

While on the whole informative and useful, the introduction and to some extent the commentary are dominated by comparison with Aeneas Tacticus, whose fourth-century treatise was edited and translated by Whitehead as *How to Survive Under Siege* (Bristol 2001, 2nd edition) and whose prose he finds livelier and more interesting than Philo's over-technical and dry style (25). Whitehead also assesses Philo on the basis of his originality and his direct experience of the military matters he writes about. In his view, *On Sieges* uses Aeneas Tacticus as a source (25). These issues would make for interesting debate; originality and direct experience could have been usefully discussed in the context of a fuller analysis of Philo's own work on its own terms, both in relation to his other extant texts and against the general background of Hellenistic literature. Greater contextualization might have allowed deeper exploration of issues of readership and rhetorical strategies, and complicated the simple distinction between being a 'dilettante' and having 'actual experience' (24). Philo's citing practice also needs to be examined further: why not refer to Aeneas, if he was drawing so extensively on him, when elsewhere in his work he does not hesitate to mention other engineers?

Perhaps, as Whitehead explains, the intervention of an epitomizer in the Greek text of *On Sieges* drastically limits the possibilities of further textual analysis (25, 60). The sorry state of the text is exacerbated both by the use of terms whose precise meaning eludes us and by the presence of different words for what one suspects is often actually the same thing. Whitehead's efforts to make the text make sense are at times nothing short of heroic. In his commentary he extensively assesses interpretations given by previous scholars and provides reasons for his choice of text, when emendations or additions seem necessary, and translation. The commentary is, however, not exclusively philological; Whitehead deftly marshals archaeological and epigraphical resources as well, in order to give the reader a sense of what the material world of fortifications was like, along with the social realities of paying for, building, maintaining and repairing wall circuits in towns around the Greek Mediterranean in the Hellenistic period. Disappointingly, there are no illustrations; there are, however, five appendixes.

The opening of *On Sieges* is missing. Whitehead, however, accepts the reconstruction, based on other extant treatises, of a dedication to Ariston, an addressee about whom nothing much is

known (22–3, 67, 135). The treatise contains advice on fortifications, provisioning and preparation, and defensive and offensive measures. Philo launches straight into instructions for building walls around a city. There is particular emphasis on the shape of towers, including a discussion about which polygonal shape offers the best protection against external projectiles and the strongest advantage when discharging counter-fire. The perspective here is mostly that of the besieged, until Philo switches to the point of view of the attacker later in the text. The context is one where different types of catapult and other siege engines and techniques (digging under walls, for instance) are in common use.

Philo provides some specifications for the breadth of walls and their distance from the houses of the city, which reflects his practice in, for instance, his book on constructing catapults. There is mention of specific materials, particular places (for example, Rhodes, which, from his *Belopoietica*, we know to have been somewhere he spent some time and practised his profession) and other engineers, all consistent with Philo's practice in other texts. He mentions cost – also noted in his other treatise as a consideration when building catapults – and indirectly provides a representation (self-representation) of the role of the *mēchanopoiōs* as simultaneously a social, political and epistemic expert.

Overall, Philo's technology is tailored to human-led military strategy, including elements of what we would call psychological warfare and how to deploy the help of non-combatants in case of necessity, and also to specifically human needs, including the storage and sourcing of food in the event of sieges. Hopefully, Whitehead's open-ended contribution will encourage readers to use the text as a starting point for further enquiries into the Hellenistic face of war.

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CORDOVANA (O.D.) and CHIAI (G.F.) (eds)
Pollution and the Environment in Ancient Life and Thought (Alte Geschichte, Geographica Historica Band 36). Stuttgart: Franz Steiner Verlag, 2017. Pp. 296. €54. 9783515116671.

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Stemming from a 2014 conference in Berlin, this collection of essays seeks to interrogate 'the historical process, which has led *homo sapiens* in

his path toward the Anthropocene Era' (11). Guiding questions include whether there was any awareness of environmental issues in antiquity and how widely such awareness may have been disseminated, queries to which J. Donald Hughes (*The Environmental Problems of the Greeks and Romans: Ecology in the Ancient Mediterranean*, Baltimore 2014) frequently recalls his readers, and which are here fore-fronted as a unifying arc. The answer, of course, is that ecological consciousness in antiquity was broad, forming the locus of ongoing debates, despite scattered evidence that is often difficult to interpret.

Thirteen scholars explore questions of pollution and 'ecological' awareness in the ancient Mediterranean world from a variety of interdisciplinary perspectives. The volume includes an introduction plus 13 chapters arranged in four unequal parts that focus on legal questions, literary and epigraphic sources, environmental diseases and material evidence. A six-part index (ancient sources, coins, papyri, ancient personal names, places and geographical names, general names) is appended. A master bibliography, in lieu of discrete chapter bibliographies, would have been desirable.

The volume benefits from vigorous editorial helmsmanship. The chapters are solid, engagingly written and well documented, adhering closely to primary sources, contemporary scholarship and rational exegesis. There is some inevitable overlap, internal cross-references are lacking and some chapters are more accessible to the non-expert than others: three chapters are in Italian and thus beyond the scope of many Anglophone readers; Luigi Capogrossi Colognesi's 'Roman rural landscape and legal rules' (a useful summary of public versus private interests in the Roman legal code, especially regarding private sewers) cites primary evidence only in Latin.

Six chapters consider literary and epigraphic evidence; I shall comment on a selection. Christina Simonetti's 'Uno e gestione delle acque in Mesopotamia nel secondo millennio a.C.' is a capable investigation of water regulation in arid Mesopotamia. Cinzia Bearzot's thoughtfully nuanced 'Ancient ecology: problems of terminology' teases out the distinctive terminology employed for describing environmental (im)balance, the characteristics of natural resources and human environmental intervention (polluting/repairing nature). Chiai's 'Rivers and waters protection in the ancient world' marshals together a compelling body of inscriptional evidence to show that the divine wrath of the gods

is invoked for the sake of protecting spaces from physical (and ritual) pollution, in sanctuaries as well as in public and private areas, including burial plots. Cordovana's 'Pliny the Elder and ancient pollution' situates Pliny's environmental views within the larger cultural and literary context, noting Pliny's emphasis on the need for harmony between humanity and the cosmos, and his call for a restoration of the natural balance that has been distorted by human greed. A companion chapter on Strabo would have been welcome.

Two chapters treat the connections between disease and ecology. Elizabeth Craik's 'Malaria and the environment of Greece' untangles anachronisms in order to contextualize narrative and medical sources within the physical environment and to examine ancient initiatives intended to mitigate mosquito-borne problems, despite the challenges of climate and architecture. Isabella Andorlini's 'Environmental diseases according to papyri from Egypt and ancient medical thought' delves into archaeological (i.e. mummies) and textual sources (for example, papyri and work-site ostraka) to scrutinize the connections between disease, urban pollution and the dry, sandy Egyptian climate. A third chapter on environmental disease in the city of Rome would also have been welcome.

Three chapters focus more directly on archaeological evidence (tempered by the literary record). Alain Bresson's 'Anthropogenic pollution in Greece and Rome' utilizes anthropological comparanda together with data from bone analysis and archaeology (for example did Mediterranean houses have chimneys?), and textual evidence to ascertain the extent of human-caused pollution, with particular emphasis on lead pollution (lead, as Bresson remarks, was the ancient analogue to plastic in its uses and ubiquity). J. Donald Hughes' 'Deforestation and forest protection in the ancient world' responds persuasively to scholars who deny the occurrence of deforestation in classical antiquity or its widespread damaging effects (for example, air and water pollution). Jocelyne Nelis-Clément's 'Roman spectacles: exploring their environmental implications' quantifies the ecological cost of circus and amphitheatre games in terms of resources required for building and maintaining temporary and permanent venues as well for staging the shows (for example, machinery). Her lengthy table helpfully quantifies, insofar as extant sources allow, the cost of Roman spectacles in terms of human and animal life. The sources are presented in full (in English translation) in two annotated appendixes.

During a course on ecology in the ancient Mediterranean, my students quickly realized that Greek and Roman culture and history make a good deal more sense against the backdrop of Mediterranean climate, environment and ecology. No aspect of the ancient world can be studied, much less understood, in isolation, as this fine volume recognizes. This collection also brings further substance and breadth to English-language scholarship in a growing field of study that has flourished particularly in German- and Italian-language research. Finally, the authors collectively emphasize how the ancient Mediterranean world can be a revelatory lens for discerning, if not solving, the environmental challenges of the Anthropocene era.

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BADOUD (N.) **Inscriptions et timbres céramiques de Rhodes: documents recueillis par le médecin et explorateur suédois Johan Hedenborg.** Stockholm: Svenska Institutet i Athen, 2017. Pp. 145. Sw.kr.500. 9789179160654.

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In the early 1840s, the Swedish physician, and for a time secretary to the consulate in Alexandria, Johan Hedenborg (1786–1865) made a home for himself and his wife on the island of Rhodes. Over the next decade and a half, Hedenborg devoted considerable time to the study of the island's past and eventually completed a manuscript of a history of Rhodes from antiquity to his own time. The manuscript, which includes an illustrated appendix of some 300 Greek inscriptions, was met with little enthusiasm by those few who saw it and has remained unpublished.

In spite of Hedenborg's questionable reputation as an epigrapher, the potential of his contribution was recognized by Danish archaeologist Christian Blinkenberg, who in 1937 published the well-known list of priests of Poseidon Hippios (*Les prêtres de Poseidon Hippios* (Lindiaka VI), Copenhagen 1937) based almost entirely on Hedenborg's copy, since the stone, excepting a few fragments, had been lost. In *Inscriptions et timbres céramiques de Rhodes*, Nathan Badoud continues this work with regard to the remaining and unexploited sections of Hedenborg's manuscript.

In the introduction, Badoud traces a short outline of Hedenborg's life and career, and the history of the manuscript. The core of the book consists of two catalogues (one of inscriptions on stone, the other of ceramic stamps), followed by a concordance with other editions, bibliography, indexes and 45 colour plates reproducing images from Hedenborg's manuscript.

The majority of the inscriptions copied by Hedenborg have since been published, mainly by Friedrich Hiller von Gaertringen (*Inscriptiones Graecae* XII.1, Berlin 1895). In many cases, however, Hedenborg's annotations provide additional information on the find-spots of inscriptions and his sketches can add to our impression of the monuments that bore them, beyond the laconic descriptions found in the lemmata of *Inscriptiones Graecae*. In one case, *IG* XII 1.51, Badoud expands the text based on Hedenborg's observations, with similar and established texts in support.

Equally important to this, 54 inscriptions in Hedenborg's manuscript are otherwise completely unknown, and Badoud provides their first critical editions. In some cases, this is a relatively straightforward matter, as the text can easily be read from Hedenborg's facsimile. In other cases, however, Hedenborg's readings are seemingly confused and unintelligible, and can only be made to make sense through considerable editing, which, in addition to supplements and restorations, also involves overruling Hedenborg's reading of many individual letters. In doing so, Badoud skates some very thin methodological ice, inasmuch as the exercise presupposes a certain amount of trust in Hedenborg's ability to record the inscriptions he saw with accuracy, all the while second-guessing significant portions of those same observations. Badoud's answer is detailed comparison with similar and securely attested words and phrases, and his reconstructions are, with one or two exceptions, plausible. The most significant result is the restoration of a fragment, perhaps a decree, that mentions a military force under the command of two or more *stratēgoi* apparently dispatched in response to a call by the Stratoniceans (25–30, no. 2), which Badoud associates with the siege of that city by Mithridates of Pontus in 88 BC (*cf.* App. *Mith.* 94) and dates accordingly.

Without autopsy, some doubts regarding the inscriptions published here must necessarily linger, but Badoud has demonstrated that there is merit and reward to be had in the re-examination of Hedenborg's manuscript. *Inscriptions et timbres céramiques de Rhodes* is a welcome