Unconventional Weapons, Siege Warfare, and the Hoplite Ideal

Thesis

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By

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Abstract

This paper examines the introduction of unconventional siege tactics, namely the use of chemical and biological weapons, during the Peloponnesian War in an effort to add to an existing body of work on conventional and unconventional tactics in Greek hoplite warfare. This paper argues that the characteristics of siege warfare in the mid-fifth century exist in opposition to traditional definitions of Greek hoplite warfare and should be integrated into the ongoing discussion on warfare in the fifth century. The use of siege warfare in Greece expanded dramatically during the Peloponnesian War, but these sieges differed from earlier Greek uses of blockade tactics, utilizing fire, poisonous gasses and new types of siege machinery that would eventually lead to a Hellenistic period characterized by inventive and expedient developments in siege warfare.
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Part 1: Hoplites: Theories and Criticisms

The disease is said to have begun south of Egypt in Aethiopia; thence it descended into Egypt and Libya, and after spreading over the greater part of the Persian empire, suddenly fell upon Athens. It first attacked the inhabitants of the Piraeus, and it was supposed that the Peloponnesians had poisoned the cisterns, no conduits having as yet been made there. Thuc. 2.48

In the age following the development of the hoplite phalanx, when Greek armies were supposedly living in a post-hoplite revolutionary world, it seems odd that the inhabitants of one polis would suspect another Greek army of such an unseemly act as poisoning its wells. And while the general consensus among scholars challenging this thesis – that one element of the hoplite ideal that developed during this dramatic shift in the Greek way of war precluded the use of such dishonorable tactics (those outside the realm of the standard hoplite phalanx) – has begun to shift to allow evidence for arrows, slings and javelins, they have neglected to acknowledge the significance of the use of unconventional siege tactics during the Peloponnesian War. Several of these sieges laid the groundwork for a Hellenistic period replete with innovations in siege tactics. In keeping with a cultural tradition of sieges and poisonous fires in their literature and drama, Greek armies demonstrated their adaptability and their ability to fight without restrictions and in clear opposition to the ‘rules’ for Greek warfare set down by modern scholars as part of an ‘ideal’ construction of hoplite warfare in the archaic and classical periods.
Challenges to the ‘hoplite ideal’ have primarily focused on the infantry debate, as scholars break down the elements of archaic and classical hoplite warfare in an effort to determine which elements of the depictions of Greek warfare provided by Hanson and Ober are supported by evidence and which are based on a purely theoretical construction. My intention is to first examine these challenges, and then extend the argument into the realm of siege warfare, where, by the first decades of the Peloponnesian War, the use of ‘unconventional’ weapons – chemical and biological attacks – had become ‘normalized’ in siege warfare, to the extent that they were used in at least three specific instances by Greeks against other Greeks. These attacks utilized machines, fire, smoke, and poisonous gasses to attack the walls of fortified cities and forts, long before the advent of the large machines of siege warfare made famous under Alexander and Hellenistic warlords. Following a discussion of these sieges and their unconventional components, I will attempt to explain why these tactics were introduced in Greece in the fifth century. This paper will cover both the rise of siege warfare around the Mediterranean in the early fifth century, looking at both Persian siege machinery and tactics during the Ionian revolt and Athenian sieges during their rise to Empire before the outbreak of the Peloponnesian War, and then the cultural and literary history of the Greeks, including familiar depictions of siege warfare at Troy and Thebes and instances of the uses of deadly poisons, plagues and magical fires in the mythology and drama of the pre-Peloponnesian war era. I will show that the idea of both siege warfare and biological and chemical weapons were quite familiar to Greeks by the mid-fifth century. When confronted with a protracted conflict, it was not unthinkable that they would deploy weapons and tactics that appear to contravene the ideals of ‘honorable’ hoplite combat.
Before engaging in a discussion on these specific instances of chemical weapons in war, it is perhaps necessary to discuss the mainstream scholarship on ‘traditional’ forms of Greek warfare and the challenges that advocate for the presence of missiles and non-hoplite soldiers in combat before the Peloponnesian War.

I. The ‘Hoplite Ideal’

In the minds of some, the image of ancient Greek armies is limited to one that solely depicts the structured imagery of the hoplite phalanx. These soldiers, marching in tight lines holding required elements of the hoplite costume, march across the fields of the countryside and into each other in a crush of linked shields. Wars, then, are won by those who hold the line and break through the shield walls of the enemy, using only spears/short swords and shields. It is an impressive picture, certainly, driven by the iconography of Archaic pottery, the idealized battle constructions of ancient literary sources, and the archaeology of eighth and seventh century hoplite armor.¹ But the study of Greek warfare in the Archaic and Classical periods is a matter of interpretation. Long-standing views on hoplite warfare and the ‘rules’ of combat have come under fire in recent years, as scholars explore new interpretations of Greek words and apply the understanding of modern tactics to ancient methodologies. This section will briefly examine the ‘standard’ understanding of Greek warfare and the opposition to this construct.

Proponents of this academically constructed ‘hoplite ideal’ cite Aristotle’s depiction of the evolution of Greek warfare. The philosopher claims that Greeks gradually moved from mounted assaults to heavily armed infantry sorties, as the political

situation in the poleis became more settled and constitutional (Pol. 4.1289b33-9, 4.1297b16-24). Demosthenes notes that hoplite armies were bound by strict rules and operated in the open and cites the battles of the Peloponnesian War as evidence for the reliability and security of pitched hoplite battles outside city walls. From this, first de Romilly and Vernant, and then Josiah Ober and Victor Davis Hanson set down the ‘rules’ of Greek warfare. Hanson, in his *Western Way of War*, following in the footsteps of Pritchett’s *Greek State at War* and Keegan’s *Face of Battle*, pushes for a socio-cultural understanding of Greek warfare. In a section entitled “Not Strategy, Not Tactics,” he explains that any analysis of tactics or attempt to understand the strategy behind Greek troop movements or formations creates a ‘distance’ from the realities of war. Hanson instead insists that analysis of the individual experience of battle can reveal the code of honor under which the hoplites lived and died. In this analysis, Hanson creates an image of Archaic warfare as an honorable process, one in which agreements are made and kept, missile-throwers and cavalry are dismissed until a 4th century rise to prominence, and deception is considered a detestable act. He emphasizes the “stark simplicity of Greek combat,” citing Curtius Rufus’ speech of Alexander against deception and Polybius’ admiration for the traditional Greek ban on missiles in battle.

For Hanson, hoplite warfare was an idealized competition between equally matched groups of men who crash into each other while defending their lands. Honorable hoplite fighting was face-to-face, shield-to-shield, using the *othismos* (a literal push

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5 Ibid., 14-15.
against the shields of one group by those of another) and originated as a way to compress disputes between landowners into a single moment of battle that would leave their agricultural production unaffected. The evolution of this system, beginning with a hoplite ‘revolution’ in the 7th century, involved increasingly fearful groups of farmers gathering together in the spirit of the growing polis system, and spontaneously forming phalanxes of self-funded, interlinked shield-bearers.6 These soldiers were untrained and thus unskilled, depending on courage and camaraderie for their motivation to fight and emerge victorious. During the Archaic period, Hanson describes this system as “a ‘pure,’ static, unchanging match between men in the heaviest of armor, void of support from auxiliary cavalry, missile-throwers, or archers…proud of their close bond to their farms,”7 although he comes to this conclusion only after noting the paucity of 7th and 6th century military records.

The change in this system, according to Hanson, came in the 5th century, and began with the Persian invasions of 490 and 480. Here, Greeks were faced with a much larger Persian army, and forced to fight longer, harder battles that included banned missile throwers in order to maintain their freedom. He cites these battles as the precedent for the later devastation of the Peloponnesian War, and blames the relative agricultural independence of the Spartans (with their Helot slave-farmers) and the Athenians (whose economy also thrived on trade from their naval fleet) for breaking with tradition and beginning a war that crossed the lines drawn by hoplite tradition. Hanson’s depiction of the hoplite way of life established an ideological picture of Greek warfare, creating the image of an untrained, unskilled army developing out of the polis system’s

6 Ibid., 29-30.
7 Ibid., 37.
governmental shifts, emerging victorious against the organized armies of Persian invaders and becoming corrupted by the observation of the regimented Persian military force.

Hanson, in his essay defending the ‘hoplite ideal’, cites Polybius’ description of earlier Greek warfare, a depiction that presents the hoplites as guided by a conventional lack of deception and a dependence on pre-announced pitched battles (13.3.2-5). Hanson goes on to say that the agreement between the Spartans and the Athenians, to fight a pitched battle in a previously announced location upon the event of a dispute, proves that the Greeks viewed the hoplite pitched battle as the ideal or ‘true’ form of warfare, and that the only way to truly decide a conflict was through hoplite battle.

Josiah Ober’s essay on warfare in Classical Greece took this idealized image one step further, and created a set of rules that governed Archaic and Classical Greek warfare. In this text, Ober lists a dozen rules that were established – and written down – in the 8th century, then broken after 450. These rules include much of Hanson’s argument for simplicity, and set down orders against involving non-combatants in battle, set campaigning seasons, ritualized announcements and acceptance of challenges, bans on the use of non-hoplite weapons, limited pursuit of the defeated, restraint in punishing those who surrender, preservation of prisoners of war, and guidelines for returning war dead to their home states. These rules argue for the existence of an honorable system of warfare in Greece, one that was constructed to be as unobtrusive and undamaging as possible.

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8 See also Strabo 10.1.12, Herod. 7.9.
Most of these rules, however, like Hanson’s argument for simplicity in Greek warfare, have been handily challenged in more recent scholarship.

II. Critiques of the ‘Hoplite Ideal’

The unwritten rules of conventional Greek warfare, hinted at by de Romilly and Pritchett and later developed by Ober and Hanson, refer to a legacy of ‘traditional’ practices that Ober dates to the late eighth or early seventh century, and lists in his contribution to a text on the laws of Western warfare. These rules include provisions for a ritualized challenge and acceptance of battle, the recognition of the inviolability of sacred places and messengers, honorable conduct with regard to prisoners of war, the exclusion of non-combatants from direct attacks, the restriction of warfare to a set season for campaigning, and the limitation of use of non-hoplite arms, among others. Ober argues that these rules were generally followed after a hoplite revolution – citing Hanson – that occurred some time in the seventh century, and began to break down in the mid-fifth. Ober’s rules conform with Hanson’s theoretical hoplite revolution and combine to create a hoplite ‘ideal’ for Greek warfare: farming for most of the year, then engaging in ritualized combat with a set selection of weaponry during the summer, and following the guidelines of an unwritten code of combat.

The restrictions of this ‘ideal,’ however, make dealing with the naval battles and sieges that began in the early fifth century difficult. Sieges in particular exist in opposition to a restriction to hoplite weaponry or, more importantly, to a rule against involving noncombatants in warfare. Additionally, the development of the Athenian and

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12 Ibid., 15.
Peloponnesian empires forces supporters of the theory to name these cities as exceptions to the rule – noting that their wide-spread influence resulted in the development of navies used to control and tax formerly independent and the large-scale enslavement of surrounding populations – while removing the Spartan hoplites from the realm of agricultural warriors.\(^{13}\) Naval power, however, was not limited to Athens. Nor was slavery (or siege tactics, as we shall later see) limited to the Spartans. In this vein, Christopher Matthew, Louis Rawlings and Peter Krentz have each offered challenges to the construction of Greek warfare offered by Hanson, Ober and their predecessors and followers.

Matthew’s argument is essentially semantic and deals with the methodology of hoplite combat according to Hanson; his focus is on the meaning and interpretation of othismos, used in Hanson as the literal shield against shield pushing motion of a tight-knit group of hoplites with interlinked shields, used elsewhere as the figurative push of the weaker force from the battlefield by a spear or javelin-ready victor. Instead of choosing to completely reject the argument, Matthew points out situations in which both meanings are clearly evident, arguing that the meaning of the word depends on the context of the battle.\(^{14}\) He notes that the mention of ‘shield against shield’ can – and should - be taken figuratively, as a metaphor for the crush of battle. In such cases, the description of the battle mentions spear attacks, which would be impossible during an actual collision of shields.\(^{15}\) However, specific mentions of shield walls, such as in the battle at Delium between Athenian and Theban hoplites in 424, demonstrate the possibility of an actual

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\(^{13}\) Hanson and Oxy, “Hoplite Battle as Ancient Greek Warfare: When, where, and why?,” 212.


\(^{15}\) Ibid., 398.
shield crush – where lines of men holding shields would actually push against each other’s shields in combat, as described by Asclepiodotus, the author of a first century text on military tactics.16 This argument questions the solid construction of hoplite combat in the afore-mentioned works, and suggests that the discussion should allow for a more open interpretation of the ancient texts.

Matthew argues that the variation in evidence supports a variation in tactics. He suggests that instead of remaining dependent on the shield wall strategy, the actuality of hoplite warfare could change depending on the nature of the battle. In one situation, the phalanx might well interlock their shields, standing in a close order grouping to avoid arrows or incoming javelins. This formation, however, would prevent the phalanx from moving quickly, instead requiring a slower pace to maintain the cohesion of the wall. In battles or locations that required faster movement, Matthew suggests that the individual hoplites could link the very edges of their shields, allowing them to hold spears in an underarm position and move at a faster clip. Here, the crash of the spears, not the clash of shields, would be the focal point of the formation.17 Matthew supports his argument with both literary evidence and artistic evidence. He notes that the depiction of hoplites on vases often includes images of hoplites holding javelins above their heads – thereby challenging the ‘rule’ against missiles – and that hoplite spears would be most effective in a looser formation than the shield wall would allow. This versatility would support the extension of Matthew’s argument into siege warfare during the Peloponnesian War, a style of combat that utilized alternative weaponry, like arrows, fire and smoke, not just

the weapons of the panoply. The ability to adapt people and tools to the new challenges of siege warfare resulted in the use of weapons designed for their efficiency against the walls and populations of besieged cities.

Additionally, Matthew’s analysis argues against Hanson and van Wees’ suggestion that the hoplites were untrained, unskilled farmers thrown together in battle. Instead, he notes, soldiers would have needed some training in the use of javelins, spears, and the tactics of both the close and intermediate shield-linked formations. These formations would also force the leaders of the phalanx to decide on the optimal formation for a particular battle, based on a tactical analysis of the field and of the enemy force, suggesting that Hanson’s decision to discard tactics and strategy from the hoplite ideology is perhaps not the best way to treat this system, and supporting the following argument that hoplites were trained.

In his chapter on hoplite activities beyond the phalanx, Rawlings addresses the contention that hoplite troops enter into battle untrained and inexperienced in forms of non-hoplite combat. He argues that the hoplite was not just responsible for carrying his shield, sword and spear into the phalanx, but that he also had the training and the responsibility to act outside of that limited context. The hoplite could be called upon to work as a marine, an officer of the peace, a garrison guard, a raider, or to conduct a siege, and thus must have had some formalized training. Matthew suggests that the ability to carry out multiple elements of offensive and defensive warfare might have allowed the hoplite its longevity.

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18 Ibid., 408 n52. Here, note challenges Van Wees 2000 n3 87-101.
Several of the duties that might fall to hoplites would have required some training. Fighting as marines stationed on warships would require men practiced in jumping on and off of ships in full panoply, as well as a certain ability to remain balanced and war-ready on the tipping decks of a warship. In raids on distant islands or cities that required a larger troop commitment than could stand on the decks, it is likely that the marines would have also served as rowers.20 Additionally, as Matthew demonstrates, a certain amount of training in javelin-throwing and moving in formation was necessary for a well-rounded hoplite to serve.

The training itself is necessarily murky. Sources for training in the arts of war are not clear until the late fourth century, but Rawlings suggests that these articulated training procedures were built from an established training regime. The ephebes who participated in the youth training program in Athens learned archery, missile-throwing, and techniques for spear and shield fighting, and were then sent off to guard garrisons. It is not so far-fetched, Rawlings argues, that the youths of the late Archaic and early Classical periods had similar, if not so organized, training periods. Certainly the Spartans trained their youths in the techniques of warfare.21 The experiences gained from this period in training might well be called upon during a siege or a marine encounter. Rawlings suggests the possibility of private military trainers for those who could afford the panoply, while others might have learned on the go, as it were.

Peter Krentz offers perhaps the most cohesive argument against the existence of any hoplite ‘ideal’. In his point-by-point deconstruction of Ober’s rules for Greek warfare, he focuses on the problematic dependence of modern scholars on the ‘customs’

20 Ibid., 236-7.
21 Ibid., 238.
and ‘traditions’ of later Greeks. Krentz notes that the use of these words does not always mean that the custom itself goes back for more than a generation – and that some originated only during the conflicts of the fifth century, perhaps even as romanticized views of the past, and should not be applied to earlier periods. Additionally, some anecdotal sources, like Herodotus, present the ‘rules’ of Greek warfare from an outside point of view, while others are later sources, writing with a specific agenda in mind. Polybius, for example, was not charged with recording the military history of the Greeks, but was instead writing for a later Greek audience and perhaps creating an idealized version of the Greek system.\textsuperscript{22} In most cases, depending on ‘the customs of our ancestors’ is much like believing a sentence that starts with ‘in the good old days.’ Krentz cautions that some of these ‘customs,’ far from being ritualized agreements, are actually just interpretations of tactical and strategic considerations and do not, then, constitute evidence for any specifically Greek ideological system of warfare.\textsuperscript{23}

The prohibition against involving civilians in warfare, for example, is a tactical consideration on the side of the defenders. Drawing battles away from city centers – by meeting the enemy on the way, or by arranging a location – is logical, but not necessarily honorable.\textsuperscript{24} Krentz notes that many of the so-called ‘rules’ of conventional warfare are really just tactical considerations based on geographic or environmental conditions, such as fighting in the summer because of the weather, or keeping civilians safe by default by fighting in fields suited to cavalry and infantry movements. These tactics, however, are

\textsuperscript{23} Ibid., 25-27.
\textsuperscript{24} Ibid., 27.
mocked viciously by Mardonius during the Persian Wars. He sees little sense in the stylized combat between city-states, as his description of Greek warfare demonstrates:

And yet, I am told, these very Greeks are wont to wage wars against one another in the most foolish way, through sheer perversity and doltishness. For no sooner is war proclaimed than they search out the smoothest and fairest plain that is to be found in all the land, and there they assemble and fight; whence it comes to pass that even the conquerors depart with great loss: I say nothing of the conquered, for they are destroyed altogether. Now surely, as they are all of one speech, they ought to interchange heralds and messengers, and make up their differences by any means rather than battle; or, at the worst, if they must needs fight one against another, they ought to post themselves as strongly as possible, and so try their quarrels. (Hdt. 7.9)

If the battle comes to the city, then the population is pulled inside the walls – the Athenian battle strategy in a nutshell. In any war that includes siege warfare, the involvement of the civilian population is generally unavoidable, and Thucydides makes no note of any conventional avoidance of such practices. If anything, the armies fighting the Peloponnesian war completely ignored this rule. Populations were directly targeted during siege operations, and noncombatants at Plataea and Thebes were slaughtered. At Mytilene, the Athenians demonstrated an initial willingness to destroy an entire population.

Perhaps the easiest ‘rule’ to disprove however, as Krentz demonstrates, is the prohibition of non-hoplite arms and missiles. The sources for the rule are Strabo (10.1.12) and Polybius (13.3-6). Strabo’s source is a stele on the Lelantine plain calling for the cessation of missile-use during the Lelantine War, which may demonstrate either the existence of rules of warfare as far back as that war, or a symbolic gesture, while Polybius generalizes based, Krentz suggests, on the evidence of the fourth century historical works of Ephoros, which are problematic in that his message was likely
motivated by his fear of the emerging prominence of the catapult in battle. Krentz, supported by Matthew and Rawling, notes that javelin-throwing in the phalanx has a clear presence in the art of the Archaic period, and suggests, in accordance with van Wees, that the archers and missile-throwers were included in the action of the Archaic and early Classical phalanx, not separated from the main hoplite force as per Hanson’s pure ‘hoplite ideal’.

For the Archaic period, Krentz cites Tyrtaios, noting that the poet exhorts light-armed troops to use missiles to defend the heavily armored infantry. In later historical sources, archers seem to have been an accepted presence in battle. Herodotus mentions the presence of archers at Plataea (9.22) and Thucydides includes skirmishes between light-armed troops at Syracuse in 415 (6.69.2); in his description of the siege at Plataea in 429, the besieging Spartans build a skin-covered shielded wall to defend against burning arrows and missiles shot from the city walls (2.75).

The separation of the groups, Krentz suggests, emerged only after the Persian Wars. Thucydides notes the separation of forces in his description of the Sicilian Expedition, and seems perfectly comfortable with the existence and participation of missile-throwers and other light-armed troops working alongside the hoplite phalanx, not

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26 Krentz, “Fighting by the Rules,” 29. Citing Tyrtaios, Frag. 11.35-38, trans. West: “You light-armed men, wherever you can aim from the shield cover, pelt them with great rocks and hurl at them your smooth-shaved javelins, helping the armored troops with close support.”
27 The presence of archers in the Iliad and Odyssey is unquestionably prolific. Strauss and Ober, however, note that “…relatively few classical battles were decided by projectile barrage. Cavalry was also light, used to guard the wings of the infantry formation and for pursuit of the defeated after one side’s line had broken... Field artillery, in the form of catapults was used by the Romans, but unknown to Greek armies until the time of Philip of Macedon...” While these archers and slingers may have been present on the field, they seem to have served as an auxiliary force, not nearly as respected or as useful as the hoplite troops marching in the center of the formation. Creveld is more than likely correct in his observance that “Honorable warfare in Greece didn’t include slingers or bowmen...these allow the weak to defeat the strong.” - Barry S. Strauss and Josiah Ober, Strauss and Ober, *The Anatomy of Error*, 5.
barred from battle. Additionally, Salazar cites the archaeological evidence of arrowheads in skeletons in the Kerameikos thought to be Spartan remains from an invasion of the Piraeus during the Peloponnesian War, and notes that in her overview of medical treatises dealing with war wounds among the Greeks, many mention treatments for removing arrows or soothing head/chest wounds presumably caused by slung stones.

Krentz’ conclusion is that the Athenians began to develop organized mass hoplite-only phalanxes after observing the effectiveness of the heavily armed infantry against a mixed, lightly armored Persian force at Marathon. He argues that the emphasis on Marathonian supremacy left the sailors of Salamis out of the spotlight. The focus on the infantry as noted by the supporters of the ‘hoplite ideal’, then, only emerged as Athens expanded its empire into the Aegean. The Peloponnesians took on a similar style after noting the Athenian success against Persian infantry. By the outbreak of the Peloponnesian War, both sides had mastered their techniques. Of course, this does not seem to account for the Athenian sieges during this period.

In his contribution to van Wees’ collection of essays on warfare, Krentz takes on the other main point of Hanson’s argument: the open, honorable nature of the Greek military machine. Here, Krentz addresses deception in all of its Archaic and Classical forms, demonstrating the underlying strategy and cunning of the Greeks, and their own admitted admiration and hatred for the practice. The article itself is a listing of examples, intertwined with Krentz’ commentary, that define the odd relationship the Greeks had

29 Ibid., 48-9.
with treachery and deception. Anecdotes in Thucydides, Herodotus, Polybius and several playwrights support the contention that deception is less valued than overt action, yet actual events in Thucydides, Xenophon and Homer reveal a certain comfort with its use.  

Xenophon is perhaps the most explicit, baldly stating “there is nothing more profitable in war than deception” (Hipparch. 5.9). Xenophon’s approval of deception, however, is dependent on the focus and the purpose of the act. Against friends, deception is wrong. Against enemies, it is natural and profitable.

Events during the Persian and Peloponnesian Wars also support Krentz’ argument for the prevalence of deception in Greek warfare. He cites several ambushes and deceptive oaths, and the tricks Athenians pulled on the Syracusans in 415 and the extremely useful tricks used against the Persians and the Spartans by Themistocles that gave the Athenians their victory at Salamis and their long walls. These events, however, occurred at a time after both Ober and Hanson claim the age of the honorable hoplite began to fade. For Hanson, the Persian Wars ended it, for Ober, the Peloponnesian War and Pericles’ strategies were the death knell. But Krentz notes that evidence for deception dates back beyond the Archaic period, and left its mark even on early democratic icons like Solon. Homer’s Odysseus is a conman of the higher caliber, responsible for ending the Trojan War, and the source of numerous deceitful hijinks on his ten-year voyage home. The Trojan War contains several incidences of kidnapping, theft and betrayal, many of which profit those responsible for the deception. Krentz cites this as evidence for a continuity of thought, stretching from Homer to the Classical Greek soldier. He

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32 Ibid., 170.
33 Ibid., 171.
suggests that the true changes in Greek warfare came after 480, as the Athenian and Spartan poleis developed and the Archaic focus on individual glory refocused on the glory of the polis; the infantry phalanx became a hoplite phalanx that engaged in a kind of ritualized battle. Tactically, as soldiers began to fight together as organized units, specialized ranks of existing cavalrymen and archers separated from the mass infantry to provide organized assaults (as Thucydides mentions) before or during the hoplites’ push. As the tactics of warfare shifted to adjust for organized state armies, military technology adjusted to the new freedom of financial stability in the Delian (Athenian) and Peloponnesian Leagues.

Matthew, Rawlings, and Krentz argue convincingly for a more realistic view of Greek land warfare. Interestingly, they tend to avoid discussing the development of siege tactics and the emergence of fire and poisonous gas as tools of war. Siege tactics are notably not in accordance with the ‘rules’ of Greek warfare; this fact and easy use and acceptance of fire and poisonous gasses could have strengthened these arguments for different interpretations of the Greek way of war. It is an odd exclusion, given that the evidence for rudimentary forms of siege warfare appears in sources dating back to the beginning of the hoplite ‘revolution.’ In siege warfare, we find evidence of armies fighting outside the chosen season of war, attacking civilian populations, using non-hoplite weaponry and unconventional tactics, and demonstrating skills and a level of adaptability that suggest either training or experience with combat outside the ritualized style of hoplite warfare. In the argument against the acceptance of the rules of hoplite

34 Krentz, “Fighting by the Rules,” 34-35.
warfare, the absence of an in-depth discussion of the development and use of siege warfare in Greece is a glaring omission.

These authors do, however, lay the groundwork for the argument that Greeks were accustomed to adapting their weapons and style to suit the conditions of battle, and that they were quite willing to employ weapons other than the sword and spear in combat. By the outbreak of the Peloponnesian War, some Greeks were willing and able to extend this adaptability to the challenges of siege warfare – particularly to the necessity of ending a siege quickly and decisively in an effort to avoid a significant financial loss. While the Athenians seemed content with long, drawn out siege operations designed to starve out their enemies, other Greeks constructed elaborate machinery and earthworks and utilized familiar chemical combinations to end sieges quickly and painlessly – for the besieging army. The Greeks inside the walls, faced with this innovative use of unconventional weaponry, adapted to the challenge, constructing ever more elaborate means of defeating the attacks of the besiegers. Far from clinging to a conception of Greek warfare as ritualized and restricted combat, these Greeks demonstrated an awareness of classic siege tactics and the ability to apply cultural knowledge – like the properties of fire, pitch and sulphur – to the problem of creating an expedient way to get through a city wall.

Ober suggested that the rules that defined hoplite warfare began to decay in the mid-fifth century, and blamed this on the rise of the Athenian navy and a rejection of the hoplite in favor of the democracy – the sailors – as the core of the city’s civil authority. But by the mid-fifth century, Athenians were familiar with siege tactics, and were well

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aware of Persian uses of similar tactics in Ionia. During the Peloponnesian war, however, Spartans and Boeotians were the first to combine blockade tactics with creative weaponry and chemical assaults. If anything, the Athenians were behind the curve in siege innovation. In the early and middle parts of the fifth century, as their Empire began to form, Athenian troops throughout the Mediterranean began to enact long-term siege tactics against rebelling city-states. Infantry combat seems to have become more formalized in the fifth century, as soldiers trained in different kinds of weapons and tactics took to the field and, during the Peloponnesian War, to new positions at city walls as besiegers and engineers. By the early years of the Peloponnesian war, siege tactics had developed from their mythical and dramatic origins, and in the hands of a few creative commanders, I would argue that this emergence of Greek siege warfare resulted in the extension and development of ‘unconventional’ weapons. The first historically attested uses of chemical weapons in Greece occur during the first decade of the Peloponnesian War, during three specific instances of siege warfare.
Part 2: Unconventional Weapons and the Peloponnesian War

There were many sieges in the years leading up to the Peloponnesian War, and many that occurred during the war without the involvement of unconventional weapons, beyond the arrow, javelin and sling that opponents of the rule against restrictions on Greek weapons of war have already demonstrated as quite conventional. Generally, these earlier sieges were operated as extended blockades of a city, where a besieging army forced the surrender of a population by starving them out. The Athenians were early adopters of these techniques, utilizing the power of their navy to develop blockade tactics. Three sieges during the war, however, involved the use of siege machinery, fire, and chemical weapons, as Spartan and Boeotian generals attempted to counter the fortifications of the Athenians and their allies. At Plataea, a Spartan general called in to aid a Boeotian besieging force used increasingly creative tactics to attempt to get over the walls of the fortified city. At Lecythus and Delium, Spartans and their allies assaulted Athenian fortifications with a weapon that looks very much like an early flamethrower. Lacking the experience with protracted sieges that the Athenians had gained in preceding years, these armies experimented with ways to get through or over city walls without depending on the uncertain weapon of starvation. These three initial sieges would lead to a Hellenistic period filled with clever advances in siege tactics, a period in which the rules of hoplite warfare could not apply.
Plataea, a tiny city less than eight miles from the territory of Thebes, was an Athenian ally at the onset of the war in 431, and a thorn in the side of its more powerful Boeotian neighbor. The position of Plataea at the center of several important trade routes made crossing into the Peloponnese hazardous for the Thebans, so they decided to take the city, using the war as a convenient excuse. An initial invasion through deception failed, and the Plataeans, secure in their promised support from Athens, killed their Theban prisoners and sent many of their women and children to Athens, leaving less than 500 men and some women to defend the walls (Thuc. 2.6, 2.78.3). The Thebans called in their Spartan allies, and Archidamus led a force against the walls of Plataea. The Spartan general began in the same way the Athenians would, building a palisade and ravaging the fields around the city. Then, they took a page from Cyrus’ handbook (discussed below): they built an embankment.

Thucydides describes the siege works at Plataea in great detail, perhaps because they were so unlike any the Athenians had constructed. This embankment, for instance, was apparently quite well-constructed: “They accordingly cut down timber from Cithaeron, and built it up on either side, laying it like lattice-work to serve as a wall to keep the mound from spreading abroad, and carried to it wood and stones and earth and whatever other material might help to complete it.” (2.75.2) The Spartans, however, were not particularly speedy builders. Unlike the Athenians, they had not spent the previous decades engaged in wall building on demand, and their slow speed seems to have allowed the Plataeans plenty of time to build up their defenses:

…the Plataeans, observing the progress of the mound, constructed a wall of wood and fixed it upon that part of the city wall against which the mound was being

36 Paul Bentley Kern, Ancient siege warfare (Indiana University Press, 1999), 97-98.
erected, and built up bricks inside it which they took from the neighbouring houses. The timbers served to bind the building together, and to prevent its becoming weak as it advanced in height; it had also a covering of skins and hides, which protected the woodwork against the attacks of burning missiles and allowed the men to work in safety. Thus the wall was raised to a great height, and the mound opposite made no less rapid progress. (2.75.4)

They also took direct action against the mound, tunneling through their own wall and pulling the dirt out from under Archidamus’ construction. When the Spartans thwarted that plan, the Plataeans dug under the walls and pulled the material of the embankment out from below. They also built a circular defensive wall inside their walls that was designed to trap any troops that came over the top (2.76.1).

Outside the walls, the Spartans engaged siege machinery for the first time in Greek history; Thucydides does not provide an exact description of the machinery, but does say that they “shook down” part of the Plataean’s new wall extensions (2.76.2-3). Campbell and Kern agree that these machines were probably primitive, uncovered battering rams, as the Plataeans reacted by dropping logs on top of them, or by catching them and ripping them apart with rope lassos (2.76.4).37 Failing at their attempt to batter down the walls, the Spartans next engaged the power of fire, hoping to burn down the timber walls. They set their kindling, then “lighted the wood by setting fire to it with sulphur and pitch. The consequence was a fire greater than any one had ever yet seen produced by human agency…and this fire was not only remarkable for its magnitude, but was also, at the end of so many perils, within an ace of proving fatal to the Plataeans; a great part of the town became entirely inaccessible…” (2.77.3-5). After all of this ingenuity, a storm stopped the fire and the Spartans returned to the tried and true tactic of

circumvallating the city walls with complex covered wall barracks of their own, waiting them out until time and the lack of Athenian aid spurred a desperate escape attempt and an eventual surrender due to starvation (3.23). An inauspicious beginning to the use of siege machinery and unconventional weapons, but one that would have considerable influence on later besieging armies. At Plataea, then, the Spartans used the first known Greek siege machinery and combined new constructs with a deadly use of common elements – sulphur and pitch – to attempt to force an end to the siege. While they did not succeed in this particular effort, this was only the beginning.

In fact, the Boeotians, led perhaps by Theban observers at Plataea, seem to have taken the usefulness of fire to heart. In 424, they met with an Athenian force at Delium, and after a rout on the battlefield, staged an assault against the Athenian fortifications at the temple of Delium. These fortifications were made up of stone, wood and vines, rather hastily erected by Athenian hoplites and their attendants. To take down this fortification, the Boeotians apparently sent out to the Malian Gulf to recruit javelin-throwers and slingers who were better suited for attacks on the defenders from a distance (4.100). What makes this siege particularly interesting in the context of this paper is the means by which the Boeotians and their allies (including some Peloponnesians) destroyed the walls.

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38 Evelyn Abbott, “The Siege of Plataea,” *The Classical Review* 4, no. 1/2 (February 1, 1890): 1-3. Abbott notes that, in accordance with Thuc. 3.18, “In a very short time, between the 'autumn' of 428 and 'the beginning of winter,' the Athenians built a wall round Mitylene; it was a single wall, it is true, but it was furnished with forts in some strong places, and effectually shut up the city on the land side,” joined with Campbell’s note (p.38) that at Pylos in 425, Demosthenes fortified his position on the headland, and his palisades thwarted the besiegers, allowing the remaining hoplites to be captured by naval reinforcements (from Thuc. 4.31), suggesting that even a hurriedly built Athenian fortified location was strong enough to stand against typical Greek siege techniques, or to stand long enough to wait out a city as strong as Mytilene.
Thucydides describes a new kind of weapon built to take down the wooden walls of the palisade. This construction, functioning much like a modern flamethrower, is described thus:

They sawed in two and hollowed out a great beam, which they joined together again very exactly, like a flute, and suspended a vessel by chains at the end of the beam; the iron mouth of a bellows directed downwards into the vessel was attached to the beam, of which a great part was itself overlaid with iron. This machine they brought up from a distance on carts to various points of the rampart where vine stems and wood had been most extensively used, and when it was quite near the wall they applied a large bellows to their own end of the beam, and blew through it. The blast, prevented from escaping, passed into the vessel which contained burning coals and sulphur and pitch; these made a huge flame, and set fire to the rampart, so that no one could remain upon it. (Thuc. 4.100.2-4)

As might be expected, the Boeotian flamethrower ended the siege at Delium fairly quickly.

In the same year, Athenian troops took refuge from Brasidas’ army within the weak fort at Lecythus, defending themselves from the fortification’s towers and from the rooftops of nearby houses. Brasidas’ army was set to attack the wooden defenses with what Thucydides called “a siege engine…from which they meant to throw fire,” (4.115.2) possibly similar to the machine used at Delium. Before they could use the device, the Athenians’ attempt to build a water tower atop a nearby house resulted in collapse, inspiring many to flee the fortress, and allowing Brasidas entry into the fortification where he proceeded to kill all that remained (4.116).

These three sieges, while quite different in scale and level of success, have one very powerful element in common: the use of specialized fire and fire weapons. In his text on early military weapons, Needham states that, “technologically speaking, the Greeks seem to have advanced more quickly than any other ancient people in the warlike
employment of incendiary substances,”^{39} At Plataea, the defenders were initially forced to use animal hide to defend their walls from fiery arrows, which were not necessarily remarkable advances in technology. Medical historians and biowarfare experts, however, often note the use of fire fueled by sulphur, pitch and resin, as the first use of chemical warfare in ancient history, whether the Spartans and Boeotians intended that particular result or not.\textsuperscript{40} The combination of sulphur, pitch and resin, once set on fire, creates a thick toxic smoke and sulphur dioxide gas. The smoke, aided by the effects of burning pitch causes eye irritation and skin inflammation, while the sodium dioxide gas can, in large enough doses, act as a respiratory suppressant. Even in small doses, the gas constricts the airways.\textsuperscript{41} While it is a fairly common side product of industrial processes, sulphur dioxide has also been labeled a chemical weapon in modern warfare; it was considered for use during the Second World War. The suggestion “included a plan to use a sulfur dioxide cloud against the Germans, screen the operation with smoke, and provide British troops a gas-proof helmet.”\textsuperscript{42} The EPA continues to monitor levels of the gas around factories and industrial areas, as leaks can be deadly for local populations.

Exposures to high levels of burning sulphur-created sulphur dioxide can kill, and even

\textsuperscript{39} Joseph Needham, \textit{Science and Civilization in China}, vol. 5.7 (Cambridge University Press, 1986), 65.
\textsuperscript{42} Sidell, Takaifuji, and Franz, \textit{Medical aspects of chemical and biological warfare}, 13-14.
less concentrated doses can result in severe illness or death in children or weaker adults.\textsuperscript{43} Using a bellows system to force the flame and gas over the walls of the fortification would have spread this cloud into the lungs of the troops and civilians on the other side.

Thucydides’ remark about the fire set at Plataea, that it made a “great part of the town…entirely inaccessible,” (2.77.5) could either refer to the smoke and gas, or to the aggressiveness of a sulphur fire fueled by an addition of the slower burning pitch. Sulphur burns blue and hot when exposed to oxygen, and sulphur fires that produce dioxide can create corrosive sulfuric acids when exposed to water – even the relatively low levels of water in the air. It is probably for the best that the water tower at Lecythus failed – pouring water directly on a sulphur-based fire can cause it to release sulphur dust and explode violently.\textsuperscript{44} Pouring water directly on the stationary fire at Plataea could have caused the fire to spread out and flash burn the area, and spread the smoke even more; an inconsistent rainfall, like the storm Thucydides cautiously suggests might have put out the fire, would have extinguished the flames safely by avoiding the explosive reaction.

The bellows system used at Delium (and perhaps nearly used at Lecythus) would have produced a much more focused blast of flame, creating a concentrated source of flame, smoke and gas. Needham compares the mechanism to a similar fourth century BC Chinese bellows recorded by Mohist military authors. This bellows was designed to blow toxic and irritating fumes into sapping tunnels.\textsuperscript{45} The bellows construction at Delium allowed for quick entry through the wooden walls of the palisade, and created a brightly-

\textsuperscript{45} Needham, \textit{Science and Civilization in China}, 66.
burning fire and gas combination that would have seemed quite terrifying to those inside the walls – and fairly dangerous to the besieging troops standing outside, as they could have been exposed to the fire and gas fairly easily. The perils of using toxic gases in warfare – that the gas and fire could easily turn back on the attacking army – remained problematic even after it came back into vogue during the First World War. Here again, mustard gas is often made in part using sulphuric reactions.  

But the larger question at issue here is: Why did these sieges invoke the use of such creative and destructive means in the first place? Thucydides discusses several other siege operations in his text, but none involve machine construction or potentially poisonous gas. Fire is understandable, perhaps, if only because it was a common enough tool. What separates these sieges from others seems to have been a combination of factors. First, Spartans and Boeotians, not Athenians, were involved. Athenians had standard practices for siege warfare, as we will see below, that did not include the use of machines or chemical weapons. The sieges at Delium and Lecythus may have drawn fire because they were against wooden constructs, not stone walls. A fiery bellows pushing toxic smoke and fire at flammable walls is very expedient, and compared to a lengthy siege operation, considerably cheaper. The siege at Plataea, against fortified stone walls, may have been an exercise in desperation and frustration. Plataea’s location and fortifications gave the residents a sense of security, and kept them well enough supplied to possibly outlast the Spartan attackers’ dedication. Seeking to end the siege faster, the Spartans used techniques designed to first get over the wall, and then destroy the people

46 Sidell, Takafuji, and Franz, Medical aspects of chemical and biological warfare.
inside. Although this particular attempt was thwarted by the weather, the precedent it set is exceedingly important.

The events at Plataea, Lecythus and Delium, represent a historical watershed in Greek military practice. Sieges were not new, but the use of poisoned gas and machinery had not been seen on Greek soil before Plataea. In hindsight, it seems that the deployment of these ‘unconventional’ weapons established a precedent for the practice of siege warfare in subsequent decades and centuries. Later armies would take these tactics and develop them even further, creating new machines, weapons, and requiring their enemies to become more creative in their defense.

For example, shortly after the Peloponnesian War, when Dionysius I of Syracuse besieged towns in Sicily in the 390s, he ordered the construction of massive siege engines and the first catapults, as well as missiles and larger ships designed for blockading and carrying catapults and siege machinery. By the 360s or 350s, perhaps in answer to the innovations of Dionysius, Aeneas the Tactician wrote a manual on surviving siege warfare, which included how to defend against machinery and a recipe for dumping firebombs on the heads of besieging troops. In his section on ‘starting fires’, Aeneas advises that similar tactics should be used to defend against besieging armies:

On shelters brought up by the enemy you should pour pitch and drop tow and sulphur: then fasten to a rope some burning brushwood and let it down onto the shelter. Materials of this kind may be slung out from the wall and dropped on the engines, which are being brought up (33.1). You yourself may make a fierce fire, which is impossible to put out, with the following materials: pitch, sulphur, tow, pounded gum of frankincense, and pine sawdust. Put these into a vessel, set a

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light to them, and apply them to any articles belonging to the enemy which you wish to catch fire (35.1). Later, Quintus Curtius Rufus records Alexander’s siege of Tyre in 332 BC, chronicling a lengthy siege effort involving creative attacks on both sides. Alexander’s army built a land bridge, several siege towers, and battering rams to use against the walls, and was confronted with a ship laden with some kind of chemical fire that may have been similar to Aeneas’ recipe. Phoenicians also countered with a combination of metal pieces and sand, heated and catapulted into the Macedonian soldiers like burning rain. Demetrius Poliorcetes, who besieged Rhodes for nearly a year in 304, used and was attacked by various forms of fiery catapult bolts and firepots. By the end of the fourth century, siege tactics seem to have included fire and siege engines by default. The sieges at Plataea, Lecythus, and Delium presaged a dramatic shift in Greek warfare, after which siege tactics could no longer be based solely on starvation or intimidation, but on the development of new techniques and technologies on both sides of the walls.

So the legacy of the three later fifth century sieges discussed above is dramatic. But this raises a further question of considerable significance, namely, how can this momentous shift in military practice be explained? In the remainder of this study, I will propose two related explanations. The first, described in Section IV, is a tactical explanation, relating this development to the larger narrative of siege warfare in and around the Greek world, a phenomenon that escalated appreciably over the course of the

49 Quintus Curtius Rufus and Christoph Cellarius, Quintus Curtius Rufus: Life and exploits of Alexander the Great (D. Appleton and company, 1860), 4.4.
50 Adrienne Mayor, Greek Fire, Poison Arrows, and Scorpion Bombs: Biological & Chemical Warfare in the Ancient World (Overlook TP, 2008), 216.
51 Ibid., 212.
fifth century. The second, found in Section V, is a cultural explanation, which seeks to explain how the recourse to ‘unconventional’ weapons might have been imaginable by the outbreak of the war. To do so, this section will examine the place of such methods in the literature of the Archaic and early Classical periods.
Part 3: Precedents: Siege Warfare Before the Peloponnesian War

Taking cities by besieging their walls was not a new tactic outside of Greece. In their extensive histories of siege warfare, Nossov and Kern trace the development of siege tactics and machinery in the writings and iconography of Israel, Mesopotamia and early Persia, yet note that the Greeks developed little in the way of siege technique until the Peloponnesian War. But by 399, Dionysius I had catapults, siege towers and shipboard missile troops (Diod. 14.50.1-4).

It seems odd that, after a relatively successful siege action against the walls of Troy, one that was recorded in the texts of Homer and proverbially well-known, the Greeks did not develop that particular skill between the time of the Trojan War and the aftermath of the Persian Wars. In his survey of ancient siege warfare, Kern determines that the Greeks had abandoned the practice in the Dark Age because of the cost require to hold a successful long-term siege – citing the fortifications on Dark Age archaeological sites, which were clearly located on defensible but not particularly fertile land. These fortresses were dependent on outside sources of water and food, making them vulnerable to the easiest tactic of siege warfare, the blockade, which was perhaps most useful in cutting off cities from external supply lines. The relatively weak fortification of the Acropolis during the Persian invasion, for instance, fell like the weak wooden wall it


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Kern even criticizes the strategy at Troy, noting that even during this 10-year siege, the Greeks preferred to draw the Trojans into direct combat on an open field of battle, not an active assault against the walls. The Greeks get inside the walls, in the end, because of Odysseus’ trickery, not their superior skill or siege tactics. The walls of Troy never fall, and there is no direct assault on their construction. Unlike the efforts at Plataea, Greek armies at Troy do not attempt to circumvent the defenses of the city with embankments or rams. Instead, they essentially sneak in the front door.

What is it then, that sets siege warfare apart from hoplite warfare? In addition to existing outside the bounds of infantry battle, the very nature of siege warfare defies the basic tenets of Ober’s rules. Sieges are conducted against civilians, and the creative weapons used in the sieges during the Peloponnesian war are strictly designed to bring them to a decisive and expedient end. In his argument against Clausewitz’ depiction of warfare, Creveld uses the open and ‘civilized’ example of Greek warfare to demonstrate that “…an exclusively 'instrumental' view is not correct. War, far from being the province of pure unbridled force, is a cultural activity and has always been subject to limitations pertaining to prisoners, non-combatants, and weapons, *inter alia*. By contrast, and in opposition to Creveld’s view, ancient siege warfare fits Clausewitz’ original definition of warfare:

…it is 'an act of violence carried to its utmost bounds'… to him, armed force was subject to no rules except those of its own nature and those of the political purpose for which it was waged. He had no patience with the 'philanthropist' belief that war could (or should) be restrained and waged with a minimum of

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54 Peter Polyaeus, *Polyaeus: Strategems of War* (Chicago Ill.: Ares Publ., 1994). Need #
violence. 'In dangerous things such as war, errors made out of kindness are the worst.'

Kern sees siege warfare as an application of total war, primarily because it breaks down the artificial boundaries between the violence of war and the safety of the city behind its fortified walls. More than that, siege warfare also removed whatever conventions might have protected non-combatants under what Creveld saw as culturally influenced warfare:

Women and children were an essential part of siege warfare. Their presence threatened the notion of war as a contest between warriors, undermined the conventional standards of honor and prowess that governed ancient warfare...Siege warfare then, was technical, unconventional, and total. It diminished the role of the traditional warrior with his conventional methods of fighting, methods designed to make possible the display of values such as honor and prowess...Siege warfare, with its technical nature and its unconventional circumstances, threatened conventional standards.

When the use of chemical and biological warfare agents are added to the particular viciousness of siege warfare, Clausewitz’ definition clearly applies. Bringing poisons, toxic gases and chemical fires to the gates of the city exemplifies the kind of total warfare that disregards the presence of women and non-combatants.

There was an element of caution to the format of common Archaic warfare. Putting aside argument for or against different kinds of troops or tactics, battles were generally fought at specific times of the year, away from the walls of individual city-states. Kern cites lack of money and an inability to commit large groups of soldiers – who are generally active farmers – from a single city to the long-term campaigns required for siege warfare. In truth, the structure of the Persian Empire was much better suited to the

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57 Ibid., 404.
58 Kern, Ancient siege warfare, 3.
59 Ibid., 4.
60 Ibid., 90.
use of siege tactics, which is perhaps why they developed similar siege tactics to those later displayed at Plataea, which will be discussed below.

Campbell provides five options for carrying out a successful siege effort. First, the besieging army could go over the defenses – using ladders or possibly by building up ramp-like earthworks against the walls. Second, by penetrating the walls of the city using a battering ram of some sort. Third, the army could tunnel under the walls, although there is a certain element of secrecy required for this to succeed. Fourth, the longest option, would be a blockade designed to starve out the inhabitants of the city. The blockade could be made up of constantly moving ships organized to prevent re-supply from the sea, or of quickly built walls around the city’s own walls, designed to prevent escape or outside aid. This is the least dangerous form of siege operation (for the besieging army), but it requires a great deal of dedication in the form of time, money, and continuous supply. Fifth, the walls could be breached through trickery. The most prominent Greek example would be Odysseus’ Trojan Horse, but Solon’s poisoning of the water at Kirrha was also a kind of deception.61

Persian siege operations exemplify many of these tactics in the years before the Persian Wars. Under Cyrus, the Persians used μηχανάς, translated as ‘machines’ or perhaps battering rams against the walls of Sardis (Xen. *Cyr.* 7.2.2), and Xenophon tells us that Cyrus encouraged the manufacture of siege machinery (*Cyr.* 6.1.20). During the Ionian revolt, Greeks on the coast, nominally supported by Athenian forces from the mainland, saw this technology first-hand. In 498/7, Persian troops put down the city of Palaepaphos on Cyprus with a combination of machinery and building techniques. There

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is archaeological evidence for the existence of an embankment, made up of stones, piled earth, wood and fragments of sculpture and architectural features from nearby temples, suggesting that the besieging troops designed a ramp during the siege that would perhaps enable them to use rams or similar siege machinery\textsuperscript{62} – perhaps even a basic siege tower, although Campbell believes that these were used primarily for battlefield support at the time, and not for siege action.\textsuperscript{63}

There also seems to be evidence that the defenders of the city fought back, throwing hastily shaped stones down on the Persians, and digging tunnels under the embankment. Within these tunnels, the defenders placed burning cauldrons at the ends below the embankment, perhaps in an attempt to bring down the tunnel supports and the parts of the embankment above. These tunnels were apparently insufficient – the Persians broke through. Evidence suggests, however, that fire was also used in some way outside of the fire in the cauldrons – there are burnt human bones at the site.\textsuperscript{64}

Persian siege tactics might have influenced Greeks on the mainland, but we have no way to know how and to what extent. We do know that the Athenians began to use sieges as weapons in their empire-building conquest of the islands and surrounding cities. At the same time, as the Athenians grew in wealth and power, fortifications around poleis became more commonplace. At Athens, Themistocles bought time for the Athenians to fortify their city in the aftermath of the Greek victory over the Persians (Plut. \textit{Them}. 19).


\textsuperscript{64} Ibid., 21-24.
Greeks in the extreme West and East, those faced with Carthaginian raids or Persian sieges, developed defensive techniques earlier than those on the mainland, but it is clear that in the years leading up to the Peloponnesian War, Athenians developed siege techniques – which primarily seem to have been in the form of blockades, to deal with unruly members of their developing empire.66

As the Athenians – under the aegis of the Delian League – sought to purge Persian influence from Greece and bring individual cities under their ‘protection,’ they ran up against fortifications and developed their blockade techniques. At some point near the end of the Persian Wars, the Athenians had gained a “reputed skill at siege techniques” (Thuc. 1.102), although this reputation was gained through assaults on wooden palisades, not fortified cities.67 Those that were fortified, like the rebellious cities of Naxos and Thasos in 470 and 465 respectively (Thuc. 1.98 and 1.101), were defeated by lengthy blockades, not direct assaults. In 457, the Athenians’ lack of skill with regard to direct assault resulted in the Egyptian expedition’s disgrace after a disastrous effort at Memphis (1.109). The Athenian Empire continued to use sieges to control rebellious cities, most notably at Samos in 440, where Pericles was said by Diodorus and Plutarch to have “utilized siege engines, being the first to employ so-called rams and tortoises,

65 Ibid., 43-44. Hannibal’s exploits against the Sicilians probably didn’t go unnoticed on the Greek mainland, and may have influenced Spartan techniques during the Peloponnesian War.
66 Kern, Ancient siege warfare, 94. Citing the revolts of Naxos and Samos, and the information from Diodorus and Plutarch on siege technologies – shields and battering rams – used to break through the walls at Samos under Pericles’ command, although Kern is correct in cautiously noting the danger of accepting siege terminology from the mouth of Ephoros, our much-doubted fourth century source for land warfare. By the fourth century, siege tactics had been refined, and terminology mastered, giving rise to doubts about why Thucydidse, generally quite precise in his descriptions of siege tactics, would leave out information on early engines.
67 Campbell, Besieged, 32. Citing Gartan, who references the “siege” of the Persian fortifications at the end of the second Persian invasion, although this siege consists primarily of Greek hoplites throwing themselves at a wooden fortification until it collapses (Hdt. 9.102.3-103.1).
which Artemon of Klazomenai built for him” (Diod. 12.28.3, Plut. Per. 27.3-4), although Thucydides does not mention these machines, and Plutarch seems to have doubted his original source on the veracity of the claims. It seems more likely that Samos fell to Pericles’ blockade. In any case, by the outbreak of the war, Athens was at least familiar with fortified walls, and had extended her long walls to reach the Piraeus. The Spartans, on the other hand, had no such experience. Cartledge notes that “If there was one chink in the Spartans' armour, it was their consistent failure (or, rather, refusal) to solve the problems of siege-warfare. But this defect only became marked in the fifth century and really serious only in the fourth.” This general ineptitude, however, was broken by moments of creative and tactical genius, as we saw in the evidence from Plataea.

The Spartan refusal to accede to the requirements of siege warfare, however, seems to have been the guide for Pericles’ actions at the dawn of the war. As the leader of his city, Pericles drew the Athenians of the coast and countryside within the fortified walls of the city (Thuc. 2.16-17), encountering bitter feelings and intense overcrowding – Thucydides (2.17) points out that even sacred grounds and temples were overwhelmed by the crowd. Straus and Ober believe this strategy was designed to wait out the Peloponnesians – Pericles had no reason to destroy the Spartan league, but in order to win, the Peloponnesians had to destroy the Athenian Empire. Pericles’ strategy called for the Athenians to stay safely within their walls, essentially drawing the Spartans into

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68 Diod. History 12.28.3, trans. Peter Green. 1st ed. (Austin: University of Texas Press, 2010). Green believes (220) that the two authors are both using Ephoros (FGrH 70 F194), and notes that Artemon is also cited by the Elder Pliny as the inventor of the tortoise (NH 7.202). He also points out, however, that Ephoros wrote nearly 100 years after these events, when such machines were standard – and that Plutarch seems to have doubted the veracity of Ephoros’ account.


an extended siege that would sap their resources, while the Athenians used their fleet to attack Spartan allies and bring food and supplies into their city.

In effect, this strategy required the Spartans to besiege Athens if they wanted to make any progress against the Imperial center. Athens becomes the longest-running siege of the Archidamean war, and is besieged once more after the Spartan occupation of Decelea, although initially the Peloponnesian armies stuck to a practiced pattern of yearly, 40-day invasions of the Attic plain, burning crops, trees and homes and leaving once supplies run short (2.12, 2.55-57). The Athenians continue their own practiced style of siege warfare at the same time; in 433, they begin an assault on the walls of Potidaea, but this one is an example of a markedly different kind of siege, in that the Athenians, now working as an imperial force, dedicate much more time and money to the siege, paying hoplites and their attendants and leaving a force at the walls year-round to sustain their blockade. By 432, the city is surrounded by siege walls built up by the Athenians, blocking Potidaean access to aid from the Peloponnesians or their own countryside. 

In Athens, the intermittent, yet overall protracted siege conditions within the city – despite a continuous source of grain supplied from colonies in the Hellespont and an unblocked port – begin to deteriorate with the outbreak of plague in the summer of 430. It is at the beginning of this outbreak that the first rumors of biological warfare appear in Thucydides. As he traces the origins of the plague through the rumored stopping points in Egypt and Ethiopia, he mentions a suspicion within the city that the Peloponnesians had poisoned the reservoirs in the Piraeus where there were no wells, and cited this intentional contamination as the reason for its quick spread into the upper city (Thuc.

71 Kern, *Ancient siege warfare*, 94. Kern also cites a reported payment of a talent a day dedicated to this siege, making it incredibly expensive to pursue for the three years it lasted.
2.48.2). This accusation seems to come out of nowhere, although it might be based in a natural tendency to accuse an enemy when catastrophe strikes. There is also some precedent for this kind of corruption of the water supply in the Archaic period, which will be discussed later in this paper, and in more recent memory, the incident at Kaffa that spread the bubonic plague into Europe by way of siege.72 The disease itself remains undiagnosed, despite the specificity of Thucydides’ description of the infection. Various causes have been put forward, ranging from typhus to anthrax, to ebola or smallpox, and even to ergot, a disease caused by rot on rye. In their article blaming ergot, Salway and Dell claim that

When the various possible sources of poisoning are considered, food and water seem the most promising. Pollution of water supplies is possible, but raises the question of how those men who were away from Athens on expedition were affected. If the water at Athens were the cause the Plague could only be an infectious disease. With food, however, it is different. Presumably ships carried a certain amount of flour on board-large expeditions undoubtedly did. Three sets of Athenians apart from those at home are mentioned as suffering from the Plague: those in the naval expedition to Laconia in 430 B.C.: those whom Hagnon took to Potidaea that year; and, after their arrival, the men already besieging Potidaea. This suggests a common origin in Athens, which might well be polluted grain.73

Whether the cause of the plague was polluted grain or not (I tend to think not), it is interesting that the Athenians in the city center would be willing to send troops carrying a contagious disease into the siege works at Potidaea. By 430, the siege there had become perhaps ruinously expensive, and the support troops sent to the wall did not seem to help. Sending troops out from a diseased city might be seen as a reverse of what happened at Kaffa, but there is no evidence to suggest that any effort was made to spread the disease into Potidaea from the outside.

These support troops arrived, already infected with the plague, with machines (Campbell says the specific word usage here suggests ladders, not true siege machinery), and proceed to kill off 1,050 out of 4,000 troops at the wall. What is left of this reinforcement group returns to Athens (Thuc. 2.58.2-3). In the end, Potidaea surrendered in the winter of 430/29, after the people inside the walls turned to cannibalism to survive. The Athenian generals at the city, relieved to see the end of the siege, were somewhat generous in their terms of surrender – leading to their own prosecution upon return to Athens (2.70). The outcome of this siege, cannibalism and desperate surrender, illustrates the cruelty of protracted siege warfare. The Athenians, at the same time, were willing to believe that the Peloponnesians had poisoned their water sources, in an effort to force them into a similar situation. It is not surprising that progressive siege tactics in this war would utilize chemicals and fire to encourage swifter – if not any more merciful – ends to siege situations. The siege at Plataea in 429 is illustrative of this progression, and of a sudden willingness on the part of the Spartan military force to engage in actual siege tactics.

Siege warfare, then, was not unfamiliar to the Spartans or the Athenians by the time of the Peloponnesian War, although the Athenians had more practical experience. But Athenians do not seem to develop the kinds of creative solutions seen at Plataea, Lecythus, and Delium under Spartan and Boeotian control. This may be due to the Athenian familiarity with naval blockades, sieges at sea that could not, at the time, utilize catapults or siege machinery based on the decks of ships. The Athenian standard, surround them, lock them in, then starve them out, served them well enough against rebellious islands and cities. Plataea, however, presented a new and expensive challenge
to the Spartans, and forced them to adapt and involve new weapons and tactics. Perhaps
the knowledge of what the Persians had done on Cyprus and during the Ionian Revolt a
generation earlier, when combined with their relative inexperience with Athenian-style
siege warfare allowed the Spartans and Boeotians to think outside the box, as it were.

But to explain the origin of such thoughts, we must look further afield, specifically
to earlier Greek literature, where ample evidence for an acquaintance with, if perhaps not
the complete acceptance of, the use of ‘unconventional’ weapons. Moving from phalanx-
style infantry warfare to unconventional siege warfare may have been less of a mental
hurdle than we might think.
Part 4: Cultural Precedents

The practice of putting a city under siege was not new in Greek cultural memory at the time of the Peloponnesian War. It would be foolish to discount the evidence from literature when discussing Greek warfare, although any discussion of the historical influence of this kind of evidence must necessarily walk the line between giving the poetry and drama too much credence and not enough. The literature that deals with siege warfare and the early uses of fire and sulphur as weapons does demonstrate that the Greeks had a cultural awareness of the practice of siege warfare and the potential dangers of poisons and unquenchable fire.

The Homeric epics, for example, along with later poems, dramas and visual images, continually recalled the dramatic events of the 10-year siege of Troy, ensuring these events a permanent place in the collective consciousness. One could say that this first siege sets the tone for those that occur before and during the Peloponnesian War, setting a precedent for a long, drawn out kind of battle, and allowing for the application of the kind of deception and trickery that both Krentz and Mayor\textsuperscript{74} use to differentiate siege warfare from infantry battle. Homer’s description of Greek behavior during and after the siege is replete with tales of kidnapping, greed, rape, and murder, and the characters seem unconcerned with the will of the gods. The scripted battles associated with hoplite

\textsuperscript{74} Mayor, \textit{Greek Fire, Poison Arrows, and Scorpion Bombs}, 102.
warfare are nowhere to be found.

This early siege, however, is more analogous with the first Athenian forays into siege warfare – the Greeks even manage to build a secondary siege wall, just as later Athenian armies would at Samos and elsewhere. Literature based off these Homeric poems offers more parallels to later Athenian actions: the choral song in Aeschylus’ Agamemnon describing the return of the urns of the dead to Argos brings to mind the set-up for Pericles’ funeral oration in its woeful reporting of the war dead and Leahy draws the obvious parallel between the Herald’s brutal tale (563-582) of the siege at Troy and harsh winter sieges at Eion and Sestos in 476/5. The Greeks at the walls of Troy are engaged in a waiting game. Unable to breach the walls by force, they spend ten years on the beach, making raids, staging duels, and arguing amongst themselves. In the end, the walls of Troy are conquered by a machine, but not one that is directly used against the stones. Instead, trickery wins the day and the city is sacked from within.

At first sight, the siege depicted by Aeschylus in his Seven Against Thebes might seem like a rather different case. Aeschylus’ story is a Cain and Abel myth, a tale of brother against brother that revolves around the inhabitants of a single city and seeks to solve a conflict that arose out of the misbehavior of a single family. Unlike the Iliad, the antagonists of Seven Against Thebes are Greeks, as are those within the city’s seven gates. Aeschylus, however, paints over the similarities between the combatants and

makes the Greeks outside the walls into barbarians who speak another language,\textsuperscript{77} forcibly re-creating a Greeks vs. Barbarian conflict that echoed the recent Persian invasion – and the siege of Troy. Here too, Rosenmeyer points out,\textsuperscript{78} the construction of the enemy outside the gates is that of a machine – made up of bestial men who have rejected the authority of the gods and who carry violently colorful shields.

Taken out of this enforced context, the events of this siege of Thebes may presage those that will occur during the siege of Athens. At Athens, the conflict is Greek vs. Greek, the Spartans at the gates have fought for and alongside Athenians before, and neither side would identify the other as ‘barbarian’. Additionally, within the city walls of Athens, just as in Thebes and Troy, there is unrest and discomfort as the long siege progresses. Voices of dissent rise like the chorus of women in the \textit{Seven Against Thebes}, questioning Pericles’ decision to remain inside. Sieges were not unknown to the Greeks. What the Athenians began to do in the years preceding the Peloponnesian war was not necessarily evidence for the decaying of a hoplite mode of warfare that ruled supreme in the archaic period, but a continuation of an accepted mode of warfare, albeit one that had no real use before cities began to fortify once more after the Persian invasions. The sieges in the literature are not historical proof of individual events, but they do demonstrate awareness of the tactic and, in the case of the \textit{Iliad}, a celebrated tale of heroism and trickery that revolved around the successful outcome of a siege.

Yet none of these sieges are similar to what happens in Plataea, Delium or Lecythus. No poisonous smoke or unquenchable fire accompany the Trojan Horse

\textsuperscript{77} Thomas Rosenmeyer, “Seven against Thebes. The Tragedy of War,” \textit{Arion} 1, no. 1 (April 1, 1962): 52.
\textsuperscript{78} Ibid., 63. Rosenmeyer’s description of the machine begins earlier, but here he lists and describes each of the seven and their attributes with an interesting discursion on psychological warfare.
through the gates of Troy, or aid in the deaths of the two brother-kings at Thebes. We do, however, find traditions of poison, fire and the many uses of sulphur in the mythic, pseudo-historic and literary tradition of Greece that may help to explain why, when faced with a city wall, some armies during the Peloponnesian War turned to the peculiar combinations of siege tactics and chemical weapons.

The mythical uses of sulphur, the element most commonly associated with the fires and gases used against city walls, are many and varied. For all of the evil uses, which will be discussed below, sulphur also had a beneficial function as a substance of purification. The purifying power of fire could be made more effective with the addition of “sharp-smelling substances” like sulphur to make the smoke and smell of the torch more present in the polluted area.\(^7\) Parker notes that as early as Homer sulphur was a purgative: “But Odysseus said to the dear nurse Eurycleia: “Bring sulphur, old dame, to cleanse from pollution, and bring me fire, that I may purge the hall; and do thou bid Penelope come hither with her handmaidens, and order all the women in the house to come” (Od. 22.481), serving to counter, or perhaps overwhelm, pollution with its acrid scent.\(^8\)

The association between sulphur and flame was aided, or perhaps inspired, by natural phenomena. The *Imagines* of Philostratus contains a passage describing an island of fire:

…fire smoulders under the whole of it, having worked its way into underground passages and cavities of the island, through which as though ducts the flames break forth and produce terrific torrents from which pour mighty rivers of fire that run in billows to the sea. If one wishes to speculate about such matters, the island provides natural bitumen and sulphur; and when these are mixed by the sea, the island is

\(^8\) Ibid., 228.
fanned into flame by many winds, drawing from the sea that which sets the fuel aflame. (2.17.5)

The uses of fire and sulphur, however, were not always purifying or particularly pleasant. On at least one occasion in the Iliad, the scent of sulphur accompanied the firebolt of Zeus, terrifying men and animals alike and sending them scurrying to hide in fear (8.130). In the mythological tradition, sulphur could be as corrupting as it was purifying elsewhere. Stesichorus, Pindar and Strabo tell of the legend of the Telkhines, sea-demons or sorcerers associated with Chios and Rhodes.\(^1\) Strabo notes that these demons take the water of the Styx, mix it with sulphur, and pour the mixture on animals and plants to kill them and pollute the land. Sulphur is just one of the potential ingredients for a chemical weapon. In the mythic tradition of Greece, there are several other options for large and small-scale destruction that may be seen as influential events in the development of chemical siege warfare in the mid-fifth century.

It is perhaps unsurprising that Heracles, whose deeds comprise one of the larger mythological traditions of ancient Greece, would provide us with a poison that has characteristics similar to the unquenchable fire seen at the siege walls of the 5\(^{th}\) century. The labors of Heracles and the story of his death may have been even more widespread than his cult, which on its own served cities stretching across Attica and the Peloponnesus. The specific episodes that concern us here are the slaying of the Hydra, the death of Nessos and Heracles’ death at the hands of Deianira. The slaying of the Hydra is the second of Heracles’ twelve labors, and one that will have long-ranging effects. The death of the Hydra is not particularly important for this argument. What Heracles did with the corpse, however, is quite interesting. Once the beast had been slain, Heracles is

said to have “he dipped the heads of his arrows in the venom, in order that when the missile should be shot the wound which the point made might be incurable” (Diod. Sic. 4.11.5).

He goes on to use these poisoned arrows against Geryon: “[Herakles arrow] (Bringing) the end that is hateful (death), having (doom) on its head, befouled with blood and with . . [lacuna] gall, the anguish of the dapple-necked Hydra, destroyer of men [Herakles used an arrow poisoned with the blood and gall of the Hydra]; and Geryon drooped his neck to one side” (Alcman Fr. 815 Geryoneis) and against the centaurs. Strabo notes that the river in Elis where the centaurs washed after the battle was marked by the stench of the poison – and was oddly known to heal diseases of the skin (Geo. 8.3.19). The centaur that escaped, Nessos, met his end at Heracles’ hand by means of these same arrows when the centaur attempted to sexually assault Deianira, Heracles’ wife. As he lay dying, “Nessus, knowing how poisonous the arrows were, since they had been dipped in the gall of the Lernaean Hydra, drew out some of his blood and gave it to Deianira, telling her it was a love-charm. If she wanted her husband not to desert her, she should have his garments smeared with this blood” (Hyg. Fab. 34).

What happens next varies according to the ancient author. Hyginus reports that Deianira applied the blood to a robe and sent it to Heracles before noticing that any blood-touched cloth burned instantly in the sunlight. The robe sent to Heracles burns as soon as he puts it on (Fab. 36). In Frazer’s translation of Pseudo-Apollodorus, “Heracles put it on and proceeded to offer sacrifice. But no sooner was the tunic warmed than the poison of the hydra began to corrode his skin; and on that he lifted Lichas by the feet, hurled him down from the headland, and tore off the tunic, which clung to his body, so that his flesh was torn away with it,” (Bibl. 2.7.7) although Frazer notes that Nonnus’ version “expressly says
that the poisoned tunic took fire and burned Herakles”°\textsuperscript{82} Sophocles’ dramatic version reports that the cloth fragment crumbled into the earth like “sawdust” and “from the place it fell, a curdling clot of bubbling foam seethed up” (\textit{Trach}. 698-99), and that the poisoned robe clung to Heracles’ sweating skin and “devoured him” (772). Heracles’ description of the effects are quite gruesome:

\begin{verbatim}
πλευραῖοι γὰρ προσμαχθὲν ἐκ μὲν ἐσχάτας
βέβρωκε σάρκας, πλεύμονός τ’ ἀρτηρίας
ῥοφεῖ ξυνοικοῦν, ἐκ δὲ χλωρὸν αἷμα μου
πέπωκεν ἤδη, καὶ διέφθαραι δέμας
τὸ πᾶν, ἀφράστῳ τῇ δεχόμενη πέδη.
\end{verbatim}

Stuck close to my sides, it has eaten away my innermost flesh and has drained dry the tubes of my lungs, dwelling inside; already it has drank away my fresh living blood, and my entire bodily frame is utterly destroyed, conquered by this inexpressible fetter (\textit{Trach}. 1053-56)

Sophocles’ description of Heracles’, dated sometime before the Peloponnesian War, speaks of a poison activated by heat, either from the sun or from the flames on a sacrificial altar; additionally, several note the amplificatory affect of water (in the form of sweat in Heracles’ case and water in the later case of Medea) on the poison. These characteristics are reminiscent of sulphuric reactions, although as the poison is essentially mythical, it is impossible to break down exactly what substance actually killed Heracles. Mayor’s suggestion, that the poison is analogous to the venom of the ancient \textit{dipsas} snake is perfectly logical, given the origin of the poison in the snake-like Hydra.°\textsuperscript{83}

Dirckx, in a review of Heracles’ death, suggests an alternate explanation: a cutaneous form of anthrax spread by the wool of the robe, not the old blood that covered it.°\textsuperscript{84}

\textsuperscript{82} Apollodorus and James George Frazer, \textit{Bibliotheca} (W. Heinemann, 1921), 270-1.1
\textsuperscript{83} Mayor, \textit{Greek Fire, Poison Arrows, and Scorpion Bombs}, 48.
The heat-activation and water-exacerbation elements of the story, however, are quite interesting. Aside from Alcman and perhaps Sophocles (dependent upon the composition date of the play), all of the extant sources for Heracles’ death write after the Peloponnesian War is long over. The artistic record is equally frustrating – the death of Nessos receives far more attention than the death of Heracles. It is possible that some of the features of this poison are influenced by the uses of different forms of fire and fire-causing metals. By 350BC, Aeneas is prescribing recipes for ‘unquenchable’ fires with cores of bitumen and sulfur. Sulfur can, in certain states, react violently to heat and salt water (sweat). Lime and sulfur together can burn when combined with water: Mayor cites Theophrastus, noting that clothing bleached with sulfur and lime would occasionally combust when splashed.\(^85\) Additionally, there is some evidence that sculptors, at least, were aware of some of the properties of phosphorus – an element that would have required Deianira to hide it in a dark, dry place just as Nessos suggested.\(^86\) When it burns, phosphorus eats through the skin and reacts with lipids, and naturally occurs in bone ash. A simpler explanation, perhaps, would be an acidic formula, given the damage to Deianira’s cloth sample. In any volcanic region, reactive metals, gases and naturally occurring acids would have been familiar to local inhabitants. The mythic tradition of Heracles from the time before the Peloponnesian War may have influenced the thinking of besieging armies during that war, although perhaps moreso in the area of flaming arrows than in flamethrowing devices, as a means of not only lighting arrows on fire, but making that fire stick to walls. The tradition of poisoned clothing does not consist solely

\(^{85}\) Mayor, *Greek Fire, Poison Arrows, and Scorpion Bombs*, 226.

\(^{86}\) George Redford, *Sculpture, Egyptian-Assyrian-Greek-Roman: With Numerous Illustrations, a Map of Ancient Greece and a Chronological List of Ancient Sculptors and Their Works* (Nabu Press, 2010), 6n. Phosphorus is found naturally in human bone ash.
of Heracles’ death throes. Medea, the sorceress married to Heracles’ friend Jason, is
known less for her role in saving the hero than for her revenge upon his second wife.

By the time of the Roman Empire, Medea’s story, and her skill with poisons and
fire, is associated with weaponized chemicals and elements. From the beginning of her
story, Medea is associated with fire. The brazen bulls her father uses to threaten Jason
and his men breathe fire, and it is only through her skill in creating a magical fire-
resistant salve that Jason survives the encounter (Ovid Met. 7.98-100). But when Jason,
like Heracles, betrays her with another woman, Medea chooses to take her revenge.

Unlike Deianira, who gave her deadly gift to her husband, Medea goes after the woman
who is taking Jason from her. In Euripides’ version of the myth, the earliest in which
there is a record of Medea’s murders, Medea sends a crown and peplos to Glauke, each
coated with a poison of her own design. In this version, Glauke dies wearing the gifts:

χρυσοῦς μὲν ἀμφὶ κρατὶ κείμενος πλόκος
θαυμαστὸν ἤτε νάμα παιμφάγου πυρός,
pέπλοι δὲ λεπτοί, σῶν τέκνων δωρήματα,
λευκὴν ἔδαπτο σάρκα τῆς δυσδαίμονος,
φεύγει δ᾽ ἀναστᾶσ᾽ ἐκ θρόνων πυρὶ
πλὴν τῷ τεκόντι κάρτα δυσάθης ἰδεῖν:
οὔτ᾽ ὀμφαλὸς γὰρ δῆλος ἦν κατάστασις
οὔτ᾽ εὐφυὲς πρόσωπον, αἷμα δ᾽ εξ ἄκρου
ἐσταξε κρατὸς συμπεφυμένον πυρὶ,
σάρκες δ᾽ ἀπ᾽ ὀστέων ὡστε πεῦκινον δάκρυ
γνάθοις ἀδήλοις φαράκων ἀπέρρεον,
δεινὸν θέαμα: τάσι δ᾽ ἦν φόβος ἤπειρον
νεκροῦ: τύχην γὰρ εἶχομεν διδάσκαλον.

The golden circlet about her head shot forth a terrible stream of consuming fire,
and the fine-spun gown, gift of your sons, was eating into the wretched girl’s
white flesh. And all aflame she leapt from the chair and fled, tossing her hair this
way and that, trying to shake off the diadem. But the gold crown held its
fastenings firmly, and when she shook her hair, the fire only blazed up twice as high. She fell to the floor, overwhelmed by disaster, barely recognizable to any but her father. Her eyes no longer kept their wonted form nor did her shapely face, and from the top of her head blood dripped, mingled with fire, and her flesh dropped from her bones like resin from a pine-torch, torn by the unseen jaws of the pharmaka, a dreadful sight to behold. And we were all afraid to touch the corpse, taught well by the event we had seen (Medea 1186-1204).  

In this case, the poison coating the gifts is set aflame on its own, bringing to mind the characteristics of a quicklime and sulfur mixture. The text goes on to describe the death of the girl’s father, as he attempts to save her and ends up trapped, melting into her poisoned peplos. Medea’s association and origin with the East gave her an air of mysterious competence. She worked with poisons, salves, and fire easily, communicating and manipulating the gods and the people around her. She had access to mysterious leaves and roots, as well as mythical poisons that enabled her to restore health to one man and then force another man’s daughters to kill. Plutarch later credits her with one of the first uses of naptha, a substance more flammable than bitumen that can also set the air between the flame and substance alight.  

Be that as it may, The deaths of Heracles and Glauke are illustrative of a cultural awareness of the use of poisons and fire to kill, and the nature of the fire that strikes Glauke is particularly interesting for its unquenchable nature. A closer look at her death also reveals that while the crown on her head burned, the peplos was poisoned – an interesting combination of poison and fire. Neither text served as a guide for the Spartans at Plataea, nor did the Iliad and Seven Against Thebes serve as instruction manuals for the Greek war machine. But the very presence of sieges, poisoned arrows (and clothing), and

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87 Euripides and David Kovacs, Euripides, with an English translation (Cambridge: Cambridge University Press, 2002).
88 Plutarco, John Laghorne, and William Laghorne, Plutarch’s lives (William and Joseph Neal, 1831), 480. Life of Alexander, 5.7. Also, Pliny. NH 2.235.
fire weapons in well-known works of Greek drama and epic do, however, help to explain
a mode of thinking that would allow troops faced with a wall or a wooden fortification to
resort to fire and perhaps poison in addition to the accepted methodology of siege
warfare. Greeks knew what sulphur could do, and they knew that when combined with
other chemicals, it would burn with a powerful odor. The willingness to use that
knowledge in the context of a siege was something new and different. While we may
never be sure why the Spartans and Boeotians chose to utilize them at that time in those
places, we can note that the component elements of these techniques were in place.

The use of sulphur and pitch at Plataea, Lecythus and Delium is evidence of a
clear lack of concern among the Spartans and the Boeotians for the consequences of
using non-hoplite weaponry and attacking civilians. Far from seeing warfare as a
ritualized battle between two equally equipped forces, the evidence from these sieges
suggests a level of comfort with the use of unconventional tools against an opposing
civilian force. The Spartans had some familiarity with oppressing non-combatants – their
Helot slaves did occasionally revolt and attempt to gain their freedom and were put down
with some force. The Thebans, noticeably, did not announce their plans to invade Plataea,
nor did they seek to defeat them in ritualized hoplite combat. This level of comfort with
forms of battle outside the constraints of the hoplite ‘ideal’ may have been partially due
to a cultural awareness of both siege warfare and the use of fire and poison in literature
and drama. When faced with the fortifications at Delium, Plataea and Lecythus, the
besieging armies had a list of options, including fire, poisonous gas and deception, to call
upon. It is perhaps important to note that these weapons and tactics were part of the
popular consciousness before the Pelopponnesian war, suggesting that the ‘rules’ of Greek warfare were not nearly as significant as Ober argues, if they were ever followed at all.

There remains one more precedent to mention in this discussion of the cultural context for the biological and chemical attacks during the Peloponnesian War. The selection from Thucydides that opened this discussion, relating the suspicions of some Athenians regarding the origin of their plague, remains something of an outlier in the context of the three more fiery sieges. Why did some Athenians believe their well had been poisoned? That suspicion certainly doesn’t fit the concept of honorable warfare, nor does it seem to be accounted for in the arguments of the challengers to the ‘hoplite ideal’.

In this overview of early sieges, those at Troy and Thebes have been discussed in regard to the practice of siege and the comparisons to protracted Athenian sieges in the fifth century. What that discussion left out, however, was a note on the plagues that befell each besieged or besieging army. Based on these two examples, in combination with the plague that hits Athens just over a year after its own siege begins, it would seem logical to associate a long siege with an outbreak of disease. If the concept of plagues during a siege was familiar, why, then would some look to poison as a solution? In the first two tales, plagues came from supernatural sources, but a third instance of disease during a siege, one which would have been well-known to the Athenian people in particular, was caused by human hands.

The plague arrows of Apollo are a familiar part of the opening of Homer’s *Iliad*. The Achaean camp outside the walls is beset by a devastating plague after Agamemnon committed a kidnapping and spurned a priest (1.10). This plague is presented as an assault by the god, as revenge for an insult to one of his mortal priests, not as an attack
from a human enemy. Similarly, the plague that affects Thebes at the opening of *Oedipus Tyrannos* beginning in the third line is a punishment for Oedipus’ unintentional crimes of murder and incest, delivered by the gods and passed down to the brothers facing off at the gates of *Seven Against Thebes*. This description of plague seems to echo the events Thucydides reports in his plague narrative, and was perhaps written (or adjusted) in response to that event. Even so, both events would have inspired Athenians to look for a cause for their agony. The accusation of well-poisoning, however, is perhaps similar to a slightly more recent siege – the one thought to have been conducted by Solon and the Amphyctionic League at Krisa.

The veracity of the events at Krisa has been called into question, just as much of Solon’s career remains nebulous; the problematic elements of this particular episode, however, involve the dating of the first records on the war to the 340s BC, much later than is necessary for this war to have an impact on the Athenians of the fifth century. What it can do, however, is suggest continuity – and, perhaps, a kind of cultural memory associated with the Mycenaean fortress located on the Kirrhan plain that inspired a series of tales about bandits preying on Delphic pilgrims; Robertson notes that the scolia to one of Pindar’s Odes refers to the Mycenaean walls as the city walls of Krisa.

The legend of Solon’s actions at Krisa, however, can perhaps be moved out of the realm of Philippean propaganda, as Robertson argues, and so separated from the problematic elements of Krisa’s location and Delphic loyalty. The specific episode,

Noel Robertson, “The Myth of the First Sacred War,” *The Classical Quarterly* 28, no. 1, New Series (January 1, 1978): 38-73; Gustav Adolf Lehmann, “Der ‘Erste Heilige Krieg’: eine Fiktion?,” *Historia: Zeitschrift für Alte Geschichte* 29, no. 2 (Qtr 1980): 242-246. Lehmann questions the war based on his reading of the oldest sources as Philippean/Macedonian propagandists, while Robertson examines the problem on the basis of evidentiary issues: namely, that there is no extant city of Krisa, and, in a sentiment that Lehmann will echo, that there are no sources for the events before 345BC.

Robertson, “The Myth of the First Sacred War,” 44.
referenced by Pausanias and Plutarch involving the poisoning of the city’s water supply with hellebore could easily reference a tradition of well/water poisoning during siege warfare in Greece. As an addendum to this argument, Aeneas’ tactical pamphlet on siege warfare also refers to poisoning water supplies (although in this case one’s own, while fleeing) with a kind of casual dismissal, seemingly suggesting that this practice should not be particularly new or shocking (8.4.4). And certainly the Athenians had the idea in their minds by 429. They had carefully locked themselves into their walls, while allowing for the movement of troops, ships and food from the port at Piraeus, and yet, despite their preparations, they were still beset with a plague that must have seemed unstoppable and incredibly localized. From his vantage point, Thucydides’ targets the origin of the plague to the east, while at least some of those inside the walls assumed that their water supply had been poisoned – perhaps just like that of some strange city near Delphi.

Of course, the suspicions of the Athenians also serve to underline the basic argument of this paper; poisoning a well during wartime, much like constructing a siege engine or flamethrower and pumping poisonous gas over a city wall, was not unthinkable in the early years of the Peloponnesian War. These alternative and unconventional methods of warfare, both real and imaginary, demonstrate the adaptability of Greek soldiers, and an acceptance of what we might consider to be a less than honorable code of military practice.
Part 5: Conclusion

The weakness of the construct of the ‘hoplite ideal’ lies in its inability to account for adaptation and flexibility. Greek armies, tightly regimented and armed according to this construction, would have been hamstrung by their inability to take advantage of terrain or weather suited to different kinds of weapons and tactics. The rules that drove hoplite warfare in Ober’s construction of Greek combat are also questionable, and don’t seem to apply to the cultural construction of warfare found in literature and drama. While this construct has been quite capably questioned on several levels, demonstrating that the idea that Greek infantry soldiers were untrained, restricted to hoplite weaponry, and restricted to the rules of hoplite warfare is not sustainable in the face of evidence, I have sought to push that challenge further.

Challenges to the hoplite ‘ideal’ and the ‘rules’ of Greek warfare have not dealt extensively with the evidence of sieges and siege tactics. The object of this paper was to demonstrate that, by the outbreak of the Peloponnesian War, Greek armies not only had experience in siege warfare, but also could and did apply new weapons and tactics to that challenge. In utilizing fire, poisonous gasses and technology to counter fortifications, the Spartans and Boeotians took their basic knowledge of siege warfare, combined it with their understanding of chemicals and fire, and constructed machinery that would enable them to directly attack the fortifications and the people within. Within the walls, populations and armies reacted by countering technology and designing their own tools to
defeat the threat of fire and battering rams. Untrained hoplite soldiers, only experienced in conducting regimented, ritualized combat, would have been unable to react and adapt to the requirements of siege warfare effectively. But trained soldiers, faced with a fortification and armed with the knowledge that sieges could be countered with unconventional and deceptive tactics and well aware of the dangers of fire and sulphur were able to take on a siege from either side and develop ways to attack and defend fortifications long before Aeneas published a manual on those same tactics.

What the Spartans and Boeotians did reflects an acceptance of unconventional methodologies in warfare, supporting the argument for javelins, stones, and arrows in earlier periods, and suggesting that there was a natural progression to fire, gas, and siege machinery. The involvement of fire and the creation of machines to enhance the power of that fire allowed for the shortening of expensive sieges and the development of new methods to react to dangerous fires – defending walls with treated hides, preparing (if not succeeding with) water towers, and the use of tunneling techniques to counter offensives. Siege tactics forced both sides to develop quick, portable responses to new challenges and led to a Hellenistic age defined by technological innovation on land, sea and in the walls of emerging military and political powerhouses.

The events at Plataea, Lecythus, and Delium are remarkable not because they exist outside of the Greek cultural or historical milieu, but because they serve as the first elements of what would become a new way of fighting wars. Those famous sieges of the Hellenistic period, where defenders and besiegers threw everything from massive stones and fire to burning sand and metal at one another, were presaged by this series of sieges,
sieges that are often lost within the larger context of the Peloponnesian War, but that marked a watershed moment in Greek military history.
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