the most explicit evidence for the ritual use of weapons among the Achaemenids is found in Herodotus' *Histories*. After Darius learned that the Athenians had taken Sardis during the Ionian Revolt, Herodotus writes that "he asked for his bow, took it and nocked an arrow, then he shot upwards towards the sky and said as he shot into the air, 'O Zeus, grant me vengeance on the Athenians.'"[168] Herodotus is likely here describing some sort of ritual, as the entreaty to Zeus (sc. Ahura Mazda) and the otherwise nonsensical action of shooting an arrow into the air make clear.

The precise meaning of this ritual is less clear, and this passage has not attracted much scholarly attention. Darius is said to have asked the god for a favour; vengeance upon his enemies. In this detail, Herodotus' story accords well with Achaemenid inscriptions which make clear that Ahura Mazda has helped the Achaemenids procure kingship so that they can protect their empire. The Athenians had attacked Sardis, a Persian city at this time, and so had disrupted the order which the king was divinely sanctioned to maintain. From Darius' perspective, the Athenians had done wrong not just to him, but also to his god, and so his entreaty to Ahura Mazda for help is understandable. Why, though, did Darius shoot at the sky? Herodotus here uses the word *ouranos*, a word which Homer used to describe the home

[168] Hdt. 5.105, *αἰτῆσαι τὸ τόξον, λαβόντα δὲ καὶ ἐπιθέντα δὲ ὀιστὸν ἄνω πρὸς τὸν οὐρανὸν ἀπεῖναι, καί μιν ἐς τὸν ἠέρα βάλλοντα εἰπεῖν, ὦ Ζεῦ, ἐκγενέσθαι μοι Ἀθηναίους τίσασθαι*.

of the gods.[169] Possibly Herodotus here imposes a Greek perspective and imagines the sky is also home to the chief god of the Persian pantheon. There is, however, another possible interpretation to this event.

The shooting of the arrow into the sky is reminiscent of another archery ritual that was used both in ancient Egypt and Sassanian Iran. In Egypt, the king shot arrows in the four cardinal directions during his coronation ceremonies.[170] A depiction of this ceremony was first recorded on the temple of Re built during the reign of Ne-user-re in the mid third millennium B.C.[171] This act was likely meant to symbolize the extent of his power. A similar ritual took place at the Sassanian Tir-Mah festival, and may be the basis for the Iranian folk story of Afrasiyab, Manuchir, and Arash. This story is reported by various medieval Iranian scholars, including Biruni and al-Tha'alibi.[172] In this story, Afrasiyab and Manuchir are at war. Afrasiyab had recently conquered the land of Eranshahr when the two made peace. One condition of this peace was that Afrasiyab should return "a part of Eranshahr as long and as broad as an arrow-shot."[173] Manuchir enlisted the help of the archer Arash, and provided him with a bow and a special arrow, which was made of "wood from a certain forest, the feather of an eagle's wing taken from a certain mountain, the point made of iron from a certain mine."[174] With a god's assistance, his arrow flew far, although the precise distance is unknown.

---

[169] LSJ s.v. *οὐρανός*, A.I.2. See also Hom. *Il.* 15.192 for his use of *ouranos* as the seat of the gods.
[170] Wilkinson 1991: 83.
[171] Keel 1977: 169.
[172] Biruni's text has been translated into English by E. Sadau, under the title *The Chronology of Ancient Nations* (1879). Al-Tha'alibi has been translated into French by H. Zotenberg under the title *Histoire des rois des perses* (1900). See also Tafazzoli and Hanaway 1986.
[173] Biruni, tr. Sachau 1879: 205.
[174] Tha'alibi 1900 : 133.

Given the similarity between Herodotus' anecdote and these archery rituals, as well as the timing of Darius' action between the Ionian Revolt and the battle of Marathon, I would suggest that Herodotus is here describing a genuine Persian custom that he has somewhat misunderstood. Darius was not asking Ahura Mazda for divine assistance against the Athenians, but rather sought to redefine the borders of his empire, presumably to include at least the city-state of Athens, if not the entire Greek peninsula.

Several of Darius' own inscriptions suggest that he envisioned his empire as stretching from one cardinal point to another, North to South and East to West, as he writes, "this is the empire which I hold, from the Saca who are beyond Sogdiana, from there as far as Kush, from the Indus as far as Sardis."[175] Darius' view of his empire in relation to the cardinal points mirrors the Egyptian practice of shooting in the four directions to symbolize the extent of their domain. In the case of Darius, he fires only one arrow because he plans to extend his border in one direction only. It may have been an Achaemenid tradition, when preparing for conquest, to fire a single arrow in the direction of the enemy to signal the beginning of aggression and mark the intention to extend territory. If this was the case, Herodotus understood some of this ritual, but was not entirely clear on certain facts.[176]

Just as the bow can symbolize military strength, for example in the case of Egypt's depiction of its enemies as the nine bows, so too can broken bows symbolize a loss of military strength or a defeat. When the image of the broken bow first appears, it could be

[175] DPa, DH. Several multi-lingual copies of this text have been found at both Persepolis and Ecbatana. This idea was common in Near Eastern kingship at least from the time of Sargon of Akkad. See, e.g., Westenholz 1997, text 1 (=MLC 641=BRM 4.4).
[176] Cf. The Caunian ritual, during which the men dress as for war, march to their border, and wave their spears in the air (Hdt. 1.172), and Livy's description of the Roman ritual for declaring war (1.32).

taken somewhat literally. The Code of Hammurabi, written in the early second millennium B.C., ends with a curse against anyone who destroys the code. One specific curse reads, "may Zamama shatter his (the transgressor's) weapons on the field of battle." Weapons certainly broke in ancient battles, and the result could have been fatal for the combatant, and so this passage, taken literally, would be an effective curse. By the time of Esarhaddon, a millennium later, we can see that the broken bow had come to symbolize the defeat of an entire people's military strength, as the king writes, "Ishtar, queen of war and battle, lover of my priesthood, stood at my side, broke their bows, shattered their battle line."[177] In this passage, the broken bow should not be taken literally. The enemy in this instance was not defeated due to some catastrophic failure of their weapons in the heat of battle. Instead, the broken bow symbolizes the enemy's collective military weakness.

It is possible that this textual metaphor eventually evolved into a ritual, with soldiers ceremonially breaking enemy bows after a successful battle. It is unlikely that all enemy bows were broken, as they would have been expensive pieces of equipment that the victorious soldiers could use or store for future campaigns. As we have seen, the time and specialized skill required to make a bow would indicate that they were valuable commodities, and were therefore likely taken as plunder. It is plausible, however, that a few enemy weapons were ceremonially destroyed, and that this custom continued into the Achaemenid era.

[177] Luckenbill 1927: 504.

CONCLUSION

Archery has been an important technology to humans since its invention. Beginning with art from the Paleolithic period, bows, arrows, and archers have been frequently depicted in art by cultures around the world. This is most likely due to its importance, first in hunting, and then in warfare. In early Egyptian and Mesopotamian art, the bow quickly became a symbol of power, both royal and military. By the time of the Achaemenid Empire, the bow had been an important symbol in the Near East for thousands of years. The bow was central to Achaemenid warfare, and so it was logical that the early kings used this weapon as a symbol for their kingship. The bow was a particularly suitable symbol for these kings, as the tension between the bow limbs, whence the arrow receives its power, is a suitable religious metaphor for the dualistic beliefs of the Achaemenids. The speed and distance at which an arrow can kill also made it a suitable symbol for the power of a king who was often far removed from his subjects. Finally, the importance of archery in Achaemenid art, royal ideology, and warfare make it likely that the Achaemenids used archery-related items in ritual contexts. Although our evidence for Achaemenid religion and ritual does not allow for any firm conclusions in this regard, there is indirect evidence for this practice.

CONCLUSION

Through over half a century of conflict, Achaemenid rulers set out from a small state in southwest Iran and became the hegemons of the largest empire the world had yet seen. In popular culture, the Achaemenids are best known for their involvement in two military campaigns, the Persian invasions of Greece under Darius I and Xerxes, and the Macedonian invasion of the Near East by Alexander the Great. Despite the importance of warfare in Persian history, Achaemenid military history has not attracted much scholarly attention. The view that the Persians were weak or effeminate, which may have dissuaded some early scholars from the study of Persian warfare, has persisted until recently, and is still visible in popular works on the Persians. I have tried throughout the present study to present a more balanced view of the Persians. They were not the unwarlike masses who had to be whipped into battle, as some accounts suggest. Nor were they the peaceful, benevolent rulers that others, including the Achaemenid kings themselves, portray. Persians and other Iranians seem to have made up the core of the army, and these troops conquered West Asia in three generations. These same troops maintained a large empire for two centuries. Their empire was built and maintained through military campaigns, yet scholars have largely ignored Achaemenid military history.

The continued absence of a comprehensive study of the Achaemenid military, remarked upon by Briant and Tuplin, may in part be attributed to the nature of our evidence.[1] This evidence exists across a broad spectrum of cademic disciplines, including archaeology, art history, philology, epigraphy, and numismatics. Textual evidence exists in numerous

[1] Briant 1999: 107; Tuplin 2010: 101.

ancient languages, some of which are not entirely understood. In addition, very few comprehensive catalogues of evidence exist for the Achaemenid world. Christopher Tuplin's forthcoming catalogue of military-themed seals is one example, and more catalogues of this sort would be of great help to future Achaemenid studies. The study of Classical history, for example, has been greatly facilitated by such works as the *Thesaurus Linguae Graecae* (and *Latinae*), the *Corpus Vasorum Antiquorum*, and the *Inscriptiones Graecae*. The digitization of many of these works has been particularly helpful. Similar collections of documents, artistic evidence, and material culture would greatly benefit future studies of Achaemenid culture.

The preceding pages are not a comprehensive study of Achaemenid military history. They are an in-depth study of what are inarguably the most important weapons of the ancient Persian world, the bow and the spear. While this project began as a study of Achaemenid military history, it became much more. The study of weapons allowed me to examine these objects in different contexts within Achaemenid society. I hope this work will increase our understanding not only of weapons as physical objects, but also the craftsmen who manufactured them, and the soldiers, hunters, and others who used them. The inclusion of weapons in monumental and personal art further allows us to understand how ancient rulers used common objects ideologically and even religiously. We can also see, particularly through the Greek evidence, how other contemporary cultures viewed and understood Achaemenid material culture. The study of ancient weaponry, therefore, elucidates far more than a culture's military history.

It is often necessary to use comparative evidence in historical studies. This is particularly true in Achaemenid studies, as our evidence often presents an incomplete picture.

A comparative approach can also be beneficial as it allows us to see a specific topic in its larger context. In the present study, for example, I hope to have shown how Achaemenid weaponry fits into the military history of the ancient Near East, how outside civilizations such as the Greeks viewed contemporary Persians, and how Achaemenid ideas about weapons influenced later Iranian peoples. It is often easy to forget that ancient civilizations did not exist in isolation, and that influence was not always direct and immediate. The field of Classics, for example, often encourages comparison between Greek and Roman civilization, but it is equally important to understand the connections between Greece and the Near East, and influences that reach even farther.

Aeschylus is the earliest of our extant sources to emphasize the Persians as archers in order to contrast Persian warriors with Greek hoplites, and this view was influential on later Greek authors and painters. Scholarly and popular works continue to emphasize the importance of archery in the Achaemenid army, but some scholars understand the importance of the Achaemenid spear.[2] In evidence from the Persian heartland, the spear is undoubtedly as important as the bow. The spear appears in monumental art from Susa and Persepolis, the Bisitun relief, and Darius' tomb at Naqsh-i Rustam. Archaeologists have found spearheads at numerous Achaemenid sites, including Persepolis and Deve Hüyük. In one of his inscriptions, Darius uses the spear as a symbol for the military strength of the empire, and élite guard units known as "spear-bearers" appear in inscriptions and documentary evidence.

Reconstructions of *gerrhon* shields suggest some important conclusions. I have shown that many scholars have greatly misrepresented these shields, and that they were not

[2] Hyland 2011.

made of wicker, as their Greek name suggests. Archaeological evidence indicates that these shields were made by weaving staves through rawhide. These shields were more effective than some historians have supposed, particularly against missile fire. Despite the opinion of some influential studies, it is not likely that each shield protected up to ten archers. It is much more reasonable to assume each shield protected only one or two archers. There is no evidence that the Achaemenids employed shield-bearer and archer combinations, as did the Assyrians and early Mesopotamians.

Evidence for recruitment, training, and logistics is not evenly distributed across the empire, but concentrations of evidence in Egypt and Mesopotamia suggest a similar practice existed in these two regions. It is not clear if the situation in these areas is representative of the empire as a whole. The Achaemenids largely continued the land-tenure system of the Neo-Babylonians. The king gave land grants in exchange for service, including military service. Often these land-holders paid for a substitute to serve in their stead. Temple dependants also frequently served in the military. As temples were given land, they were also required to provide troops as needed. Many temples also employed specialist craftsmen to produce weapons. Some soldiers also seem to have been able to purchase weapons themselves, perhaps in an open market. Near Eastern documentary sources indicate that some soldiers were supplied rations while serving, and others bought their own supplies. It is possible that soldiers who served in exchange for land had to supply themselves from their land revenue, while other troops were given rations. Conscript troops were levied either seasonally or before campaigns, in order to bolster the professional core of the army.

In the final chapter, I examined the ideological use of weapons in the Achaemenid Empire. Weapons had a long history as symbols of royal power in the Near East, which

continued through the Achaemenid era. The spear as a symbol of royal power, most famously used by Darius, does not have a clear precedent in the Near East, and was likely an Achaemenid innovation. Archery may have been particularly well suited to Achaemenid cosmology, as the opposing tension of the bow limbs mirrors their cosmological views, as expounded in their inscriptions. Comparative evidence from Egypt and later Persian folklore, and a single line of Herodotus, suggests that the Achaemenids used archery in various rituals.

I wanted to frame the topic of this study in such a way that we could discuss issues related to this subject in as much detail as possible. Nevertheless, questions naturally arose which were beyond the scope of this discussion, or that required familiarity with languages, sources, and scholarship that were beyond my expertise. I have suggested that the invention of the composite bow coincided with the formation of more complex states in Mesopotamia, and that the construction of composite bows and the logistics of fielding large armies of archers may have been facilitated by centralized power. I have left this as a conjecture, partly because the invention of the composite bow occurred several millennia before the Achaemenid Empire, and so was outside the scope of the present study.

As the experiments reconstructing *gerrha* were so successful, I also tried to recreate ancient composite bows. It was my hope that these reconstructions would allow greater insight into the ancient bow-making process, and increase our understanding of Achaemenid weaponry. Unfortunately, composite bows proved too difficult, time-consuming, and expensive to build. In addition, many of the materials used in Achaemenid bows are not available in North America, or are simply not attested in our sources. Such experiments were not feasible in this instance, but in the future could benefit our understanding of ancient weapons and craftsmen.

One chapter was devoted to the Achaemenid use of the *gerrha*, rectangular shields similar to types used by the Assyrians and others. While these shields are not directly related to bows and spears, we include them here as they are often used in conjunction with archers and spearmen, particularly in Assyrian sources. There are several other types of Achaemenid shield, known through artistic depictions, which did not fit in to the focus of the present study. Reliefs from Persepolis, for example, show Persians wielding *dipylon* or figure-eight shields, and Attic vases suggest later Persians adopted the crescent shield similar to the Thracian *pelte.* There may also have been other shaped shields known as *gerrha,* including an ivy-leaf shaped shield and perhaps a round buckler. As Greek authors name these shields *gerrha,* they were likely constructed using the same materials and technique as the rectangular *gerrha,* but their purpose must have been different. A short monograph on Achaemenid shield types could elucidate this topic.

Finally, we have discussed the role of weapons in the ideological programme of the Achaemenid kings, and included the possibility that they used weapons in ritual contexts. This section required us to draw on comparative evidence, as Achaemenid religious practices are still poorly understood. In particular, there appears to be a connection between Achaemenid archery, later Iranian folklore, Avestan Mithra, and Vedic Mitra. A collaborative approach may best explore these connections, as a single scholar is unlikely to be well versed in the languages and secondary scholarship of these various fields. In fact, Achaemenid studies in general, and its military history in particular, could benefit from collaborative research, as the evidence is spread across numerous specialized sub-fields.

I began this work with a discussion of Pierre Briant's comments, made twenty years ago, that Achaemenid studies lack a comprehensive military history. While such a work

would be difficult, it is not impossible. I suggest three factors that may facilitate the production of such a study. Perhaps most important is the need for exhaustive collections or catalogues of evidence. At the moment too much evidence is spread across specialist publications, and it can be difficult for an Achaemenid historian to feel that one has examined all the evidence related to a topic. In this instance, we should look to Classics, which has a long history of compiling and organizing bodies of evidence. Secondly, I would encourage increased collaboration between scholars of various backgrounds. Finally, we must understand that Achaemenid evidence is not always sufficient. This lack of evidence should not necessarily dissuade us from studying a topic, but rather we should look to comparative evidence whenever possible. If we take these three issues into consideration, we may see an increased focus on Achaemenid military history, and other less studied aspects of Achaemenid history, in the near future.

FIGURES

Fig. 1.1 – Persian troops with *gorytus* bowcases, Persepolis (Schmidt 1953).

Fig. 1.2 – Duck head limb tip, Achaemenid “Elamite” bow (author’s photograph)

Fig. 1.3 – Greek depiction of Persian with Scythian Bow (Zutterman 2003)

Fig. 1.4 – Bronze Arrowhead Mould, Mosul (Trustees of the British Museum)

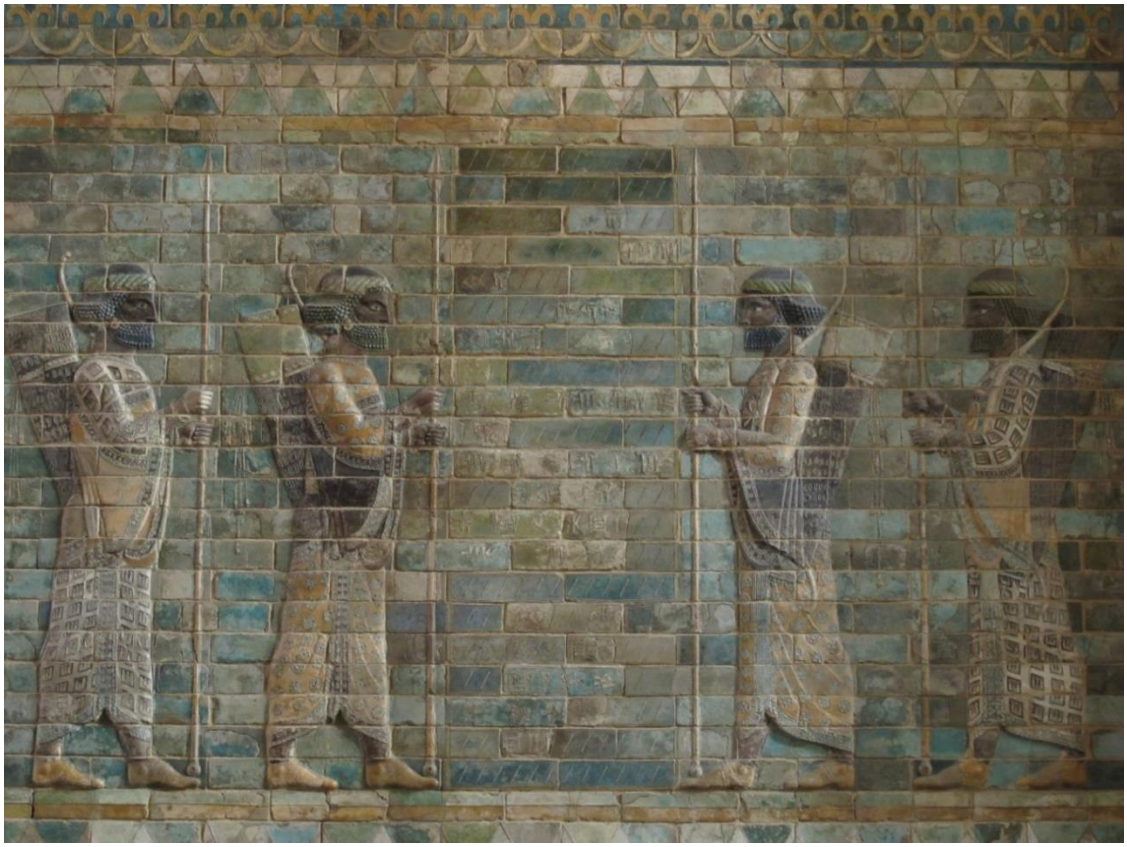

Fig. 2.1 – Royal guards, Susa (author's photograph).

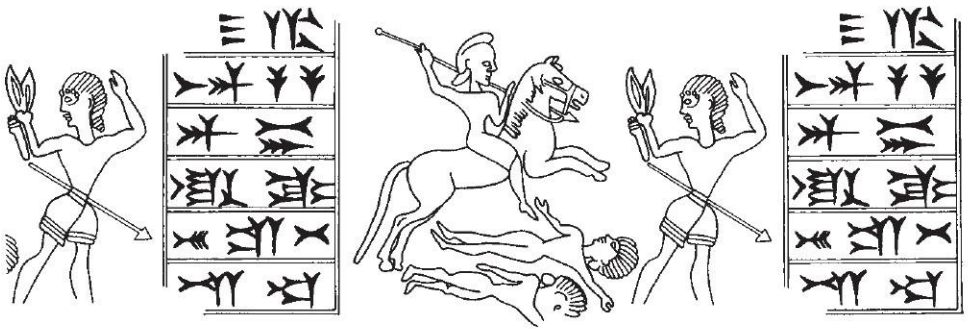

Fig. 2.2 – PFS 93* (Garrison 2011a).

Fig. 2.3 – Oxford Brygos Cup detail (Barrett and Vickers 1978).

Fig. 3.1 – Boar Hunt, PFS 2323 (Garrison 2011b)

Fig. 3.2 – Egyptian Bow Workshop (McLeod 1958)

Fig. 4.1 – Mari Plaque (Parrot 1971)

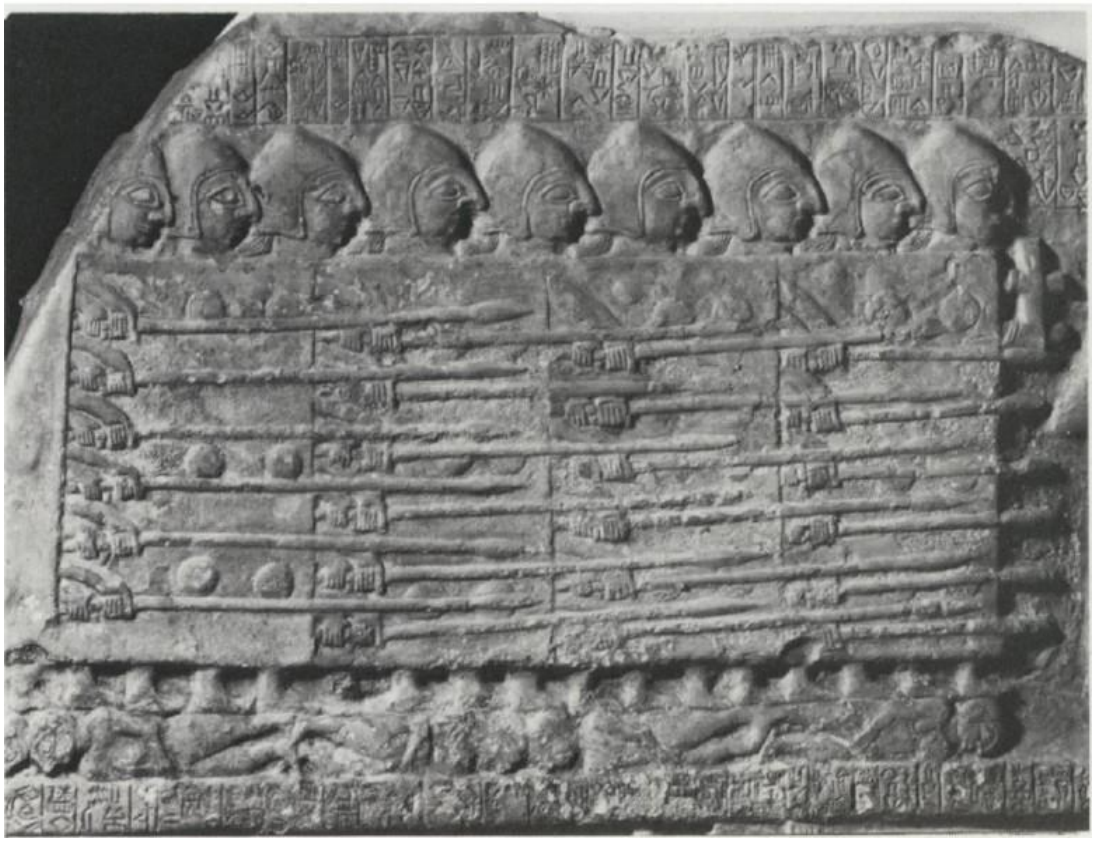

Fig. 4.2 – Stele of the Vultures (Winter 1985)

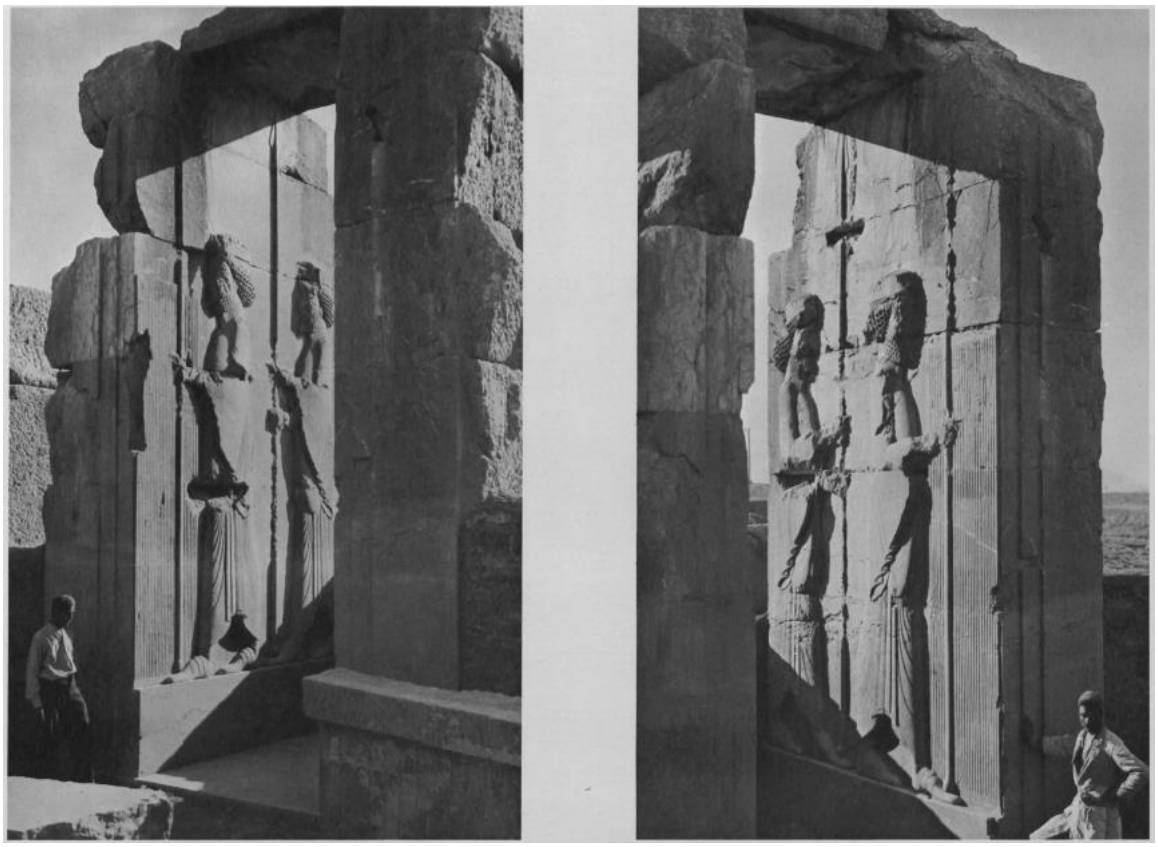

Fig. 4.3 – Persian soldiers with *gerrha*, Persepolis (Schmidt 1953)

Fig. 4.4 – *Gerrhon* shield, Dura Europos (James 2004)

Fig. 4.5 – Our second attempt to reconstruct a *gerrhon* shield

Fig. 4.6 – Broadhead penetration of reconstructed *gerrhon*

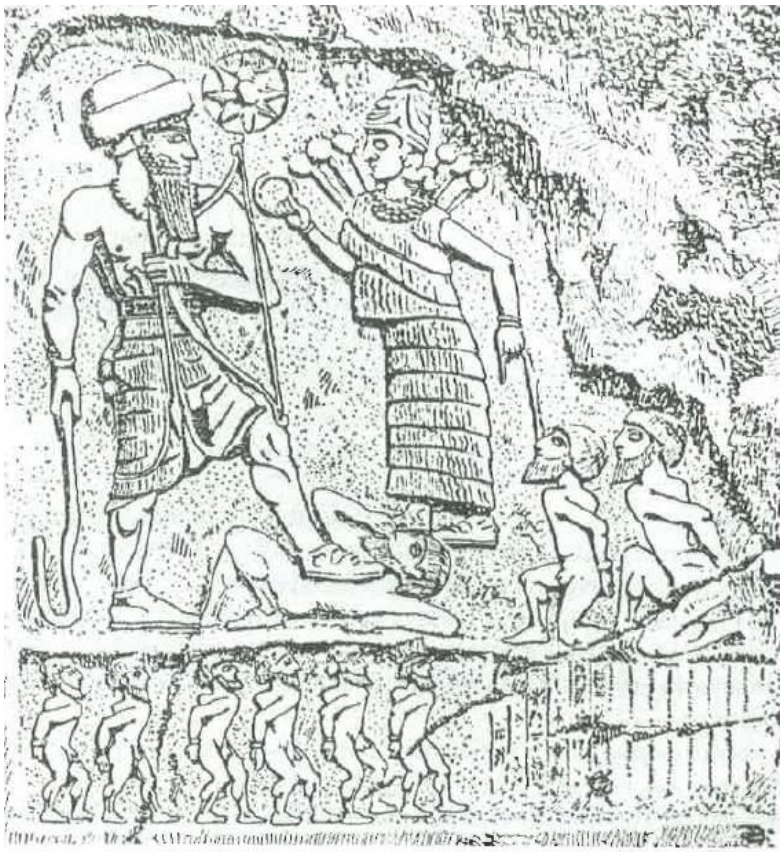

Fig. 5.1 – Sar-i Pol relief (Root 2013)

Fig. 5.2 – Hunt scene from Çan sarcophagus (Ma 2008)

ABBREVIATIONS

A^2H = Artaxerxes II's Inscriptions at Ecbatana (Hamadan)

AO = Musée du Louvre number

AV = Atharva Veda

BE = The Babylonian Expedition of the University of Pennsylvania, Series A: Cuneiform Texts

BM = British Museum

BRM = Babylonian Records in the Library of J. Pierpont Morgan

CAD = The Assyrian Dictionary of the Oriental Institute of the University of Chicago

Camb. = Inschriften von Cambyses, J.N. Strassmaier

CANE = Civilizations of the Ancient Near East

CT = Cuneiform Texts from Babylonian Tablets

CTN = Cuneiform Texts from Nimrud (Vol. 3: Dalley and Postgate, Tablets from Fort Shalmaneser)

DB = Darius' Inscription at Bisitun

DH = Darius' Inscription at Ecbatana (Hamadan)

DN = Darius' Inscriptions at Naqsh-e Rustam

DS = Darius' Inscriptions at Susa

MARV = Mittelassyrische Rechtsurkunden und Verwaltungstexte

ME = British Museum

MLC = Texts in the Collections of the J. Pierpont Morgan Library

PFS = Persepolis Fortification Seals

Sb = Musée du Louvre number

TAD = Textbook of Aramaic Documents from Ancient Egypt.

Tell Halaf = J. Friedrich et al., *Die Inschriften vom Tell Halaf*

XP = Xerxes' Inscriptions at Persepolis

YOS = Yale Oriental Series, Babylonian Texts

Yt. = Yasht

BIBLIOGRAPHY

Akamatis, N. 2012. "Red-figured Pelike with a Battle Scene from Pella." *Κεραμέως παῖδες. Αντιδωρο στον Καθηγητή Μιχάλη Τιβέριο από τους μαθητές του.* Edited by E. Kefalidou and D. Tsiafaki. Thessalonica. 143-150.

Albenda, P. 1972. "Ashurnasirpal II Lion Hunt Relief BM 124534." *Journal of Near Eastern Studies* 31, 3: 167-178.

---. 2008. "Assyrian Royal Hunts: Antlered and Horned Animals from Distant Lands." *Bulletin of the American Schools of Oriental Research* 349: 61-78.

Albright, W.F. and G.E. Mendenhall. 1942. "The Creation of the Composite Bow in Canaanite Mythology." *Journal of Near Eastern Studies* 1, 2: 227-229.

Aldrete, G.S., S. Bartell, and A. Aldrete. 2013. *Reconstructing Ancient Linen Body Armor: Unravelling the Linothorax Mystery.* Baltimore.

Allen, L. 2005. "Le roi imaginaire: An Audience with the Achaemenid King." *Imaginary Kings: Royal Images in the Ancient Near East, Greece, and Rome.* Edited by O. Hekster and R. Fowler. Stuttgart. 39-62.

Aperghis, G.G. 2004. *The Seleukid Royal Economy: The Finances and Financial Administration of the Seleukid Empire*. Cambridge.

Alram, M. 1994. "Daric." *Encyclopaedia Iranica.* Vol. VII, Fasc. 1. Available online at http://www.iranicaonline.org/articles/daric (accessed July 8th, 2017).

---. 2012. "The Coinage of the Persian Empire." *The Oxford Handbook of Greek and Roman Coinage*. Edited by W.E. Metcalf. Oxford.

Allsen, T.T. 2006. *The Royal Hunt in Eurasian History.* Philadelphia.

Álvarez-Mon, J. 2004. "Imago Mundi: Cosmological and Ideological Aspects of the Arjan Bowl." *Iranica Antiqua* 39: 203-237.

---. 2013. "Braids of Glory. Elamite Sculptural Reliefs from the Highlands: Kūl-e Farah IV." *Susa and Elam. Archaeological, Philological, Historical and Geographical Perspectives*. Edited by K. De Graef and J. Tavernier. Leiden. 207-248.

---. 2015. "A Highland Elamite Archer from Kūl-e Farah IV, CI:4." *Iranica Antiqua* 50: 251-277.

Amiet, P. 1973. "La glyptique de la fin de l'Élam." *Arts Asiatiques* 28: 3-43.

---. 1977. *L'art antique du proche-orient.* Paris.

Asheri, D., A. Lloyd, and A. Corcella. 2007. *A Commentary on Herodotus Books I-IV.* Edited by O. Murray and A. Moreno. Translated by B. Graziosi, M. Rossetti, C. Dus, and V. Cazzato. Oxford.

De Backer, F. 2011. "Siege-Shield and Scale Armour: Reciprocal Predominance and Common Evolution." *Historiae* 8: 1-29.

Balfour, H. 1921. "The Archer's Bow in the Homeric Poems." *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 51: 289-309.

Baker, T. 2000. "Glue." *The Traditional Bowyer's Bible Volume One.* Edited by J. Hamm. Guilford. 195-206.

Barkworth, P.R. 1993. "The Organization of Xerxes' Army." *Iranica Antiqua* 27: 149-167.

Barnett, R.D. 1972. "More Addenda from Toprak Kale." *Anatolian Studies* 22: 163-178.

---. 1976. *Sculptures from the North Palace of Ashurbanipal at Nineveh (668-627 B.C.).* London.

Barrett, A.A. and M. Vickers. 1978. "The Oxford Brygos Cup Reconsidered." *The Journal of Hellenic Studies* 98: 17-24.

Barron, A.E. 2010. *Late Assyrian Arms and Armour: Art versus Artifact.* Unpublished thesis, University of Toronto.

Baughan, E.P. 2010. "Persian Riders in Lydia? The Painted Frieze of the Aktepe Tomb Kline." *Bollettino di Archeologia Online* Special Volume: 24-36.

Beck, R. 1998. "The Mysteries of Mithras: A New Account of their Genesis." *The Journal of Roman Studies* 88: 115-128.

---. 2000. "Ritual, Myth, Doctrine, and Initiation in the Mysteries of Mithras: New Evidence from a Cult Vessel." *Journal of Roman Studies* 90: 144-179.

---. 2006. *The Religion of the Mithras Cult in the Roman Empire: Mysteries of the Unconquered Sun.* Oxford.

Beekes, R. and L. van Beek. 2010. *Etymological Dictionary of Greek.* Leiden.

Best, J.G.P. 1969. *Thracian Peltasts and their Influence on Greek Warfare.* Groningen.

Billows, R.A. 2010. *Marathon: How One Battle Changed Western Civilization.* New York.

Biruni, Abu Rayhan. 1879. *The Chronology of Ancient Nations.* Translated by C.E. Sachau. London.

Blecher, I. 2006. "The Stoic Method of Happiness." *Apeiron: A Journal for Ancient Philosophy and Science* 39, 2: 157-176.

Blyth, P.H. 1977. *The Effectiveness of Greek Armour against Arrows in the Persian War (490-479 B.C.): An Interdisciplinary Enquiry.* Unpublished Thesis, University of Reading.

Bonfiglio, R.P. 2012. "Archer Imagery in Zechariah 9:11-17 in Light of Achaemenid Iconography." *Journal of Biblical Literature* 131,3: 507-527.

Bovon, A. 1963. "La representation des guerriers perses et la notion des Barbares dans la première moitié du Ve siècle." *Bulletin de correspondence hellénique* 87.2: 579-602.

Briant, P. 1985. "Dons de terres et de villes: l'Asie mineure dans le context Achéménide, avec des observations de Th. Petit et de P. Lévêque." *Revue des Études Anciennes* 87: 53-72.

---. 1988. "Ethno-classe dominante et populations soumises dans l'empire achemenide: le cas d'Egypte." *Achaemenid History III: Method and History.* Edited by A. Kuhrt and H. Sancisi-Weerdenburg. Leiden.137-173.

---. 1996. *Histoire de l'empire Perse: De Cyrus à Alexandre*. Paris.

---. 1999. "The Achaemenid Empire." *War and Society in the Ancient and Medieval Worlds: Asia, The Mediterranean, Europe, and Mesoamerica.* Edited by K. Raaflaub and N. Rosenstein. Cambridge. 105-128.

---. 2002. *From Cyrus to Alexander. A History of the Persian Empire.* Translated by P.T. Daniels. Winona Lake.

---. 2013. "Susa and Elam in the Achaemenid Empire." *The Palace of Darius at Susa: The Great Royal Residence of Achaemenid Persia.* Edited by J. Perrot. London. 3-28.

Brinkman, J.A. 1986. "The Elamite-Babylonian Frontier in the Neo-Elamite Period, 750-625 B.C." *Fragmenta Historiae Elamicae: Mélanges offerts à M.J. Steve.* Edited by L. de Meyer, H. Gasche, and F. Vallat. Paris. 199-207.

Broneer, O. 1933. "Excavations on the North Slope of the Acropolis in Athens, 1931-1932." *Hesperia: The Journal of the American School of Classical Studies at Athens* 2, 3: 329-417.

---. 1935. “Excavations on the North Slope of the Acropolis in Athens, 1933-1934.” *Hesperia: The Journal of the American School of Classical Studies at Athens* 4, 2: 109-188.

Brosius, M. 1996. *Women in Ancient Persia (559-331 BC)*. Oxford.

---. 2005. “Pax persica: Königliche Ideologie und Kriegführung in Achämenidenreich.” *Krieg – Gesellschaft-Institutionen: Beiträge zu einer vergleichenden Kriegsgeschichte*. Edited by B. Meissner, O. Schmitt, and M. Sommer. Berlin. 135-161.

Brown, F.E. 1937. “A Recently Discovered Compound Bow.” *Seminarum Kondakovianum* 9: 1-10.

Bryce, T. 2002. *Life and Society in the Hittite World.* Oxford.

Buraselis, K. and K. Meidani (ed.). 2010. *Marathon: The Battle and the Ancient Deme*. Athens.

Burkert, W. 1983. *Homo Necans: The Anthropology of Ancient Greek Sacrificial Ritual and Myth.* Translated by P. Bing. Berkeley.

---. 1987. *Ancient Mystery Cults.* Cambridge.

Calmeyer, P. 1979. “Zur Genese altiranischer Motive VI: Toxotai.” *Archäologische Mitteilungen aus Iran* 10: 303-313.

Cardascia, G. 1951. *Les Archives des Murašu: une famille d’hommes d’affaires babyloniens à l’époque perse (455-403 av. J.-C.).* Paris.

Carter, E., H. Pittman, A. Benoit, Z. Bahrani, and M.W. Stolper. 1992 “Protoliterate Susa.” *The Royal City of Susa: Ancient Near Eastern Treasures in the Louvre.* New York. 47-80.

Cartledge, P. 2007. *Thermopylae: The Battle that Changed the World.* New York.

Cary, M. and A.D. Nock. 1927. “Magic Spears.” *The Classical Quarterly* 21, 3/4: 122-127.

Caubet, A. and N. Daucé. 2013. “The Fired Arts.” *The Palace of Darius at Susa: The Great Royal Residence of Achaemenid Persia.* Edited by J. Perrot. London. 301-330.

Chantraine, P. 1977. *Dictionnaire étymologique de la langue grecque. Histoire des mots. Tome IV-1: P-Y.* Paris.

Charles, M.B. 2011. “Immortals and Apple-Bearers: Towards a Better Understanding of Achaemenid Infantry Units.” *The Classical Quarterly* 61, 1: 114-133.

---. 2012a. “Herodotus, Body Armour and Achaemenid Infantry.” *Historia: Zeitschrift für Alte Geschichte* 61, 3: 257-269.

---. 2012b. “The Persian Κάρδακες.” *Journal of Hellenic Studies* 132: 7-21.

---. 2015. “Achaemenid Elite Cavalry: from Xerxes to Darius III.” *Classical Quarterly* 65, 1: 14-34.

---. 2016. “Athenaeus, Clearchus and the Dress of the Persian Apple-Bearers.” *Iranica Antiqua* 51: 149-164.

Christesen, P. 2006. “Xenophon’s ‘Cyropaedia’ and Military Reforms in Sparta.” *The Journal of Hellenic Studies* 126: 47-65.

Cleuziou, S. 1977. “Les pointes de fleche ‘scythiques’ en proche et moyen Orient.” *Le plateau iranien et l’Asie central dès origins à la conquête islamique: Leur relations à la lumière des documents archéologiques*. Edited by J. Deshayes. Paris. 187-199.

Coghlan, H.H. 1952. “Casting Moulds Made in Metal.” *Man* 52: 162-164.

Colburn, H.P. 2014. *The Archaeology of Achaemenid Rule in Egypt.* Unpublished thesis, Department of Classical Art and Archaeology, University of Michigan.

Collins, P., L. Baylis, and S. Marshall. 2008. *Assyrian Palace Sculptures.* Austin.

Collon, D. 1983. “Hunting and Shooting.” *Anatolian Studies* 33: 51-56.

---. 2008. “Le development de l’arc en Mesopotamie.” *Les armée du Proche-Orient ancient (IIIe-Ier mill. Av. J.-C.).* Edited by P. Abrahami and L. Battini. Oxford. 93-112.

Coomaraswamy, A.K. 1943. “The Symbolism of Archery.” *Ars Islamica* 10: 105-119.

Cowley, A. 1923. *Aramaic Papyri of the Fifth Century B.C.* Oxford.

Curtis, J. and S.J. Simpson (ed.). 2010. *The World of Achaemenid Persia: History, Art and Society in Iran and the Ancient Near East*. London.

Dalley, S. and J.N. Postgate. 1984. *The Tablets from Fort Shalmaneser*. Oxford.

Dandamayev, M.A. 1992. *Iranians in Achaemenid Babylonia*. Costa Mesa.

---. 1997. “Education i. In the Achaemenid Period.” *Encyclopaedia Iranica,* Vol. VIII, Fasc. 2. Available online at http://www.iranicaonline.org/articles/education-i (accessed April 4th, 2017).

---. 1999. “Temple Archers in the Neo-Babylonian Sippar.” *Michael: Historical, Epigraphical and Biblical Studies in Honor of Prof. Michael Heltzer.* Edited by Y. Avishur and R. Deutsch. Tel Aviv. 95-98.

Davies, N. 1922. *The Tomb of Puyemrê at Thebes.* New York.

DeGraef, K. 2002. “An Account of the Redistribution of Land to Soldiers in Late Old Babylonian Sippar-Amnānum.” *Journal of the Economic and Social History of the Orient* 45, 2: 141-178.

DeJong, A. 2010. “Ahura Mazda the Creator.” *The World of Achaemenid Persia: History, Art and Society in Iran and the Ancient Near East.* Edited by J. Curtis and St.-J. Simpson. London. 85-89.

Delougaz, P. and H.J. Kantor. 1996a. *Chogha Mish Volume I: The First Five Season of Excavations, 1961-1971. Part 1: Text.* Edited by A. Alizadeh. Chicago.

---. 1996b. *Chogha Mish Volume I: The First Five Season of Excavations, 1961-1971. Part 2: Plates.* Edited by A. Alizadeh. Chicago.

Derin, Z. And A. Çilingiroğlu. 2001. “Armour and Weapons.” *Ayanis I: Ten Years` Excavations of Rusahinili Eiduru-Kai, 1989-1998.* Edited by Cilingiroglu and Salvini. Rome. 155-187.

Dezső, T. 2006. “The Reconstruction of the Neo-Assyrian Army as Depicted on the Assyrian Palace Reliefs, 745-612 B.C.” *Acta Archaologica Academiae Scientiarum Hungaricae* 57: 87-130.

---. 2012a. *The Assyrian Army I. The Structure of the Neo-Assyrian Army, as Reconstructed from the Assyrian Palace Reliefs and Cuneiform Sources 1. Infantry.* Budapest.

---. 2012b. *The Assyrian Army I. The Structure of the Neo-Assyrian Army 2. Cavalry and Chariotry*. Budapest.

---. 2016. *The Assyrian Army II. Recruitment and Logistics.* Budapest.

Dirr, M.A. 2011. *Dirr’s Encyclopedia of Plants and Shrubs.* Portland.

Draycott, C. 2007. “Dynastic Definitions: Differentiating Status Claims in the Archaic Pillar Tomb Reliefs of Lycia.” *Ancient Near Eastern Studies* Supp. 20: 103-134.

---. 2010. “Convoy Commanders and Other Military Identities in Tomb Art of Western Anatolia around the Time of the Persian Wars.” *Bollettino di Archeologia Online* Special Volume: 7-23.

Dubovský, P. 2004-2005. “Neo-Assyrian Warfare: Logistics and Weaponry during the Campaigns of Tiglath-pileser III.” *Anodos: Studies of the Ancient World* 4-5: 61-67.

---. 2013. “Dynamics of the Fall: Ashurbanipal’s Conquest of Elam.” *Susa and Elam. Archaeological, Philological, Historical and Geographical Perspectives.* Edited by K. de Graef and J. Tavernier. Leiden. 451-470.

Dusinberre, E.R.M. 2013. *Empire, Authority, and Autonomy in Achaemenid Anatolia.* Cambridge.

Ebeling, E. 1952. “Die Rüstung eines babylonischen Panzerreiters nach einem Vertrage aus der Zeit Darius II.” *Zeitschrift für vorderasiatische Archäologie* 16: 203-213.

Erdmann, E. 1973. “Die sogenannten Marathonpfeilspitzen in Karlsruhe.” *Archäologischer Anzeiger* 88: 30-58.

Evans, J.A.S. 1993. “Herodotus and the Battle of Marathon.” *Historia: Zeitschrift für Alte Geschichte* 42, 3: 279-307.

Estienne, H. 1854. *Thesaurus Graecae Linguae Volumen Septimum.* Paris.

Fagan, G. 2010. “‘I Fell upon Him like a Furious Arrow:’ Toward a Reconstruction of the Assyrian Tactical System.” *New Perspectives on Ancient Warfare.* Edited by G. Fagan and M. Trundle. Leiden. 81-100.

Farrokh, K. 2007. *Shadows in the Desert: Ancient Persia at War.* London.

Franks, H.M. 2009. “Hunting the Eschata: An Imagined Persian Empire on the Lekythos of Xenophantos.” *Hesperia: The Journal of the American School of Classical Studies at Athens* 78 4: 455-480.

Friedrich, J, G.R. Meyer, A. Ungnad, and E.F. Weidner. 1967. *Die Inschriften vom Tell Halaf: Keilschrifttexte und aramäische Urkunden au seiner assyrischen Provinzhauptstadt.* Osnabrück.

Garrison, M.B. 2010. “Archers at Persepolis: The Emergence of Royal Ideology at the Heart of the Empire.” *The World of Achaemenid Persia: History, Art and Society in Iran and the Ancient Near East.* Edited by J. Curtis and S.J. Simpson. London. 337-359.

---. 2011a. “The Seal of ‘Kuraš the Anzanite, Son of Šešpeš’ (Teispes), PFS 93*: Susa – Anšan – Persepolis.” *Elam and Persia*. Edited by J. Álvarez-Mon and M.B. Garrison. Winona Lake. 375-405.

---. 2011b. “Notes on a Boar Hunt (PFS 2323).” *Bulletin of the Institute of Classical Studies* 54,2: 17-20.

Garrison, M.B. and M.C. Root. 2001. *Seals on the Persepolis Fortification Tablets Volume I: Images of Heroic Encounter.* Chicago.

Garson, R.W. 1983. “Observations on some Recurrent Metaphors in Aeschylus’ ‘Oresteia.’” *Acta Classica* 26: 33-39.

Gelb, I.J. et al. 1956-2010. *The Assyrian Dictionary of the Oriental Institute of the University of Chicago*. 21 volumes. Chicago.

George, A.R. 2003. *The Babylonian Gilgamesh Epic: Introduction, Critical Edition, and Cuneiform Texts Volume I.* Oxford.

Gerhard, E. 1847. *Auserlesene griechische Vasenbilder, hauptsächlich etruskischen Fundorts*. Berlin.

Ghirshman, R. 1954. *Iran from the Earliest Times to the Islamic Conquest.* New York.

Gibson, J.C.L. 1977. *Canaanite Myths and Legends.* London.

Gnoli, G. “Dualism.” *Encyclopaedia Iranica* Vol. VII, Fasc. 6. Available online at http://www.iranicaonline.org/articles/dualism (accessed January 18th, 2019).

Goff, C. 1978. “Excavations at Baba Jan: The Pottery and Metal from Levels III and II.” *Iraq* 16: 29-65.

Gorelik, M.V. 1993. *Weapons of the Ancient East* (in Russian). Moscow.

Görkay, K. 2002. “Representations of Shield-Aprons on Attic Pottery and their Connection with the Battle of Marathon and Miltiades.” *Tekmeria* 7: 49-62.

Grayson, A.K. 1987. *Assyrian Rule of the Third and Second Millennia BC (to 1115 BC)*. Toronto.

Grayson, C.E., M. French, and M.J. O’Brien. 2007. *Traditional Archery from Six Continents: The Charles E. Grayson Collection.* Columbia.

Green, P. 1996. *The Greco-Persian Wars.* Berkeley.

Grossman, D. 1995. *On Killing: The Psychological Cost of Learning to Kill in War and Society.* New York.

Grote, G. 1857. *History of Greece* 2nd ed. New York.

Güterbock, H.G. 1956. “Notes on Some Hittite Monuments.” *Anatolian Studies* 6: 53-56.

Hallock, R.T. 1969. *Persepolis Fortification Tablets*. Chicago.

Hamblin, W.J. 2006. *Warfare in the Ancient Near East to 1600 BC: Holy Warriors at the Dawn of History*. London.

Hardcastle, R. 2000. "Cutting and Seasoning Wood." *The Traditional Bowyer's Bible Volume One*. Edited by J. Hamm. Guilford. 19-42.

Harper, P.O., J. Aruz, and F. Tallon (eds.). 1992. *The Royal City of Susa: Ancient Near Eastern Treasures in the Louvre*. New York.

Harris, H.A. 1963. "Greek Javelin Throwing." *Greece & Rome* 10,1: 26-36.

Harris, R. 1975. *Ancient Sippar: A Demographic Study of an Old Babylonian City (1894-1595 B.C.)*. Leiden.

Harrison, T. 2011. *Writing Ancient Persia*. London.

Harrod, J.B. 1981. "The Bow: A Techno-Mythic Hermeneutic: Ancient Greece and the Mesolithic." *Journal of the American Academy of Religion* 49, 3: 425-446.

Hayes, W.C. 1978. *The Scepter of Egypt: A Background for the Study of the Egyptian Antiquities in The Metropolitan Museum of Art from the Earliest Times to the End of the Middle Kingdom Volume I*. New York.

Head, D. 1993. *The Achaemenid Persian Army*. Stockport.

Henkelman, W.F.M. 2002. "Exit der Posaunenbläser. On lance-guards and lance-bearers in the Persepolis Fortification archive." *Arta* 2002.007. 1-35.

---. 2008. *The Other Gods Who Are: Studies in Elamite-Iranian Acculturation based on the Persepolis Fortification Texts*. Leiden.

---. 2017. "Imperial Signature and Imperial Paradigm: Achaemenid Administrative Structure and System across and beyond the Iranian Plateau." *Die Verwaltung im Achämenidenreich: Imperiale Muster und Strukturen*. Edited by B. Jacobs, W.F.M. Henkelman, and M.W. Stolper. Wiesbaden. 45-256.

Henshaw, R.A. 1969. "The Assyrian Army and its Soldier, 9th - 7th c., B.C." *Palaeologia* 16, 1: 1-24.

Herford, M.A.B. 1914. "A Cup Signed by Brygos at Oxford." *Journal of Hellenic Studies* 34: 106-113.

Hiebert, F.T. 1992. "Pazyryk Chronology and Early Horse Nomads Reconsidered." *Bulletin of the Asia Institute* 6: 117-129.

How, W.W. 1923. “Arms, Tactics and Strategy in the Persian War.” *The Journal of Hellenic Studies* 43, 2: 117-132.

How, W.W. and J. Wells. 1928. *A Commentary on Herodotus. 2nd ed.* Oxford.

Hunt, P. 2007. “Military Forces.” *The Cambridge History of Greek and Roman Warfare Volume I: Greece, the Hellenistic World and the Rise of Rome.* Edited by P. Sabin, H. van Wees, and M. Whitby. Cambridge. 108-146.

Hyland, J.O. 2011. “Review: Contesting Marathon: Billows, Krentz, and the Persian Problem.” *Classical Philology* 106, 3: 265-277.

Jackson, A.V.W. 1894. “Herodotus vii.61, or Ancient Persian Armour.” *Classical Studies in Honour of Henry Drisler*. New York. 95-125.

James, S. 2004. *Excavations at Dura-Europos Final Report VII, the Arms and Armour and Other Military Equipment.* London.

Jursa, M. 2010. *Aspects of the Economic History of Babylonia in the First Millennium BC: Economic Geography, Economic Mentalities, Agriculture, the Use of Money and the Problem of Economic Growth*. Münster.

---. 2011. “Taxation and Service Obligations in Babylonia from Nebuchadnezzar to Darius and the Evidence for Darius’ Tax Reform.” *Herodot und das persische Weltreich*. Edited by R. Rollinger, B. Truschnegg, and R. Bichler. Wiesbaden. 431-448.

Kent, R.G. 1950. *Old Persian: Grammar, Texts, Lexicon*. New Haven.

Keel, O. 1977. “Der Bogen als Herrschaftssymbol: Einige unveröffentlichte Skarabäen aus Ägypten und Israel zum Thema ‘Jagd und Krieg.’” *Zeitschrift des Deutschen Palästina-Vereins* 93: 141-177.

Kleber, K. 2014. “Zu Waffen und Ausrüstung babylonischer Soldaten in der zweiten Hälfte des 1. Jt. v. Chr.” *Krieg und Frieden im Alten Vorderasien*. Editedy by H. Neumann, R. Dittmann, S. Paulus, G. Neumann, and A. Schuster-Brandis. Dresden. 429-446.

Konijnendijk, R. 2012. “‘Neither the Less Valorous nor the Weaker:’ Persian Military Might and the Battle of Plataia.” *Historia: Zeitschrift für Alte Geschichte* 61, 1: 1-17.

Kooi, B.W. 1983. *On the Mechanics of the Bow and Arrow.* Unpublished Thesis. Mathematisch Instituut, Rijksuniversiteit Groningen.

Kozloff, A.P. 2012. *Amenhotep III: Egypt’s Radiant Pharaoh*. Cambridge.

Krentz, P. 2010. *The Battle of Marathon.* New Haven.

Kuhrt, A. 1995. *The Ancient Near East c. 3000-330 B.C.* London.

---. 2007. *The Persian Empire: A Corpus of Sources from the Achaemenid Period.* London.

Kuhrt, A. and H. Sancisi-Weerdenburg. 1987. "Introduction." *Achaemenid History II: The Greek Sources.* Edited by H. Sancisi-Weerdenburg and A. Kuhrt. Leiden. IX-XIII.

Lee, J.W.I. 2007. *A Greek Army on the March. Soldiers and Survival in Xenophon's* Anabasis. Cambridge.

Leichty, E. 2011. *The Royal Inscriptions of Esarhaddon, King of Assyria (680-669 BC).* Winona Lake.

Lewis, C.T. and C. Short. 1879. *A Latin Dictionary. Founded on Andrews' edition of Freund's Latin dictionary.* Oxford.

Liddell, H.G., R. Scott, and H.S. Jones. 1996. *Greek-English Lexicon 9th edition.* Oxford.

Lincoln, B. 2007. *Religion, Empire, and Torture. The Case of Achaemenian Persia, with a Postscript on Abu Ghraib*. Chicago.

Llop, J. 2016. "The Weaponry of the Middle Assyrian Army according to the Written Sources." *Kakkēka rukusma (‹‹Ceins tes armes!››): 2e Rencontre d'Histoire militaire du Proche-Orient ancient (Lyon, 17-18 octobre 2013*. Edited by P. Abrahami and C. Wolff. Paris. 199-221.

Loades, M. 2013. *The Longbow.* Oxford.

Luckenbill, D.D. 1924. *The Annals of Sennacherib*. Chicago.

---. 1927. *Ancient Records of Assyria and Babylonia Volume II: Historical Records of Assyria from Sargon to the End.* Chicago.

Ma, J. 2008. "Mysians on the Çan Sarcophagus? Ethnicity and Domination in Achaemenid Military Art." *Historia: Zeitschrift für Alte Geschichte* 57, 3: 243-254.

Ma, J., C. Tuplin, and L. Allen. 2013. *The Arshama Letters from the Bodleian Library Volume 1: Introduction*. Published online at: http://arshama.bodleian.ox.ac.uk/publications/

Macan, R.W. 1908. *Herodotus: The Seventh, Eighth, and Ninth Books with Introduction, Text, Apparatus, Commentary, Appendices, Indices, Maps.* London.

MacGinnis, J. 2010. "The Role of Babylonian Temples in Contributing to the Army in the Early Achaemenid Empire." *The World of Achaemenid Persia: History, Art and*

Society in Iran and the Ancient Near East. Edited by J. Curtis and St-J. Simpson. London. 495-502.

---. 2012. *The Arrows of the Sun: Armed Forces in Sippar in the First Millennium B.C.* Dresden.

Majidzadeh, Y. 1992. "The Arjan Bowl." *Iran* 30: 131-144.

Malandra, W.W. 1973. "A Glossary of Terms for Weapons and Armor in Old Iranian." *Indo-Iranian Journal* 15, 4: 264-289.

---. 1983. *An Introduction to Ancient Iranian Religion: Readings from the Avesta and Achaemenid Inscriptions*. Minneapolis.

Manning, S. 2016. *A Closer Look at the Gadal-Yama Contract (UCP 9/3 269 ff.).* Unpublished.

Markle, M.M. III. 1977. "The Macedonian Sarissa, Spear, and Related Armor." *American Journal of Archaeology* 81, 3: 323-339.

Marriott, J. and K. Radner. 2015. "Sustaining the Assyrian Army among Friends and Enemies in 714 BC." *Journal of Cuneiform Studies* 67: 127-143.

Marsden, E.W. 1969. *Greek and Roman Artillery: Historical Development.* Oxford.

Massey, J. 2000. "Self Arrows." *The Traditional Bowyer's Bible Volume One.* Edited by J. Hamm. Guilford. 299-320.

Matthews, D.M. 1992. *The Kassite Glyptic of Nippur*. Freiburg.

McLeod, W. 1958. "An Unpublished Egyptian Composite Bow in the Brooklyn Museum." *American Journal of Archaeology* 62, 4: 397-401.

---. 1962. "Egyptian Composite Bows in New York." *American Journal of Archaeology* 66, 1: 13-19.

---. 1965. "The Range of the Ancient Bow." *Phoenix* 19,1: 1-14.

---. 1969. "Were Egyptian Composite Bows Made in Asia?" *Journal of the Society of Archer-Antiquaries* 12: 19-23.

---. 1970. *Composite Bows from the Tomb of Tutankhamun.* Oxford.

Medvedskaya, I.N. 2015. "A Shield-Bearer from Sialk: Rectangular Shields in the Ancient Near East." *Iranica Antiqua* 50: 159-170.

Meiggs, R. 1982. *Trees and Timber in the Ancient Mediterranean World.* Oxford.

Melville, S. 2016. *The Campaigns of Sargon II, King of Assyria, 721-705 B.C.* Norman.

Michel, A. 2014. “Skin Deep: An outline of the structure of different skins and how it influences behaviour in use. A practitioner’s guide.” *Why Leather? The material and cultural dimensions of leather*. Edited by S. Harris and A.J. Veldmeijer. Leiden. 21-40.

Miller, M.C. 1995. “Persians: The Oriental Other.” *Notes in the History of Art* 15, 1: 39-44.

---. 2004. “In Strange Company: Persians in Early Attic Theatre Imagery.” *Mediterranean Archaeology* 37: 165-172.

---. 2006/7. “Persians in the Greek Imagination.” *Mediterranean Archaeology* 19/20: 109-123.

Miller, R., E. McEwen, and C. Bergman. 1986. “Experimental Approaches to Ancient Near Eastern Archery.” *World Archaeology* 18.2: 178-195.

Molloy, B.P.C. 2012. “Martial Minoans? War as Social Process, Practice, and Event in Bronze Age Crete.” *The Annual of the British School at Athens* 107: 87-142.

Moorey, P.R.S. 1975. “Some Elaborately Decorated Bronze Quiver Plaques Made in Luristan, c. 750-650 B.C.” *Iran* 13: 19-29.

---. 1980. *Cemeteries of the First Millennium B.C. at Deve Hüyük, near Carchemish. Salvaged by T.E. Lawrence and C.L. Woolley in 1913.* Oxford.

---. 1985. “The Iranian Contribution to Achaemenid Material Culture.” *Iran* 23: 21-37.

---. 1986. “The Emergence of the Light, Horse-Drawn Chariot in the Near-East c. 2000-1500 B.C.” *World Archaeology* 18, 2: 196-215.

Muscarella, O.W. 1980. *The Catalogue of Ivories from Hasanlu, Iran.* Philadelphia.

---. 1988. *Bronze and Iron: Ancient Near Eastern Artifacts in the Metropolitan Museum of Art*. New York.

Muth, S. 2008. *Gewalt im Bild*. Berlin.

Nadali, D. 2005. “The Representation of Foreign Soldiers and their Employment in the Assyrian Army.” *Ethnicity in Ancient Mesopotamia*. Edited by W.H. van Soldt. Leiden. 222-244.

---. 2010. “Assyrian Open Field Battles: An Attempt at Reconstruction and Analysis.” *Studies on War in the Ancient Near East.* Edited by J. Vidal. Dresden. 117-152.

---. 2016. “Images of War in the Assyrian Period: What They Show and What They Hide.” *Making Pictures of War:* Realia et Imaginaria *in the Iconology of the Ancient Near East*. Edited by L. Battini. Oxford. 83-88.

Nefedkin, A.K. 2006. “The Tactical Development of Achaemenid Cavalry.” *Gladius: Estudios sobre armas antiguas, armament, arte military y vida cultural en oriente y occidente* 26: 5-18.

Nicholls, R.V. 1958/1959. “Old Smyrna: The Iron Age Fortifications and Associated Remains on the City Perimeter.” *The Annual of the British School at Athens* 53/54: 35-137.

Nimchuk, C.L. 2002. “The ‘Archers’ of Darius: Coinage or Tokens of Royal Esteem?” *Ars Orientalis* 32: 55-79.

Novák, M. 2002. “The Artificial Paradise: Programme and Ideology of Royal Gardens.” *Sex and Gender in the Ancient Near East. Proceedings of the 47th Rencontre Assyriologique Internationale, Helsinki, July 2-6, 2001.* Edited by S. Parpola and R.M. Whiting. Helsinki. 443-460.

Nylander, C. 1979. “Achaemenid Imperial Art.” *Power and Propaganda: A Symposium on Ancient Empires.* Edited by M.T. Larsen. Copenhagen. 345-359.

Olmstead, A.T. 1939. “Persia and the Greek Frontier Problem.” *Classical Philology* 34, 4: 305-322.

Pancritius, M. 1908. “Der kriegsgeschichtliche Wert der Geierstele.” *Memnon: Zeitschrift für die Kunst und Kultur Geschichte des Alten Orients* 2: 155-179.

Parrot, A. 1971. “Les fouilles de Mari Dix-neuvième campagne (printemps 1971).” *Syria* 48, 3/4. 253-270.

Polat, G. 1994. “Eine Neuerwerbung des Uşak-Museums. Eine anatolisch-persische Grabstele.” *Türk Arkeoloji Dergisi* 2: 61-66.

Porten, B. 1968. *Archives from Elephantine: The Life of an Ancient Jewish Military Colony*. Berkeley.

Porten, B., J.J. Farber, C.J. Martin, G. Vittmann, L.S.B. MacCoull, and S. Clackson. 1996. *The Elephantine Papyri in English: Three Millennia of Cross-Cultural Continuity and Change.* Leiden.

Porter, B. and R.L.B. Moss. 1960. *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs, and Paintings I: The Theban Necropolis Part 1. Private Tombs. Second Edition.* Oxford.

Postgate, J.N. 1971. “Land Tenure in the Middle Assyrian Period: A Reconstruction.” *Bulletin of the School of Oriental and African Studies* 34: 496-520.

---. 1979. “The Economic Structure of the Assyrian Empire.” *Power and Propaganda: A Symposium on Ancient Empires*. Edited by M.T. Larsen. Copenhagen. 193-221.

---. 1982. “*Ilku* and Land Tenure in the Middle Assyrian Kingdom: A Second Attempt.” *Societies and Languages of the Ancient Near East: Studies in Honour of I.M. Diakonoff*. Edited by M. Dandamayev. Warminster. 304-313.

---. 2000. “The Assyrian Army in Zamua.” *Iraq* 62: 89-108.

Potts, D.T. 1999. *The Archaeology of Elam: Formation and Transformation of an Ancient Iranian State*. Cambridge.

Powell, J.E. 1938. *A Lexicon to Herodotus.* Cambridge.

Pritchett, W.K. 1957. “New Light on Plataia.” *American Journal of Archaeology* 61, 1: 9-28.

Randall, K.C. IV. 2016. *Origins and Comparative Performance of the Composite Bow.* Unpublished thesis, University of South Africa.

Rawlinson, G. 1867. *The Five Great Monarchies of the Ancient Eastern World, or The History, geography, and Antiquities of Chaldæa, Assyria, Babylon, Media, and Persia Volume IV.* London.

Razmjou, S. 2002. “Assessing the Damage: Notes on the Life and Demise of the Statue of Darius from Susa.” *Ars Orientalis* 32: 81-104.

Richardson, M.E.J. 2000. *Hammurabi’s Laws: Text, Translation and Glossary.* London.

Robazza, C., L. Bortoli, and V. Nougier. 1999. “Emotions, Heart Rate and Performance in Archery: A Case Study.” *Journal of Sports Medicine and Physical Fitness* 39: 169-176.

Rollin, C. 1786. *Histoire ancienne des Egyptiens, des Carthaginois, des Assyriens, des Babyloniens, des Medes et des Perses, des Macedoniens, des Grecs. Tome Second, Nouvelle Edition.* Paris.

Van Rookhuijzen, J.Z. 2017. “Lost in Cappadocia: Reconsidering Xerxes’ Visit to Kritalla (Hdt. 7.26).” *Mnemosyne* 70: 281-289.

Roosevelt, C.H. 2014. *The Archaeology of Lydia, from Gyges to Alexander*. Cambridge.

Root, M.C. 1979. *The King and Kingship in Achaemenid Art: Essays on the Creation of an Iconography of Empire*. Leiden.

---. 1989. “The Persian Archer at Persepolis: Aspects of Chronology, Style and Symbolism.” *Revue des Études Anciennes* 91, 1-2: 35-50.

---. 2013. “Defining the Divine in Achaemenid Persian Kingship: The View from Bisitun.” *Every Inch a King: Comparative Studies on Kings and Kingship in the Ancient and Medieval Worlds*. Edited by L. Mitchell and C. Melville. Leiden. 23-65.

Rose, C.B. 2013. *The Archaeology of Greek and Roman Troy.* Cambridge.

Rose, H.J. 1924. *The Roman Questions of Plutarch: A New Translation with Introductory Essays and a Running Commentary*. Oxford.

Rose, J. 2011. *Zoroastrianism: An Introduction*. London.

Rudenko, S.I. 1970. *Frozen Tombs of Siberia: The Pazyryk Burials of Iron Age Horsemen.* Translated by M.W. Thompson. Berkeley.

Russell, J.M. 1998. “The Program of the Palace of Assurnasirpal II at Nimrud: Issues in the Research and Presentation of Assyrian Art.” *American Journal of Archaeology* 102,4: 655-715.

Ruzicka, S. 2012. *Trouble in the West: Egypt and the Persian Empire 525-332 BCE.* Oxford.

Schmidt, E.F. 1953. *Persepolis I: Structures, Reliefs, Inscriptions.* Chicago.

---. 1957. *Persepolis II: Contents of the Treasury and Other Discoveries*. Chicago.

Schmitt, R. 1983. “Achaemenid Dynasty.” *Encyclopaedia Iranica* Vol. I, Fasc. 4. Available online at http://www.iranicaonline.org/articles/achaemenid-dynasty (accessed August 26th, 2017).

---. 2013. “Bisotun iii. Darius’s Inscriptions. *Encyclopaedia Iranica* Vol. IV, Fasc. 3. Available online at http://www.iranicaonline.org/articles/bisotun-iii (accessed September 4th, 2018).

Schwartz, A. 2013. “Large Weapons, Small Greeks: The Practical Limitations of Hoplite Weapons and Equipment.” *Men of Bronze: Hoplite Warfare in Ancient Greece.* Edited by D. Kagan and G.F. Viggiano. Princeton. 157-175.

Sekunda, N. 1988. “Achaemenid Military Terminology.” *Archaeologische Mitteilungen aus Iran* 21: 69-77.

---. 1992. *The Persian Army 560-330 B.C.* London.

Selby, S. 2000. *Chinese Archery.* Hong Kong.

Sevinç, N, R. Körpe, M. Tombul, C.B. Rose, D. Strahan, H. Kiesewetter, J. Wallrodt. 2001. "A New Painted Graeco-Persian Sarcophagus from Çan." *Studia Troica* 11: 383-420.

Shahbazi, S. 1992. "CLOTHING ii. In the Median and Achaemenid Periods." *Encyclopaedia Iranica* Vol. V, Fasc. 7. Available online at http://www.iranicaonline.org/articles/clothing-ii (accessed July 4th, 2017).

---. 2004. "HUNTING IN IRAN i: In the pre-Islamic Period." *Encyclopaedia Iranica* Vol. XII, Fasc. 6. Available online at http://www.iranicaonline.org/articles/hunting-in-iran (accessed June 20th 2018).

Shannahan, J. 2014. "Two Notes on the Battle of Cunaxa." *Ancient History Bulletin* 28,1-2: 61-81.

Shefton, B.B. 1969-70. "The Greek Museum, University of Newcastle upon Tyne." *Archaeological Reports* 16: 52-62.

Skjærvø, P.O. 2005. *Introduction to Zoroastrianism*. Available online at: https://sites.fas.harvard.edu/~iranian/Zoroastrianism/zorocomplete.pdf

Snodgrass, A.M. 1964. "Carian Armourers: The Growth of a Tradition." *The Journal of Hellenic Studies* 84: 107-118.

---. 1999. *Arms and Armor of the Greeks.* Baltimore.

Spalinger, A.J. 2005. *War in Ancient Egypt: The New Kingdom*. Oxford.

Spawforth, A.J.S. 2012. "The Pamphleteer Ephippus, King Alexander and the Persian Royal Hunt." *Histos* 6: 169-213.

Stol, M. 1983-4. "Cress and Its Mustard." *Journal of the Ancient Near Eastern Societ "Ex Oriente Lux"* 28: 24-32.

Stolper, M.W. 1985. *Entrepreneurs and Empire: The Murašû Archive, the Murašû Firm, and Persian Rule in Babylonia.* Leiden.

---. 1994. "Mesopotamia, 482-330 B.C." *The Cambridge Ancient History Second Edition Volume VI: The Fourth Century B.C.* Edited by D.M. Lewis, J. Boardman, S. Hornblower, and M. Ostwald. Cambridge. 234-260.

---. 2001. "Fifth Century Nippur: Texts of the Murašûs and from their Surroundings." *Journal of Cuneiform Studies* 53: 83-132.

Streck, M. 1916. *Assurbanipal und die letzten assyrischen Könige bis zum untergange Niniveh's*. Leipzig.

Stronach, D. 1958. “Metal Objects from the 1957 Excavations at Nimrud.” *Iraq* 20, 2: 169-181.

---. 1989. “Early Achaemenid Coinage: Perspectives from the Homeland.” *Iranica Antiqua* 24: 255-279.

Sulimirski, T. 1954. “Scythian Antiquities in Western Asia.” *Artibus Asiae* 17, 3-4: 282-318.

Summerer, L. 2007a. “From Tatarlı to Munich: The Recovery of a Painted Wooden Tomb Chamber in Phrygia.” *The Achaemenid Impact on Local Populations and Cultures in Anatolia.* Turkish Institute of Archaeology. 131-158.

---. 2007b. “Picturing Persian Victory: The Painted Battle Scene on the Munich Wood.” *Ancient Civilizations from Scythia to Siberia* 13: 3-30.

---. 2011. “Die persische Armee in Kelainai.” *Kelainai-Apameia Kibotos: Développement urbain dans le contexte anatolien.* Edited by L. Summerer, A. Ivantchik, and A. von Kienlin. Bordeaux. 33-54.

Szudy, M.J. 2015. *Archery Equipment in the Neo-Assyrian Period.* Unpublished Thesis, Universität Wien.

Tafażżoli, A. and W.L. Hanaway, Jr. 1986. “Āraš.” *Encyclopaedia Iranica* Vol. II, Fasc. 3. Available online at http://www.iranicaonline.org/articles/aras-avestan-erexsa (accessed July 10, 2019).

Tallis, N. 2005. “Transport and Warfare.” *Forgotten Empire: The World of Ancient Persia.* Edited by J. Curtis and N. Tallis. London. 210-235.

---. 2010. “The Achaemenid Army in a Near Eastern Context.” *The World of Achaemenid Persia: History, Art and Society in Iran and the Ancient Near East.* Edited by J. Curtis and S.-J. Simpson. London. 309-314.

Taracha, P. 2012. “The Sculptures of Alacahöyük: A Key to Religious Symbolism in Hittite Representational Art.” *Near Eastern Archaeology* 75,2: 108-115.

Tarn, W.W. 1927a. “Persia, from Xerxes to Alexander.” *The Cambridge Ancient History Volume VI: Macedon 401-301 B.C.* Edited by J.B. Bury, S.A. Cook, and F.E. Adcock. Cambridge. 1-24.

---. 1927b. “Alexander: the Conquest of Persia.” *The Cambridge Ancient History Volume VI: Macedon 401-301 B.C.* Edited by J.B. Bury, S.A. Cook, and F.E. Adcock. Cambridge. 352-386.

Tavernier, J. 2010. “Migration des savoirs entre l’Élam et la Mésopotamie.” *Res Antiquae* 7: 199-222.

Taylor, D. 2013. *The Arshama Letters from the Bodleian Library Volume II: Texts, Translations, and Glossary*. Published online at: http://arshama.bodleian.ox.ac.uk/publications/

Tekhov, B.V. 1972. “The Necropolis of Tli and the problem of the chronology of the Late Bronze and Early Iron Age in the Central Caucasus.” *Soviet Archaeology* 3: 18-37 (in Russian).

Tha’alibi, A.M. 1900. *Histoire des rois des perses.* Translated by H. Zotenberg. Paris.

Thureau-Dangin, F. 1912. *Une relation de la huitième champagne de Sargon (714 av. J.-C.)*. Paris.

Tomka, S.A. 2013. “The Adoption of the Bow and Arrow: A Model based on Experimental Performance Characteristics.” *American Antiquity* 78, 3: 553-569.

Trundle, M. 2004. *Greek Mercenaries: From the Late Archaic to Alexander.* London.

Tuplin, C. 1987. “Xenophon and the Garrison of the Achaemenid Empire.” *Archaeologische Mitteilungen aus Iran* 20: 167-245.

---. 2010. “All the King’s Horse: In Search of Achaemenid Persian Cavalry.” *New Perspectives on Ancient Warfare.* Edited by G. Fagan and M. Trundle. Leiden. 101-182.

---. 2013. *The Arshama Letters from the Bodleian Library Volume III: Commentary*. Published online at: http://arshama.bodleian.ox.ac.uk/publications/

---. 2014. “The Changing Pattern of Achaemenid Royal Coinage.” *Explaining Monetary and Financial Innovation.* Edited by R. Vaubel. Cham. 127-168.

---. Unpublished. “Sigillography and Soldiers: Cataloguing Military Activity on Achaemenid Period Seals.”

Uphill, E. 1965. “The Egyptian Sed-Festival Rites.” *Journal of Near Eastern Studies* 24,4: 365-383.

Vanden Berghe, L. 1983. *Reliefs rupestres de l’Iran ancient.* Brussels.

Waerzeggers, C. 2003/2004. “The Babylonian Revolts against Xerxes and the ‘End of Archives.’” *Archiv für Orientforschung* 50: 150-173.

---. 2006. “The Carians of Borsippa.” *Iraq* 68: 1-22.

---. 2010. *The Ezida Temple of Borsippa: Priesthood, Cult, Archives.* Leiden.

Waldbaum, J.C. 1983. *Metalwork from Sardis: The Finds through 1974*. Cambridge.

Waldman, N.M. 1978. "The Breaking of the Bow." *The Jewish Quarterly Review* 69,2: 82-88.

Wallace, P.W. 1982. "The Final Battle at Plataia." *Hesperia Supplements* 19: 183-192.

Wardman, A.E. 1959. "Tactics and Tradition of the Persian Wars." *Historia: Zeitschrift für Alte Geschichte* 8,1: 49-60.

Western, A.C. and W. McLeod. 1995. "Woods Used in Egyptian Bows and Arrows." *The Journal of Egyptian Archaeology* 81: 77-94.

Weidner, E.F. 1932-1933. "Assyrische Beschreibungen der Kriegs-Reliefs Aššurbânaplis." *Archiv für Orientforschung* 8: 175-203.

Westenholz, J.G. 1997. *Legends of the Kings of Akkade: The Texts*. Winona Lake.

Wilkinson, R.H. 1988. "The Representation of the Bow in the Art of Ancient Egypt and the Near East." *Journal of the Ancient Near Eastern Society* 20: 83-100.

---. 1991. "The Representation of the Bow in the Art of Egypt and the Ancient Near East." *Journal of Ancient Near Eastern Studies* 20: 83-99.

Winter, I.J. 1985. "After the Battle Is Over: The 'Stele of the Vultures' and the Beginning of Historical Narrative in the Art of the Ancient Near East." *Studies in the History of Art* 16: 11-32.

Wolf, W. 1926. *Die Bewaffnung des altägyptischen Heeres.* Leipzig.

Wulff, H.E. 1966. *Traditional Crafts of Persia.* Cambridge.

Yoyotte, J. 2013. "The Egyptian Statue of Darius." *The Palace of Darius at Susa: The Great Royal Residence of Achaemenid Persia.* Edited by J. Perrot. Translated by D. Collon and G. Collon. London. 241-281.

Zaccagnini, C. 1983. "Patterns of Mobility among Ancient Near Eastern Craftsmen." *Journal of Near Eastern Studies* 42, 4: 245-264.

Zadok, R. 1994. "Elamites and Other Peoples from Iran and the Persian Gulf Region in Early Mesopotamian Sources." *Iran* 32: 31-51.

Zawadzki, S. and M. Jursa. 2001. "Šamaš-tirri-kuṣur, a smith manufacturing weapons in the Ebabbar temple at Sippar." *Wiener Zeitschrift für die Kundi des Morgenlandes* 91: 347-363.

Zimmermann-Elseify, N. 2015. *Corpus vasorum antiquorum. Deutschland, Bd 99; Berlin, Antikensammlung ehemals Antiquarium, Bd. 16: Attische Salbgefässe*. Munich.

Zutterman, C. 2003. "The Bow in the Ancient Near East, a Re-evaluation of Archery from the Late 2nd Millennium to the End of the Achaemenid Empire." *Iranica Antiqua* 38: 119-165.