

Boethus the Epicurean

Francesco Verde



Electronic version

URL: <http://journals.openedition.org/philosant/419>

DOI: 10.4000/philosant.419

ISSN: 2648-2789

Publisher

Presses universitaires du Septentrion

Printed version

Date of publication: 24 November 2015

Number of pages: 205-224

ISBN: 978-2-7574-1141-4

ISSN: 1634-4561

Electronic reference

Francesco Verde, « Boethus the Epicurean », *Philosophie antique* [Online], 15 | 2015, Online since 01 November 2018, connection on 01 May 2019. URL : <http://journals.openedition.org/philosant/419> ; DOI : 10.4000/philosant.419



La revue *Philosophie antique* est mise à disposition selon les termes de la Licence Creative Commons Attribution - Pas d'Utilisation Commerciale - Pas de Modification 4.0 International.

BOETHUS THE EPICUREAN*

Francesco VERDE

“Sapienza” Università di Roma

RÉSUMÉ. Cet article se concentre principalement sur Boéthos, philosophe épicurien qui a été souvent négligé : aucune source ancienne, excepté Plutarque, ne le mentionne. L'étude tente d'examiner la perspective philosophique de Boéthos et, plus particulièrement, son attitude envers la géométrie.

SUMMARY. *This paper mainly focuses on the (rather neglected) Epicurean Boethus, not mentioned by any ancient source except Plutarch. The article aims to examine the views of this philosopher, more specifically his attitude towards geometry.*

* I wish to thank Tiziano Dorandi, Jean-Baptiste Gourinat, Michel Narcy, David Sedley, Emidio Spinelli, and the anonymous referee of *Philosophie antique* for their very generous and helpful remarks on a version of this paper. I also extend my gratitude to Samuel H. Baker who checked my English.

Philosophie antique, n° 15 (2015), 205-224

As is well known, the existence of a *positive* Epicurean geometry is an extremely controversial question that has been discussed at length by scholars. That the Epicureans dealt with geometry in order to refute its veracity (and usefulness) is beyond doubt.¹ It is more difficult to ascertain whether the Epicureans ever *positively* theorized a peculiar geometric doctrine mainly aimed at legitimizing or otherwise improving an aspect of their philosophy. The sources on this issue are very scarce, and especially difficult to interpret; judging from my previous investigations, it seems to me that the meticulous study of these Epicurean texts makes it very plausible that the Epicureans were genuinely interested in geometry not only because they wished to refute it, but also because it helped them to develop their own theoretical proposal based on the fundamental criterion of *solida utilitas* (Cic. *Fin.* I 21, 71-72 = 227 Us.).² While this is an (attractive) hypothesis, claiming that Epicureanism completely dismissed the sciences (*mathemata*) means having a rather partial view, which fails to take account of the available evidence. Within Epicureanism the sciences are pursued and studied in depth *if and only if* they are useful as a means to justify (or clarify) a specific philosophical doctrine or theory. The most famous and striking case concerns the study of nature: from Epicurus' *Principal Doctrine*, 11, we learn that the study of nature is not necessary as a theoretical pursuit in itself, but is directly oriented towards ethics.³ Consequently, according to Epicurean thought all science, if it is actually useful, contributes directly (as well as indirectly) to the ultimate end of philosophy according to Epicurus: attaining stable and enduring imperturbability (*ataraxia*).

1. See Bénatouil, 2010.

2. See Verde 2013a, p. 249-308 et Verde 2013b. For a different view, see the significant and stimulating (but still unpublished) paper by Netz forthcoming (I wish to thank the author for giving me the opportunity to read this important contribution in advance).

3. Cf. Cic. *Fin.* IV 5, 11-12. See too Spinelli 2012, and now Parisi 2014.

The contents of (presumed or probable) Epicurean geometry fundamentally elude us because of the scarcity of sources. However, just to limit ourselves to one example, on the basis of some important passages from Sextus' *Against the Geometers* (M III 100-101; 104; 106) it seems as though the Epicureans developed some definitions of angle that (significantly) employed the concept of minimal part (*elachiston*). Epicurus wrote an entire work *On the Angle in the Atom* (Περὶ τῆς ἐν τῇ ἀτόμῳ γωνίας; Diog. Laert. X 28); it cannot be excluded that his interest in the theory of the angle had to do not only with the internal structure of atoms (as the title of the work seems to suggest) and, therefore, with the doctrine of atomic minima, but also with the theory of *clinamen* (the swerve).⁴ Of course, one could argue that definitions of this kind are not good enough evidence for us to claim that the Epicureans possessed a positive geometry. While this is a reasonable objection, it makes it difficult to understand *why* the Epicureans – and (perhaps) Epicurus himself, as we have seen from the title of one of his works, whose contents, unfortunately, we do not know – provided several definitions of the angle, if these were ultimately unnecessary or even alien to their own philosophical system. If, on the contrary, this reconstruction is plausible, it seems clear that the definitions of angle are an important clue of the existence of an Epicurean “geometric proposal”. Here we have an example of the fact that, if the definitions of angle are indeed Epicurean and if these are really related to the internal structure of atoms and to the *clinamen* motion, geometry is strictly connected to the science of nature: through the definitions of angle that explicitly use the (Epicurean) notion of minimal part, geometry succeeds in explaining why the atom declines only at a minimum degree (*cf.* Lucret. II 243-245: *quare etiam atque etiam paulum inclinare necessest/corpora; nec plus quam minimum, ne fingere motus/obliquos videamur et id res vera refutet*). Geometry,⁵ therefore, is used to support a crucial physical doctrine which, in turn, helps to justify a decisive ethical doctrine: the existence of *libera voluntas* (Lucret. II 256-257).⁶

4. See Giovacchini 2010.

5. Furthermore, from a terminological point of view, in order to understand better what kind of geometry is being talked about, one could call this discipline a particular “physics of space” rather “geometry”: as a matter of fact, one can deal with angles, lines, etc. in a way compatible with (Epicurean) canonic and atomism, since *stricto sensu* it is difficult to imagine something called “geometry” which would be fully compatible with Epicurean ontology and epistemology (empiricism, criticism of demonstration and definition; see again Verde 2013b, p. 141-145). In this article for convenience I continue to call “geometry” this particular physics of space, that makes use of geometric principles and notions.

6. A deep analysis of the sources, therefore, proves not only the likelihood of (positive) Epicurean geometry, but also the fact that, according to the Epicureans, this discipline, albeit very technical, was closely linked to the science of nature (*physiologia*).

Thanks to some Herculaneum scrolls, and the decisive testimony from Proclus' *Commentary on the First Book of Euclid's "Elements"* (see below, 219), we learn the name of some Epicurean philosophers who were certainly acquainted with geometry – for example, Philonides of Laodicea, Zeno of Sidon and Demetrius Laco. Some passages from Plutarch, in addition, are especially valuable because they bear witness to the existence of an Epicurean geometer named Boethus, not mentioned by any other ancient source. The purpose of this article, therefore, is quite straightforward: to reconstruct the views of this philosopher, and in particular his attitude towards geometry, on the basis of the little information provided by Plutarch (who, as is well known, is a rather problematic source, given his clear loathing for Epicureanism).⁷ I will not attempt to draw a complete profile of Boethus, but I will instead just focus on his geometrical interests.

The first significant passage comes from Plutarch's *The Oracles at Delphi no Longer Given in Verse* (396D-E):

Ἵπολαβῶν οὖν Βόηθος ὁ γεωμέτρης (οἶσθα γὰρ τὸν ἄνδρα μεταπαττόμενον ἤδη πρὸς τὸν Ἐπίκουρον)...

At this point Boethus the geometer entered into the conversation. (You know that the man is already changing his allegiance in the direction of Epicureanism.)⁸

Plutarch introduces Boethus who, in answer to the Stoic philosopher Sarapion, raises cogent (and traditionally Epicurean)⁹ arguments against the Delphi oracle, and against divination more generally. Strangely enough, in the dialogue Plutarch is not hostile to Boethus (or the other Epicureans): this suggests that the Epicurean philosopher was a friend of Plutarch's, or, at any rate, a personality worthy of respect.¹⁰ It is crucial to note that Boethus is described as ὁ γεωμέτρης and that at the same time he is said to side with Epicurus now (ἤδη).¹¹

7. For a first overview on this matter see the recent studies by Corti 2014, p. 21-28, and Kechagia-Ovseiko 2014.

8. Transl. Babbitt 1969 (slightly modified).

9. See Ferrari 2000, p. 149-163. This is very clear in the writing of the Epicurean Diogenianus (2nd AC?), who writes against Chrysippus' fatalism and mantic art: see Isnardi Parente 1990. Also Philodemus, especially in his treatise *On Gods*, deals with Stoic divination in order to criticize it, often by quoting some passages from Stoic works and showing how the theory of divination and providence of the Stoics contradicts their theology (namely their notion of God): see now Essler 2014.

10. See Flacelière 1959, p. 201-202; Del Corno 1983, p. 53; Hershbell 1992, p. 3355; Babut 2003 p. 275-277; Boulogne 2003, p. 18, 22, 37, and Koch 2005, p. 49.

11. The fact that Plutarch calls Boethus "geometer" could imply that Boethus kept using geometry *after* becoming Epicurean: if Boethus is an Epicurean philosopher, why does Plutarch continue to call him "geometer"? I believe that a plausible explanation is that Plu-

The second passage is from Book 5 of Plutarch's *Table-Talk* (673C). Here Plutarch informs us that the conversation is held in the Athenian house (ἐν Ἀθήναις) of the Epicurean Boethus (παρὰ Βοήθῳ τῷ Ἐπικουρείῳ), where many Epicureans are gathered (συνεδείπνουν δ' οὐκ ὀλιγοὶ τῶν ἀπὸ τῆς αἰρέσεως).¹² The debated question (occasioned by the victory of the comedy writer Strato, apparently unknown)¹³ concerns the fact that we feel pleasure in hearing actors representing anger and pain, but we do not derive any pleasure at all from the sight of people actually experiencing these emotions. While the (Epicurean) interlocutors are convinced that the imitator can communicate pleasure and delight because he does not personally experience the suffering he portrays, Plutarch believes that this view is inadequate. He maintains that we possess an affinity for any performance that exhibits reason or artistry, and admire its success. According to Plutarch, people require no instruction in order to be attracted to subtlety and cleverness; as a matter of fact, if a person shows to a child a shapeless lump of silver, while another brings him a little silver animal or cup, it is certain that the child will prefer and be drawn to the latter. Similarly we feel acute pain at the sight of the sick or dying, but a painting of Philoctetes or statue of Jocasta will give us pleasure – indeed, we will feel admiration for these works. To criticize the position of the Epicureans, at the end of his argument Plutarch points out that his position is really good evidence in favour of the Cyrenaics (with whom the followers of Epicurus polemicize): for according to the Cyrenaics we receive pleasure from sights and sounds not through our sight or hearing, but in our minds.¹⁴ It is interesting to note that the discussion of issues of this kind related to poetics (a subject already studied by Plato and Aristotle)¹⁵ takes place in a circle of Epicureans of the Imperial Age: this may provide important confirmation

tarch makes use of the term “geometer” in order to identify distinctly and without ambiguity Boethus. On the basis of *De Pyth. or.* 396D (but above all 397C: [...] ὑμᾶς τοὺς τοῦ Ἐπικούρου προφήτας (δῆλος γὰρ εἶ καὶ αὐτὸς ὑποφερόμενος) [...]) Fuhrmann 1978 suggests the hypothesis that Boethus' conversion into Epicureanism might have been rather recent (p. 49). This could be another likely reason to explain Plutarch's definition of Boethus as ὁ γεωμέτρης.

12. On the presence of Boethus in Athens as a significant testimony of the vitality of Athenian Epicureanism at the time of Plutarch, see Graindor 1931, p. 153. Graindor believes that Boethus might have been the son or descendant of the Peripatetic Boethus of Sidon, a hypothesis which does not seem convincing to me in the absence of any concrete evidence. On Epicureanism of Imperial Age see Erler 2009.

13. This might be the Menandrian actor Q. Marcius Strato of the deme of Chollidae (see Teodorsson 1990, p. 147).

14. On this matter see Warren 2013.

15. See Plato *Resp.* X. 605c9-607a7; Aristot. *Poet.* 1448b8-19. Plutarch examines the same topic in *Quomodo adulescens poetas audire debeat* 17F-18C too.

of the fact that even the Epicureans dealt with poetics on the basis of specific theories, and that Boethus perhaps had a specific interest in this matter. In citing the position of the Cyrenaics Plutarch seems to suggest, moreover, that the problem of poetics is related to the theory of knowledge (and indirectly also to physics): it is not possible to rule out that Boethus may have been interested in poetics chiefly because of its epistemological implications.

The last passage is from Book 8 of *Table-Talk* (720E-F=323 Us.):¹⁶

‘ Ησυχίας δὲ γενομένης Βόηθος ἔφη νέος μὲν ὦν ἔτι καὶ σοφιστεύων ἀπὸ γεωμετρίας αἰτήμασι χρῆσθαι (F) καὶ λαμβάνειν ἀναποδείκτους ὑποθέσεις, νυνὶ δὲ χρῆσεσθαι τισι τῶν προαποδεδειγμένων ὑπ’ Ἐπικούρου.

When silence fell, Boethus said that when he was still young and occupied with sophistic pursuits, he had been accustomed to using postulates from geometry and adopting unproved hypotheses, but that he would now employ some of the demonstrated doctrines of Epicurus.¹⁷

The problem under examination is why sounds can be heard better at night than in the morning. The conversation – which gives a strong impression of historicity¹⁸ – takes place in the house of Plutarch’s master Ammonius in Athens, and is occasioned by the fact that Ammonius is being boisterously cheered by a crowd of people after his third appointment as *strategos* (“general”).¹⁹ The original problem, then, is why those who are inside hear those screaming outside, while the latter cannot hear those inside equally well. Ammonius recalls that this issue has already been solved by Aristotle:²⁰ the voice coming from inside weakens and dissipates when it goes outside in the open air, whereas the voice that goes from the outside to the inside remains clear. Given that the problem has already been treated by Aristotle, the discussion moves on to the reasons why voices at night are

16. Plutarch’s passage is found in Usener’s Epicurean collection, but it was not included by Bailey or Arrighetti in their editions.

17. Transl. Minar 1961 (modified).

18. See Teodorsson 1996, p. 181.

19. According to Graindor 1931 (p. 78), Ammonius was appointed *strategos* for the third time in 81 AC, a date which coincides, therefore, with one of Plutarch’s stays in Athens.

20. The reference is to Ps.-Aristot. *Probl.* XI, 903b13-18. Plutarch here does not address the problem of the authorship of this work, which he simply attributes to Aristotle (*cf.* below n. 35). On the authenticity of *Problemata* I shall merely refer to the research conducted by Louis 1991 (p. XXIII-XXX), whose results have been usefully summed up by Quarantotto 2011, p. 23 n. 1.

more sonorous and clear.²¹ Ammonius (in a “Platonic” way, one might add)²² attributes this fact to providence:²³ at night when sight is of little use, hearing becomes clearer and purer, since the perception removed from the eyes is returned to the ears. However, since one must discover the causes necessarily produced by nature (720E: τὰ δι’ ἀνάγκης φύσει περαινόμενα τῶν αἰτίων ἀνευρίσκειν), and given that it is the natural philosopher who deals with the material and instrumental principles (τοῦ φυσικοῦ ἴδιόν ἐστιν, ἢ περὶ τὰς ὕλικὰς καὶ ὀργανικὰς ἀρχὰς πραγματεία), Ammonius asks the audience whether anyone is able to provide a convincing explanation of the problem (πρῶτος ὑμῶν εὐπορήσειεν λόγου τὸ πιθανὸν ἔχοντος;). It is very interesting to note that only Boethus answers this request: it is as though he felt singled out by Ammonius – and this, for at least four reasons. (1) Firstly, Ammonius refers to the natural philosopher and it is well known that according to the Epicureans natural science or *physiologia* is the very heart of philosophy. (2) Ammonius’ reference to providence evidently arouses “repulsion” from an Epicurean such as Boethus, who on other occasions had sharply criticized divination and fate.²⁴ (3) Ammonius also draws attention to material and instrumental causes, and for the Epicureans the concept of cause plays a basic role, as we learn, for example, from a passage of the *Letter to Herodotus* (§ 78): the primary task of *physiologia* or the science of nature is the careful – and “Aristotelian”, one might add – investigation (ἐξακριβῶσαι) of the cause of the most important (τῶν κυριωτάτων αἰτία) (physical) issues, hence of fundamental phenomena.²⁵ (4) Finally, in the *Letter to Pythocles* (§ 87), which deals with the theory of multiple explanations for

21. In fact this argument too is examined in the pseudo-Aristotelian *Problemata* (XI, 903a 7-26). The first explanation is offered by Anaxagoras (59 A 74 DK): in the morning, the air heated by the sun reverberates, while at night it is quieter because the sun has set.

22. On Ammonius’ Platonism (not very different from Plutarch’s) see Donini 1986 (= 2011).

23. On Plutarch’s appeal to the notion of providence see Opsomer 1997. About Ammonius’ deep religiosity and involvement in public religion, see Jones 1967, and Follet 1976, p. 162-166.

24. See above, 211.

25. One could notice that this argument could be used in an opposite way too: the Epicureans are interested only in the causes of the most important phenomena and should thus not get interested in problems such as the one raised by Ammonius. On this topic see Philod. *De elect.* col. XIII 17-19 Indelli-Tsouana McKirahan, who shows that one of the basic “principles” of *physiologia* (valid also in the field of ethics, in particular in relation to what it is necessary to choose or shun) concerns the fact that nothing is produced and has its fulfilment without a cause (χωρὶς αἰτίας). See too Lucret. VI, 50-55 (according to Flores’ text): *cetera quae fieri in terris caeloque tuentur / mortales, pauidis cum pendent mentibus saepe / et faciunt animos humilis formidine diuom / depressosque premunt ad terram propterea quod / ignorantia causarum conferre deorum / cogit ad imperium res et concedere regnum.*

celestial and meteorological phenomena, one finds a reference to τὸ πιθανολογούμενον, i.e. that level of persuasiveness²⁶ (in accordance with sense-perception) which is the aim that the doctrine of multiple explanations must achieve.²⁷

Plutarch introduces Boethus by saying that he is an Epicurean philosopher who, when he was still young, took up sophistic pursuits (σοφιστεύων);²⁸ Boethus used the postulates of geometry (ἀπὸ γεωμετρίας αἰτήμασι χρῆσθαι) and also accepted unproved hypotheses (λαμβάνειν ἀναποδείκτους ὑποθέσεις). Hence some scholars believe that Boethus had originally studied at the Academy – which would explain why he was a friend of Plutarch’s – before converting to Epicureanism.²⁹ Boethus’ geometrical interests have

26. On this matter see Verde 2013 c, esp. p. 136.

27. One objection that could be made is the following: on the basis of these reasons, one does not see how these motivations prove or suggest that Boethus (and, more generally, the Epicureans) should be interested in explaining why sounds are best heard at night. To answer, one could argue that this is a very specific topic; nevertheless we know that the Epicureans were actually interested in specific physical problems too. Evidence of this can be found in the *Letter to Pythocles*, which is a doctrinal epitome containing several *scientific* explanations of very specific meteorological topics. If a genuine Epicurean philosopher is interested in a particular physical phenomenon, this happens because the purpose of every scientific research is exclusively ethical. However this does *not* imply that the investigations of the Epicureans in this field are not fully scientific inquiries (see Graham 2013, p. 211-212). From this point of view, the explanation of why sound is best heard at night must be included in this same philosophical perspective, in order to avoid any providential, theological, or teleological explanations of a phenomenon of this kind: the crucial point is that more specific phenomena are reducible to atoms and void.

28. In Imperial times the noun *sophistes* and the verb *sophisteuo* acquire particular meanings: a *sophistes* can be a teacher of rhetoric, eloquence or oratory (within a school or not), or a learned man of questionable moral value. Plutarch often sharply distinguishes the philosopher from the sophist, maintaining that the philosopher despises the value of rhetoric in general. Brunt 1994 (p. 38, see too p. 42-43) argues that «in the second century the term sophist is generally derogatory, when it does not denote a teacher of rhetoric, or occasionally a *savant*». I think that in the case of Boethus the term clearly has a derogatory meaning: Plutarch seems to be stressing the shrewd and none-too-serious (that is, non-philosophical) attitude of Boethus, since the latter postulates unproved hypotheses. At the same time, it cannot be completely ruled out that in this case *sophisteuo* means that Boethus taught geometry. For the meaning of *sophisteuo* in the sense of “to teach” (often rhetoric, and of course at a fee) in Plutarch see *Lucull.* 22, 7; *Caes.* 3, 1; *Demost.* 24, 3; *De Stoic. rep.* 1047F; see e.g. too Diog. Laert. VIII 87 (= T 7 Lasserre) about Eudoxus’ teaching at Cyzicus and the Propontis (ἐντεῦθεν τε γενέσθαι ἐν Κυζίκῳ καὶ τῇ Προποντίδι σοφιστεύοντα).

29. See e.g. Braccini and Pellizer 2014, 223. Several scholars have read – in my view, with little justification – the term σοφιστεύων in *Quaest. conv.* 720E as a clear reference to Boethus’ (early) Academic studies, translating it as «occupied with academic pursuits» (Minar 1961 in his “Loeb” translation, p. 133) or «il étudiait à l’Académie» (Frazier and

also been taken to denote a Pythagorean affinity on his part (prior to his joining Epicurus' Garden).³⁰ It is very likely that this view depends on the fact that for many scholars it is essentially inconceivable that an Epicurean philosopher might deal with geometry: hence the hypothesis of Boethus' affiliation with the Academy or Pythagoreanism, although we have no sure evidence to substantiate such view. Nevertheless Boethus' early affiliation with Academy seems a more plausible possibility, since according to Plutarch the philosopher accepted unproved hypotheses, and this could recall the well known passages of Plato's *Republic* Book VI (510c-e; see too *Resp.* VII, 533c, for the task of dialectics to ground and justify the hypotheses) about the (unproved) hypotheses of geometry, arithmetic, and similar sciences.³¹

After taking the floor, Boethus deals with the problem raised by Ammonius by presenting a doctrine that seems to express a genuinely orthodox form of Epicureanism. This is evident from the very beginning, when Boethus, in reply to Ammonius' question about causes and principles, argues that existing things are borne about in the non-existent (φέρεται τὰ ὄντα ἐν τῷ μὴ ὄντι).³² This is a clear reference to the grounds of Epicurean atomism: atoms and the void.³³ On the basis of these principles, Boethus

Sirinelli 1996 in their "Les Belles Lettres" translation, p. 90). Teodorsson 1996 (p. 184) without any hesitation writes that Boethus «had formerly studied at the Academy, probably as a fellow student of Plutarch». There is also no concrete evidence that Boethus belonged or was close to the «Kreise des Ammonios» (Ziegler 1951, col. 669), or that he was «d'abord disciple d'Ammonios» (Puech 1992, p. 4842). What is much more likely, however, is the bond of friendship between Plutarch and Boethus: this *might* be a clue of Boethus' background as a member of the Academy, where he may have trained to become a geometer. For a first survey on Academic geometry and its relationship with philosophy see Bénatouil and El Murr 2010.

30. See Ziegler 1951, col. 695-696, who also includes Boethus among the Pythagoreans, at least «in seinen Anfängen». This hypothesis is (rightly) ruled out by Hershbell 1984, p. 73-79: «There also seem to be no convincing reasons to regard Boethus, Erato, and Hermias as "Pythagoreans." Boethus appears consistently as an Epicurean at *Quaest. conviv.* 673C and 720E-F where in the latter passage he mentions his youthful interest in geometry, hardly a reason for considering him a former Pythagorean» (p. 73).

31. For a first overview see Franco Repellini 2003, esp. p. 360-374. As David Sedley suggested to me (*per litteras*), Boethus' closing remark (721D: μηδεὶς ἐνιστάσθω πρὸς τὰς πρώτας ὑποθέσεις) is a bit surprising. Here Boethus calls "hypotheses" (perhaps ironically?) the pre-demonstrated principles: one cannot rule out that these are the *proved* hypotheses, completely different from the (unproved) hypotheses of geometry.

32. On the role played by void in Boethus' argument see Boulogne 2003 p. 76.

33. It is certainly interesting to observe that Boethus uses the terminological dichotomy "being"/"not being" to indicate the atoms and the void, something typical of ancient Atomists (Leucippus and Democritus), especially judging from Aristotle's evidence: see *e.g.*

explains that the void is mixed with atoms of air, and that heat, unlike cold, looses, separates and dissolves atomic concentrations. Consequently, in the morning, thanks to the heat these concentrations become dilated; in this way, the atoms of voices or sounds (that is the *eidola*/"images" or *simulacra*)³⁴ are hampered and hindered, causing them to disperse. During the night, on the contrary, the cold "coagulates" atoms: so the atoms of voices do not find any obstacles, and can more easily reach the listener. For the same reason, empty bodies transmit sound more effectively than full bodies: gold and stones, being solid and dense bodies, retain sounds, while bronze, being less dense, is a much more sonorous material.³⁵ Leaving aside

Aristot. *GC* I 8, 325a23 (= 67 A 7 DK), and *Simpl. In Aristot. De caelo* 294, 33 Heiberg (= 208 Rose= 68 A 37 DK; see Sedley 1982). This reversion from Epicurean to Democritean terminology is difficult to explain: as David Sedley supposed (*per litteras*), the being/not-being dichotomy could be in aid of *proving* that the body/void dichotomy is logically exhaustive. But one also cannot rule out the possibility that Boethus claims that the body/void dichotomy (at least at the very beginning of his speech) is a limiting and restrictive terminology. I am not persuaded by the idea that τὸ μὴ ὄν here simply «means 'space'» (Teodorsson 1996, p. 185). Using the peculiar language of atomism, Boethus rather wishes to refer to the basic principles to which everything is reduced: in this sense τὸ μὴ ὄν means 'void'. There is, therefore, no contradiction with the next sentence, which indeed clarifies *what* these principles are: πολλὸν γὰρ κενὸν ἐνδιέσπαρται καὶ μέμικται ταῖς τοῦ ἀέρος ἀτόμοις (720F).

³⁴. See Epicur. *Hrdt.* 52-53, and the commentary by Verde 2010, p. 140-145.

³⁵. The example of bronze and the sound it emits also occurs in another certainly Epicurean context (Sext. *Emp. M* VII 208 = 247 Us.). Already in *Problemata* (XI, 903a11-15) one of the explanations provided concerns the fact that through an empty space one hears better than in a full space: in the morning the air is dense and full of light and rays, whereas in the night, it is more rarefied and thin, because the fire and the rays (which are bodies, according to the author) have gone away (διὰ τὸ ἀπεληλυθῆναι ἐξ αὐτοῦ τὸ πῦρ καὶ τὰς ἀκτῖνας, σώματα ὄντα). According to Aristotle (see *De an.* II 7, 418b13-20) light is not corporeal, whereas, according to the Peripatetic Strato of Lampsacus (see *Simpl. In Aristot. Phys.* IV 9, 693, 10-29 Diels = 65a Wehrli = 30A Sharples, and Hero *Pneum.* 1, 24, 20-28 11 Schmidt = 65b Wehrli = 30B Sharples; cf. Sanders 2011, p. 274) and Epicurus (on the basis of Lucret. II, 381-390; cf. Longo 1987-1988), it is a body. This seems to be an indication of the fact that this section of the *Problemata Physica* cannot be easily attributed to Aristotle. The affinities of Section XI with the *De audibilibus*/Περὶ ἀκουστών (e.g. Louis 1991 p. 4-5) – a treatise attributed to Strato of Lampsacus by Gottschalk 1968 – have been taken to suggest that this part of the *Problemata* could properly be attributed to Strato. However, this hypothesis too should be regarded with extreme caution and probably re-examined, mainly because Strato's authorship of the Περὶ ἀκουστών is far from certain (see Petrucci 2011 p. 190 n. 23, and p. 193). Since according to the *Problemata* light is a body, this section cannot be attributed to Aristotle. This is (indirectly) confirmed by Plutarch, who evidently does not know that the topic of night hearing had been already investigated by Aristotle. As a matter of fact, Ammonius recognizes that *only* the problem of internal/external sound was

the several doubts that Boethus' argument could arouse,³⁶ I believe it is clearly consistent with the fundamental principles of atomism. For this reason, it seems to me that the argument is not at all confused, but rather that it connects (in an orthodox manner) these issues of acoustic physics to atoms and void: when there is more void (according to Boethus, at night, when the heat thins out and gives way to the cold), sound (or, more correctly, the atoms of sound) propagate better.

On the basis of Boethus' strictly physical explanation, I will now return to Plutarch's presentation of the Epicurean philosopher. It has been argued that Boethus categorically denied his (youthful) involvement in geometry (even considering it «une erreur de jeunesse») after his final conversion to Epicureanism.³⁷ Boethus' case closely resembles that of another Epicurean philosopher with a past as a mathematician: Polyaeus of Lampsacus, one of the *kathegemones* or *andres* ("leaders") of Epicurus' Garden.³⁸ From Cicero (*Acad.* II 106 = 39 Tepedino Guerra) we learn that Polyaeus was a *magnus mathematicus*; later, following Epicurus (*posteaquam Epicuro ad-sentiens*), he came to regard all geometry as false (*totam geometriam falsam esse credidit*), but – and this is the more relevant point – never lost the mathematical knowledge he had acquired. The truthfulness of this account is indirectly confirmed by a work of the Epicurean Demetrius Laco entitled *Πρὸς τὰς Πολυαίου ἀπορίας*, *For (or On) the Aporiai of Polyaeus* (*PHerc.* 1429).³⁹ The *aporiai* to which the title alludes are in all likelihood of geometric nature too; it is reasonable to think, then, that Demetrius may have authored this work *in support* of the difficulties raised by Polyaeus against a kind of geometry that obviously did not respect the grounds of Epicurean philosophy. This is (perhaps) the reason why, according to Cicero, Polyaeus *totam geometriam falsam esse credidit*: of course, it is necessary to understand *which* geometry this is. The fact that Polyaeus believed all geo-

solved by Aristotle (720D). It is very likely, therefore, that Plutarch read a text of the *Proble-mata* different from the version we know: it is difficult (if not impossible) to establish whether the version used by Plutarch was close to that directly drawn up by Aristotle, or was an edition of Aristotle's work expanded by his successors (see Sandbach 1982 p. 224; and Braccini and Pellizer 2014, p. 28, and p. 222).

36. Some of these perplexities (raised mainly by Teodorsson 1996, p. 186-189) seem overly severe and often essentially unjustified, as rightly detected by Braccini and Pellizer 2014, p. 225-227.

37. See Puech 1994. The same has been argued for Polyaeus: for example, according to Brittain 2006, p. 133, Polyaeus was an Epicurean philosopher «who had been a geometer before he met Epicurus».

38. See Longo Auricchio 1978.

39. See Angeli and Dorandi 1987, 2008, Del Mastro 2014a, p. 302-305, and now Dorandi 2015, p. 6-9.

metry to be false without ever losing his mathematical knowledge after his Epicurean “conversion” does not necessarily entail that he no longer used his (duly “modified”) knowledge in favour of Epicurus’ philosophy.⁴⁰

Among the Herculaneum scrolls, *PHerc.* 1044 contains an anonymous *Life of Philonides*, perhaps attributable to Philodemus. From some of the fragments of this work we learn that the Epicurean Philonides was interested in geometry and also wrote (possibly exegetical) works on the Epicurean notion of minimum from a geometrical perspective (fr. 13 inf.-14 Gallo).⁴¹ In the Preface to Book 2 of his *Κωνικά* (I, p. 192 Heiberg), Apollonius invites his addressee Eudemus of Pergamum to send his treatise also to Philonides, who in this passage is significantly called ὁ γεωμέτρης, which is exactly how Plutarch describes Boethus in *De Pyth. or.* 396D-E.⁴²

I would argue that it is rather simplistic (and historically short-sighted) to think that Polyaeus, Philonides and Demetrius are isolated cases within the history of Epicureanism, but this does not rule out the existence of other Epicurean philosophers who completely aim to refute geometry. If we carefully examine the passage from *De Pythiae oraculis*, the fact that Plutarch says that *now* Boethus is on Epicurus’ side seems to imply that he disowned his past as a geometer. Plutarch is emphasizing Boethus’ complete “conversion” to Epicurus’ philosophy: in the passage of Plutarch’s *Table-Talk*, Book 8, this “conversion” is clearly confirmed by the opposition between νέος μὲν ὦν and νυνὶ δέ. What is more complex is the presentation of Boethus in Book 8 of *Table-Talk*. Boethus states that in his youth he behaved in the manner of the sophists and, above all, that he used the postulates of geometry and accepted unproved hypotheses, while now, as an Epicurean, he accepts principles demonstrated by Epicurus.⁴³ This presentation may seem rather “innocent”, but it really says a lot: in order to understand it thoroughly, one must compare it with what Proclus argues in his *Commentary on the First Book of Euclid’s “Elements”*.⁴⁴

According to Proclus, most of those who have spoken out against geometry (πρὸς γεωμετρίαν) have questioned the “consistency” of the principles on which geometry is based. The speeches of these detractors of geometry have been “repeated” by many people, and most notably by the Ephectics, who reject and deny all knowledge (πᾶσα ἐπιστήμη) through the

40. See Verde, 2013a, p. 266-277, and p. 287-299.

41. See Verde 2013a, p. 277-287.

42. See above, p. 211, and n. 11.

43. Although Plutarch talks about the principles *demonstrated* by Epicurus, one should not overlook the fact that Epicurus himself criticized the use of demonstration (see e.g. *Hrdt.* 37-38). On this issue see now the significant contribution by Morel 2015.

44. Procl. *In Eucl.* 199-200; 214-218 Friedlein (= 27 Angeli-Colaizzo = 46-47 Edelstein-Kidd).

suspension of judgment. Others, instead, only wish to challenge and refute geometric principles, as is the case with the Epicureans; others still, while admitting the principles of geometry, believe that what follows these principles (τὰ μετὰ τὰς ἀρχάς) cannot be demonstrated (ἀποδεικνύσθαι) if not by adding something further (which obviously is not contained in the principles themselves). Zeno of Sidon, a follower of Epicurus' ἀἴρεσις, supported this perspective: Posidonius wrote an entire book (ἔλον [...] βιβλίον) to prove that Zeno's thought was weak and flawed (σαθρὰν αὐτοῦ πᾶσαν τὴν ἐπίνοιαν).

The criticism of Zeno revolves around the issue of the principles: if these axioms were really "complete", what stems from them would not require further additions. What Zeno refutes – in turn being disproved by Posidonius – is the adequacy and completeness of geometric principles. It is true, therefore, that Zeno admits and accepts the principles of geometry (unlike the other Epicureans mentioned by Proclus);⁴⁵ but according to his formulation these principles "lack" what ought to be added to them in order to demonstrate the validity of the propositions which follow on from them. One must also bear in mind that the question of the principles of science seems to be precisely the point that the Epicureans criticize in their rebuttal of the sciences. A passage from Cicero (*Fin.* I 21, 71 = 227 Us.) is particularly enlightening: the reason why it is not necessary to cultivate the sciences is a genuinely *epistemological* one according to the Epicureans, since the sciences, being based on false assumptions, cannot be true (*a falsis initiis profecta vera esse non possunt*).⁴⁶

Returning to Plutarch, Boethus' position seems at first glance rather similar to that of Zeno (at least judging from Proclus' account). Boethus once accepted the postulates of geometry and used unproved hypotheses, but now, having understood that this methodology is probably fallacious and unproductive, has thought to adopt the principles demonstrated by Epicurus. Both Zeno and Boethus criticize from the Epicurean side the accuracy and completeness of the postulates especially from the epistemological point of view. Boethus, in particular, seems to reject the idea that geometry should be based on unproved hypotheses: that is why he assumes the principles *demonstrated* by Epicurus.

45. It is not easy to understand whether the Epicureans quoted by Proclus, and Zeno have the same purpose, which is the *complete* refutation of geometry. Proclus clearly differentiates Zeno's position about geometry from that of the Epicureans, but, even though Proclus does not say so explicitly, the possibility that the Epicureans and Zeno have different strategies for the same goal cannot be ruled out. Nevertheless the idea that the strategies (and consequently the goals) of Zeno and the Epicureans are different indeed seems to me a more convincing interpretation (see Verde 2013a, p. 304-306).

46. See Verde 2013a, p. 299-306; on Zeno of Sidon see now Del Mastro 2014b.

The actual problem is to understand whether Boethus *totally* rejected geometry. It is not so easy to draw a certain conclusion about Boethus' position on geometry. An analysis of the little evidence from Plutarch in the light of surviving Epicurean texts *could* suggest at first glance not only that Boethus may not have rejected geometry completely, but even that he is perhaps to be counted among those Epicureans who were interested in geometry and (possibly) applied it to the science of nature in order to give certain doctrines a more articulate explanation.⁴⁷ Although I believe that Plutarch's testimony about Boethus does not in itself strengthen the case for a positive Epicurean geometry, given that there is no strong evidence for this, the view that the Epicurean philosopher did not reject the methodology of geometry is an *exegetical possibility* based on the fact that Plutarch is not completely clear on this point. On this matter, David Sedley offered to me (*per litteras*) an interesting remark: «At 720E-F it seems to me that Boethus does not clearly reject the methodology of geometry. He does not say explicitly that he now *only* uses demonstrated doctrines of Epicurus (actually doctrines demonstrated *by* Epicurus would be more accurate here), just that on this occasion he *will* be using the latter. His point could simply be that the Epicurean method of using pre-demonstrated premises is *superior* to the geometrical method of using undemonstrated – or perhaps rather, more positively, 'indemonstrable' – premises, without meaning that the latter method is invalid and should be abandoned.» Nevertheless we do not have clear evidence that could validate this view completely. In his explanation of acoustic physics, Boethus does not explicitly refer to geometric doctrines (but we cannot exclude that he may have done so in other circumstances). One ought to bear in mind that, all in all, Plutarch is a very hostile source on the Epicureans, and that he therefore may have misrepresented or consciously ignored certain points. On this matter, I find interesting a suggestion that I received (*per litteras*) by Jean-Baptiste Gourinat:

47. It is not a coincidence, then, that Boethus, at the very beginning of his speech, immediately states the basic principles of Epicurean atomism and, above all, deals with a physical problem. In Epicureanism geometry seems to have a privileged field of application, that is, the science of nature (see above, p. 210 and n. 6). What is very significant from this point of view is a passage from Sextus Empiricus' *Against the Geometers* (M III 98 = 273a, p. 351 Us.) where Sextus presents an Epicurean definition of straight line: this definition is particularly interesting because it involves the (physical) notion of void. According to the Epicureans, the straight line in the void does not turn, because void does not allow movement neither in its wholeness nor in its parts. It is possible that this definition has to do with the *clinamen*, or swerve of atoms. In this passage, however, the close relationship between geometry and physics according to the Epicureans emerges very clearly.

Sur la géométrie pratiquée par Boéthos une fois devenu épicurien, il y a peut-être quelque éclairage à gagner en comparant la solution proposée par Boéthos au problème d'acoustique posé par Ammonius avec la façon, rappelée par ce dernier, dont ce problème est résolu par le ps.-Aristote : raisonnant, d'une façon qui peut être considérée comme "géométrique", sur la dispersion ou la concentration de flux d'air, le ps.-Aristote traite le problème à un niveau macroscopique, tandis que Boéthos raisonne sur les variations de taille des atomes en fonction de la température – la question étant de savoir, une fois de plus, s'il s'agit là de géométrie, et non pas d'une explication physique proposée en alternative à une explication "géométrique".

This suggestion is very stimulating, although in his speech on acoustics Boethus does not seem clearly to use geometry to explain the issue.

Furthermore, one could also note a basic element of dissimilarity between Zeno's and Boethus' views about geometry. The sources are very scarce, and it is very difficult to ascertain if Boethus after his Epicurean "conversion" continued to use an alternative Epicurean geometry: if this were indeed proved, Boethus' position would be very similar to Philonides' and Demetrius' one. However, from Plutarch we learn that Boethus does not use postulates from geometry anymore: he prefers to start from Epicurean demonstrated principles. His criticism seems indeed stronger than Zeno's: Boethus does not supplement geometrical postulates with other geometrical (more complete and adequate) premises needed to prove the conclusions, since he does away with geometrical postulates. My final view is indeed that Boethus' position is essentially identical to the view of the Epicureans quoted by Proclus.

Even if Boethus' view were similar to Zeno's, according to Plutarch, it does not seem a position aimed at preserving part of geometry for Epicurean purposes. In Plutarch we have a text saying that Boethus used to practice geometry, and that he then replaced it with Epicurean philosophy. One can weaken or qualify what Plutarch says by comparing Boethus to Philonides (or Demetrius), but one can also use what Plutarch says about Boethus to strengthen the idea that Epicureans were strictly hostile to geometry. Nevertheless, according to Plutarch's evidence, the fact that Boethus does not use geometry in his explanation of sound is an argument for thinking, exactly as Plutarch says when he introduces him, that Boethus replaced geometry with Epicurean physics, by abandoning geometrical reasoning and principles.

To conclude, Boethus is an interesting figure within Imperial Epicureanism, and we must be grateful to Plutarch for having informed us of his philosophical position. It seems probable that Plutarch's depiction of Boethus does not provide new evidence in favour of the existence of a positive Epicurean geometry. The case that Boethus did develop a positive Epi-

curean geometry seems much weaker than the case that other Epicurean philosophers — like Demetrius Laco and Philonides — did so. Nevertheless, despite the great scarcity (and the rather limited clarity) of sources, I would like to reaffirm that Boethus is an interesting figure, since his depiction in Plutarch (who remains a hostile source for Epicureanism) does not seem to support the idea that the Epicureans did not at all reject their (possible) education as geometers. In fact unlike Boethus, other Epicureans, like Philonides, Demetrius, and, perhaps, already Polyaeus, in all likelihood dealt with very technical disciplines such as geometry — suitably redefined by them according to the principles of the philosophy of Epicurus — but would engage in them only on condition that doing so would contribute to achieving the goal of the happy life. At least on the basis of Plutarch's evidence, it is not plausible to attribute the same view to Boethus. However, it is worthy of remark, on the one hand, that Boethus is an Epicurean philosopher in whom there is somehow a (hostile) relationship between geometry and Epicurus' philosophy, and, on the other hand, that the case of Boethus might suggest the possibility that within Epicureanism there was indeed a philosophical debate about geometry and its use, as, after all, Proclus' testimony confirms by differentiating the view of the Epicureans from the view of Zeno on the issue of the principles of geometry.⁴⁸

48. See above, p. 222.

BIBLIOGRAPHY

- ANGELI, A. et T. DORANDI 1987: "Il pensiero matematico di Demetrio Lacone", *Cronache Ercolanesi*, 17 (1987), p. 89-103.
- 2008: "Gli Epicurei e la geometria: un progetto di geometria antieucleidea nel Giardino di Epicuro?", in M. Beretta & F. Citti (eds.), *Lucrezio: la natura e la scienza*, Firenze, 2008, p. 1-9.
- BABBITT, F. C. 1969 (tr.): Plutarch: *Moralia: V, 351C-438E*, London, 1969 (The Loeb Classical Library, 306).
- BABUT, D. 2003: *Plutarco e lo Stoicismo*, pres. di R. Radice, ed. it. a cura di A. Bellanti, Milano, 2003 (Temi metafisici e problemi del pensiero antico. Studi e testi, 96).
- BÉNATOUIL, T. 2010: "Les critiques épicuriennes de la géométrie", in P. E. Bour, M. Rebuschi & L. Rollet (eds.), *Construction: Festschrift for Gerhard Heinzmann*, London, 2010, p. 151-162.
- BÉNATOUIL, T. & D. EL MURR 2010: "L'Académie et les géomètres: usages et limites de la géométrie de Platon à Carnéade", *Philosophie antique*, 10 (2010), p. 41-80.
- BOULOGNE, J. 2003: *Plutarque dans le miroir d'Épicure: analyse d'une critique systématique de l'épicurisme*, Villeneuve d'Ascq, 2003.
- BRACCINI, T. & E. PELLIZER 2014 (ed. and tr.): Plutarco: *Conversazioni a tavola. Libro ottavo*, introd., testo critico, trad. e com. a cura di T. Braccini; trad. e coord. a cura di E. Pellizer, Napoli, 2014 (Corpus Plutarchi Moralium, 50).
- BRITAIN, C. 2006 (ed. and tr.): Cicero: *On Academic Scepticism*, trans. with introd. and notes, Indianapolis-Cambridge, 2006.
- BRUNT, P.-A. 1994: "The Bubble of the Second Sophistic", *Bulletin of the Institute of Classical Studies*, 39 (1994), p. 25-52.
- CENTRONE, B. 2011 (ed.): *Studi sui Problemata Physica aristotelici*, Napoli, 2011 (Elenchos, 58).
- CORTI, A. 2014: *L'Adversus Colotem di Plutarco: storia di una polemica filosofica*, Leuven, 2014 (Plutarchea Hypomnemata).
- DEL CORNO, D., M. CAVALLI & G. LOZZA 1983 (ed. and tr.): Plutarco: *Dialoghi delfici*, introd. di D. Del Corno; trad. di M. Cavalli & G. Lozza, Milano, 1983 (Piccola Biblioteca Adelphi, 148).
- DEL MASTRO, G. 2014a: *Titoli e annotazioni bibliologiche nei papiri greci di Ercolano*, Napoli, 2014 (Cronache Ercolanesi. Suppl., 5).
- 2014b: "Filodemo e la lode di Zenone Sidonio: ΠICTOC EPACTHC KAI AKOΠIATOC YMNHTHC", in M. Beretta, F. Citti & A. Iannucci (eds.), *Il culto di Epicuro: Testi, iconografia e paesaggio*, Firenze, 2014 (Centro Studi "La permanenza del Classico", Ricerche, 31), p. 89-109.
- DONINI, P. 1986: "Plutarco, Ammonio e l'Academia", in F. E. Brenk & I. Gallo (eds.), *Miscellanea plutarchea: atti del primo convegno di studi su Plutarco, Roma, 23 novembre 1985*, Ferrara, 1986, p. 97-110 (Quaderni del Giornale filologico ferrarese, 8) = P. Donini, *Commentary and Tradition: Aristotelianism, Platonism, and Post-Hellenistic Philosophy*, ed. by M. Bonazzi, Berlin-New York, 2011, p. 315-326.
- DORANDI, T. 2015: "La recezione degli *Elementi* di Euclide nell' Antichità - La tradizione pairacea", in V. Gysembergh & A. Schwab (eds.), *Le Travail du savoir/ Wissensbewältigung: Philosophie, sciences exactes et sciences appliquées dans l'Antiquité*, Trier, 2015.
- ERLER, M. 2009: "Epicureanism in the Roman Empire", in J. Warren (ed.), *The Cambridge Companion to Epicureanism*, Cambridge, 2009, p. 46-64 (The Cambridge Companions to Philosophy).

- ESSLER, H. 2014 : “Zum Fragment aus Chrysipps *De divinatione* (PHerc. 152/157, Kol. 7, 26-Kol. 8, 5)”, *Cronache Ercolanesi*, 44 (2014), p. 117-128.
- FERRARI, F. 2000 : “La falsità delle asserzioni relative al futuro : un argomento epicureo contro la mantica in Plut. *Pyth. orac.* 10”, in M. Erler & R. Bees (eds.), *Epikureismus in der späten Republik und der Kaiserzeit: Akten der 2. Tagung der Karl-und-Gertrud-Abel-Stiftung vom 30. September-3. Oktober 1998 in Würzburg*, Stuttgart, 2000, p. 149-163 (Philosophie der Antike, 11).
- FLACELIÈRE, R. 1959 : “Plutarque et l'épicurisme”, in *Epicurea: in memoriam Hectoris Bignone. Miscellanea philologica*, pref. di M. Untersteiner, Genova, 1959, p. 197-215.
- FOLLET, S. 1976 : *Athènes au II^e et au III^e siècle: études chronologiques et prosopographiques*, Paris, 1976 (Collection d'études anciennes).
- FRANCO REPELLINI, F. 2003 : “La linea e la caverna”, in M. Vegetti (ed.), *Platone: La Repubblica*, vol. V, libro VI-VII, trad. e com. a cura di M. Vegetti, Napoli, 2003, p. 355-403 (Elenchos, 28).
- FRAZIER, F. and J. SIRINELLI 1996 (tr.): Plutarque : *Œuvres morales. Tome IX, Troisième partie: Traité 46, Propos de table (livres VII-IX)*, texte établi et trad. par F. Frazier et J. Sirinelli, Paris, 1996 (Collection des Universités de France. Série grecque, 372).
- FUHRMANN, F. 1978 (ed. and tr.): Plutarque : *Œuvres morales: Tome IX, deuxième partie: traité 46, Propos de table (livres IV-VI)*, texte établi et trad. par F. Fuhrmann, Paris, 1978 (Collection des Universités de France. Série grecque, 265).
- GIOVACCHINI, J. 2010 : “L'angle et l'atome dans la physique épicurienne : réflexions sur un rémoignage de Sextus Empiricus”, *Philosophie antique*, 10 (2010), p. 139-166.
- GOTTSCHALK, H. B. 1968 : “The *De Audibilibus* and Peripatetic acoustics”, *Hermes*, 96 (1968), p. 435-460.
- GRAHAM, D. W. 2013 : *Science Before Socrates: Parmenides, Anaxagoras, and the New Astronomy*, Oxford-New York, 2013.
- GRAINDOR, P. 1931 : *Athènes de Tibère à Trajan*, Le Caire, 1931 (Recueil de travaux publiés par la Faculté des Lettres de l'Université égyptienne, 8).
- HERSHBELL, J. P. 1984 : “Plutarch's Pythagorean Friends”, *The Classical Bulletin*, 60 (1984), p. 73-79.
- 1992 : “Plutarch and Epicureanism”, *Aufstieg und Niedergang der Römischen Welt*, II, 36.5, Berlin, 1992, p. 3353-3383.
- ISNARDI PARENTE, M. 1990 : “Diogeniano, gli epicurei e la τὴν ἡγή”, *Aufstieg und Niedergang der Römischen Welt*, II, 36.4, Berlin, 1990, p. 2424-2445.
- JONES, C. P. 1967 : “The Teacher of Plutarch”, *Harvard Studies in Classical Philology*, 71 (1967), p. 205-213.
- KECHAGIA-OVSEIKO, E. 2014 : “Plutarch and Epicureanism”, in M. Beck (ed.), *A Companion to Plutarch*, Oxford, 2014, p. 104-120 (Blackwell Companions to the Ancient World).
- KOCH, R. 2005 : *Comment peut-on être dieu? La secte d'Épicure*, Paris, 2005 (L'Antiquité au présent).
- LONGO, O. 1987-1988 : “Onde e/o corpuscoli: La luce fra Aristotele ed Epicuro”, *Atti e Memorie dell'Accademia Patavina di Scienze, Lettere ed Arti*, 100 (1987-1988), p. 55-68.
- LONGO AURICCHIO, F. 1978 : “La scuola di Epicuro”, *Cronache Ercolanesi*, 8 (1978), p. 21-37.
- LOUIS, P. 1991 (ed. and tr.): Aristote : *Problèmes: Tome I, Sections I-X*, Paris, 1991 (Collection des Universités de France. Série grecque, 346).
- MARCHAND, S. et F. VERDE 2013 (eds.): *Épicurisme et scepticisme*, Roma, 2013 (Collana Convegna, 22).

- MINAR, E. L. 1961 (tr.): Plutarch: *Moralia: IX, 697C-771E*, with an English tr. by E. L. Minar, F. H. Sandbach & W. C. Helmbold, London, 1961 (The Loeb Classical Library, 425).
- MOREL, P.-M. 2015: "Usi e condizioni della dimostrazione in Epicuro", in D. De Sanctis, E. Spinelli, M. Tulli & F. Verde (eds.), *Questioni epicuree*, Sankt Augustin, 2015 (in press).
- NETZ, R. forthcoming: "Were there Epicurean Mathematicians?", *OSAP* 49 (2015), forthcoming.
- OPSOMER, J. 1997: "Quelques réflexions sur la notion de Providence chez Plutarque", in C. Schrader, V. Ramón & J. Vela (eds.), *Plutarco y la historia: actas del V Simposio Español sobre Plutarco, Zaragoza, 20-22 de junio de 1996*, Zaragoza, 1997, p. 343-356 (Monografías de filología griega, 8).
- PARISI, A. 2014: "Le forme del sapere astronomico nell'Epicureismo: un saggio di lettura di PHerc. 831, IX-XI Körte", *Cronache Ercolanesi*, 44 (2014), p. 49-64.
- PETRUCCI, F. M. 2011: "Una traccia della dialettica scolastica del primo Peripato: le sezioni musicali dei *Problemata Physica* (XI e XIX)", in Centrone 2011, p. 175-238.
- PUECH, B. 1992: "Prosopographie des amis de Plutarque", *Aufstieg und Niedergang des römischen Welt*, II, 33.6, Berlin, 1992, p. 4831-4893.
- 1994: "Boéthos" *RE* 6 (B 42), in R. Goulet (dir.), *Dictionnaire des philosophes antiques*, Tome II: *De Babélyca d'Argos à Dyscolius*, Paris, 1994, p. 122.
- QUARANTOTTO, D. 2011: "Il dialogo dell'anima (di Aristotele) con se stessa: I *Problemata*: l'indagine e l'opera", in Centrone 2011, p. 23-57.
- SANDBACH, F. H. 1982: "Plutarch and Aristotle", *Illinois Classical Studies*, 7 (1982), p. 207-232.
- SANDERS, K. R. 2011: "Strato on "Microvoid"", in M.-L. Desclos & W. W. Fortenbaugh (eds.), *Strato of Lampsacus: Text, Translation, and Discussion*, [actes du colloque international de Grenoble, 5-7 avril 2005], New Brunswick/NJ-London, 2011, p. 263-276.
- SEDLEY, D. 1982: "Two Conceptions of Vacuum", *Phronesis*, 27 (1982), p. 175-193.
- SPINELLI, E. 2012: "Physics as Philosophy of Happiness: The Transmission of Scientific Tenets in Epicurus", in M. Sgarbi (ed.), *Translatio Studiorum: Ancient, Medieval, and Modern Bearers of Intellectual History*, Leiden-Boston, 2012, p. 25-36 (Brill's Studies in Intellectual History, 217).
- TEODORSSON, S. V. 1990: *A Commentary on Plutarch's Table Talks*, Vol. II: *Books 4-6*, Göteborg, 1990 (Studia Graeca et Latina Gothoburgensia, 53).
- 1996: *A Commentary on Plutarch's Table Talks*, Vol. III: *Books 7-9*, Göteborg, 1996 (Studia Graeca et Latina Gothoburgensia, 62).
- VERDE, F. 2010 (transl.): Epicuro: *Epistola a Erodoto*, introd. di E. Spinelli, trad. e com. di F. Verde, Roma, 2010 (Classici, 5).
- 2013a: Elachista: *La dottrina dei minimi nell'Epicureismo*, Leuven, 2013 (Ancient and Medieval Philosophy, 48).
- 2013b: "Epicurean Attitude toward Geometry: The Sceptical Account", in Marchand & Verde 2013, p. 131-150.
- 2013c: "Cause epicuree", *Antiquorum Philosophia*, 7 (2013), p. 127-142.
- WARREN, J. 2013: "Epicureans and Cyrenaics on Pleasure as a *Pathos*", in Marchand & Verde 2013, p. 85-103.
- ZIEGLER, K. 1951: "Plutarchos (2)", *Paulys Realencyclopädie der Classischen Altertumswissenschaft*, XXI/1, col. 636-962, München, 1951.