EMBOΛON: A STUDY IN TACTICAL TERMINOLOGY

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The term *embolon* (wedge) appears in a military context most often in relation to the tactics of Alexander the Great, but also to those of Philip II of Macedon, the Theban general Epaminondas, and the horsemen of the Scythian tribes. In Xenophon's account of the battle of Mantineia, it is applied first to the infantry of the Theban left (*Hell.* 7.5.22) and then to a formation of Epaminondas' cavalry mixed with supporting light infantry (7.5.24). Polybius (1.26.13, 16) uses it of a formation taken up by the Roman fleet at the battle of Cape Ecnomus in 256 B.C.[1] However, it is only in three later authors—Asclepiodotus, Aelian, and Arrian[2]—that the term receives any detailed exposition. From Aelian (*Tact.* 47.4) and Arrian (*Tact.* 11.2) taken together, we learn that Epaminondas employed a wedge-formation at the battle of Leuctra as well. Arrian, moreover, uses the word three times in his *Anabasis Alexandri*: of a formation taken up by the Macedonian phalanx at the battle of Pelion during Alexander's Illyrian campaign of 335 (1.6.3); of a Persian cavalry formation at the battle of the Granicus (1.15.7); and of the formation into which Alexander threw his Companion cavalry and part of his infantry phalanx at the crisis of the battle of Gaugamela (3.14.2). The more theoretical Asclepiodotus confines himself to distinguishing two variants of the wedge-formation: the cavalry wedge, invented (he says) by the Scythians and Thracians and later used by the Macedonians (*Tact.* 7.2–3, 6–7); and the larger-scale wedge formed from the infantry phalanx (11.5). The same distinction between the cavalry wedge (Arr. *Tact.* 16.1, 16.6–8, 17.3, Ael. *Tact.* 18.1, 18.4, 19.5, 40.2–4, 40.6) and the allegedly derivative infantry wedge (Ael. *Tact.* 47.3–5, 37.6 = Arr. *Tact.* 29.5) is made in virtually identical terms by both Aelian and Arrian.

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[1]For detailed discussion of this defensive-offensive naval formation, see F. W. Walbank, *A Historical Commentary on Polybius* 1 (Oxford 1957) 85–87 with 84, map 1.

[2]The main works to be referred to here are as follows: Asclep. *Tact.* = Asclepiodotus Τέχνη τακτική; Ael. *Tact.* = Aelian Τακτικὴ θεωρία; Arr. *Tact.* = Arrian Τέχνη τακτική; Arr. = Arrian *Anabasis Alexandri*. On the relationship of the Hellenistic tactical manuals, see now P. A. Stadter, "The *Ars Tactica* of Arrian: Tradition and Originality," *CP* 73 (1978) 117–128, especially 117–118: "Aelian and Arrian . . . derive independently from a common source. Asclepiodotus' treatise is distinct but closely related . . . . it is likely that all these works go back, directly or through an intermediary, to Posidonius' book." Cf. A. Dain, *Histoire du texte d'Élian le tacticien* (Paris 1946) 26–40, especially 39 (stemma); and R. Förster, *Hermes* 12 (1877) 426–449. Asclepiodotus' work belongs to the first century B.C., Aelian's treatise is dedicated to Trajan (*praef.* 1–2), and Arrian's *Tactica* can be dated to A.D. 136/7 by a reference at *Tact.* 44.3 to Hadrian's twentieth regnal year.

The Δ-shaped cavalry wedge has often been discussed.[3] The ancient descriptions are highly stylized, coming as they do from the pens of "philosophers" rather than soldiers—Arrian himself being only a partial exception here.[4] His account (*Tact.* 16.6–8) is marginally more informative than the others:

"We hear that the Scythians especially have used wedge-shaped formations, and likewise the Thracians, having learnt it from the Scythians. Moreover, Philip of Macedon trained the Macedonians also to use this formation. Now, this formation seems useful because the leaders are posted in a semi-circle (ἐν κύκλῳ), and the front narrowing down to a point makes it easy to break through every enemy formation, while permitting rapid wheeling and withdrawing movements. For square formations are difficult to manoeuvre; but the one that is pointed, even if it advances in depth, yet, by wheeling with its leading point within a small arc, renders the entire formation easy to manoeuvre."[5]

The parallel passage in Aelian (*Tact.* 18.4) adds little to this, aside from a somewhat more explicit statement of Philip's role in the adoption by the Macedonians of this type of formation.[6] Asclepiodotus, with a keener sense of imagery but with some inaccuracy, compares the arrangement to a flight of cranes (*Tact.* 7.3). Arrian himself has nothing more to say of the cavalry wedge other than the oft-repeated (but only geometrically correct) assertion that the *embolon* is half of a *rhombos* (*Tact.* 17.3 = Ael. *Tact.* 19.5, Asclep. *Tact.* 7.7), the diamond-shaped cavalry formation said to have been invented by Jason of Pherae and favoured by the Thessalians (Arr. *Tact.* 16.3 = Ael. *Tact.* 18.2, Asclep. *Tact.* 7.2).[7] Finally, Aelian repeats

[3]See, for example, E. W. Marsden, *The Campaign of Gaugamela* (Liverpool 1964) 68–73; Griffith in N. G. L. Hammond and G. T. Griffith, *A History of Macedonia* 2 (Oxford 1979, hereafter *HM*) 413–414; and Droysen, *RE* 5.2 (1905) 2492, s.v. *embolon* no. 2.

[4]Stadter (above, note 2) 118–119; Dain (above, note 2) 15–21; F. Kiechle, "Die 'Taktik' des Flavius Arrianus," *BRGK* 45 (1964) 109 and 113–114; and A. B. Bosworth, "Arrian's Literary Development," *CQ* N.S. 22 (1972) 163–185. Add now A. B. Bosworth, *A Historical Commentary on Arrian's History of Alexander* 1 (Oxford 1980) 1–7.

[5](6) ταῖς δὲ δὴ ἐμβολοειδέσι τάξεσι Σκύθας κεχρῆσθαι μάλιστα ἀκούομεν, καὶ Θρᾷκας, ἀπὸ Σκυθῶν μαθόντας. Φίλιππος δὲ ὁ Μακεδὼν καὶ Μακεδόνας ταύτῃ τῇ τάξει χρῆσθαι ἐπήσκησεν. (7) ὠφέλιμος δὲ καὶ αὕτη δοκεῖ ἡ τάξις, ὅτι ἐν κύκλῳ οἱ ἡγεμόνες τεταγμένοι εἰσί, καὶ τὸ μέτωπον ἐς ὀξὺ ἀπολῆγον εὐπετῶς πᾶσαν τάξιν πολεμίαν διακόπτειν παρέχει, καὶ τὰς ἐπιστροφάς τε καὶ ἀναστροφὰς ὀξείας ποιεῖσθαι δίδωσιν. (8) αἱ γὰρ τετράγωνοι τάξεις δυσπεριάγωγοί εἰσιν· ἡ δ' εἰς ὀξὺ προηγμένη, εἰ καὶ προϊοῦσα ἐς βάθος προχωρεῖ, ἀλλ' αὐτῇ γε τῇ ἀρχῇ δι' ὀλίγου ἐπιστρέφουσα τὴν πᾶσαν τάξιν εὐμαρῶς ἐξελισσομένην παρέχεται.

[6]For parallel texts of Arr. *Tact.* and Ael. *Tact.*, see H. Köchly and W. Rüstow, *Griechische Kriegsschriftsteller* 2.1. (Leipzig 1855) 240–470. The belief of H. Köchly, *De libris tacticis, qui Arriani et Aeliani feruntur, dissertatio*, Index lectionum (Zurich 1851), that Arrian and Aelian are merely two recensions of a single work has been decisively refuted by Förster (above, note 2) 426–449 and Dain (above, note 2) 26–40.

[7]The *rhombos* is described in detail by Asclep. *Tact.* 7.5–9, Ael. *Tact.* 19.1–4, and Arr. *Tact.* 17.1–2.

much of his exposition of the theme at *Tact.* 40.2–6, in the context of his discussion of the ἀντίστομος διφαλαγγία as the riposte appropriate to an attack by a cavalry wedge on infantry.[8]

Yet, despite all this attention to the cavalry wedge, it is rather the evolution of the "infantry" wedge which marks a revolution in the history of tactics. Regarding this latter formation, Arrian unfortunately says only (*Tact.* 29.5),

"Whenever, in the case of an ἀμφίστομος διφαλαγγία, the leading ends are joined together and the rearward ends set apart, the resulting formation is called a 'wedge.'"[9]

Asclepiodotus (*Tact.* 11.5) is somewhat more illuminating:

"And when the wings in oblique order are put together, they have two options [as regards formation]. For either the left is advanced on the left side and the right on the right side and the whole formation is called a 'hollow wedge,' or the reverse is the case and is called a 'wedge'. . . ."[10]

Aelian deals with the topic twice. In one place (*Tact.* 37.6) his discussion is almost *verbatim* the passage from Arrian (*Tact.* 29.5) quoted above. Elsewhere (*Tact.* 47.3–5) Aelian provides us with an account that is of the utmost importance for a full understanding of this tactical concept and its early historical development:

[8]Ael. *Tact.* 40.1: ἀντίστομος διφαλαγγία, ἥτις τοὺς ἡγεμόνας οὐκέτι ἐκτὸς ἐν παρ-αγωγαῖς, ἀλλ᾽ ἐντὸς ἔχει ἀπ᾽ ἐναντίας ἀλλήλων παρατεταγμένους, τοὺς δὲ οὐραγοὺς ἐκτός, τοὺς μὲν ἐν δεξιᾷ παραγωγῇ, τοὺς δὲ ἐν εὐωνύμῳ ("an ἀντίστομος διφαλαγγία is a formation which, in marches-in-formation, has the file-leaders posted not on the outside, but on the inside, in juxtaposition with one another, with the file-closers marching in formation, one half on the right, the other half on the left"). The formation envisaged is thus a pair of infantry columns advancing, of course, with the eventual files functioning as ranks, but with the file-leaders, who are to constitute the two fronts in battle-order, marching on the juxtaposed sides of the two columns. The employment which Ael. *Tact.* 40.2–5 prescribes for this kind of formation amounts to making enemy cavalry wedges "run the gauntlet." Another application, specified by Ael. *Tact.* 37.7 and Arr. *Tact.* 29.6, is the formation of the κοιλέμβολον, or "hollow wedge:" cf. Asclep. *Tact.* 11.5.

[9]Ὅταν δὲ ἡ ἀμφίστομος διφαλαγγία τὰ μὲν ἡγούμενα πέρατα ἀλλήλοις συνάψῃ, τὰ δὲ ἑπόμενα διαστήσῃ, τὸ τοιοῦτον ἔμβολον καλεῖται. Cf. Arr. *Tact.* 29.2: διφαλαγγία δὲ ἀμφίστομος, ἥτις ἐν τῇ πορείᾳ τοὺς ἡγεμόνας ἔχει ἐξ ἑκατέρων τῶν μερῶν ἐν παρ-αγωγαῖς τεταγμένους, τοὺς μὲν ἐν δεξιᾷ τοὺς δὲ ἐν εὐωνύμῳ, τοὺς δὲ οὐραγοὺς ἔσω τεταγμένους ("an ἀμφίστομος διφαλαγγία is formed when on the march the file-leaders from each part in marches-in-formation are posted, one half on the right and the other half on the left, with the file-closers stationed on the inside"). This arrangement is merely the reverse of the ἀντίστομος διφαλαγγία (above, note 8), that is, a marching formation of two parallel columns, whose outer sides are to constitute its eventual fronts in battle-order. For the definition of παραγωγή as a "march-in-formation," see Asclep. *Tact.* 11.1, Ael. *Tact.* 36.3, and Arr. *Tact.* 28.3.

[10]Καὶ τὰ λοξὰ δὲ συντιθέμενα διττὰς ἔχουσι διαφοράς· ἢ γὰρ λαιὸν ἐν λαιῷ τάττεται μέρει καὶ δεξιὸν ἐν δεξιῷ καὶ καλεῖται ἡ ὅλη κοιλέμβολος, ἢ ἀνάπαλιν καὶ λέγεται ἔμβολος . . . .

". . . the infantry formation called the 'wedge', which has all of its sides made up
of heavy infantry. This type of formation is derived from the cavalry wedge, but
whereas in the case of the cavalry wedge one man is enough to lead the attack, three
are required in that of the infantry wedge, one not being sufficient to engage the
enemy alone. By this device, Epaminondas the Theban, fighting the Spartans at
Leuctra, defeated a very large force by compacting (πυκνώσας) his army into a
wedge. It [sc. the wedge] is formed when the ἀμφίστομος διφαλαγγία in
marching joins its wings together in front, while holding them open in the rear in
the shape of the letter Λ."[11]

This piece of evidence for Epaminondas' tactics at Leuctra has remained
unnoticed by modern scholars, in spite of the fact that it is corroborated and
amplified by Arrian (*Tact.* 11.1–3):

"The phalanx is drawn up . . . in depth where a more compact order is required, as
when it is necessary to dislodge the enemy by sheer compactness and force—just as
when Epaminondas at Leuctra drew up the Thebans themselves, and at Mantineia all
the Boeotians, making, as it were, a wedge and leading it against the Spartan
formation . . . . And 'compacting' is the contracting from a more open to a more
compact order as regards both rank and file, that is, in both length and depth."[12]

Thus it is clear that, while the Δ-shaped cavalry wedge belongs exclusive-
ly to the sphere of minor tactics, since it constitutes a way of forming and
manoeuvring individual units of cavalry (*ilai*), the infantry wedge can be
used in grand tactics, as it can be applied to the movement and manoeuvre
of the large-scale components of armies. This latter type of formation,
whose characteristic shape is that of the open-based letter Λ (as opposed to
the solid Δ of the cavalry wedge) is ultimately not confined to infantry, but,
as we will see, also constitutes the conceptual basis for very large-scale
formations involving mixed forces of cavalry and infantry.

Before moving on to discussion of this formation's role in the history of
grand tactics, we must clarify one point which has led to confusion
amongst modern scholars. J. K. Anderson, for example, writes: "Arrian
. . . says that Epaminondas formed his hoplites in an ἔμβολον at Leuctra

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[11](3) . . . φάλαγξ πεζική, ἣ καλεῖται ἔμβολος καὶ ἔχει πάντα τὰ πλευρὰ ἐξ ὁπλιτῶν
τεταγμένα· εἴληπται δὲ τὸ σχῆμα ἐκ τῶν ἱππικῶν ἐμβόλων, ἀλλ' ἐπὶ μὲν τῶν ἱππέων
εἷς προτρέχων ἐξαρκεῖ, ἐπὶ δὲ τῶν πεζῶν τρεῖς, ὡς οὐκ ὄντος ἑνὸς ἱκανοῦ προσβαλεῖν
τοῖς πολεμίοις. (4) οὕτως γοῦν Ἐπαμινώνδας ὁ Θηβαῖος πρὸς Λακεδαιμονίους μαχόμενος
ἐν Λεύκτροις πυκνώσας εἰς ἔμβολον τὸ στράτευμα κατεκράτησε πλείστης δυνάμεως.
(5) γίνεται δέ, ὅταν ἡ ἀμφίστομος τῆς πορείας διφαλαγγία τὰ μὲν ἔμπροσθεν κέρατα
συνάψῃ, τὰ δὲ ὄπισθεν διαστήσῃ ἐν σχήματι τοῦ Λ στοιχείου.

[12](1) τάττεται δὲ ἡ φάλαγξ . . . κατὰ βάθος δὲ ὅπου πυκνοτέραν [sc. χρὴ τετάχθαι],
εἰ αὐτῇ τῇ πυκνότητι καὶ τῇ ῥύμῃ τοὺς πολεμίους ἐξῶσαι δέοι, (2) καθάπερ
Ἐπαμεινώνδας ἔν τε Λεύκτροις αὐτοὺς τοὺς Θηβαίους ἔταξε καὶ πρὸς Μαντινείας τοὺς
πάντας Βοιωτούς, ὥσπερ ἔμβολον ποιήσας καὶ ἐπάγων τῇ τάξει τῶν Λακεδαιμονίων
. . . . (3) καὶ ἔστι πύκνωσις μὲν ἡ ἐκ τοῦ ἀραιοτέρου ἐς τὸ πυκνότερον συναγωγὴ κατὰ
παραστάτην τε καὶ ἐπιστάτην, ὅπερ ἔστι κατὰ μῆκός τε καὶ βάθος.

and Mantinea (*Tactica* 11.2), and is here speaking of deepening the phalanx and not of a wedge . . . ."[13] This is a plausible exegesis of the text until it is compared, as above, with Aelian *Tact.* 47.3–5, from which it is plain that the forming of a wedge is properly deemed a mode of πύκνωσις. Its forming would certainly exhibit the two characteristics of "compacting" cited by Arrian (*Tact.* 11.3): troops being withdrawn from the flanks to give a narrower front, and the ranks drawing closer together to form a keener cutting edge for penetrating the enemy's formation.

I THE BATTLE OF LEUCTRA

Although Aelian (*Tact.* 47.3) claims that the infantry wedge was derived from the cavalry formation, this seems unlikely since the Macedonians under Philip II are the first civilized people known to have adopted the latter, while Epaminondas' employment of the former is attested by Xenophon, Aelian, and Arrian. In fact, it appears almost certain that it was Epaminondas himself who devised this tactical form and put it into effect for the first time at the battle of Leuctra.

Xenophon, the best and fullest source for this battle,[14] does not mention the wedge in this context, but both Diodorus (15.55.2) and Plutarch (*Pelop.* 23.1) speak of a λοξὴ φάλαγξ. Diodorus' account is straightforward: he refers to Epaminondas "making the phalanx oblique" (λοξὴν ποιήσας τὴν φάλαγγα). Plutarch's version is more ambiguous: τοῦ 'Επαμεινώνδου τὴν φάλαγγα λοξὴν ἐπὶ τὸ εὐώνυμον ἕλκοντος. Though this statement has been interpreted as meaning simply that Epaminondas marched the Theban contingent leftward at a slight angle to the enemy's front,[15] this exegesis seems to miss the point of the assertion, since an oblique march to the left could be expected simply as an economical method of approaching the enemy. It would, in any case, result in Epaminondas' formation being

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[13]*Military Theory and Practice in the Age of Xenophon* (Berkeley and Los Angeles 1970) 327, note 3. Anderson's interpretation is accepted, for example, by Stadter (above, note 2) 123–124.

[14]For an assessment of Xenophon's value as a source for Leuctra, see Anderson (above, note 13) 198–205.

[15]Cf. Anderson (above, note 13) 218 and 324, note 60: "This does not seem to mean the same thing as the apparently similar phrase in Diodorus . . . . I believe that Plutarch may be keeping more closely to the original sense, and that in Diodorus the sense has been changed to make it fit the technical meaning given to *loxe phalanx* by the later tacticians." Cf. the definition of λοξὴ φάλαγξ at Arr. *Tact.* 26.3: λοξὴ δὲ ὀνομάζεται φάλαγξ ἥ τὸ μὲν ἕτερον κέρας, ὁπότερον ἂν ὁ στρατηγὸς βούληται, τοῖς πολεμίοις πελάζον ἔχουσα καὶ αὐτῷ μόνῳ ἀγωνιζομένη, τὸ ἕτερον δὲ δι' ὑποστολῆς σῴζουσα. ("that formation is called λοξὴ in which one wing, whichever the general decides, is advanced against the enemy and alone does the fighting, while the other is held in reserve"); cf. also Asclep. *Tact.* 10.21 and Ael. *Tact.* 30.3.

λοξή.[16] Furthermore, Diodorus uses the significant word πυκνότης of the Theban phalanx at 15.55.4.

There appears, in fact, to be a close relationship between the terms, or at least the concepts, that correspond to "wedge," "oblique phalanx," and "compact formation:" Asclepiodotus (*Tact.* 11.5) states that an *embolon* is formed from two oblique lines (τὰ λοξὰ) in apposition, Arrian (*Tact.* 11.1–2) cites Epaminondas' formation of wedges as an instance of πύκνωσις, and Aelian (*Tact.* 47.4) speaks of Epaminondas "compacting his army into a wedge" (πυκνώσας εἰς ἔμβολον τὸ στράτευμα). But while this evident connection between these terms can hardly be used to show that Diodorus is here making a veiled allusion to a wedge as such, it does suggest that his source contained an account of the battle which was in more obvious agreement with that fragmentarily preserved in Aelian and Arrian.

Even more problematical is the issue raised by Xenophon's statement (*Hell.* 6.4.12) that the Thebans were drawn up "not less than fifty shields deep." The number of Theban hoplites present at Leuctra is uncertain, but the totals in Diodorus (15.52.2—"not more than six thousand men altogether") and Polyaenus (*Strat.* 2.3.12—4,000 Thebans, including 400 cavalry) make a figure of the order of four or five thousand probable.[17] In the block-formation envisaged by most modern commentators,[18] such a force would present a front of no more than 80 or 100 men. A formation of this type, with its narrow front,[19] could be easily enveloped by the necessarily much longer Spartan formation, which was only twelve deep (Xen. *Hell.* 6.4.12). Ingenious solutions have been proposed for this difficulty: the posting of the Sacred Band in rear of the main body to act as a concealed flank-guard at the crisis of the battle has been a particular favourite.[20] There is, however, no evidence for this view, and the natural inference to be drawn from Plutarch (*Pelop.* 19.3) is that the normal

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[16]Cf. H. Delbrück, *Geschichte der Kriegskunst im Rahmen der politischen Geschichte*[3] 1 (Berlin 1920), translated by W. J. Renfroe as *History of the Art of War within the Framework of Political History* 1 (Westport and London 1975) 170, note 4 (all references to Delbrück will be to this translation).

[17]Cf. N. G. L. Hammond, *A History of Greece*[2] (Oxford 1967) 493 and 663, who estimates that the Boeotians as a whole mustered 6,000 hoplites; Anderson (above, note 13) 197 and 321, note 26, though he does not commit himself, favours a figure of 4,000 as a total for the Theban hoplites.

[18]Cf., for example, Anderson (above, note 13) 402–403 fig. VIII *a* and *b*.

[19]Some 80–100 yards in normal battle-order; cf. Asclep. *Tact.* 4.1–3 and Ael. *Tact.* 11.1–2.

[20]Cf. H. Köchly and W. Rüstow, *Geschichte des griechischen Kriegswesens* (Arrau 1852) 171 ff.; H. Droysen, "Heerwesen und Kriegführung der Griechen," in K. F. Hermann (ed.), *Lehrbuch der griechischen Antiquitäten* (Freiburg 1888–89) 99; the view has recently been revived by Anderson (above, note 13) 217–219, with 402–403 fig. VIII *a* and *b*.

position of the Sacred Band was in the van of the attacking wing.[21] Furthermore, it is unclear what possible benefit there might be in a hoplite formation fifty deep. The Thebans are known to have been experimenting with unusually deep formations for some time—at the battle of Delium in 424 they were drawn up twenty-five deep (Thuc. 4.93.4; cf. Diod. 12.70), while at the Nemea in 394 they disregarded their own convention of a phalanx sixteen ranks deep (Xen. *Hell.* 4.2.18: we are not in fact told what their actual depth here was)—but their efforts had met with only limited success. A formation of infantry, it should be remembered, is not a solid object, and the living flesh of which it consists can bear only so much physical pressure in any push forward. Aside from the obvious vulnerability of the deep flanks, the vast numbers of men in the interior files and the rearward ranks of the formation would be unable to come to grips with the enemy or give effective support to their comrades in the front ranks or in the flanking files. Thus the factor of inherent military probability itself weighs heavily against the conventional "literal" interpretation of Epaminondas' fifty-deep formation.[22]

I propose the following tentative interpretation: Epaminondas' *embolon* was not a solid block-formation, but a literal wedge, fifty echelons deep. In fact, it would have been a wedge in the shape of a Λ, formed from two oblique "wings"—the ἀμφίστομος διφαλαγγία of the tactical authors—of Theban hoplites, held together at the "joint" by the Sacred Band drawn up in a solid Δ-shaped wedge so as to provide a point for the great wedge-formation as a whole. The two "wings" of hoplites would, to begin with, be drawn up some distance apart in conventional Theban battle-order, sixteen deep, with the Sacred Band posted between them. The infantry line as a whole would initially be screened by the well-trained Theban cavalry, which could be trusted to make short work of the qualitatively inferior Spartan cavalry (Xen. *Hell.* 6.4.10–11). Then, under cover of the anticipated opening cavalry action, taking place between the opposing lines of infantry (Xen. *Hell.* 6.4.10, 13),[23] the Sacred Band would form itself into a

[21]Delbrück (above, note 16) 1.167–168 is of the opinion that the Sacred Band fought at the head of Epaminondas' formation, and observes that if the Sacred Band's role had been that of a flank-guard, it "would not have been placed at the tail of the column but would, as a withheld echelon, have been stationed to the side of the column . . . . " (168).

[22]Cf., for example, Anderson (above, note 13) 209, 212, 216–219, 402–403 fig. VIII *a* and *b*; Hammond (above, note 17) 494, however, conscious of the difficulty, speaks of "the massive spearhead of the Theban infantry."

[23]As Anderson (above, note 13) 216 cogently argues, "Cleombrotus proposed to march in column to the right and, when he was well clear of the Thebans, wheel left and form up at right-angles to his original front. He did not want the Thebans to realize what he was doing; and therefore interposed his cavalry between himself and the enemy." In essence, this would be a repeat of the manoeuvre that had produced the Spartan victory at Nemea (Xen. *Hell.*

Δ-shaped wedge[24] and move directly forward. Meanwhile, each "wing" would form itself into a column, advancing obliquely inward to link up with the rear of the Sacred Band. A final partial turn by each file as it came up would bring it into alignment with the ranks of the Sacred Band. Thus the original files of the "wings" would become ranks, with the file-leader (λοχαγός) as the exposed part of each echelon.[25]

The attested strength of the Sacred Band is 300 (Plut. *Pelop.* 18.1), and a Δ-shaped wedge sixteen ranks deep would contain 288 men $(3 + 5 + \ldots + 31 + 33)$. The remaining 34 echelons would appear on each limb of the Λ, and these 34 ranks (= the original files) would give each limb a strength of 544 men (34×16). The total strength of the great wedge as a whole would thus be 1,376 $(288 + 544 + 544)$.[26] The remaining 3–4,000 hoplites of the Theban army would be drawn up in conventional order, sixteen deep, to the right of the *embolon* so as to act as a tactical reserve for it.[27]

This is an entirely plausible arrangement from the tactical standpoint. Unlike the block-formation usually envisaged by modern commentators, the wedge would present no exposed and vulnerable flank to the enemy. Its great depth of fifty echelons would give it an internal "reserve" of thirty-eight echelons after it had achieved a complete breakthrough of the twelve-deep Spartan phalanx (Xen. *Hell.* 6.4.12). Not only would such a wedge facilitate the concentration of force at its apex, but the flank of each echelon would be covered in turn by the echelon in right or left flank rear of it (depending on the limb of the wedge on which it was located). In breaking through the enemy phalanx, the foremost echelons would tend to pull in behind one another and then, if necessary, could face about and push outward, thus giving rise to the classic "thin end of the wedge" effect. Moreover, the psychological impact of a formation that looked much
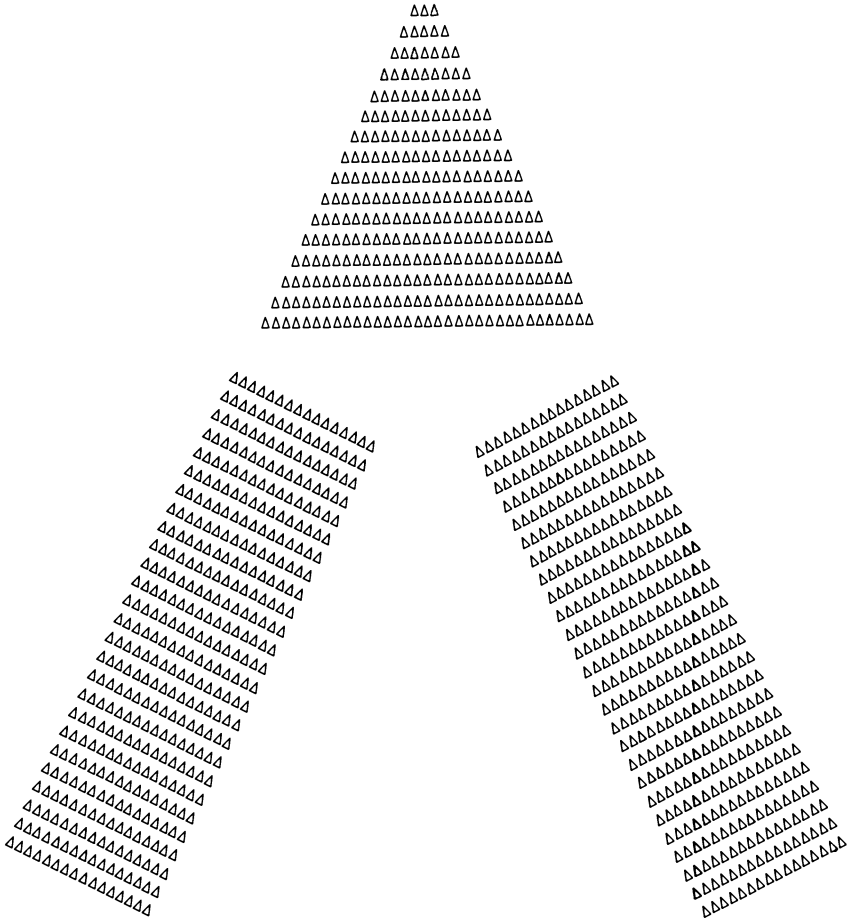

4.2.19–21), and could be anticipated by Epaminondas, who would likewise have a manoeuvre—the formation of the wedge—that he wished to conceal. Xenophon's apparent belief that the posting of the Theban cavalry in a forward position was merely a response to the prior appearance of the Spartan cavalry in such a position is indicative of nothing more than the historian's essentially Spartan perspective. For a detailed discussion of the cavalry battle, see Anderson (above, note 13) 213–216.

[24]None of our sources describes the drill procedure for forming a Δ-shaped wedge, but a number of methods can be hypothesized. The most probable are (1) forming, rank by rank, forward of a set rear rank, and (2) forming, rank by rank, behind the front rank. The essential prerequisite would, in any case, be a clear understanding on the part of the individual soldier of his own prescribed position within the wedge. As *élite* hoplites, the Sacred Band could be drilled to change formation with an economy of movement.

[25]See Fig. 1.

[26]See Fig. 2.

[27]Cf. Anderson (above, note 13) 203, 208–209, and 402–403 fig. VIII *a* and *b*.

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Δ = 1 hoplite (apex of Δ indicates direction of march)

Figure 1: Epaminondas' wedge at Leuctra being formed from an ἀμφίστομος διφαλαγγία

more solid and numerous than it really was would be an appreciable asset. Nor would the element of surprise be lacking, for (as we have seen) the evolution into wedge-formation would have taken place under the cover of a cavalry engagement (Xen. *Hell.* 6.4.13). Employed against an enemy occupied, as the Spartan army was, in opening out its right wing and moving round to attempt an envelopment (Plut. *Pelop.* 23.2—τὸ δεξιὸν ἀνέπτυσσον καὶ περιῆγον ὡς κυκλωσόμενοι καὶ περιβαλοῦντες ὑπὸ πλήθους
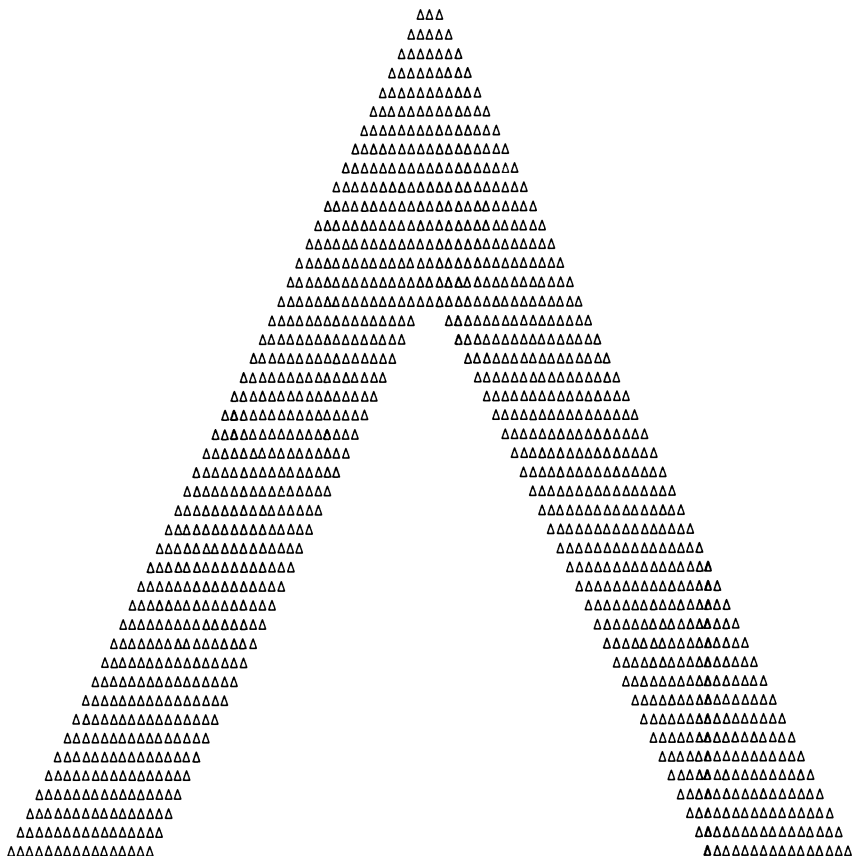
Δ = 1 hoplite

Figure 2: Epaminondas' wedge at Leuctra fully formed

τὸν Ἐπαμεινώνδαν), its effect would be, and was, both devastating and tactically decisive.[28]

II THE BATTLE OF MANTINEIA

Xenophon records the formation of two separate wedges at Mantineia: one of infantry (*Hell.* 7.5.22), also attested by Arrian (*Tact.* 11.2), the

[28]Cf. Anderson (above, note 13) 211–216; and above, note 20. An interesting modern parallel can be noted in the battle of Salamanca in 1812, where Wellington defeated Marmont by throwing his own right-wing brigades into oblique order, so as to exploit a gap which had appeared in the latter's left wing as a result of the French attempt to outflank and envelop the British right: see Sir Arthur Bryant, *The Age of Elegance, 1812–1822* (Harmondsworth 1958) 45–50.

other of cavalry mixed with light infantry (for which *Hell.* 7.5.24 is the
only evidence). The formation of the former is described as follows: "it was
not until he [sc. Epaminondas] had wheeled the *lochoi* marching in column
into a front, and made a strong wedge about himself, that he gave the order
to take up the arms and led off."[29] Xenophon's account of the formation
of the latter is as follows: "Epaminondas by contrast made a strong wedge
out of the cavalry as well, and drew up together with them supporting light
infantry . . . . "[30]

The meaning of these passages is something of a *crux*. Commenting on
Hell. 7.5.22, J. K. Anderson adduces the context of Arrian's reference to
Epaminondas' use of the wedge in support of his contention that Arrian "is
here speaking of deepening the phalanx and not of a wedge."[31] But, as we
have seen, πύκνωσις means "compacting" rather than "deepening," and
Epaminondas' formation of wedges is given as an instance of "compact-
ing." Furthermore, "compacting" is not concomitant with "deepening," but
normally occurs in opposition to it (cf. Arr. *Tact.* 11.3, where "compact-
ing" is defined in terms of a reduction in a phalanx's length and actual
depth). Compare Diodorus' description of Epaminondas' formation at
Mantineia (15.86.4): "he [sc. Epaminondas] therefore immediately took
the best troops and, after packing them close together, charged into the
midst of the enemy." Anderson's exegesis is thus not a cogent objection to
our interpreting Arrian *Tact.* 11.2 and Xenophon *Hell.* 7.5.22 to mean
that Epaminondas at Mantineia again made use of the grand tactical,
Λ-shaped, infantry wedge he had originally devised for Leuctra.

The difficulty in interpreting Xenophon's statement (*Hell.* 7.5.24) that
Epaminondas made a wedge of the cavalry and drew up with them
supporting light infantry (ἄμιπποι) is two-fold. In the first place, as both
Aelian (*Tact.* 18.4; cf. 40.6) and Arrian (*Tact.* 16.6) say that Philip II
introduced the cavalry wedge to the civilized world, it is improbable that the
Δ-shaped, "Scythian" wedge is meant. It is much more likely that what we
have here is a formation based, at least in general terms, on Epaminondas'
own Λ-shaped tactical design. The force of cavalry in question—perhaps
as many as 1,600 horsemen[32]—would in any case have been too numerous
to draw up in a single Δ-shaped formation. The second difficulty is the

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[29]Ἐπεί γε μὴν παραγαγὼν τοὺς ἐπὶ κέρως πορευομένους λόχους εἰς μέτωπον ἰσχυρὸν
ἐποιήσατο τὸ περὶ ἑαυτὸν ἔμβολον, τότε δὴ ἀναλαβεῖν παραγγείλας τὰ ὅπλα ἡγεῖτο.

[30]Ὁ δ' Ἐπαμεινώνδας αὖ καὶ τοῦ ἱππικοῦ ἔμβολον ἰσχυρὸν ἐποιήσατο, καὶ ἀμίππους
πεζοὺς συνέταξεν αὐτοῖς . . . .

[31]Anderson (above, note 13) 327 note 3.

[32]Hammond (above, note 17) 509 estimates its strength at 1,600, on the reasonable
assumption that it was more than half of the 3,000 cavalry (Diod. 15.84.4) available to
Epaminondas at Mantineia. Hammond is, however, mistaken in interpreting, as he appears
to do (509 and 508, fig. 28), the "mixed" cavalry and infantry wedge (and likewise the
infantry wedge) as a solid Δ-shaped formation.

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Θ = 1 horseman

Δ = 1 infantryman (hoplite or peltast: apex of Δ indicates direction of advance)

Figure 3: Epaminondas' "mixed" wedge of cavalry and infantry at Mantineia

question of the position of the ἄμιπποι within the wedge. It is clear from Xenophon *Hipp.* 5.13 that such ἄμιπποι were to be posted, either individually or in small groups, between or behind the horsemen in any given cavalry formation.[33] Such an admixture of horse and foot would, of course, make a geometrically precise formation like a true Λ-shaped wedge impracticable, no matter how small its scale. Such an arrangement involving 1,600 horsemen would fall apart almost immediately it began to move, since a mounted man has nowhere near the manoeuvrability of a footsoldier. By contrast, a conventional square or rectangular formation composed of mixed cavalry and infantry could advance coherently, if not particularly rapidly, to the attack. Thus it appears most probable that this second *embolon* consisted of a number of conventional rectangular forma-

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[33] Ἔστι δὲ πεζοὺς οὐ μόνον ἐντός, ἀλλὰ καὶ ὄπισθεν ἱππέων ἀποκρύψασθαι· πολὺ γὰρ μείζων ὁ ἱππεὺς τοῦ πεζοῦ. See *Hell.* 3.4.23 for Agesilaus' use of ἄμιπποι—in this case, the youngest of the hoplites, together with the peltasts—at the battle of the Pactolus in 395. Cf. also *Hell.* 2.4.32, 3.5.19, 5.4.40, 7.2.20, Thuc. 5.57.2. Note also Alexander's use of light infantry mixed with cavalry at the battle of the Granicus (Arr. 1.16.1) and at his forcing of the Jaxartes (4.4.6–7); cf. Arr. *Ect.* 29 for Arrian's own employment of this tactical device in his campaign against the Alani: on which, see now A. B. Bosworth, "Arrian and the Alani," *HSCP* 81 (1977) 217–255, expecially 252–253.

tions drawn up *en échelon* on two separate axes coinciding to give the overall shape of a Λ.[34]

III THE BATTLE OF PELION

Caught in a difficult position near Pelion during his Illyrian campaign of 335, Alexander mesmerized the Illyrians with a display of Macedonian drill, while at the same time preparing a tactical surprise.[35] He began by drawing up his phalanx to a depth of 120 ranks, had it go through its standard drill, and then led it in the direction of either wing,[36] thus extending it on both sides. Then, "making, as it were, a wedge of the phalanx on the left," he led it against the by now thoroughly confused enemy.[37]

What Alexander appears to have been doing here is carrying out the procedure for forming the Λ-shaped infantry wedge,[38] which the Macedonians had evidently learnt from the Thebans, doubtless through the agency of that erstwhile hostage at Thebes, Philip II. As at Leuctra, the wedge would have involved only part of the available infantry—here most probably only a single *taxis* (1,500 men) of Alexander's *pezhetairoi*. The phalanx's initial movements "in the direction of either wing" may well have been intended to separate the "wings" of the ἀμφίστομος διφαλαγγία as the first stage in the formation of the required *embolon* on the strict Epaminondian model. Indeed, it is probable that, at this early stage in his career, Alexander had not yet modified his tactical inheritance in any significant way.

IV THE BATTLE OF THE GRANICUS

In his account of the battle on the river Granicus, Arrian (1.15.7) mentions a wedge of Persian cavalry: ". . . seeing Mithridates, the son-in-law of Darius, riding a good way ahead of the others and leading with him [sc. Mithridates] a wedge, as it were, of cavalry, he himself [sc.

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[34]See Fig. 3. Cf. Anderson (above, note 13) 222–223.

[35]Arr. 1.6.1; correctly interpreted by N. G. L. Hammond, "Alexander's Campaign in Illyria," *JHS* 94 (1974) 66–87, especially 82–83.

[36]Arr. 1.6.2 ἐπὶ τὰ κέρατα ἄλλοτε ἄλλη παρήγαγε.

[37]Arr. 1.6.3 κατὰ τὸ εὐώνυμον οἷον ἔμβολον ποιήσας τῆς φάλαγγος. Anderson (above, note 13) 327, note 3, endeavours, unconvincingly, to distinguish two "historical" senses of ἔμβολον: the earlier, he thinks, is only a synonym for a "deepened" phalanx, while the later, Hellenistic sense denotes a literal wedge. He cites Arr. 1.6.3 as a possible instance of the latter. There is no justification for Anderson's claims that "this is another instance of a word acquiring in later tactical authors a precise technical sense unknown to Xenophon" and that "Arrian uses it in its old sense when writing of fourth-century battles."

[38]This view is accepted and splendidly illustrated by N. G. L. Hammond, *Alexander the Great: King, Commander and Statesman* (London 1981) 52 and 55 fig. 4.

Alexander] also dashes out in front of the others and, striking him in the face with his spear, overthrows Mithridates."[39]

Though we would naturally expect to find Alexander, and not Mithridates, leading a cavalry wedge, the fear that the text is corrupt at this point is, I think, unjustified. The formation conventionally used by the Persian cavalry was the square (τετράγωνον: Asclep. *Tact.* 7.4, Ael. *Tact.* 18.5, Arr. *Tact.* 16.9), but it is certainly possible that at the Granicus some, at least, of the Persian cavalry were making use of a formation learnt from Scythian cavalry, whose presence at Gaugamela as allies of the Persians is attested by our sources (Arr. 3.8.3, 11.6, 13.2–4; Curt. 4.11.6, 15.12–13, 15.18; Diod. 17.59.5–8). This departure from convention was prompted, one would imagine, by intelligence gathered regarding Macedonian practice, and was meant as a response in kind.

V THE BATTLE OF GAUGAMELA

The most important instance of the employment of a tactical wedge by Alexander took place at the battle of Gaugamela. Narrating the crisis of the battle, Arrian (3.14.1–2) writes as follows: ". . . when [some of] the [Persian] cavalry had been sent to help those who were enveloping the [Macedonian] right wing, thus breaking [the continuity of] the barbarian front line, he [sc. Alexander], wheeling towards the gap, and making, as it were, a wedge of the Companion cavalry and of the phalanx posted there, led them at the charge and with a battle-cry towards Darius himself."[40]

It is obvious that Arrian is not speaking here of either the Δ-shaped cavalry wedge[41] or the Λ-shaped infantry wedge. To start with, the number of cavalry involved—the eight *ilai* of the Companions, together some 1,800 strong (cf. Diod. 17.17.4, Arr. 6.14.4)—would have been too great to be effectively employed in a single minor tactical unit.[42] In fact, it is a

[39] . . . ἰδὼν Μιθριδάτην τὸν Δαρείου γαμβρὸν πολὺ πρὸ τῶν ἄλλων προϊππεύοντα καὶ ἐπάγοντα ἅμα οἷ ὥσπερ ἔμβολον τῶν ἱππέων ἐξελαύνει καὶ αὐτὸς πρὸ τῶν ἄλλων, καὶ παίσας ἐς τὸ πρόσωπον τῷ δόρατι καταβάλλει τὸν Μιθριδάτην. E. Badian's otherwise thoroughgoing study, "The Battle of the Granicus: a New Look," *Ancient Macedonia* 2 (Institute for Balkan Studies 155, Thessaloniki 1977) 271–293, is flawed by the author's misreading of the passage as referring to a Macedonian wedge (291). The passage is corectly interpreted by Hammond (above, note 38) 74.

[40] . . . τῶν δὲ ἐκβοηθησάντων ἱππέων τοῖς κυκλουμένοις τὸ κέρας τὸ δεξιὸν παραρρηξάντων τι τῆς πρώτης φάλαγγος τῶν βαρβάρων ἐπιστρέψας κατὰ τὸ διέχον καὶ ὥσπερ ἔμβολον ποιήσας τῆς τε ἵππου τῆς ἑταιρικῆς καὶ τῆς φάλαγγος τῆς ταύτῃ τεταγμένης ἦγε δρόμῳ τε καὶ ἀλαλαγμῷ ὡς ἐπ' αὐτὸν Δαρεῖον.

[41]Cf. the mistaken interpretations of J. F. C. Fuller, *The Generalship of Alexander the Great* (London 1958) 171 diagram 11; and P. Green, *Alexander of Macedon* (Harmondsworth 1974) 291 (plan).

[42]Cf. Marsden (above, note 3) 68–69 and 71–73 for plausible estimates of the numbers of horsemen contained in, and the space occupied by, such cavalry wedges. The limit for effectiveness would, in fact, be about 300 horsemen.

very reasonable assumption[43] that each of the Companion *ilai* advanced to the attack in the (for them) conventional Δ-shaped wedge-formation. Moreover, it is clear from Arrian's description of the actual fighting at this point (3.14.3) that by "phalanx" he does in fact mean the hypaspists and the *pezhetairoi*[44]—an interpretation which seems to be confirmed by the fact that he goes on to say (3.14.4) that Simmias and his *taxis*[45] were unable to take part in this great rupture of the enemy line,[46] which of course implies that they had been expected to do so. The inference to be drawn from Arrian 3.14.2–4 is that Alexander's wedge included, as well as the Companions themselves, the hypaspists and the four *taxeis* of *pezhetairoi* to the right of Simmias—in other words, at least 1,800 heavy cavalry and 9,000 heavy infantry. It is likely, furthermore, that the formation also involved Balacrus' javelin-men, Agrianians, and archers (Arr. 3.12.3, 13.5), whose function it was to screen the Companions from attack until they themselves were ready to charge. Balacrus' troops would constitute an additional force of, say, 1,500 light infantry.[47] Given such a combination of troops of different arms, it is evident that Alexander's model here was the second of Epaminondas' wedge-formations at Mantineia. Thus, while the overall shape of the formation would approximate a Λ, the constituent units, arranged *en échelon* down either limb of the Λ, would, nonetheless, be individually drawn up in their characteristic formations. The βασιλικὴ ἴλη, at the apex of the Λ, and the remaining Companion *ilai*, forming most of the Λ's right limb and probably part of its left,[48] would each charge in Δ-shaped wedge-formation, while the hypaspists and the *taxeis* of the *pezhetairoi*, completing the disproportionately extended left limb,[49] would advance to the attack in the accustomed rectangular formation, eight ranks deep.[50] Balacrus' light infantry, completing the right limb of the Λ,[51] would try to keep up with the Companions while advancing in loose

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[43]Made by Marsden (above, note 3) 68–73 and diagram 2, and by the present author in "Grand Tactics at Gaugamela," *Phoenix* 29 (1975) 374–385, especially 377 fig. 2.

[44]Wrongly excluded by A. B. Bosworth, *A Historical Commentary on Arrian's History of Alexander* 1 (Oxford 1980) 307.

[45]For the position of this unit, see Arr. 3.11.9 with Devine (above, note 43) 378, 381, 377 fig. 2.

[46]Devine (above, note 43) 381.

[47]Cf. Marsden (above, note 3) notes on diagram 2, and 67.

[48]Devine (above, note 43) 380, 384, 377 fig. 2. Cf. now Bosworth (above, note 44) 307. The βασιλικὴ ἴλη, initially posted to the right of the other Companion *ilai* (Arr. 3.11.8), would doubtless have changed post to leftward as soon as Alexander had determined the location of the weak point (in this case, the gap) in the Persian front.

[49]Devine (above, note 43) 380–381, 384, 377 fig. 2.

[50]Polyb. 12.19.6.

[51]Cf. Bosworth (above, note 44) 307, who believes these units alone comprised the right limb of the wedge.

skirmishing order.[52] With perhaps as many as 12,300 troops involved,
Alexander's wedge at Gaugamela would represent a very daring and signific-
ant tactical advance over Epaminondas' modestly sized "mixed" wedge-
formation at Mantineia, which can hardly have contained more than two or
three thousand cavalry and ἄμιπποι. But, to Epaminondas' original genius
would still belong a great part of the credit.[53]

Indeed, Arrian's terminology at 3.14.3 (ἥ τε φάλαγξ ἡ Μακεδονικὴ πυκνὴ
καὶ ταῖς σαρίσσαις πεφρικυῖα ἐμβεβλήκει ἤδη αὐτοῖς) recalls, with πυκνή,
his own reference at *Tact.* 11.1–2 (as well as that of Aelian *Tact.* 47.4)
to Epaminondas' wedge-formations at Leuctra and Mantineia, while
ἐμβεβλήκει looks forward to his description (5.15.2 κατ' ἴλας
ἐμβεβληκός)[54] of Alexander's attack at the battle of the Hydaspes with his
cavalry in wedge-formation.

CONCLUSION

Aside from the naval instance in Polybius, the three types of formation
to which the term ἔμβολον refers are:

(1) the solid Δ-shaped cavalry wedge, invented by the Scythians, employed by the
Thracians and other tribes of mounted warriors,[55] adopted by the Macedonians
under Philip II, and utilized by them throughout Alexander's campaigns;
(2) the hollow Λ-shaped infantry wedge, devised by Epaminondas himself, and used
by the Thebans to break the Spartan phalanx at the battles of Leuctra and Mantineia,
but also adopted by the Macedonians[56] and used by Alexander at Pelion;
(3) the grand tactical, roughly Λ-shaped, wedge, composed of troops of more than
one arm, apparently invented by Epaminondas, and utilized by him in his final battle
at Mantineia, but developed and perfected by Alexander for use at least in the battle
of Gaugamela.[57]

[52]Cf., for example, Arr. 1.2.4–5, 6.7, 6.9–10, 28.4–5, 2.9.4, 3.13.5–6, 4.26.3,
Curt. 3.4.13; and above, note 33.
[53]These conclusions are in general agreement with my initial reconstruction of Alexan-
der's wedge at Gaugamela—(above, note 43) 379–381, 384, 377 fig. 2—which was made
without the benefit of reference to the tactical manuals of Aelian, Arrian, and Asclepiodotus.
It must be conceded, however, that I there underestimated the influence of Epaminondas: cf.
Devine (above, note 43) 384.
[54]Correctly interpreted by Griffith, *HM* 2.413.
[55]Cf. Ammianus 31.2.8 for the application of the term *cuneus* to the fighting formations
of the Huns, whom Ammianus indeed regards as "Scythians" (31.2). Curt. 7.7.35 in fact
uses *cuneus* of formations of Scythian Dahae cavalry.
[56]It is probably in this sense that Curt. 3.2.13 applies the term *cuneus* to the Macedonian
phalanx: *cuneos . . . ipsi phalangem vocant*; cf. the probable source for this observation, Livy
32.17.11: *cuneum Macedonum—phalangem ipsi vocant*.
[57]Cf. Livy's use of *cuneus* to describe the grand tactical formation of Hannibal's centre
in its initial convex posture at the battle of Cannae (22.47.5, 8).

Yet, despite this dramatic divergence in scale, content, and precise form, all three formations are essentially offensive in character and properly belong to the sphere of tactical penetration. That they share the name of *embolon* thus serves to emphasize their common conceptual origin in one of the simplest and most ancient of human tools, the wedge.[58]

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