

INTRODUCTION

(A) BASICS

(i) Text(s)

The principal manuscripts are three in number: E (*Scorialensis graecus* Y-III-11), from the end of the 10th century; V (*Vaticanus graecus* 1164) and P (*Parisinus graecus* 2442), from the beginning of the 11th. Editors have envisaged a variety of stemmatic relationships between them: see in brief Garlan 285–286, with bibliography. References, hereinafter, to ‘the manuscripts’ will mean these principal ones unless otherwise indicated. Some of the later (15th to 17th century), derivative ones are surveyed in Graux 102–104. For *Vaticanus graecus* 1605 (11th century), which includes a scholiast’s text of Ph.’s B32–40 [88.32–89.10], see the Comm. to B32 under **ἄφεψηθείσης**.

The *editio princeps* is Melchisédec(h) Thévenot and others, *Veterum mathematicorum Athenaei, Apollodori, Philonis, Bitonis, Heronis et aliorum opera Graece et Latine pleraque nunc primum edita* (Paris 1693) 79–104. Though Thévenot’s actual text has long since been superseded, largely because it was based on a single late manuscript (the 16th-century *Parisinus graecus* 2435), his page-numbers and (usually) line-numbers are a referencing-system still widely in use; see above, Conventions and Abbreviations, 3.

The first section (Thévenot 79–86.21) – taken as an autonomous book of *Teichopoiika, Fortification-matters*¹ – was re-edited by Charles Graux, ‘Philon de Byzance: Fortifications’, *Revue de Philologie* 3 (1879) 91–151, posthumously reprinted in his *Oeuvres* (Paris 1886) 2.153–227. This comprises a general introduction, parallel text and translation, and ‘notes explicatives’. During the course of it, the co-authorship of the amateur polymath and military specialist Eugène August Albert de Rochas d’Aiglun is acknowledged; see also below, under Translations.

The following three re-editions embrace the complete text:

Richard Schoene, *Philonis Mechanicae Syntaxis libri quartus et quintus* (Berlin 1893). [No page-numbering.] A root-and-branch textual revaluation, incorporating many otherwise unpublished suggestions by August Brinkmann, Franz Buecheler, Hermann Diels, Friedrich Haase, Alfred Schoene (Richard’s brother), Hermann Schoene (Richard’s son), and Johannes Vahlen.

Hermann Diels and Erwin Schramm, *Exzerpte aus Philons Mechanik B.VII und VIII (vulgo fünftes Buch). Griechisch und Deutsch. (Abhandlungen der preussischen Akademie der Wissenschaften, philosophisch-historische Klasse no. 12: Berlin 1919 [1920])*. A new text, with German translation, brief notes, and 33 fig-

1 Erroneously listed as *Technopoiika* by K. Orinsky et al., ‘Philon(48)’, *RE* 20.1 (1941) cols.53–54, at 54.

ures; and an unpublished 1886 edition (with translation and ‘Erläuterung’) of Thévenot 79–86.21 by Ernst Fabricius is incorporated.

Diels-Schramm is the text available on the on-line TLG.

Yvon Garlan, *Recherches de poliorcétique grecque* (BEFAR fasc. 223: Paris 1974) 278–404. After an Introduction, Garlan gives a parallel text and French translation, and a commentary in the form of endnotes; they are most lavish on the first (archaeological) section of the treatise.

The labours of this succession of scholars (and others), especially in the century which spans Graux to Garlan, have made very significant advances toward the most plausible and satisfactory text of Ph. that can be established. Nevertheless, what he wrote – and/or what he meant by it – remains in many places uncertain.

(ii) Translations

Into French: Graux, Garlan; see already under Text(s). Also, a few years earlier than Graux, Rochas d’Aiglun published an annotated French translation based on Thévenot’s text: *Traité de fortification d’attaque et de défense des places par Philon de Byzance* (Paris 1872).²

Into German: Diels-Schramm; see already under Text(s).

Into English. The principal item here is A. W. Lawrence, *Greek Aims in Fortification* (Oxford 1979) 69–107. After an Introduction, he translates all parts ‘relevant, even indirectly, to the study of fortifications’. (This turns out to mean: A1–87 [79.1–86.21], i. e. part A complete; B49–53 [89.46–90.24]; C1 [90.46–49], C3–44 [91.3–94.20], C49–59 [94.32–95.25], C63–71 [95.32–96.14]; D1–11 [96.27–97.34], D17–19 [98.4–20], D24–27 [98.34–99.3], D29–51 [99.6–100.32], D55–58 [100.39–101.2], D66 [101.31–35], D71–75 [102.3–27], D111 [104.40–42].) There is no continuous Greek text, but the parallel ‘analysis and notes’ includes occasional textual observations and suggestions amidst the substantive comment.

Brian Campbell, *Greek and Roman military writers: selected readings* (London 2004), provides an all-purpose selection of eight short translated extracts (A20–21 [81.6–25], A32–33 [82.6–21], B1–2 [86.21–32], B49–50 [89.46–90.5], C3–5 [91.3–15], C32–36 [93.25–44], D59–60 [101.2–11], D71–72 [102.3–12]). W. M. Murray, *The Age of Titans: the rise and fall of the great Hellenistic navies* (Oxford 2012) 283–301 (= Appendix E), is a translation, with footnotes, of the material relating primarily to naval warfare (C51–71 [94.36–96.14], D5 [96.37–41], D21–33 [98.24–99.20], D38 [99.37–40], D53–55 [100.33–44], D101–111 [104.1–42]).

2 It is partially available on-line at <http://remacle.org/bloodwolf/erudits/philon/fortification1.htm> (or via attalus.org).

(iii) Sources

Ph. never names his sources, and in all but one instance they are indeterminable by name. The exception, whether he had read it directly or in the epitome by Cineas the Thessalian,³ is unsurprising: his best-known predecessor in the genre, Aeneas Tacticus (mid-fourth century).

Aeneas's *Procurement* (*Poristikê biblos*, which its author mentions in 14.2) and *Preparations* (*Paraskeuastikê biblos*, mentioned in 7.4, 8.5, 21.1 and 40.8) are both lost, a fact which obscures the most vital aspects of how far they might underpin the recommendations in Ph.'s part B;⁴ but other links are clear enough, to varying extents. A particularly striking instance occurs with B55–57 [90.28–45], where a system for adding detail to fire-signals by the use of the synchronized outflow from two water-vessels stems from an Aenean invention reported by Polybius 10.44–45. See also (e. g.) the following passages of Aeneas:

7.1 (and 10.4), *re* D2–3 [96.28–33];
 22.7–8, *re* C34 [93.32–36];
 24–25, *re* C29 [93.8–11] and C35–38 [93.36–52];
 26.3, *re* C28 [93.5–8];
 31 (esp. 10–13), *re* D77–82 [102.31–50] (esp. D80–81 [102.40–47]);
 32.8, *re* A76 [85.22–29];
 32.12, *re* C18 [92.22–27];
 33.1, *re* C39–41 [94.1–10], etc.;
 34.1, *re* D34–35 [99.21–28];
 36, *re* A79 [85.35–39];
 37.1, *re* C7 [91.19–24];
 37.3, *re* D32 [99.18–19];
 39.1–2, *re* C32 [93.25–29];
 39.6–7, *re* C65 [95.39–44] and D41 [99.48–51].

On Ph.'s apparent use (direct or indirect) of Hippocratic treatises see below, section B (end), and again in the preface to the Commentary on part B.

(iv) Use and Influence

The first unambiguous proofs of Ph. being used by his successors in the genre come in two interconnected writers of the second half of the first century: Athenaeus of (?)Seleucia, a. k. a. Athenaeus Mechanicus, and Vitruvius.⁵

- 3 On Cineas see in brief D. Whitehead (ed.), *Aineias the Tactician: How to Survive under Siege* (Oxford 1990; edn.2 with addenda and corrigenda Bristol 2001) 6; M. Bettalli (ed.), *Enea Tattico: La difesa di una città assediata* (Pisa 1990) 4.
- 4 See generally Bettalli, *Enea* 337; and (on this and the other passages cited) in the Comm. below.
- 5 On their interconnection see most recently D. Whitehead and P.H. Blyth (ed.), *Athenaeus Mechanicus: On Machines* (*Historia Einzelschriften* 182: Stuttgart 2004) *passim*.

The latter's *de architectura* mentions Ph. explicitly, in an unchronological list of twelve authorities given in chap.14 of the preface to his Book 7: *Diades Archytas Archimedes Ctesibios Nymphodorus Philo Byzantius Diphilos Democles Charias Polyidos Pyrros Agesistratos*. It is noteworthy that only Ph., in this roster, is thought to need an ethnikon – so as to avoid confusion with homonyms, presumably; and his origins in Byzantium are confirmed by two other (later) writers.⁶ In any event, Vitruvius had already drawn on Ph. without citing him by name in an earlier context; for Book 1 chap.5 of Vitruvius sounds unmistakable echoes of what Ph. says, at length, about city-wall construction and related topics in his part A. See **Appendix 1**.⁷

Athenaeus, for his part, does not deal with fortifications and thus does not draw on that material; nor does he proffer a consolidated list of names like the one in Vitruvius. Instead, he introduces his authorities *seriatim*. The one named at 15.13 is 'Philo of Athens' (Φίλων ὁ Ἀθηναῖος) – but since that writer is cited there for the construction of a filler tortoise, *χελώνη χωστρίς*, as mentioned in our Ph.'s D10.7–11 [97.25–29], there can be no doubt that the designation 'ὁ Ἀθηναῖος' is a slip (whether by Athenaeus himself, his immediate source Agesistratus, or a copyist).⁸ See **Appendix 2**.

Next comes Onasander's treatise *On Generalship (Stratēgikos)*, addressed in Greek to the Quintus Veranius who was consul *ordinarius* in 49 CE and subsequently governor of Britain.⁹ Though the sources of Onasander's morally-driven – notionally Platonic (Suda ο 386) – advice to generals are never stated, there seems little doubt that he had read and absorbed Ph., whether directly or indirectly. Some of the correspondences between the two works are no more striking than would be expected from two writers who cover many of the same topics; and the limits on the scope and extent of those correspondences are unsurprising when one bears in mind that at no point does Onasander take up the stance represented by Ph.'s parts A-C, that of a city-commander who is resisting a siege. On the other hand he does, at

6 Hero, *de automatis* 20.1 (τῶν ὑπὸ Φίλωνος τοῦ Βυζαντίου ἀναγεγραμμένων); Eutocius, *Commentaries on [Archimedes'] de sphaera et cylindro* 60.28 (Ὡς Φίλων ὁ Βυζάντιος). (See Garlan 284.) Both of these allusions are to other parts of Ph.'s output, but the identification is certain.

7 See also, for Babylon and 'bitumen' (Vitruvius 1.5.8), B53.5 [90.18] with Comm.

8 Vitruvius does not make the same mistake, but does twice (in chaps.12 and 17 of the Preface to his Book 7) refer to the individual with whom Athenaeus's 'Philo of Athens' should be identified: the architect and writer Philon Exekestidou of Eleusis, second half of the fourth century (OCD Philon(1)); so e.g. Garlan 284; Whitehead and Blyth, *Athenaeus* 108–109. The correction of Athenaeus's slip here was attributed by Whitehead and Blyth to R. Schneider, *Griechische Poliorketiker mit den handschriftlichen Bildern herausgegeben und übersetzt, III: Athenaios, Über Maschinen (Abhandlungen der Königlich-Preussischen Akademie der Wissenschaften zu Göttingen, philologisch-historische Klasse, Neue Folge 12 no.5: Berlin 1912) 59–60; however, see already Graux 99.*

9 See generally W.A. Oldfather et al., *Aeneas Tacticus – Asclepiodotus – Onasander: with an English translation by members of the Illinois Greek Club* (Cambridge Mass. & London [Loeb Classical Library] 1923) 341–527; C.J. Smith, 'Onasander on how to be a general', in M. Austin et al. (ed.), *Modus Operandi: essays in honour of Geoffrey Rickman* (London 1998) 151–166; C. Petrocelli, *Onasandro, Il Generale* (Bari 2008).

40–42, have his general *prosecute* a siege, and it is in those sections above all that we find him saying much what Ph. (particularly in part D) had said.¹⁰

In a much later age, Ph.’s treatise, together with others of its kind, exerted a discernible influence upon middle-Byzantine siege-writing.¹¹ I mention here three prime manifestations of this.

One is the text formerly known as the anonymous *Περὶ στρατηγικῆς* (*De re strategica*) and dated to the sixth century CE; it is nowadays regarded as one of three parts of the *Military Compendium* by Syrianus Magister, and placed in the ninth or even tenth century.¹² Though Syrianus never mentions Ph. by name – because, like Onasander, it is not his habit to name sources at all – there are some echoes of Ph. in the sections entitled ‘How one should found a city’ (12) and ‘How one should make preparations against the machines of the besiegers’ (13). They will be noted in the Commentary where they arise. So too will the occasional echoes (probable or possible) of Ph. in the treatise *Ὅπως χρῆ τὸν τῆς πολιορκουμένης πόλεως στρατηγὸν πρὸς τὴν πολιορκίαν ἀντιτάττεσθαι καὶ οἷσις ἐπιτηδεύμασι ταύτην ἀποκρούεσθαι* (*How the general of a city under siege should withstand the siege and with what sort of methods to repel this*), better and more conveniently known as the *De obsidione toleranda*, compiled apparently in the first half of the tenth century CE.¹³

Ph.’s treatise was also (and more extensively) quarried by his purported fellow-citizen “Heron of Byzantium” – actually another anonymous writer of the tenth century CE. Assigned the title *Parangelmata Poliorketika* (*Siege-warfare Instructions*) by its editor Rudolf Schneider,¹⁴ the work is most easily accessible nowadays in a painstaking re-edition by the American Byzantinist Denis Sullivan.¹⁵ The exemplary list of *μηχανικοί* who are this Byzantine writer’s sources (197.7–

10 See the Commentary to D4 under *εἰ δὲ μή*, D6 under *πρῶτον*, D9 under *ἐπιτηρύξας*, D10 under *ἐπαλξίν*, D13 under *καὶ τὸν μὲν δοῦλον*, D16 under *Τοὺς δ’ ἀχρείους*, D18 under *Μὴ φανερός*, D20 under *Αὐτός*, D26 under *ποιού*, D27 under *Καὶ θόρυβον*, D68 under *παρακάλει*, D70 under *Ἀλισκομένης*. Otherwise, consult the Index of Passages Cited s. v.

11 For a survey of the miscellany of works which fall under this head see D. F. Sullivan, ‘Byzantine military manuals: prescriptions, practice and pedagogy’, in P. Stephenson (ed.), *The Byzantine World* (London & New York 2010) 149–161.

12 P. Rance, ‘The date of the military compendium of Syrianus Magister’, *BZ* 100 (2007) 701–737, with lavish bibliography and discussion (cf. in brief D. Whitehead (ed.), *Apollodorus Mechanicus: Siege-Matters* (*Historia Einzelschriften* 216: Stuttgart 2010) 18 n.7); I. Eramo, ‘Sul compendio militare di Siriano Magister’, *RSA* 41 (2011) 201–222.

13 H. van den Berg, *Anonymus de obsidione toleranda* (Leiden 1947); D. F. Sullivan, ‘A Byzantine instructional manual on siege defense: the *de obsidione toleranda*. Introduction, English translation and annotations’, in J. W. Nesbitt (ed.), *Byzantine Authors, Literary Activities and Preoccupations: texts and translations dedicated to the memory of Nicolas Oikonomides* (Leiden 2003) 139–266 (including a reprint of van den Berg’s text).

14 R. Schneider, *Griechische Poliorketiker mit den handschriftlichen Bildern herausgegeben und übersetzt, II: Anweisen zur Belagerungskunst* (*Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen, philologisch-historische Klasse, neue Folge* 11 no.1: Berlin 1908 [1909]).

15 D. F. Sullivan, *Siegecraft: two tenth-century instructional manuals by “Heron of Byzantium”* (*Dumbarton Oaks Studies* 36: Washington DC 2000). Analogously to what Diels-Schramm did

198.7 Wescher¹⁶ = 1.8–18 Sullivan) does not, as transmitted, include the name of Ph., but editors have posited a lacuna in which, after the mention of Apollodorus, Athenaeus and Biton, it could well have featured. For Ph.’s name does occur, twice: as ‘Philo of Athens’ (reproducing Athenaeus’s slip: see above) in 212.11–12 = 12.1–2, at the start of a section (212.11–214.3 = 12.1–25) where the writer presents ideas, drawn from Ph., on opportunistic besieging tactics (D2–4 [96.28–37], D73 [102.12–19]); and as ‘Philo of Byzantium’ at 260.5 = 48.1, which introduces Ph.’s D11 [97.30–34] (filler tortoises with “rafts”) and D74–75 [102.19–27] (wall-climbing techniques). In other places, too, it is either certain or probable that our Ph. is the source of unattributed material here. See, principally:

203.2–4 (= 3.43–46), *re* B31 [88.25–31] and B40 [89.8–10];

204.8–18 (= 4.4–15), *re* (D6 [96.42–49]), D9 [97.9–19], D18 [98.13–17] and D26–27 [98.45–99.3];

207.12–16 (= 8.1–5), *re* D36–37 [99.29–37];

209.3–212.10 (= 11.1–29), *re* A76 [85.22–29], D10 [97.19–30], D30 [99.11–13], D32 [99.18–19], D39 [99.41–44] and D43–44 [100.2–11];

259.1–13 (47.1–14), *re* D11 [97.30–34] and D35 [99.26–28];

261.3–10 (= 49.1–9), *re* C65 [95.39–44] and A79 [85.35–39];

276.15–17 (= 58.8–10), *re* D111 [104.40–42].

Appendix 3 presents these nine *Par.Pol.* passages.

(B) THE WORK AND ITS AUTHOR¹⁷

As will already be evident, the ‘work’ of Ph. which is my concern here formed part of a larger whole. At *Bel.* 56.13 he uses a phrase which, when capitalized, has been regarded as its overall title: *Mêchanikê Syntaxis* (Μηχανικὴ Σύνταξις), *Engineering Compendium*. In that same sentence he refers back to its *Introduction* (Εἰσαγωγή), and elsewhere in *Bel.* two other, substantive components are mentioned, as neuter plurals: *Mochlika* (Μοχλικά), *Matters of Leverage*, in 59.18–19 and 61.21–22; *Limenopoiika* (Λιμενοποιικά), *Harbour-construction*, at the very start of *Bel.* in 49.1–3, with the implication that it is the topic immediately preceding *Bel.* itself. Thus, the scholarly consensus is, we see Ph.’s first four volumes in order of appearance; three lost ones and the surviving *Bel.*¹⁸ Thereafter the element of conjecture

with Ph., Sullivan divides the *Par.Pol.* into 58 short chapters, each with their own line-numbers, and adds Wescher page numbers (unaltered by Schneider) in the margin. I cite by both systems.

16 See the asterisked footnote in Conventions and Abbreviations.

17 A recent encapsulation, brief but expert, of what follows here is P. Rance, ‘Philo of Byzantium’, in R. S. Bagnall et al. (ed.), *The [Wiley-Blackwell] Encyclopedia of Ancient History* (Malden MA 2013) 5266–5268 (and on line).

18 Besides the annotated translation of *Bel.* in Marsden, *Treatises* 105–184, see J. G. Devoto, *Philon and Heron: artillery and siegecraft in antiquity* (Chicago 1996) 4–94; and latterly M. J. Schiefsky, ‘Technê and method in ancient artillery construction: the *Belopoeica* of Philo of Byzantium’, in B. Holmes and K.-D. Fischer (ed.), *The Frontiers of Ancient Science* (Berlin 2015) 613–651.

increases apace,¹⁹ but conventionally placed next is a *Pneumatika* (on devices operated by heated air or fluids), which survives only in a heavily-interpolated Arabic version and a partial Latin translation of another,²⁰ and then an *Automatopoika* on the manufacture of mechanical toys and other amusements.

It is after these two lost treatises that Ph.'s recommendations for siege-warfare are nowadays routinely located. Once regarded as a single piece of writing – a position also taken by Garlan – in four parts first discerned by Rochas d'Aiglun (I–IV, followed by Schoene and Lawrence; A–D in Diels-Schramm, followed by everyone else, including me), it is more usually conceived as two halves: an initial *Paraskeuastika*, I–II/A–B, and a subsequent *Poliorketika*, III–IV/C–D. (Ph. himself appears to use the first of these titles, retrospectively, at D92.2 [103.33]. The second has no basis in the text but is simply a common-sense description of the topics covered.) Whatever view is taken of the internal organisation and description of this siege-related matter, however, the points of substantive importance are two. One is that Ph. begins (in A–C) by adopting the standpoint of the besieged community, before (in D) reversing the perspective to that of their assailants.²¹ And the other is that what we can read of Ph.'s recommendations nowadays, under both heads, is a significant diminution of what he himself wrote. Diels and Schramm entitled it *Exzerpte aus Philons Mechanik B.VII und VIII*, and others have followed them. To my mind the term is (or at any rate might be) ambiguous, implying that selected matter has been transmitted in its full and original form – something which seems highly unlikely to be so. Rather, the impression left on the modern reader is that of a severe, even brutal, epitome or précis overall, with numerous lacunae along the way.²²

After the poliorketic coverage, in any event, there may have been a further volume of the *Syntaxis* (forecast in D82.2–4 [102.48–50]) devoted to cryptography, and other stratagems either included with it or treated separately.

Who then was the author of this compendious product?

Whether 'of Byzantium' by birth or by naturalization, Ph. cannot be safely identified with any other bearer of his commonplace name, so the meagre set of

19 I have nothing to add to the long-standing controversies in this area, which are well documented and summarized by Garlan 282–283 (and already in his 'Cités, armées et stratégie à l'époque hellénistique d'après l'oeuvre de Philon de Byzance', *Historia* 22 (1973) 16–33, at 16–18).

20 See F.D. Prager, *Philo of Byzantium, Pneumatica: the first treatise on experimental physics, western version and eastern version* (Wiesbaden 1974), whose translations I rely on here. I have not consulted the earlier editions by W. Schmidt (Leipzig 1899, part of his *Heronis Alexandrini opera*) and B. Carra de Vaux (Paris 1902).

21 Compare (but in reverse) book 3, on sieges, of Frontinus's *Stratagems*: sections 1–11 illustrate possible ploys for the attacking side, sections 12–18 do the same for defenders.

22 In this regard Garlan 286 notes, as have others, the sharp stylistic contrast between *Bel.* and the present material, with the latter frequently exhibiting an excessive degree of concision and/or confusing transitions. Garlan postulates, surely rightly, an editor/epitomizer of the early Byzantine period, perhaps the reign of Justinian; cf. W.M. Murray, *Age of Titans* 287 with n.14. (Contrast the fate of Apollodorus (Mechanicus) of Damascus, whose *Poliorketika* underwent not diminution but extensive enlargement in late antiquity; see generally Whitehead, *Apollodorus.*)

facts (and assumptions) about him are all drawn from the *Syntaxis* itself, and particularly from the *Belopoiika*. At *Bel.* 51.15–23 he undertakes to recount what he has discovered by associating with *technitai* in Alexandria and *architektones* in Rhodes. Thereafter the name most frequently mentioned is that of Ctesibius (of Alexandria): 56.22–23, 67.43–45, 72.36–43, 77.15–17, 77.46–78.2. A phrase which occurs in the second of these passages, Κτησίβιον τὸν ἐν Ἀλεξανδρείᾳ γεγονότα (67.44–45), has given rise to an orthodoxy that he was no longer alive at the time when Ph. was writing,²³ but unwarrantably so in my opinion; the perfect participle γεγονότα, taken to show this, need mean only that Ctesibius had been born in Alexandria. (Compare e.g. *Andoc.* 1.127, ἐκ Χρυσίλλης γεγονότα, used of a living son of Callias.) It is not even certain that Ph. had encountered Ctesibius in person.²⁴ Nevertheless he seems to be a figure of the recent past. Consequently, since Ctesibius's *floruit* is nowadays placed in the second quarter of the third century, under the reign of Ptolemy II Philadelphus,²⁵ I find no call to question the modern orthodoxy which places Ph. himself in the second half of that century. Further precision than that seems out of reach.²⁶

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Ph.'s *Syntaxis* was written 'in the manner now familiar to us from Archimedes and Apollonius of Perge, that of the literary epistle, with the difference that the books were apparently wholly composed in the epistolary form, and not simply the introduction. They were all addressed to a certain Ariston'.²⁷ This generalization does appear to be sound, given the formulaic phrase 'Philon to Ariston, greetings', Φίλων Ἀρίστωνι χαίρειν, which opens both the *Belopoiika* (49.1) and, albeit garbled in the Arabic and Latin, the *Pneumatika*;²⁸ and it has been routinely supplied at the start of the poliorcetic material also, despite there being no express manuscript authority for this.

But who was Ariston? As with the name of the writer himself, identification is thwarted by the sheer number of its attested bearers. Of the ones proposed, arguably the most plausible is the one proffered by Lawrence, who cites Diodorus Siculus

23 Already in Graux 91; see also e.g. P.M. Fraser, *Ptolemaic Alexandria* (Oxford 1972) 2.623 n.446.

24 Fraser, *Alexandria* loc.cit. is insistent that Ph.'s allusion to Ctesibius's water-organ in *Bel.* 77.46–78.2 proves personal acquaintance, given that the device was 'described to him by Ctesibius'. However, Marsden (*Treatises* 153) translates the relevant phrase, ἐπεδείκνυτο δὲ ἡμῖν ὁ Κτησίβιος παραδεικνύων τήν τε τοῦ ἀέρος φύσιν κτλ (77.46–48), as 'Ctesibius, it was explained to us, demonstrated the natural property of air etc.'. Roundly to declare Ph. a 'Schüler des Ktesibios' (Orinsky et al., 'Philon' 53; cf. Fraser, *Alexandria* 1.432, 434) is too bold.

25 So e.g. A.G. Drachmann, *Ktesibios, Philon and Heron: a study in ancient pneumatics* (Copenhagen 1948) 1 ff.; Marsden, *Treatises* 6–9; Fraser, *Alexandria* 1.428 (and 2.622–623 n.445); T. Rihll, *The Catapult: a history* (Yardley PA 2007) 140–147.

26 It is customary, nowadays, to assign Ph. a date of c.200, though Lawrence 71 has tried to place him in the 240s on the basis that he was prompted to write by the campaigns of Ptolemy III Euergetes, in the second half of that decade, which resulted in the conquest of Phoenicia and much of Syria.

27 Fraser, *Alexandria* 1.428–9.

28 On the dedication in the latter work see Prager, *Pneumatica* 46–48; the form of the name he prints (from the Arabic version) is Muristom.

3.42.1 for ‘that Ariston who was despatched by Ptolemy [‘almost certainly Ptolemy II’: Lawrence] to investigate the coast of Arabia as far as the ocean’.²⁹ Lucianic agnosticism, though, looks like the sounder position.³⁰

As regards a generic characterization: in view of the wide range of topics and disciplines covered by the *Syntaxis* as a whole, to envisage Ariston as a practical military man (whether as a commander of troops or on the engineering side)³¹ seems to me less compelling than the picture conjured up by the opening of *Pneumatika*, that of an “armchair” theoretician and experimenter. ‘Your interest in ingenious devices has been known to me. You say and urge that you want a book about them. I wrote it and send it gladly. May it be an aid to your studies of all these devices. Indeed such matters are worth the attention of learned men’.³²

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With no extrinsic information or insight able to be generated through identifying either the writer or his dedicatee, one is driven back to what is either stated in or can legitimately be deduced from Ph.’s text itself, when set in the general chronological and cultural context of Fraser’s ‘Ptolemaic Alexandria’, even if that does not imply or necessitate his fixed domicile (and permanent writing base) there. The recollection in *Bel.* 51.19–23 of time spent in Rhodes (see above) is twice echoed by allusions to that city – which in themselves imply, without expressly claiming, autopsy – in this poliorcetic material: A17–18 [80.45–51], A59 [84.5–8].³³ Alexandria itself is not mentioned again here, though a passing allusion to Egyptians and their wall-climbing methods is (D75 [102.23–27]).³⁴ References to (?)Ake and Babylon (B53 [90.14–24]), for natural products occurring there, might suggest personal acquaintance with either or both of those places, though of course they do not have to.³⁵ All

29 Lawrence 73 (anticipated, in fact, by a comment *obiter* in Rochas d’Aiglun). An older alternative, less attractive because it belongs in a purely Sicilian context (Ariston Onasou, a general at Tauromenium in the late third century), is mentioned and discounted by Garlan 285 (where ‘CIG’ XIV 421 should read IG).

30 ‘Lucianic’ because of the exchange between Lexiphanes and Lycinus in *Lexiphanes* 1: when the former announces that he has written a *Symposium* as a challenge to ‘the son of Ariston’, the latter replies ‘there are many Aristons’ (Πολλοὶ μὲν οἱ Ἀρίστωνες). Lacking the clue which nevertheless allows Lycinus to identify his friend’s Ariston as the father of Plato, students of Ph. cite the passage purely for wit’s sake: Graux 94; Fraser, *Alexandria* 2.620 n.427; Garlan 285 (and already in ‘Cités’ 19).

31 So e.g. F. Haase, ‘Philon’, in J. S. Ersch and J. G. Gruber (ed.), *Allgemeine Encyclopädie der Wissenschaften und Künste* 23 (1847) 428–435, at 429 n.13; Garlan 284–285; W. M. Murray, *Age of Titans* 129.

32 Prager’s translation (*Pneumatica* 127).

33 On Rhodes in Ph.’s time see generally R. M. Berthold, *Rhodes in the Hellenistic Age* (Ithaca NY & London 1984); V. Gabrielsen, *The Naval Aristocracy of Hellenistic Rhodes* (Aarhus 1997); H.-U. Wiemer, *Rhodische Traditionen in der hellenistischen Historiographie* (Frankfurt 2001).

34 Note also the casual references to Egyptian artefacts in the *Pneumatika* (2, 6, 16, 60).

35 Another toponym, Megalopolis, might occur in A44.3–4 [83.8–9], but only if one can endorse the long and (in my opinion) dubious Diels-Schramm supplement for the lacuna there. See the Comm. thereto.

in all, the siege warfare toward which Ph. directs his recommendations probably needs to be visualized as taking place in what Lawrence calls ‘the border-land for which the Ptolemies and Seleucids contended, over more than a century of alternate open war and uneasy peace’: in broad terms, Palestine, Phoenicia and Syria.³⁶

Whether Ph. was drawing on personal experience of such warfare is another matter. Readers of Aeneas Tacticus, his predecessor in the field, receive the distinct impression that *he* has suffered the travails of being under siege himself, in the sort of mid-fourth-century polis he is writing about (and for); perhaps that he has himself occupied a position of military authority and responsibility in such a place. By contrast one cannot feel at all certain that Ph. had ever had first-hand experience of what it was like to be under (or subject to) siege; nor that he was any kind of *vir militaris* in a practical, hands-on sense.³⁷

Such indications as there are, indeed, positively suggest that he was not. Some of these are to be found in the *Belopoiika*, where one recent study comments, for example, that ‘Philon’s personal inexperience of catapult construction and use is evident in his reliance on other people’s testimony when he gives his recommendations for the dimensions of the springs and arms of a palintone’.³⁸ In that highly technical field Ph. was a dilettante, someone absorbing a given subject via lectures and/or written treatises (by Ctesibius and others, in that instance); and what is true of artillery is likely to be true also of the wider range of topics covered in the poliorcetic material. To put the point bluntly: a civilian’s life spent in Byzantium, Rhodes and, especially, Alexandria will not have required Ph. to build a city’s fortifications (part A), arrange its food supply (part B), protect it from military attack (part C) or successfully prosecute such an assault (part D). And conversely, it is from the author of the *Pneumatica* that we are unsurprised to see a fanciful suggestion for ladders, too, activated by inflation (D73 [102.12–19]).

Of course, characterising Ph. as more of a theoretician than a practician of Hellenistic siege-warfare opens up possible avenues of its own into the intellectual content of his writings and the intellectual influences upon them. Heinrich von Staden has drawn attention to several facets of interplay between Ph. and the works of his contemporary Andreas of Karystos, court doctor to Ptolemy IV Philopator, besides noting that the vocabulary of Ph.’s detailed recommendations on nutrition in the besieged city (part B) is heavily indebted – probably via Andreas and his own teacher Herophilus – to Hippocratic treatises on the subject.³⁹

36 Lawrence 70–71 (quotation from 70). A modern analytical narrative corresponding to this terrain is J. D. Grainger, *The Syrian Wars* (Mnemosyne Supplements 320: Leiden 2010). On the negative significance – in directing our gaze away from Balkan and Aegean Greece – of Ph.’s assumption that date-palms are likely to be available in his city (B1.7 [86.27], B48.5 [89.42], B52.7 [90.14], C3.2–3 [91.4–5], D10.6 [97.24] and D17.5 [98.8]), see the Comm. to B1 **πρὸς δὲ τοὺς φοινικικοὺς ἄρτους**.

37 On Aineias in this regard see already Whitehead, *Aineias* 34 (citing earlier assessments in the same vein). I did not compare Aineias with Ph. at that time, but doing so now leads me to dissent from (e.g.) W. M. Murray, *Age of Titans* 284 n.3, who writes of ‘military men like Aeneas and Philo’.

38 Rihll, *Catapult* 163.

39 H. von Staden, ‘Andréas de Caryste et Philon de Byzance: médecine et mécanique à Alexandrie’. in G. Argoud and J.-Y. Guillaumin (ed.), *Sciences exactes et sciences appliquées à Alexandrie*

At more mundane levels Ph.'s reliance on pre-existing material is harder to fathom, beyond the fact (noted already) that he knew and used Aeneas; but what Ph. demonstrates even so is that it was possible to follow in Aeneas's literary footsteps without conveying much sense of real-life conflict.⁴⁰

(C) STYLE, TONE AND TERMINOLOGY

For the purposes of this section it is particularly important to keep in mind that comment on what 'Ph.' does or does not do – in the poliorcetic material – can mean no more than what we find in this transmitted epitome.

'[W]ritten in the most vivid style ... even more vivid than that of Aeneas Tacticus'. Peter Fraser's response to Ph.⁴¹ strikes me as an unduly warm one, rather unlikely to be shared by most modern readers. The contrast with Aeneas, to the latter's disadvantage, is particularly puzzling on several counts, including the (apparent) fact that Ph. chose not to do⁴² one crucial thing that Aeneas had so successfully done: to lighten what could otherwise have been a dead weight of didacticism, positive and negative, with specific historical instances, i.e. illustrating where the course of action in question had been either adopted with good results or ignored with bad.⁴³ If Ph.'s original had, in reality, included historical material of this kind, the summarizer has done us a signal disservice by jettisoning it. In any event, and setting aside any further stylistic comparisons with Aeneas, the fact of the matter with Ph. is that, whatever else he is, he is (in this work) no paragon of Greek prose style. Rather, he says what he has to say in a businesslike manner: plain, often inelegant, and, especially for readers of large stretches of him at a time, repetitive – so much so, indeed, that most translators have felt impelled to introduce some degree of the syntactical variety that he himself, it seems, abjured.

His very opening sentence, it turns out, is a typical one (A1 [79.1–7]): Πρῶτον μὲν δεῖ τοὺς οἰκοδομοῦντας πύργους <καὶ τεῖχη> ὀρύξαντας μέχρι πέτρας ἢ ὕδατος ἢ τινος ἐδάφους ἀσφαλῶς τοῦτον ἀποστερεώσαντας τὸν τόπον ὡς μάλιστα τιθέναι τοὺς θεμελίους ἐν γύψῳ, ἵνα μὴ ἔνδον τῶν θεμελίων οἱ τοῖχοι ῥηγνύωνται μηδ' ὑπορύττηται τὰ τεῖχη. Here at the outset are the twin building-blocks of his mode of presentation: (a) the instruction itself and (b) the purpose (or result) of following it.

Element a is here conveyed by a δεῖ clause, and there will be 59 more instances of this. It is Ph.'s favourite didactic idiom (in this work: *Bel.*, a slightly longer one,

(Actes du colloque international de Sainte-Étienne, 6–8 juin 1996). Publications de l'Université de Sainte-Étienne (Sainte-Étienne 1998) 147–172; Hippocrates point at 166 (with table II) there.

40 Aeneas, for instance, is never guilty of the sort of near-banalities that Ph. lapses into (unless a summarizer is to blame?) at D58 [100.50–101.2].

41 Fraser, *Alexandria* 1.433.

42 Except in transitory passing at A17.1–2 [80.45–46] and A59.4 [84.8] (Rhodes), and D75.5 [102.27] (Egyptians).

43 See in brief Whitehead, *Aineias* 8; at length M. Pretzler, 'Aineias the historian', in M. Pretzler and N. Barley (ed.), *Brill's Companion to Aineias Tacticus* (Leiden & Boston 2016) chap. 4.