

# The Egalitarian Battlefield: Reflections On the Origins of the Majority Rule in Archaic Greece\*

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## Abstract

We explore the emergence of formal majoritarian voting institutions in archaic Greece from a historical and conflict-theoretic perspective. Judging from original sources we first conclude that the formal majority rule entered Greek collective decision-making in the seventh century B.C. In this time a ritualized form of hoplite warfare was adopted in Greece. By help of a conflict model we show that under the conditions of hoplite warfare numerical superiority must have been the decisive factor for the outcome of battles. Under these circumstances fighting and majority votes are analogous. Based on this result and pointing out to historical similarities between archaic Greece and medieval Switzerland we formulate a hypothesis of how majority decisions may have spontaneously emerged from conflict.

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## 1 Introduction

Let him go ahead! Ares is a democrat. There are no privileged people on a battlefield. (Archilochos, c. 680 B.C.)

The ancient Greeks left an important political legacy which has long been almost exclusively a subject of three branches of scholarship: ancient history, political theory and political philosophy. The fundamental question “where does democracy come from?” is nowadays increasingly demanding the attention not only of one branch of scholarship. Game theory, rational choice and political economy are increasingly being applied in the analysis of Greek political institutions.<sup>1</sup> It seems a truly “interdisciplinary field of classical democracy studies” is emerging (Ober 2007: 67).

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<sup>1</sup>See e.g. Kyriazis (2008), Teegarden (2007), Ober (2008), Kaiser (2007), Fleck/Hanssen (2006), Lyttkens (2006), Morris (2004), Quillin (2002), Scholtz (2002), von Ungern-Sternberg (1998).

What do we know about the emergence of Greek democracy? Although many important details are not clear it is today generally understood that the adoption of democratic institutions in Greek politics was the result of interdependent economic, institutional, and technological trends that reach back as far as the eighth-century B.C. There is less consensus on the influence of these trends relative to each other in promoting democratic development. Economic growth, the emergence of the city-state (*polis*), new military practices as well as developments in social and political thought resulted in far-reaching changes of political institutions. Research in this topic is a difficult task as one needs to take into account diverse evidence ranging from archaeological findings, ancient and modern sources of literature, economic history *etc.* Making use of all these requires an interdisciplinary approach.

Some works on the origins of Greek democracy start from the assumption that two earlier innovations, which took place roughly at the same time, greatly accelerated the evolution of political institutions towards democracy. The first is the introduction of formal voting procedures and application of the majority rule in political assemblies.<sup>2</sup> The second is the emergence of an idiosyncratic method of warfare which was based almost exclusively on heavy-armed infantry (*hoplites*). The concurrence of these important innovations appears not to be the result of coincidence. But what was cause and what was effect? Both innovations may have been caused by a third variable, like the emergence of the concept of the ‘individual’ (Ruzé 1984). Or hoplite warfare followed from a democratization of politics as an extension of democratic ideology to warfare (Hanson and Heath 2001). A third possibility is that the democratization of politics followed from the very experience of hoplite warfare. We would like to contribute to the debate by presenting some new arguments for the last thesis.

Our starting point is that majority decisions emerged as a conflict resolution-mechanism. This is a classical topic in political sociology. According to Georg Simmel “outvoting”, *i.e.* a majoritarian decision where the will of the majority is binding even though the minority does not agree, “operates on the idea that the many are more powerful than the few, and that the function of voting is merely to reach the result of the real contest of forces without engaging in this contest itself” (Simmel 1908: 243).<sup>3</sup> Our hypothesis is that the majority rule in its purest form could have emerged as a substitute for fighting. Or—twisting the words of Clausewitz—we develop an idea of politics as the continuation of war by other means.

Formulating this provocative hypothesis requires a differentiated inventory. We will argue that factors like technology and institutions produced a unique ‘microtechnology of conflict’ such that a trial of military strength between the opposed groups and a decision by majority rule led to analogous outcomes and were thus exchangeable. Finally, we will formulate an hypothesis on the emergence of formal majority-voting procedures by pointing to historical similarities between ancient Greece and medieval Switzerland.

This paper is organized as follows: in Section 2 we explore the emergence of formal majoritarian voting procedures in ancient Greece. In the first part of Section 3 we explore the conditions of warfare that were given in ancient Greece roughly in the period 750–500 B.C. In the second part we explore whether under the conditions

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<sup>2</sup>The Greeks certainly were not the first to apply the majority rule. However, they were the first to introduce it as a principle for determining the general will of a collective; *cf.* Larsen (1949: 164) and Ruzé (1984: 247).

<sup>3</sup>This theory was adopted by an influential school of thought founded by the French historian Gustave Glotz (1928) who used it to explain the origin of the Greek city-state.

of hoplite battle fighting and majority votes turn out to be substitutes. In Section 4 we develop an hypothesis of how majority decisions may have emerged by pointing out to similarities between archaic Greece and medieval Switzerland. Section 5 concludes and summarizes our results.

## 2 Collective Decision-Making in Archaic Greece

It is today generally understood that the Greeks started to take majority votes in the Archaic Period (800–480 B.C.) and most probably some time during the seventh century B.C. The institution of taking formal votes in political assemblies seems so normal in the modern context that “the average observer does not realize that any invention has been necessary; yet it would be hard to point out any single innovation which has influenced more profoundly the development of political institutions” (Larsen 1949: 164).

Why it was adopted is unclear. The majority rule has a number of radical implications and implies a fundamental change compared to consensual forms of decision-making (Flaig 2004). First of all, it presupposes individualism, and equality of the votes. Social, economic and status differences have to be set aside for the purpose of collective decision-making. Second, political equality is only a necessary but not sufficient condition for the majority rule. Anthropological research suggests that it is avoided by explicitly egalitarian societies because its application means the will of the minority is actively disregarded (*e.g.* Nicholas 2006: 54). Third, it works if people somehow express their preference; this is however only possible in a limited way. One can vote for a proposal, against, or abstain. Fourth, the majority rule differs from the unanimity rule or consensus principle because of its divisiveness. It is conflict-prone and may lead to the break-up of the decision-making group. Still the Greeks employed it most systematically and comprehensively. Their experiment in new forms of collective decision-making allowed the citizens of a community (*demos*) to experiment with new conceptions of citizenship and radically new forms of political organization. As a result of these experiments the first democratic constitutions were drawn up in Greek poleis during the sixth century B.C. Citizenship became to mean equality before the law (*isonomia*), equal rights to address the assembly (*isegoria*), and equal shares in power (*isokratia*). The *demos* exercised supreme power (*kratos*) because the citizens voted *on* political issues, not *for* candidates for official positions.

But where did the majority rule come from? According to Eastland Staveley it would be wrong to suggest that the majority vote was a purely political invention because it was probably employed in an informal way and almost instinctively *within* the family and in other small social groups since prehistoric times (Staveley 1972: 13). It would enter the sphere of government as a social device to resolve differences of view concerning prospective action. When collective decisions in form of continuing trials of strength would be too costly common policies could be decided by a simple counting of heads. Donald Saari points out that majority decisions may have helped to resolve serious differences *between* groups, too, by replacing “might in battle with the right of the ballot” (Saari 1995: 9). Possibly competing prehistoric tribes assessed the numerical strength of the opposition to determine whether fighting or negotiations would serve best. This count is actually a crude majority decision (*ibid.*: 15).<sup>4</sup>

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<sup>4</sup>Of course this can work only under special circumstances. It seems unlikely that a small group of

Using a counting of heads to assess the opposition's strength is the idea of the "measurement cost approach" to voting (Barzel 2002: 125). When votes are allocated in proportion to individuals' power (or fighting strength) the majority of voters will have a preponderance of power; the vote simply reveals which side would be able to decide the outcome anyway. Under these circumstances the vote is a direct measure of coercive force. Economies of scale in the 'production' of coercive force may however distort the outcome: "In reality, vote allocation is unlikely to be strictly proportionate to voters' power, and for that reason decisions will not be made by a simple majority. Because the measurement of power cannot be highly accurate, neither the actual power behind a vote nor its perception by the two sides will be exactly to the "true" power or the perceived power" (*ibid.*).

The emergence of the majority decision out of a situation of conflict is a classical topic in political sociology. According to Georg Simmel majority decisions may emerge if the minority realizes that in case of a serious contest it would have to pay severe penalty:

Although, or rather because, the voting individuals are considered to be equals, the majority has the physical power to coerce the minority, whether the majority is ascertained by preliminary vote or by representation. The voting serves the purpose of avoiding the immediate contest of forces and of finding out its potential result by counting votes, so that the minority may convince itself that its actual resistance would be of no avail. In the group, therefore, two parties confront one another like two independent groups, between which the decision is made by power relations, represented by votes. Voting has the same methodological function here as have, between parties, diplomatic or other negotiations designed to avoid the ultima ratio of fight. (Simmel 1908: 242)

Balance of power and equal individual ability to affect the outcome are obviously crucial to the functioning of the majority rule. The majority rule can only be a way out of anarchy if "might and right" are balanced. Fighting can not be substituted by voting when a vote does not mean that the winning side enjoys a superiority in exercising power—in other words when the balance between might and right is tilted. Put differently: the majority-rule is viable only as long as the majority would win the fight if the minority chooses to impose its will by force. It is interesting to find out whether and why such conditions were given in archaic Greece at the time when majority decisions were introduced.

Unfortunately regarding the emergence of the majority rule in ancient Greece not much is known. The specialist literature on the topic is extremely limited.<sup>5</sup> There seems to be consensus that the majority rule was adopted in the seventh century B.C. but many important questions remain unanswered: was the majority rule a novelty or were older and cruder forms of social choice gradually formalized? Which groups or assemblies were the first to formally employ the majority rule? What induced them to adopt majority decisions? These questions should be addressed in the following sections.

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hunters would yield control over an important resource like a well or spring to a large group of gatherers.

<sup>5</sup>Larsen (1949) is to our knowledge the only article dedicated to the origins of formal voting. Stavely (1972) is explicitly concentrating on Greek and Roman voting. Hansen (1999) is very detailed on the procedures in the classical Athenian popular assembly but has not much on the origins of voting. Allen (1904), Boegehold (1963) and de Ste Croix (1976) touch on the issue.

## 2.1 The World of Homer

The emergence of the majority rule falls into a time where systematic historiography did not yet exist. Still some ancient sources allow for us to perform a partial reconstruction of the existing political institutions. The most important are the Homeric epics, the Iliad and the Odyssey. These texts were most probably written around 800–700 B.C. but were dealing with events which supposedly took place five or six hundred years earlier. The described conditions are generally regarded as those obtaining around at earliest 850 B.C.

What is the picture of Homeric political institutions? This depends very much on the interpretation of several key passages in the poems. Unlike the Mycenaean world it refers to the world of Homer appears to be one of petty kings and nobles, who possessed the best land and flocks. The kings assumed the functions of lawgivers, judges and military commanders. Their relations among each other as well as with the nobles were subject to a code of honour. Raids and local wars, probably over farmland, were frequent. There was no specialized bureaucracy or formal laws: “The power equilibrium was delicately balanced; tension between king and nobles was chronic, struggles for power frequent” (Finley 1970: 85). Politics revolved around aristocratic councils which appear to be the sole organ of government: “Mass assemblies might be held occasionally to show approval or disapproval of vital decisions which could lead to disaster without mass support [...], possibly in some cases to give formal assent to a choice of magistrate, but only to a choice that had already been made elsewhere” (Forrest 1966: 54,5). It happened often that the nobles dispensed with the king and replaced monarchy with aristocracy. The common people “also had an existence as a corporate body [...] but not as a political force in any constitutional sense” (Finley 1970: 87).

How was collective decision-making practiced? Jakob Larsen (1949: 164) has decidedly argued that there is evidence of such kind that they leave *no* room for formal majority decisions. The Homeric poems would offer wide evidence for autocratic monarchy, the growing influence of aristocratic councils and the complete impotence of the common people, but none whatsoever for voting in popular assemblies. He suggests that the vote seems to have been introduced as a preventive remedy for civil war (Larsen 1949: 167). Warriors’ assemblies existed, but judging from the procedures that were applied they were no egalitarian forums and met primarily to hear the decisions of the king, the advice of aristocrats and, sometimes, to express approval or disapproval by shouting applause when the king wished so (Staveley 1972: 15-18).

For example in a famous passage of the Iliad the treatment of nobles and commoners in the assembly of Greek warriors laying siege to Troy by Odysseus, King of Ithaca, is described:

Whomsoever he met that was a chieftain or man of note, to his side would he come and with gentle words seek to restrain him, saying: “Good Sir, it beseems not to seek to affright thee as if thou were a coward, but do thou thyself sit thee down, and make the rest of thy people to sit. For thou knowest not yet clearly what is the mind of the son of Atreus; now he does but make trial, whereas soon he will smite the sons of the Achaeans. Did we not all hear what he spake in the council? Beware lest waxing wrath he work mischief to the sons of the Achaeans. Proud is the heart of kings, fostered of heaven; for their honour is from Zeus, and Zeus, god of counsel, loveth them.”

But whatsoever man of the people he saw, and found brawling, him would he smite with his staff; and chide with words, saying, "Fellow, sit thou still, and hearken to the words of others that are better men than thou; whereas thou art unwarlike and a weakling, *neither to be counted in war nor in counsel*. In no wise shall we Achaeans all be kings here. No good thing is a multitude of lords; let there be one lord, one king, to whom the son of crooked-counselling Cronos hath vouchsafed the sceptre and judgments, that he may take counsel for his people." (Iliad 2.188–206, Murray translation, italics added)

The here is that nobles and commoners were not only treated with different levels of politeness but also that it was the King's business to enforce order in the assembly and to impose decisions if necessary. Threats were made, either openly or hidden. Does this imply that no votes were taken? This very much depends on the interpretation of the passage.<sup>6</sup> Still closer inspection of the Homeric descriptions conveys a clearer picture. Homeric warrior assemblies seem to have had considerable power (Raaflaub 2007: 28). Although formal votes are indeed not reported the assembled warriors react to the King's attempts to persuade the assembly of unpopular courses of action with exit and voice.

The political theory of the Odyssey is different from that of the Iliad. It mentions two polities that hold peacetime assemblies, that of the Phaiacians and that of Ithaca. The former assembly appears to be powerless and more or less subject to the king (Havelock 1978: 93). In contrast to that Odysseus "vigorously pursued an explicitly political role in Ithaca by regularly seeking out the counsel of Ithaca's deliberative agora" (Deneen 2000: 35). Here the majority might have served as a criterion for forming the general will. For example a passage in the Odyssey describes an assembly of citizens meeting to deal with whether to punish King Odysseus for the slaying of the suitors. Eupheithes calls for avenging the dead by attacking Odysseus and his followers, Halitherses advises against doing so:

So [Halitherses] spoke, but they sprang up with loud cries, *more than half of them*, but the rest remained together in their seats; for his speech was not to their mind, but they hearkened to Eupheithes, and quickly thereafter they rushed for their arms. Then when they had clothed their bodies in gleaming bronze, they gathered together in front of the spacious city. And Eupheithes led them in his folly [...]. (Odyssey 24.463–470, Murray translation, italics added)

The passage could imply that the majority might have served in some way as a criterion for forming the general will already in Homeric assemblies.<sup>7</sup> At least this cannot be excluded with certainty. It seems however that the majority rule was not formally applied. This would happen in later times.

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<sup>6</sup>Interestingly, the Greek adjective *enarithmios* in the original text of the passage is directly translated into "to be numbered" or "to be counted in". In which meaning *enarithmios* is used here is not clear. It is usually interpreted as meaning "respectable" or "to be of account". The distinction is important. There is a fundamental difference between "being of account" or "being counted". "To be counted" could imply that votes in the assembly may have been taken. Interestingly, it may imply that being counted in the assembly depended on being counted on the battlefield.

<sup>7</sup>Whether the passage implies that "for the first time in world history the majority is serving as criterion for formation of the general will" (Flaig 2004) is debatable. The reported fact that "more than half" of the assembly springs up with loud cries may just be an observation and does not necessarily imply that it served as a social choice rule.

## 2.2 Sparta and Athens

About the subsequent developments of political institutions not much is known. The first reported formal majority decisions would take place a century after Homer. These were either improvements of earlier, informal practices or political innovations. Let us first deal with the case of Sparta. It is known that acclamation was the formal collective decision-making mechanism in the Spartan popular assembly (*apella*).<sup>8</sup> According to Plutarch decisions were here taken in form of a ‘shouting contest’ between supporters of conflicting proposals.<sup>9</sup> Aristotle dismissed this practice as childish (Politics, 4.1270b28). A similar procedure was probably used to fill vacancies in the senate (*gerousia*), which consisted of 28 aristocrats and the two kings as *primi inter pares*, from the *apella*:

The people being called together, some selected persons were locked up in a room near the place of election, so contrived that they could neither see nor be seen, but could only hear the noise of the assembly without; for they decided this, as most other affairs of moment, by the shouts of the people. This done, the competitors were not brought in and presented all together, but one after another by lot, and passed in order through the assembly without speaking a word. Those who were locked up had writing-tables with them, in which they recorded and marked each shout by its loudness, without knowing in favour of which candidate each of them was made, but merely that they came first, second, third, and so forth. He who was found to have the most and loudest acclamations was declared senator duly elected. (Plutarch, Life of Lycurgus, 26.2–3, Dryden translation)

The first formal voting practices probably were introduced in Sparta at earliest around 750 B.C. and could have been employed in the senate. How the senate itself took its decisions is completely unknown, except for one case around 400 B.C. when the *gerousia* and the five highest elected officials (*ephors*) acted together as a law court to decide on the fate of King Pausanias. Since it is reported how many individuals voted for and against acquittal it seems clear that at that time a formal public voting method was used (Larsen 1949: 169).

It is important to notice that the Spartan *apella* seems to register a formal majority vote only after a long period of protracted wars against the Messenians and the powerful city-state of Argos. To achieve victory the Spartans heavily relied on their hoplite citizen army. The demands of these hoplites for the redistribution of land and for a more efficient administration “were maybe met by a social revolution which took place at the end of the seventh century” (Staveley 1972: 22). A formal majority vote in the *apella* is recorded at the beginning of the Peloponnesian War in 432 B.C. (Flaig 1993).

Less is known about the first application of the majority rule in Athens. The existence of the *areopagus*, an aristocratic council which probably reached its decisions by formal vote, should be dated to the second half of the eighth century B.C. while the popular assembly (*ekklesia*) is unlikely to register a formal vote before the end of the seventh century. The Athenians of the fourth century voted in a formal procedure by show of hands (*cheirotomia*) and later secretly by means of voting tokens

<sup>8</sup>Tacitus reports similar practices in Germanic tribes in 98 A.D. (cf. Bendix 1980: 25).

<sup>9</sup>The *apella* being a popular assembly does not mean it was democratic. For example only kings, aristocrats and foreign ambassadors had the right to bring a proposal before the assembly.

(*psephophoria*) (Hansen 1991: 147). All magistrates except the highest military commander were elected by lot. Some Athenians of later times traced the origins of their democracy back to legendary King Theseus. For most the constitutional reforms of Solon around 590 B.C., who transferred the vote from the areopagus to the ekklesia, marked the beginning of democracy. The reforms of Solon were aimed at restoring order after a period of civil strife and to prevent tyranny. His reforms included the introduction of certain fundamental citizens' rights as well as a property reform and an introduction of four census-classes according to the quantity of agricultural produce.<sup>10</sup> The census classes were used to determine eligibility for office (Sinclair 1988: 2). After a period of tyrannies the reforms of Cleisthenes would pave the way for a more formally democratic Athenian constitution.

What explains the introduction of formal majority decisions? Larsen (1949: 172) presents three theories of the origins of a formal counting of the votes: First, it is possible that the vote was used in assemblies of aristocratic warriors both for elections and judicial decisions and was later conferred to popular assemblies to safeguard the interests of the people, as was done in Athens by Solon. Second, voting may have been introduced as an alternative to (civil) war in order to satisfy the demands of the hoplite class for franchise. Third, the use of votes may have been first developed in inter-*polis* organizations, like the Amphictyonic, Delian or Peloponnesian Leagues.<sup>11</sup>

It is unlikely decision-making mechanisms in inter-*polis* organizations would be introduced in politics. Much then points to the origins of a majority decision as an alternative to conflict, either within or between states.

### 2.3 The Role of the Hoplites

The hoplites deserve special attention here. Their role on the battlefield and in politics seems to be related to democratic egalitarianism (Hanson and Heath 2001: 118). In the hoplite phalanx no hierarchy existed; the hoplites formed a body politic based on political equality. Coupled with this egalitarianism was an expression of a strong form of 'republicanism' where only a part of the native male population participated as citizens. They rejected the political monopoly of small elites, but also the participation of persons below a certain socio-economic level (Ober 2007). According to Aristotle the earliest Greek 'democracies' were consequently 'hoplite republics' (Oliver 1979: 53):

And indeed the earliest form of constitution among the Greeks after the kingships consisted of those who were actually soldiers, the original form consisting of the cavalry (for war had its strength and its pre-eminence in cavalry, since without orderly formation heavy-armed infantry is useless, and the sciences and systems dealing with tactics did not exist among the men of old times, so that their strength lay in their cavalry); but as the states grew and the wearers of heavy armor had become stronger, more persons came to have a part in the government.

<sup>10</sup>The highest census class was that of the *pentakosiomedimnoi* (at least 500 measures of produce), the second highest that of the *hippeis* (knights, 300 and more), the third the *zeugitai* (yoke-men, 200 and more) and the *thetes* ('menials', less than 200). It is unclear whether 'yoke-men' refers to owners of a pair of oxen or to the *hoplites* who formed the *zeugoi* (lines) of the phalanx.

<sup>11</sup>Amphictyonic Leagues were associations of city-states responsible for the maintenance and protection of sacred sites. The most famous was the Great Amphictyonic League, founded around 1,100 B.C. which was responsible for the Oracle at Delphi and the temples of Apollo and Demeter. In contrast to this the Delian and Peloponnesian Leagues were hegemonic networks between a military powerful polis and more or less voluntary allies.

Hence what we now call constitutional governments the men of former times called democracies. (Aristotle, Politics, 4.1297b)

Aristotle presents us a picture of a coevolution of constitutional orders and warfare. Early democracy was made possible by changes in military technology such that hoplites would be able to defeat the aristocratic horsemen by fighting in orderly formation and employing superior tactics. As the hoplite republic was basically ruled by a minority it was not classified as a democracy by Aristotle but as an oligarchy.

Max Weber took up this point and developed the first modern sociological theory of ‘hoplite revolution’:

The voting right in the general citizens’ assembly was either granted to all land owners attached to the demes and enrolled in the military association of a phratry<sup>12</sup>—this was the first stage of “Democracy”—or also to the owners of other types of wealth. The decisive criterion was initially the capacity to equip oneself for service in the hoplite infantry. (Weber 1978: 1311)

According to Weber the transition to democracy was caused by a change in military technology (Weber 1978: 1352).<sup>13</sup> The basic idea is that the Archaic period brought dramatic changes in Greek military practices which had major social and political consequences (Krentz 2007: 61). Technological innovations like the invention of the double-handled shield made a new style of fighting in phalanxes possible (Nilsson 1928, Lorimer 1947). The integral part of these was the individual heavy-armed hoplite. The economic growth created by the developing polis would make a growing number of free landowning men sufficiently prosperous to buy the expensive hoplite equipment. This group would eventually claim greater political rights. Andrewes (1953) concluded that this new military class came to power in several poleis by overthrowing aristocratic or tyrannical rulers; it established the first republics based on egalitarian constitutions. Snodgrass (1965) challenged this theory by pointing out that archeological evidence suggests slow change in military technology, probably in reaction to the needs of mass fighting. Military and political reform processes probably influenced each other over a longer period.

Although the theory of the hoplite revolution always raised many questions it remained the dominant paradigm for most parts of the first half of the last century. A progressive school of thought now questions this paradigm (Ober 2007: 96). The starting point here is “a model of polis evolution that assumes the interdependence of military and sociopolitical change: the polis, the phalanx, and the sphere of “the political” in the polis evolved in an interactive process over a long time” (Raaflaub 1999: 134). The role played by the hoplites in questioning the aristocratic monopoly of power can not be explained simply by assuming a revolution (Salmon 1977).

The evolutionary theory of the emergence of democracy is probably the correct one (von Ungern-Sternberg 1998: 103). Yet it is possible that the hoplites introduced new institutions into the politics of their poleis, even if this might not have happened suddenly. The picture would then be one of competing political institutions and the adoption of those that proved to be efficient.<sup>14</sup>

<sup>12</sup>A *phratry*, or: brotherhood, was a military guild based in theory of kinship (Forrest 1966: 50).

<sup>13</sup>Cf. Mann (1989: 208).

<sup>14</sup>Bernholz (1998: 124) has pointed out these and other developments must be seen in connection with “strong international competition among city-states and pressure from outside powers”.

### 3 Conflict in Archaic Greece

Conflict is the most thoroughly researched topic in the field of ancient Greek history. The Greeks themselves made it one of their favourite historical, dramatic and poetic topics: war was seen as the permanent condition of mankind and, according to Plato, always existing by a law of nature between every Greek polis (Laws, 1.625e–626a). Civil wars (*staseis*), too, were typical for Greek poleis. The Greeks themselves perceived a close connection between warfare, class and politics. Nobles could afford to fight as cavalry while the poor could only afford to fight with light arms. The “middling men” (*metrioi*) joined ranks with each other and fought as hoplites in the phalanx.<sup>15</sup> Thus, classes were distinguished not only by one’s wealth but also by one’s role on the battlefield. In Solonian Athens the top three census classes were required to fight as hoplites and only they would have the right to vote and the privilege of being eligible for public office.

#### 3.1 Warfare in the World of Homer

Hoplite warfare emerged in the late 8th and 7th centuries B.C.<sup>16</sup> The phalanx of hoplites would dominate the Greek battlefields for at least two centuries until it would be integrated as an important element within more diverse and mobile armies. The adoption of this new style of mass combat has been called “the most important military innovation in all Greek history” (Finley 1970: 101). Interestingly, from a strategic perspective it appears as a step *backwards* from a more flexible and fluid style of fighting towards a static one.

Warfare in earlier societies was characterized by ambushes as well as hit-and-run tactics with missile weapons. Close combat was usually avoided at least until one was sure the battle was already won. These tactics were suitable for the open plains of the Near and Middle East, where the first great civilizations rose to power. Their military technology and organization aimed to meet the tactical battlefield demands. The archaic Greeks were the first to adopt a new way of warfare, emphasizing decisive shock combat.

What is our picture of archaic warfare? Iron and horses were expensive and the opportunity cost of training combat skills must have been prohibitive for subsistence farmers. Therefore the possession of the means for effective fighting were a monopoly of the nobility. Yet it would be wrong to judge from the fact that most of the battle accounts in the Iliad concentrates on heroes that mass combat did not take place (Latacz 1977). Aristocratic warriors would be mounted for the approach to battle, pursuit and retreat, but not practice manoeuvre warfare. Missile weapons, like javelins as well as bow and arrow but also stones, were often used but not very effectively. The actual fighting would take place on foot. The aristocratic fighter would be protected by a single-handed shield most probably attached with a strap around the neck so that it could be swung on the back. The mass of commoners would most probably be armed and rigged out haphazardly and not be very effective on the battlefield.

In the world of Homer ...

There are other sources on warfare and military technology. A fragment of poetry by Archilochos, apparently a mercenary from the island of Paros, gives a vivid

<sup>15</sup>The phalanx is defined “as a line formation with a width considerably greater than its depth” (Pritchett 1974: 134). During the archaic period it became the standard battlefield-formation of polis armies.

<sup>16</sup>Cf. e.g. Krentz (2007), Lendon (2006: 20–39), Raaflaub (1999: 133), Sage (1996: 1–18), Forrest (1966: 88–97).

picture of a seventh century battle (Davenport 1995: 23–24):

Pallas Athena and our strong arms,  
That victory. From hill to hill in retreat  
We walked backward under their javelins  
Until we reached the rampart of stones  
She, Zeus's daughter, led us toward.  
We attacked later, chanting hymns  
Of Mytilenian Apollo, while they,  
Keeping their courage with harp and song  
Fell back to their hill, withered by arrows  
We crossed a harvest of our dead.

This picture is one of fluid combat with a movement back and forth, extensive use of missile weapons, fighting from fortifications etc. However, several passages in the *Iliad* (e.g. 13.129–34; 16.212–17) as well as poetry by Archilochos (Fragment 16) and Tyrtaios (Fragment ...) clearly depict rather static and dense infantry formations. Concluding, it appears already in the archaic age a transformation of warfare towards shock combat between forces consisting almost exclusively of heavy infantry was taking place.

Whether this happened by chance or by design is unclear.<sup>17</sup> According to Moses Finley “it was only a matter of decades before some commander—possibly the half-legendary Pheidon of Argos—saw the possibility of organizing heavily armed infantrymen [...] into a close formation in close ranks” (Finley 1966: 101). Peter Krentz, on the other hand, argues that archaic Greece “did not experience a military revolution, much less one that led to political revolutions as well. Mass fighting took place already in the Early Iron Age, as described by Homer” (Krentz 2007: 79).

Unclear is, too, whether hoplite technology was developed to complement new or improved phalanx tactics or whether they were a result of some key technological breakthroughs in the military field (*cf.* Hanson 1991: 64–65). What appears to be certain is that the phalanx predates the hoplite. The nature of the change of military practices is controversial. One school of thought argues in favour of a gradual change of existing methods of warfare and not accompanying wider social revolution. Another one argues in favour of a key breakthrough in military technology with accompanying changes in tactics and wide sociopolitical consequences (e.g. Ducrey 1986: 61).

During the archaic period the role of the hoplites became more formalized, both in warfare and in politics. After the Dark Age (1,600–1,200 B.C.) economic growth caught up and living standards increased considerably. Archaeological findings suggest that by archaic times standards of living in the Greek world were comparable to those in the Middle East, but much more evenly distributed (Morris 2004: 729, 734). As a result of the increase in population densities the early city-states began to grow; a natural result of their growth being increasing territorial conflicts with neighbouring cities. In order to react quickly and decisively to invasions of polis territory new organizational forms of mobilization for war were needed and developed. Most likely the

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<sup>17</sup>This question and related ones seem to be of minor relevance “yet they are fundamental to the very study of Greek history: there is no consensus about, and often little interest in, the circumstances of the panoply's introduction into Greece or the ensuing ramifications (military, social, and political) of its adoption for the tactics of phalanx warfare” (Hanson 1991: 63). Jack Hirshleifer has pointed out that “[h]istorically, the number, size, and political structure of independent states have been heavily influenced by the relative pace of improvements in offensive and defensive technologies” (Hirshleifer 2000: 786).

introduction of farmer-hoplites was such an innovation. Militiamen who had provide their own—not inexpensive—equipment<sup>18</sup> were able to react quickly to intrusions on farmland, but they needed tactics which enabled them to fight effectively.<sup>19</sup>

The process of refining existing tactics and technology would be completed by 650 B.C. At the height of phalanx warfare hoplite fighting was strictly regulated, even ritualized. Raaflaub concludes that the new defensive institutions of the polis, now better adapted to its specific military needs, would have an impact on the constitution and politics on the polis: “In some way or another, in such “timocratic systems” political participation was linked to military and economic capacity” (Raaflaub 1999: 135).

### 3.2 Hoplites and Phalanx Warfare

The first reported use of hoplites is sometimes dated to the battle of Hysiai around 670 B.C. on the side of King Pheidon of Argos against the Spartans (Salmon 1977: 92). It appears that only two decades later all the Greek poleis had adopted the method. The individual hoplite carried a circular composite shield (*aspis*) of approximately three feet in diameter, a panoply, often made of bronze, consisting of a breastplate, sometimes bronze greaves and a helmet. The very common ‘Corinthian’ helmet was heavy and obstructed hearing and vision considerably. The hoplite’s weapons were usually one or sometimes two thrusting spears of approximately six feet length and a short thrusting sword. The total weight of hoplite equipment in the late eighth century is estimated to have been up to 70 pounds (Hanson 2004: 58).

As a formation the phalanx was a perfect tactical complement to hoplite technology. Its features were highly idiosyncratic. It provided an ingenious solution to the problem of how to transform a large group of militiamen into a coherent unit, thus making sure that the own forces are not split, and of how to overcome the fundamental problem of military team production (Brenann and Tullock 1982: 226). Interestingly, hoplite technology provided a “strategic solution” to the problem of how to organize potentially unwilling individuals into a fighting force such that the *own* troops enforced constraints on the behaviour of individual agents.

This was achieved mainly by two things. First, the large circular shield could not cover the own body completely but let the right body-half more or less exposed to enemy weapons while the left part of the shield extended beyond the own body.<sup>20</sup> Instinctively every hoplite at least in the exposed front rows of the phalanx would seek protection by moving close to his right-hand comrade. As a result the early phalanx achieved a high level of cohesion even when spontaneously assembled. As a consequence of the natural tendency of each hoplite to shelter his unprotected right body half under the shield of his right-hand neighbour, phalanxes tended to drift to the right (Thucydides, Peloponnesian War, 5.71.1). Interpreting the hoplite phalanx as a network of self-interested individual agents hoplite technology created positive external effects and thus incentives to co-operate. These incentives would however

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<sup>18</sup>Krentz (2007: 71) estimates that the total cost of a complete set of hoplite equipment (*hopla*) would be the equivalent of three months’ pay of a skilled worker.

<sup>19</sup>It is tempting to interpret the phalanx as a mechanism deliberately based on a ‘spontaneous order’ (Hayek 1969).

<sup>20</sup>The ‘strategic function’ of the shield was known in antiquity. In his collection of famous Spartan sayings Plutarch accords to the fifth century King Demaratos an answer to someone enquiring why Spartans disgrace those that lose their shields in a battle and not those that lose their head-pieces or breastplates: “Because these serve for their private safety only, but their shield for the common defence and strength of the whole army” (Plutarch, *Moralia*, 220A).

be very sensible to disruptions and could disappear instantaneously (Brennan and Tullock 1982: 232). In fact, Xenophon's stated opinion was that psychology was even the most important factor in winning battles and that "neither numbers nor physical strength make for victory in war, but whichever side—with the god's help—advances upon the enemy stouter in spirit, their foes usually do not stand against them" (Xenophon, *Anabasis*, 3.1.42).

Second, as reported already in the *Iliad* (4.297–300), the general would put the best men in the front rows, the young and inexperienced fighters behind them, followed by the unreliable and then most experienced in the back. This principle of construction made the phalanx offensive: the convex shield was used by the men not only to push against the enemy frontline but also by the men in the back rows to push the own men in the front rows towards the enemy against their will. As a result, many hoplite battles were fought as a bloody pushing-contest—the very opposite of a tug-of-war. Some battles were won by the *othismos aspidon*, the pushing with shields, with the ranks behind the killing zone pushing the men in front with their shields into the enemy formation like a "human battering-ram" (Hanson 1989: 69). The *othismos* mainly aimed at breaking up the opposing lines in order to attack the unprotected flanks and might have originated as a manoeuvre to retrieve the body of a fallen king. If the line was broken the incentives to fight as a collective within the phalanx unravelled. In such cases usually a disorganized rout ensued. Routed armies usually ran away, often throwing away their equipment in an effort to speed their escape. The winning army did not pursue the fleeing enemies over a long distance, most probably because of exhortation and the sheer weight of the panoply.

Another central characteristic of phalanx warfare was that there was virtually no field command, no tactics or manoeuvre, no reserves, no use of mixed forces. There are several reasons for that. First, citizens placed a heavy premium on the visible courage of their field generals. Once the forces were arranged on the battlefield the general's place was at the head of his troops, removing his ability to issue orders until that combat was concluded. As a consequence of their exposed position most Greek citizen-generals died in battle. For this reason it was difficult to accumulate knowledge of military tactics. Second, the heavy and cumbersome hoplite equipment restricted not only movement but also reduced audiovisual communication to a minimum. These features were a function of technology, economics, geography and—maybe—politics. Saddles and stirrups had not yet been invented, thus making head-on charges against heavy infantry difficult (Hanson 1999: 8). Light troops, like archers or javelinists, were only effective with constant training. The Greeks seem to have thought that a major advantage of close combat weapons over distance weapons was that it was impossible to excel with the latter except by constant practice, and that therefore almost anybody called up to fight in a hoplite phalanx would not be at an disadvantage (Anderson 1989: 28). Besides, many citizens may have rejected the idea that the poor should specialize in fighting against hoplites (Snodgrass 1965: 117).

One interpretation of hoplite warfare is that wars focused on strongly ritualized one head-on, all-or-nothing clash between hoplite phalanxes (Lendon 2006: 41, Hanson 1991: 3). Missile weapons, light troops and cavalry were either banned or simply ineffective. There is, for example, a well documented convention between the city-states Chalkis and Eretria in the Lelantine War (c. 700–650 B.C.) on the prohibition of missiles and the reduction of warfare to pitched battles exclusively (Pritchett 1985: 16). Even though most conflicts were about the control of rugged borderlands battles would be decided on an open, flat plain in the fertile areas (Hanson 1999: 6,7). In order to avoid encirclement the flanks of the opposed phalanxes would be anchored to

natural obstacles like rivers or hills. In order to challenge an enemy to battle invaders would often previously ravage the countryside and devastate agriculture. The generals would *ex ante* agree on a battlefield. According to this view warfare had to be decisive for many reasons: equipment was nearly half the body weight of an average man, military expeditions were only possible during the summer months when food was rotting away quickly, and minor wounds might lead to lethal infections (Hanson 1999: 2).

A different interpretation of hoplite warfare rejects the idea of a reduction of conflicts to a single battle. The idea here is that it cannot be excluded that wars consisted of series battles which were often indecisive (*cf.* Krentz 2007: 79–80). According to this view, most of the fighting took place on a small scale. Deception, surprise attacks, ambushes *etc.* were common. Under such circumstances one should not expect the hoplites to drive political changes in archaic Greece. Their role evolved together with the polis and land ownership (Raaflaub 1997).

Which interpretation is the correct one? Depending on the circumstances phalanx warfare could result in highly attritional and decisive battles as well as series of smaller, indecisive battles. Sometimes one of the opposing armies might break apart on the first charge. In other cases the phalanxes might not break and hand-to-hand fighting continue for a long time. In the worst case an army could have been completely destroyed in a single battle.

### 3.3 The Microtechnology of Ancient Warfare: On the Interaction of Attrition, Tactics and Morale

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What were the features of phalanx warfare? Let us approach this question from a microeconomic perspective, treating conflict as “a kind of “industry” in which different “firms” compete by attempting to disable opponents” (Hirshleifer 1985: 64). Conflict can be interpreted as a production-process where the inputs are things diverse as numbers of soldiers, offensive and defensive technologies, vehicles, but also strategy and tactics, morale and psychology, leadership, intelligence *etc.* Conflict takes place between networks of individual agents “who are, in some senses, as much at war with one another and their own leaders as they are with the enemy forces” (Brennan and Tullock 1982: 226). Essentially the objective of battle is *not* the destruction of opposed agents but rather the destruction of the network enabling them to fight as a collective (Brennan and Tullock 1982: 232). The ‘goods’ for each party in this production process are enemy losses (dead, captured, deserted *etc.*).

If a conflict between two destructive networks of agents over irreconcilable objectives arises a military decision must essentially be seen as a social choice. Instead of aggregating individual preferences the inputs of the military production function are aggregated into an army’s fighting strength. This expresses its ability to determine an outcome by use of force. Economies of scale, which describe the output response to a proportionate increase of all military inputs, apply in this process (Latzko 1993: 477). Taking  $z$  as a vector of inputs the military production function  $f(z)$  exhibits increasing economies of scale if  $f(\lambda z) > \lambda f(z)$  for all  $\lambda > 1$ . In the simplest possible case  $z$  reflects just manpower.

The extent of military economies of scale depends mainly on technological and tactical factors. Missile weapons and firearms are fundamentally different from hand-to-hand weapons. The former allow to concentrate the own fire on selected enemy units. Large numbers then provide a disproportionate advantage. When fighting power is proportional to the numerical size of an army limiting the area of interaction

with the enemy will result in a situation where adding more fighters will not increase fighting strength. The military production function of an army  $i$  could then take the form  $f_i(z_i) = a_i z_i$  where  $a_i$  is a positive constant, e.g. the individual effectiveness (or ‘lethality’) of a representative unit and  $z$  the number of units. Defining fighting strength narrowly as enemy losses we can write this function as  $df_i/dt = -a_j z_j$ .

Let us now introduce the dimension of time. The vector of military inputs  $z$  enters the production process as a stock variable, depending on the nature of the conflict. The military outcome is a flow variable. In the simplest case  $f(z_i, t) = -a_j z_j$  ( $i, j = 1, 2; i \neq j$ ). This equation of attrition is the simplest formulation of the so-called Lanchester equation.<sup>21</sup> It reflects the microtechnology of unit-on-unit battles. The model assumes a homogenous mixing of forces, i.e. combat without manoeuvre and tactics. For two armies, engaging in combat with technologies that do not result in military economies of scale the Lanchester model takes the form

$$\begin{aligned} \dot{f}_1 &= -a_2 z_2, \\ \dot{f}_2 &= -a_1 z_1. \end{aligned}$$

Increasing or decreasing military economies of scale can be implemented by extending this basic model. Bracken (1995) proposed the system

$$\dot{f}_1 = -a_2 z_2^p z_1^q, \quad (1)$$

$$\dot{f}_2 = -a_1 z_1^p z_2^q. \quad (2)$$

In this formulation the equations of attrition are similar to an interdependent system of Cobb-Douglas-functions. Separating the variables and integrating yields

$$a_2 z_2^\alpha - a_1 z_1^\alpha = c \quad (3)$$

where  $c$  is a constant and  $\alpha \equiv 1 + p - q$ . The polar cases are  $p = 1, q = 0$  ( $\alpha = 2$ ) and  $p = q = 1$  ( $\alpha = 1$ ). In the first case the manpower of a unit in combat has a quadratic effect; in the second case the fighting strength is directly proportional to numerical size. If  $c > 0$  army 2 wins the battle, if  $c < 0$  army 1 wins. If  $c = 0$  both armies face a stalemate leading to mutual destruction. As for  $c = 0$  we observe

$$\frac{a_2}{a_1} = \left( \frac{z_1}{z_2} \right)^\alpha$$

obviously Bracken’s equations are related to the classical contest success function in ratio form (Hirshleifer 2000: 783).

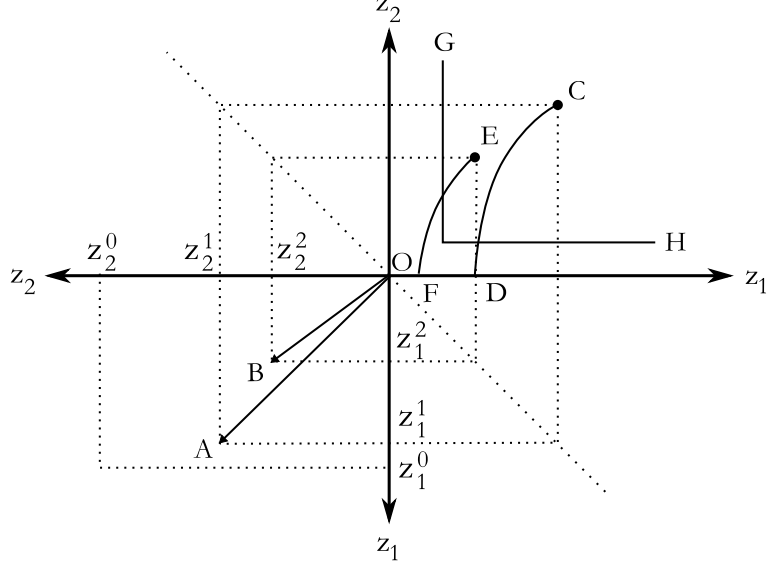
‘Winning’ in this context means that the enemy is completely annihilated which is of course not necessarily the typical outcome of a battle. Suppose army 2 is indeed obliterated, then the expected number of survivors of army 2 is given by

$$z_1 = \left( \frac{c + a_2 z_2^\alpha}{a_1} \right)^{\frac{1}{\alpha}}.$$

This can easily be shown diagrammatically by plotting the graph of (3), shown in the first quadrant of Figure 1. Note that the trajectory depends on the relative numerical

<sup>21</sup>After Frederick William Lanchester (1916); cf. Lutzko (1993: 479) and Hirshleifer (2000: 782).

Figure 1: Tactics and morale-enhanced combat model



size of the armies, the relative effectiveness of the representative soldier as well as the technological parameter  $\alpha$ .

Let us now introduce simple notions of tactics, morale and their intercation to this basic model. A weaker army will generally seek to avoid a head-on clash with the enemy but instead try to split the latter's forces and concentrate as much fighting strength as possible on the fractions sequentially. If necessary, a justifiable number of own units is sacrificed to achieve this. This is the most basic principle of military tactics. The principle was already well understood in antiquity. To start with, we define tactics as a separate contest between the leaders of both armies with the objective of each to engage the smallest possible fraction of the enemy with the complete own force. The polar outcomes of the tactical contest are (i) the situation where the friendly army manages to confront every single enemy agent sequentially and (ii) the situation where both armies confront each other in a set battle. This contest is repeated for every iteration until the battle comes to an end.

A diagrammatical exposition is shown in Figure 1. It is assumed here that the initial size of the two armies are  $z_1^0$  and  $z_2^0$  with  $z_2^0 > z_1^0$  as well as that the battle comes to an end after  $N = 2$  engagements. In the third quadrant the tactical space is shown. Here for every one of  $N$  iterations a vector originating in  $O$  shows the relative numerical strength in each of the two engagements. The vector  $OA$  shows the division of forces in the first engagement. In this example army 1 by superior tactics achieved to engage a fraction  $z_2^1$  of army 2 with almost its complete force  $z_1^1$ . In the first quadrant the trajectories of attrition are shown. Starting from the initial value combinations  $z_1^1, z_2^1$  the losses of both armies follow the trajectory  $CD$ . The vector  $OB$  shows the division of forces in the second engagement. Here army 1 engages the total of army 2's survivors  $z_2^2$  with its remaining force  $z_1^2$ . The losses follow trajectory  $EF$ . In this example army 1—despite its initial numerical inferiority—achieves victory against the larger army 2. A number  $F$  of its soldiers survive. Anticipating

this outcome at least in approximate terms the general of army 1 can assess *ex ante* how many of her units can be sacrificed deliberately in order to induce army 2 to split its forces.

The effects of success in the tactical contest on morale has not been addressed so far. We now introduce a simple kind of morale as well as its interaction with tactics. The interdependence between tactics and morale is a complex matter in reality and a number of strong restrictions must be introduced here. It is assumed here that tactics influence morale but not *vice versa*. We moreover take morale as given for a battle and do not treat it as an endogenous variable depending on developments during battle. Morale thus is assumed to change only between battles. The basic ideas of our approach are the following: (i) It is unlikely that an army will fight until completely annihilated, although this may of course under circumstances happen. One function of morale is therefore to provide a break-off condition for combat. (ii) Tactics must as well be expected to affect morale in a different manner, namely by influencing factors like operational loss rates (*e.g.* caused by desertion, fatigue *etc.*). (iii) Tactics may affect the fighting strength of an army, *e.g.* by influencing the average effectiveness of individual units.<sup>22</sup>

All three aspects can be covered with the basic framework developed here. In the first quadrant of Figure 1 break-off conditions (or: ‘rout levels’) for the two engagements are shown by the curve *GH*. If the state point of the system (1),(2) crosses one of the rout levels the army in question is assumed to turn into flight. This is the point where the network of incentives to fight as a collective unravels. In the next engagement operational losses might have reduced both the numerical size of the side whose army was previously routed as well as the average effectiveness. We should then expect  $z_1^2$  and  $a_2$  to be negatively affected and  $a_1$  positively. Thus as a result of the interaction between tactics and morale both the relative numerical size of the armies as well as the relative unit-effectiveness are influenced.

Let us construct some simple examples in order to illustrate the effects. . .

Judging from this preliminary and extremely simplified framework several aspects of conflict in the ancient world can already be observed. Taking into account the interaction of tactics and morale it makes sense to reduce conflict to a single, set battle. Under conditions of pure phalanx warfare, *i.e.* a conflict reduced to a single engagement on a mutually agreeable battlefield without any effective missile weapons, reserves *etc.*, combat must then be expected to result in a process of attrition where the loss rate of both armies is proportional to the relative average effectiveness.<sup>23</sup> In a battle between amateur militiamen the relative average effectiveness should moreover be expected to be close to unity. Put differently: battle in this case is analogous to a series of individual duels with similar success-chances for the participants. Under these circumstances indeed numerical superiority would *ceteris paribus* be the crucial factor. Fighting and voting would then determine the same winner.

Fighting until the bitter end in order to find out which army has the more effective soldiers would be a costly discovery mechanism. Accordingly we should expect that institutions would have emerged that lower the cost of discovering fighting strengths. Indeed, duels between selected champions (*monomachy*) were in common practice in archaic Greece: “Duel combats were fought by chosen warriors instead of an all-out battle. If neither contestant had won, military decision was gained by the

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<sup>22</sup>One simple way to introduce this interdependence could be to assume functional relationships  $a_i(N)$ . Using historic data on protracted conflicts and losses these could be estimated empirically.

<sup>23</sup>This point had already been made by Lanchester (1916) where he argued that “ancient combat” is characterized by an attrition processes with constant loss rates.

committal to battle of both armed forces". (Pritchett 1985: 16-18). Collective duels were also common. For example, about 550 B.C. the Spartans and Argives fought a collective duel of three hundred versus three hundred champions to determine control over a piece of Argive territory. When night fell, only two Argives and one Spartan remained alive.

## 4 The Majority Rule as a Substitute for Hoplite Battle?

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Hanson and Heath have speculated that the citizens of the polis "would manifest an impatience with military formality by structuring war around around an instantaneous collision of arms that produced as decisive and instant a referendum as their own votes in the landed assembly" (Hanson and Heath 2001: 67, italics omitted). The structural similarities between warfare and decision-making allowedly render this interpretation obvious. On the other hand, it is also possible that the citizens of the polis structured decision-making around an instantaneous collision of votes that produced an outcome as decisive as a clash of hoplite phalanxes.

An interesting hypothesis on the emergence of the majority rule in archaic Greece can now be developed. We know that in the world of Homer formal majority votes were not taken. But new interpretations of certain key passages suggest that popular assemblies were not completely powerless and were not completely disregarded by the nobles. At least in warriors' assemblies a direct connection between one's skills as a fighter and one's political role is apparent.

As military technology and tactics underwent changes in the following period the role of warriors changed. The citizen-hoplites were probably introduced as a militia; their equipment and tactics were perfectly suited for short, defensive battles against invaders from competing city-states. Entering the sphere of war, which hitherto was almost an aristocratic monopoly, the hoplites adopted many of the aristocratic rituals, e.g. bans on missile weapons.

Political structures in the city-states were quickly changing and often resulting in civil wars. This had the effect that hoplites would often fight against hoplites, either from another polis or the same. It is not unlikely that in these constant battles and skirmishes the decisive role of numerical superiority became apparent. Probably the first large-scale formal majority decisions were used as a conflict resolution-mechanism *on* the battlefield in order to determine the likely winning side of a battle.<sup>24</sup>

For such a thing to happen, this would require institutions or other ways to achieve a cessation of battle at the moment when it was about to commence. Indeed there are examples<sup>25</sup> where an exclamation of single individual stopped the approach of a phalanx and induced the general to negotiate. Xenophon reports such an incident in the early fourth century B.C.:

But when the Lacedaemonians as they retired along the road came out into open ground, they immediately formed themselves in line of

<sup>24</sup>Rectangular phalanx formations would make moreover it easy to count even large numbers of combatants. From our modern point of view this appears trivial, but the Greeks had indeed difficulties to count large numbers.

<sup>25</sup>These incidents took place in the classical era but it is likely that there were similar incidents in the archaic age as well.

battle against the enemy. The Arcadians on their side stood in close order, just as they were, and while inferior in numbers, they were in better spirits by far, since they had attacked a foe who retreated and had killed men. The Lacedaemonians, on the other hand, were exceedingly despondent, for they saw that Archidamus was wounded and they had heard the names of the dead, who were not only brave men but well nigh their most distinguished. *But when, the Arcadians being now close at hand, one of the older men shouted out and said: "Why, sirs, should we fight, and not rather make a truce and become reconciled?" both sides heard him gladly and made a truce.* Accordingly the Lacedaemonians took up their dead and departed, while the Arcadians returned to the place where they had originally begun to advance, and there set up a trophy. (Xenophon, *Hellenica*, 7.4.24–5, italics added)

It is unknown how the Arcadians and Spartans made the truce but they must obviously have compared the fighting strengths of both armies. Here the Arcadians were actually inferior in numbers but obviously had a better morale than the Spartans because of losses during a previous battle.

Are there any historical parallels outside Greece that would support our hypothesis? In the middle ages, the phalanx formation of heavy infantry enjoyed a brief revival: The pikemen of the Swiss Confederation adopted a similar but much narrower and deeper formation than the Greek hoplite phalanx. The Swiss *Reisläufer*, mercenary pikemen, had great success—particularly against the French knights—for half a century. Their first major victory came with the battle at St. Jacob-en-Birs 1444 A.D., “where less than a thousand pikemen attacked a state-of-the-art French army 15,000 strong. The Swiss died to a man, but took 2,000 foes with them” (Showalter 1993: 12). Their short interlude in the history of war ended with the Swiss defeat in the battle of Marignano 1515 A.D. which established the superiority of artillery and cavalry over the reputedly invincible Swiss infantry tactics. The German *Landsknechte* imitated the Swiss and continued their tactics in the sixteenth century A.D. As a matter of fact in this period “a particular harmless form of war emerged. When two opposing armies met, the respective number of soldiers were counted, and the side with the lower number simply surrendered to the other” (Frey and Buhofer 1988: 43).

## 5 Summary

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In this paper we developed a provocative hypothesis on the emergence of formal majoritarian voting institutions in archaic Greece from a historical and conflict-theoretic perspective. Judging from several original sources we first conclude that the formal majority rule entered Greek collective decision-making in the seventh century B.C. Still it appears that popular assemblies were not completely powerless and played not an unimportant role in society.

In Homeric warriors’ assemblies a direct connection between one’s skills as a fighter and one’s political role is apparent. As military technology and tactics underwent changes in the archaic period the role of warriors changed. ‘Real’ hoplites were probably introduced as a militia in the sixth or seventh century. Their role was the protection of cattle and farmland from invaders. Equipment and tactics were perfectly suited for short, defensive battles. A majority of historians seems to agree that at least early hoplite warfare was strongly ritualized. Horses would be used to

transport hoplites to the battlefield but the actual fighting would take place on foot. Missile weapons were banned from being used in combat, sometimes even by quasi-religious decrees.

By help of a simple conflict model enhanced by the interaction between tactics and morale we show that under these conditions numerical superiority must have been the decisive factor for the outcome of battles between armies of equally (un-)trained and (un-)motivated militiamen. Under these circumstances fighting and majority votes lead to analogous social choices. Frequent (civil) wars had the effect that hoplites would often fight against hoplites. It is not unlikely that in these constant battles and skirmishes the decisive role of numerical superiority became apparent. Probably the first large-scale formal majority decisions were then used as a conflict resolution-mechanism *on* the battlefield in order to determine the likely winning side of a battle. There are striking historical parallels from medieval Europe which suggest that under similar circumstances the majority rule was indeed used as a conflict resolution-mechanism.

One can imagine that the class of hoplites, after coming to power in city-states, would sooner or later be faced with collective decisions that had the potential for civil war. Under these circumstances the ‘natural’ social choice rule would be the majority rule, as it would be a reliable prediction of the fighting strength of the opposed factions.

If our hypothesis would be correct, and phalanx warfare indeed inspired citizen-hoplites to make collective decisions by counting heads, one could argue that there was a time-window of around 200 years during which the majority rule could have emerged. With the demise of hoplite warfare in the fourth century B.C. this time window would close again until a similar military technology became dominant. Fortunately the time-window was open long enough for the world’s first democracies to emerge in classical Greece.

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