

**David Whitehead, *Philo Mechanicus: on sieges, translated with introduction and commentary*.** (Stuttgart, Franz Steiner Verlag, 2016). Pp. 510. €84. ISBN 9783515113434.

This is an excellent volume. Whitehead provides the Greek text (basically the same as that of Garlan<sup>1</sup>) with the first complete English translation (pp. 63–131) of two treatises, the *Paraskeuastika* (*Preparations*) and *Poliorketika* (*Siege Matters*), parts of Philo of Byzantium's (fl. ca. 250-200 BCE) *Μηχανικὴ Σύνταξις* (*Engineering Compendium*). Organizationally the two texts are best seen in four parts: fortifications, provisioning and preparation, defensive operations, and offensive operations, with the first three taking the perspective of the besieged, the last of the besiegers. Notably the text has suffered from what Whitehead characterizes as “a severe, even brutal, epitome or précis overall, with numerous lacunae” (p. 21), wisely leading to a translation which he describes as “purely functional,” refusing to turn a sow's ear into a silk purse. The text-translation is preceded by an introduction (pp. 15–64) examining issues of author, style, genre, terminology, and also providing an analysis of Philo's presentation of the besieged community articulated by comparison with the community described by Philo's 4th-century predecessor Aeneas Tacticus. Whether original to Philo or the work of the epitomizer, the text, unlike that of Aeneas, provides virtually no historical examples to illustrate the instructions, leaving a heavily didactic product. A highly detailed line commentary elucidates the text-translation (pp. 133–403), followed by five appendices, a gazetteer, bibliography, an index of passages cited, select Greek index, and a general index.

Philo's “city under siege” is the polis of the Hellenistic eastern Mediterranean, “an urban center, inside a circuit wall” (p. 35), most often associated with proximity to the sea. Unlike Aeneas who assumes circuit walls, Philo provides detailed models of fortification design for curtains, towers and gates and Whitehead's exemplary commentary on this material brings to bear archaeological as well as philological evidence to overcome “the sheer fact that it is often hard, sometimes downright impossible, to determine exactly what he means” (p. 134). The defensive forces within the city are referred to as citizens, soldiers (mercenaries), metics and slaves, and, if the enemy has entered the town, children, slave women, (free) women and girls are to play a role (p. 42). His recommendations for provisioning the population consist of stockpiling grain and foodstuffs in purpose-made granaries and rationing it intelligently and sparingly, admittedly obvious recommendations and perhaps also drawing in part on Aeneas Tacticus (p. 220).

Philo has considerably more on military hardware issues than Aeneas, but noting improvements in artillery with corresponding responses in fortifications from the 4th to the 3rd century, Whitehead finds little sign in Philo's text that the balance between offense and defense had shifted since Aeneas' time (pp. 52ff.). The author also notes

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<sup>1</sup> Y. Garlan, *Recherches de poliorcétique grecque* (Paris 1974).

that Philo like Aeneas is concerned with the potential for fomenting stasis within the besieged city, an area where he sees Philo as “fully attuned to the mind-games of siege warfare” (p. 56), but this is now less a product of ideological differences of democracy vs. oligarchy than a matter of competition for power and to some extent allegiance to Hellenistic kings.

The approach taken in the commentary is best illustrated by a series of examples. In the section on fortifications Philo presents a discussion of extra-mural artillery emplacements that involve “ground and underground” (ὑπόγειοι) sites, protection of the operators, and ability to lower the aim of fire if the enemy comes close. In commenting Whitehead draws on Garlan’s citation of the parallel of Archimedes’ placement of defensive artillery “under” the walls of Syracuse (an interpretation dependent on the interpretation of the phrase ὑπὸ τοῦ τείχους in Plutarch *Marc.* 16.2), cites Graux, Schoene, Diels-Schramm, Garlan and Lawrence on textual problems regarding ground excavation issues, suggests that the underground siting may be an innovation in that it is explained in some detail (“with a view to having plenty of space and ensuring that the operatives are not wounded and, out of sight themselves, wound their opponents”), and in asking how far underground, cites Lawrence’s solution of far enough to “fire at ground level at approaching enemy.” Regarding use of the term καταστρέφειν, presumably of the ability of the operators to lower the aim of their weapon, he cites with disagreement the translations of Rochas d’Aiglun and Diels-Schramm and with agreement those of Graux, Garlan, Lawrence, Marsden, and Campbell.

In the section on provisioning Philo includes a discussion (B10) of “elevated” granaries coated in olive-pressing fluid with windows, ventilation-holes, nets to keep out birds and animals, and use of vinegar to prevent rot. Whitehead notes that the term translated “elevated” (ὑπερώϊος) is problematic, agreeing with Diels-Schramm and Garlan that it should be classified as an adjective here and is intended to contrast these granaries with the sunken pits mentioned earlier. He cites Rickman on archaeological remains of Roman granaries in Britain elevated on posts, notes the existence of Bronze Age examples, but particularly focuses on five granaries on the acropolis of Pergamum, dated “between 280 and the (?)150s” “on stone foundations with wooden floors.” He cites the *Geoponica* (2.27.7) for olive-pressing fluid as a preservative in granaries and again Rickman on “ventilators in archaeologically-attested granaries.”

In the section on defensive operations (C3–6) Philo provides a discussion on protection against rock-projectors (πετροβόλοι) that includes hanging date-palm planks (their joints covered with additional padding, the ropes from which they are hung protected by screens) or hanging woven nets filled with seaweed, and also providing two rock projectors to return enemy fire. In his commentary Whitehead disagrees with Campbell’s translation “covers made from palm-leaves” based on the term (σανίδες) which must refer to “planks,” while agreeing with those of Diels-Schramm, Garlan and Rihll. On the use of padding he notes the parallels in Aeneas

Tacticus (32.3), defends Wessling's emendation (φύκους ["sea-weed"] for the manuscript's φυλάκους) and notes the use of stitched hides and skins filled with sea-weed by the Tyrians in defending against Alexander's siege (Diodorus Siculus 17.45.4), suggesting that the fame of that siege may have given rise to use of sea-weed rather than chaff or wool found in other similar contexts.

In the section on offensive operations Philo (D2–4) describes techniques for taking the enemy by surprise. He recommends attacking when a festival is being celebrated outside the city or at harvest or vintage time. Alternatives are to attack by night, during a storm or when the enemy inside is drunk from celebrating a festival, using ladders to seize towers. Whitehead, citing relevant scholarship, notes the piety of previous centuries in which scruples might act as a check on attacks during religious observances, while acknowledging that violations did occur. He likewise notes similar advice regarding attacks during the harvest in Aeneas Tacticus as well as 5th century BCE examples and plausibly argues against Diels–Schramm that χειμών here should be translated “storm” as opposed to “Winterszeit” on the grounds that Philo did not intend to preclude surprise attacks in summer. He also cites Polybius (8.37) on the Roman capture of Syracuse in 212 BCE by ladders when the inhabitants were celebrating a festival of Artemis with copious wine consumption. The annotations here also discuss a number of textual problems.

Whitehead's work shows exceptional attention to detail, a deep knowledge of the related literature, nicely contextualizes Philo's recommendations with both technical and historical parallels, and makes this difficult text wonderfully accessible.

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