The Mathematician Zenodorus

G. J. Toomer

ZENODORUS the mathematician is best known for his treatise περί ἰσοπεριμέτρων χειμάτων, On Figures of Equal Boundary. This, like all his works, is lost, but part of its contents has been preserved in three secondary sources. Only one of these, Theon’s commentary on Book I of the Almagest, specifically mentions Zenodorus, but the other two, Pappus, Synagoge 5.4–19, and the so-called “Introduction to the Almagest” are so similar to Theon’s version that there is no doubt that they are derived from the same work (in fact all three versions may well be derived from an intermediary source, Pappus’ lost commentary on Almagest I). The contents of Zenodorus’ treatise, in so far as it is available to us from these sources, have been adequately described in modern works, and are therefore omitted here. Only two other ancient authors mention mathematical works by Zenodorus:

1 The two earlier editions of Theon’s commentary on the Almagest (in the ed.princ. of the Almagest [Ioannes Walderus, Basel 1538] 11, and by N. Halma, Commentaire de Théon d’Alexandrie sur le premier livre de la composition mathématique de Ptolémée [Paris 1821] 33) read ἰσομετρῶν, and this was defended against Nokk’s obvious conjecture (Zenodorus’ Abhandlung über die isoperimetrischen Figuren von Dr. Nokk [Freiburger Lyceums-Programm, 1860] 26), ἰσοπεριμέτρων, by Fr. Hultsch (Pappi Alexandrini Collectionis quae supersunt III [Berlin 1875–78] 1190 n.2), and adopted by T. L. Heath (History of Greek Mathematics II [Oxford 1921] 207) and others. But A. Rome, in his edition of Theon’s commentary (Commentaires de Pappus et de Théon d’Alexandrie sur l’Almageste II [Città del Vaticano 1936] 355), shows that ἰσομετρῶν is merely a variant reading of some MSS. The correctness of ἰσοπεριμέτρων is shown by the context in Theon and also by the remark of Simplicius (Comm. in Aristotelis de Caelo, ed. Heiberg [Berlin 1894] 412): δεδεικτα . . . παρὰ Ἀρχίμηδους καὶ παρὰ Ζενοδόρου πλατύτερον, διὶ τῶν ἰσοπεριμέτρων χειμάτων πολυχωριστότερος ἔστιν ἐν μὲν τοῖς ἑπτάθεοις ὁ κύκλος, ἐν δὲ τοῖς στερεοῖς ἡ σφαῖρα.


3 ed. Hultsch (supra n.1) I.308–34.

4 The section of this on isoperimetric figures was printed by Hultsch in his edition of Pappus, III.1138–64. On the work in general see J. Mogenet, “L’introduction à l’Almageste,” MémAcBelg 51.2 (1956).

5 Nokk (see n.1), with reconstruction, in German translation, from Theon and Pappus; Heath, HGM (supra n.1) II.207–13; W. Müller, “Das isoperimetrische Problem im Altertum,” Sudhoffs Archiv 37 (1953) 39–71, with German translation of Theon’s version.
Zenodorus; one of these references is certainly to the \( \text{Περὶ ἱσοπερμετρῶν εὐθυμάτων} \), the other probably so.⁶

The date of Zenodorus has been the subject of some discussion. Older works on the history of mathematics⁷ made him a disciple or contemporary of Oinopides, i.e. mid-fifth century B.C., apparently by confusion with one Zenodotus who is said by Proclus⁸ to belong to "the tradition of Oinopides." Nokk rightly protested against this, and concluded from the several references to Archimedes in the Theon and Pappus versions of the \( \text{Περὶ ἱσοπερμετρῶν εὐθυμάτων} \) that Zenodorus was probably subsequent to Archimedes.⁹ The inference was plausible, though not quite certain, given the secondhand nature of our information,¹⁰ and has been universally accepted. However the attempts of Hultsch and Cantor¹¹ to establish a lower limit for the date of Zenodorus on stylistic grounds or supposed knowledge of his work by Quintilian are worthless. The first solid evidence for Zeno-

⁶ The first is the reference by Simplicius quoted in n.1. The second is Proclus, Comm. on Euclid I (ed. G. Friedlein [Leipzig 1873] 165), where it is stated that Zenodorus gave the name \( \text{κοιλογιώνα} \) to the quadrilateral with one angle greater than two right angles. For the latter cf. "Introduction to the Almagest" in Pappus, ed. Hultsch, III p.1154 lines 11–16. See also A. Rome, Comm. de Théon p.371 n.(1).

⁷ e.g. J. F. Montucla, Histoire des mathématiques¹² I (Paris, An vii [=1798]) 151. The error persists as late as 1883 in the large and inept work of M. Marie, Histoire des sciences mathématiques et physiques I (Paris 1883) 26, where Zenodorus is put at 450 b.c.; the author (p.261) pays his tribute to more recent scholarship by creating another Zenodorus who was born about A.D. 290.


⁹ Nokk, op.cit. (supra n.1) 27–29.

¹⁰ An exactly similar inference, which is now known to be incorrect, has been made for Diocles. His work On Burning Mirrors was for long known only from two extracts in Eutocius' commentary on Archimedes' Sphere and Cylinder. Because there are references to Apollonius' Conics in one of these (e.g. Archimedes, ed. Heiberg¹³ III [Leipzig 1915] p.142 lines 8–9), it is commonly assumed that Diocles is subsequent to Apollonius (see e.g. Heath, HGM [supra n.1] I.264; II.200, where Diocles is described as "writing a century or more later than Apollonius," on no grounds whatever). However, the recently discovered Arabic translation of Diocles' treatise (see below) shows that Eutocius has recast the original in the 'classical' form of analysis and synthesis, and added the references to Apollonius. From other indications in the work it appears that Diocles was in fact a contemporary of Apollonius. The suspicion of P. Tannery (Mémoires scientifiques II [Toulouse and Paris 1912] 46) has been justified: "Les citations des coniques d'Apollonius qui se trouvent dans la solution de Dioclès doivent être des interpolations d'Eutocius et ne peuvent servir pour déterminer la limite supérieure de l'époque où vivait Dioclès."

¹¹ Hultsch, in Pappus, III pp.1189–90; M. Cantor, Vorlesungen über Geschichte der Mathematik¹⁴ I (Leipzig 1894) 341. Rome, Comm. de Théon pp.355–56, points out how the latter's argument falls to the ground. An even more confused attempt to date Zenodorus in the second century was made by Cantor, CRAcSc 51 (1860) 630–33.
dorus' date was turned up by Cronert, who published in 1900 a fragmentary biography of the Epicurean philosopher Philonides from the Herculaneum papyrus roll no.1044. Philonides is dated by his dealings, as a mature man, with the Seleucid kings Antiochus IV Epiphanes (reigned 175–164? B.C.) and Demetrius I (162–150 B.C.).

Philonides was, at least in his youth, very interested in mathematics and came into contact with several notable mathematicians, including Apollonius of Perge, Eudemus and Dionysodorus.

The Herculaneum biography provides the only secure evidence for dating these men. It also mentions, at least once and possibly twice, a Zenodorus whom Philonides appears to have known. Cronert (p.956) identified this man with the author of the treatise on isoperimetric figures. The identification dates Zenodorus to the first half of the second century B.C. It has been generally accepted.

I believe that the identification proposed by Cronert is correct, but I also believe that it requires argumentation, which neither Cronert nor anyone else has offered. The fact that Philonides is known to have associated with mathematicians is an argument for identifying the Zenodorus whom he knew with Zenodorus the mathematician, but is not in itself sufficient. If the name in question had been not Zenodorus but its synonym Diodorus, the identification would have been highly dubious, since Diodorus is an extremely common name at all times and in all parts of the Greek-speaking world. In order to judge the probability of Cronert's identification, then, it is necessary to examine the evidence for the occurrence of the name Ζηνόδωρος.¹⁷

¹³ Cronert, op.cit (supra n.12) 956–57.
¹⁵ Cronert, op.cit. (supra n.12) 956. Eudemus was the recipient of the first three books of Apollonius' Conics. Dionysodorus is known as an able mathematician from several secondary sources. See I. Bulmer-Thomas, s.v. DIONYSODORUS, in Dictionary of Scientific Biography IV (New York 1971) 108–10.
¹⁶ e.g. by W. Schmidt, "Zur Geschichte der Isoperimetrie im Altertum," Bibliotheca Mathematica 3 F. 2 (1901) 5–8; G. Loria, Le Scienze esatte nell'antica Grecia² (Milan 1914) 419. Heath, however, writing in 1921, appears to be ignorant of the evidence adduced by Cronert (HGM [supra n.1] II.207). This is one of many instances in which Heath's "standard" work is inferior to Loria's excellent book, which was published earlier than Heath's and is therefore, apparently, seldom referred to now. That the evidence is also unknown to the author of an even more recent "standard" work (Ch. Mugler, Dictionnaire historique de la terminologie géométrique des Grecs [Paris 1958] 254) and to the ed.³ of Cantor's Vorlesungen I (Leipzig 1907) 356–57, will surprise no one acquainted with those compilations.
¹⁷ The importance of the study of the chronological and geographical distributions of
As in all such investigations, the evidence is largely inscriptions. For \( \text{Z} \eta \nu \delta \omega \rho \omicron \omicron \) one can supplement the inscriptions with a few literary references and, for Egypt and Dura-Europos, occurrences in papyri. I have not attempted to make a complete collection of all occurrences of the name, but have tried to establish the pattern of its appearance.

In only one area of the Greek-speaking world can the name \( \text{Z} \eta \nu \delta \omega \rho \omicron \) be considered common: in Palestine and Syria and adjacent areas, from the second century B.C. with increasing frequency up to at least the late third century there are numerous examples. In such investigations, the evidence is largely inscriptions. For \( \text{Z} \eta \nu \delta \omega \rho \omicron \) one can supplement the inscriptions with a few literary references and, for Egypt and Dura-Europos, occurrences in papyri. I have not attempted to make a complete collection of all occurrences of the name, but have tried to establish the pattern of its appearance.

In only one area of the Greek-speaking world can the name \( \text{Z} \eta \nu \delta \omega \rho \omicron \) be considered common: in Palestine and Syria and adjacent areas, from the second century B.C. with increasing frequency up to at least the late third century there are numerous examples. In other words, the evidence is largely inscriptions. For \( \text{Z} \eta \nu \delta \omega \rho \omicron \) one can supplement the inscriptions with a few literary references and, for Egypt and Dura-Europos, occurrences in papyri. I have not attempted to make a complete collection of all occurrences of the name, but have tried to establish the pattern of its appearance.

In other words, the evidence is largely inscriptions. For \( \text{Z} \eta \nu \delta \omega \rho \omicron \) one can supplement the inscriptions with a few literary references and, for Egypt and Dura-Europos, occurrences in papyri. I have not attempted to make a complete collection of all occurrences of the name, but have tried to establish the pattern of its appearance.
many of these examples it is certain that the bearers of the name were Semites or, more precisely, speakers of Aramaic, who had a veneer of Hellenization. In most cases it is probable that they had a Semitic name as well. The adoption of a Greek name in addition to, or rather as an alternative to, one's native name is a well-known phenomenon in Aramaic-speaking areas. The best discussion of this and of the

---

20 Several cases of men bearing two names, one Semitic, one Greek, are known from Hellenistic Babylonia, but in no case is there any obvious relationship between the pair.
different types of correspondence between the original Semitic name and the adopted Greek name has been given by Rosenthal with reference to the Palmyrene inscriptions. He shows that some of the Greek names are translations of the Semitic name, but that in many cases the main factor in choosing the Greek equivalent seems to have been that it sounded similar to the Semitic original. An example of this is Zenobia herself, whose Semitic name was Batzabbai, ‘daughter of Zabbai’. I believe that the use of Ζηνόδωρος in Aramaic-speaking areas is a mixture of both these motives. It must correspond to a Semitic theophoric name such as Zabdiböl, ‘gift of Bōl’, or Zabdilah, Rosenthal, Die Sprache der palmyrenischen Inschriften [MVAG 41.1, Leipzig 1936] 94; for a Phoenician example see O. Masson, BCH 93 [1969] 699. On the general topic of Greek names in Babylonia see A. Aymard, “Une ville de la Babylonie seleucide,” in his Études d’histoire ancienne (Paris 1967) 200–02, where references to the literature will be found; on double names ibid. p.197 n.6 and 201 n.3.

21 Rosenthal, op.cit. (supra n.20) 93–94. The phenomenon was recognized long ago, and the essential was enunciated by C. S. Clermont-Ganneau, Recueil d’archéologie orientale I (Paris 1888) 186: “Quand un Sémit adoptait un nom grec, il pouvait procéder de trois façons dont nous avons de nombreux exemples: ou bien il transcrivait purement et simplement son nom; ou bien il le traduisait; ou bien il choisissait un véritable nom hellénique présentant avec son nom sémitique une assonance souvent très superficielle.”

22 Thus Vaballathus, the son of Zenobia, was also known as Athenodorus (examples in Rosenthal p.93). WHB means ‘gift’ in Palmyrene Aramaic (cf. Arabic وَهْب ‘give’), and the goddess Allat was equated with Athena.

23 Both motives are adduced by O. Masson in an interesting article on names of Phoenicians in Greek inscriptions, “Recherches sur les Phéniciens dans le monde hellénistique,” BCH 93 (1969) 679–700. E.g., for the first, he conjectures (p.691) that Baccalēdψ= MLK or MLKY (‘king’), or MLKBΛ (‘Bā’al is king’); for the second he conjectures (p.692) that Φλδστρατος= ’ΒΔΥΣΤΡΤ (‘slave of Astarte’), and shows from a bilingual inscription (p.698) that Ἰερώνημος= ’ΒΔΠΛΝΜ (‘slave of the gods’).

24 Inscriptionally attested CIS II.3 3947, 3971. There are several examples of Ζηνόβος as the equivalent of the names Zabdilah or Zabidā (Zabbai is a hypoeoristieon derived from the same root ZBD ‘give’): CIS II.3 3932, Ἰωύλων Αὐρήλων Ζηνόβων τόν καὶ Ζαβδίλαν (A.D. 242/3), cf. ibid. 4031 (A.D. 233), 4168 (A.D. 149), 4201 (A.D. 212).

25 It is not attested at Palmyra itself, but this is probably accidental, since it occurs several times in the files of the Cohors Vicesima Palmyrenorum stationed at Dura-Europos in the third century. See Dura-Europos, Final Report V.1: The Parchments and Papyri, ed. C. B. Welles, R. O. Fink, J. F. Gilliam (New Haven 1959) 380, no.107 (ca. A.D. 240) ii 16: Aurel Zenodorus; ibid. 98 iv 24 (A.D. 210): Zenodorus Artemidori. Cf. ibid. p.312, 100 viii 1; p.345, 101 xii 13. An optio Ζηνόδωρος appears in a dedication to Zeus Dolichenus at Dura of A.D. 251 (SEG 17.770). Note (Welles, op.cit. p.59) that Ζηνόδωρος is not among the Greek names found at Dura before the establishment of the Roman camp there in the early third century.

'gift of god'. Thus it is a translation. But the reason for selecting Ζηνόδωρος, rather than e.g. Διόδωρος, was the greater similarity in sound to the Semitic original. I have found no explicit evidence for the equivalence, but it is the most plausible hypothesis to explain the frequency of the name Zenodorus in this area alone.

Elsewhere the name is surprisingly rare, when one considers that both its elements are extremely common in other combinations. In most parts of the Greek-speaking world it is not attested at all. It occurs occasionally in the Cyrenaica, where it may be an example of the survival of Theran nomenclature. There are several examples of

---

riennes IV [Paris 1953] 39-40). Note also οἱ ἐγ γένοντες Ζαβδιβωλείων, Lebas-Waddington III 2595, Palmyra, a.d. 179. (On this tribe, the Beni Zabdiibol, at Palmyra see e.g. Clermont-Ganneau, Recueil d’archéologie orientale VII [Paris 1906] 13; two tesserae inscribed BNY ZBDDBWL, Recueil des tessères de Palmyre, ed. H. Ingholt, H. Seyrig, J. Starcky [Paris 1955] nos. 138, 141; on the tribes at Palmyra in general see du Mesnil du Buisson, Les tessières et les monnaies de Palmyre [Paris 1962] 453-63.) The name is found also in the files of the Cohors Vicesima Palmyrenorum, e.g. Dura, Papyri (supra n.25) no.122 (p.394), [A]urel[ [Zdbib[i][us (a contemporary of the Aurelius Zenodorus of no.107, mentioned in n.25, but there is no reason to identify the two). Note too the Ζαβδιβωλος, leader of a contingent of "Arabs" (Palmyrenes?: see J. Starcky ap. Seyrig, cited above) serving under Antiochus III at the battle of Raphia (Polyb. 5.79.8). See Zucker’s remarks, op.cit. (supra n.19) 60, on names beginning Ζαβδ- in the Hermopolis stele, and (on the element ΖBD in Palmyrene names) A. Caquot, "Sur l’onomastique religieuse de Palmyre," Syria 39 (1962) 244.

27 Stark, op.cit (supra n.26) 17-18.

28 The frequency of the onomastic element -δωρος requires no documentation (though it does not become ubiquitous until the fourth century b.c., as was remarked by Letronne, "Mémoire sur l’utilité qu’on peut retirer de l’étude des noms propres grecs," Œuvres Choisies, 3e sér. II [Paris 1885] 76-77). As for Ζην-, Ζηνων is common in many areas from the Hellenistic period onwards, and there are numerous and widespread examples of Ζηνοδοτος.

29 SEG 20.735a π 13 (Cyrene, fourth century b.c.), Ζηνόδωρος Βάκαλ[ος]. SEG 9.533 (Taur-chiris-Arsinoe). Cf. CIG III 5202 (Ptolemais, imperial period) Ζηνοδόρα. SEG 17.823.19 (Berenice, a.d. 56; republished by B. Lifshitz, Donateurs et fondateurs dans les synagogues juives [Paris 1967] no.100). But this man, Ζηνόδωρος Θεουλος, is a Jew (one of a list of contributors to the building of a synagogue), so his name may reflect Palestinian influence rather than Cyrenaean (cf. n.19). The λόξαγος Ζηνόδωρος of P.Sorb. 14a.8 (266 b.c.; same person, ibid. 15.3) was a Cyrenaean according to the plausible supplement of the editor, Hélène Cadelle. Αλεξεινός Ζηνοδωρος Κυρηναῖος appears on a tombstone of the first century b.c. in the museum at Eleusis (IG II 9 1125).

30 On the frequent onomastical relationship between metropolis and colonies see e.g. Robert, "Noms de personnes et civilisation grecque, 1," JSav 1968, pp.209–10, with the literature cited p.210 n.78. The only example of Ζηνοδωρος from Thera itself known to me is SEG 16.473. It is perhaps worth noting that Thera is one of the few places where Ζηνος occurs as the genitive of Ζεώ in ordinary speech; see C. D. Buck, The Greek Dialects (Chicago 1955) 93, and e.g. SGDI 3.2. 4734, Ζανος(τος); but names with the element Ζην- are common throughout the Greek world, cf. n.28.
the name amongst the voluminous onomastic material from Ptolemaic and Roman Egypt. Unfortunately it is rarely possible to determine the ethnic background of individuals mentioned in papyri. It seems certain that most, if not all, of the Ζηνόδωροι occurring in papyri of the earlier Ptolemaic period (to which most of the published examples belong) are of Greek or Macedonian origin, but in only one case (the probably Cyrenaean λοχευός mentioned in n.29) do we know the place of origin of the man or his ancestors. Nevertheless, the fact that we find men called Zenodorus holding responsible administrative positions in the mid-third century, combined with indications of Macedonian connections for some Ζηνόδωροι, suggests

31 Some fifteen occurrences can be derived from Fr. Preisigke, Namenbuch (Heidelberg 1922) col.117, and some 25 more from D. Foraboschi, Onomasticon alterum papyrologicum (Milan 1967) fasc.2, s.v. Many of these consist of double or multiple references to the same person (see n.32), and the total of different Ζηνόδωροι is not large.

32 The name occurs several times in the Zenon papyri of the mid-third century B.C. There are at least two individuals involved: (1) a man in the employment of Apollonius: P.Col.Zen. 2 line 4, P.Col.Zen. 90 line 1, P.S.I. 485 line 21 (more fully edited P.S.I. 854 lines 12, 21), P.S.I. 505 lines 8, P.Cair.Zen. 59009(a) (but see n.18), P.Cair.Zen. 59035 line 1, P.Cair.Zen. 59090 line 1, P.Cair.Zen. 59434 line 1. These do not necessarily all refer to the same man. (2) The official in the Ptolemaic administration at Alexandria in the early years of Ptolemy III Euergetes, plausibly conjectured by M. I. Rostovtzeff (A Large Estate in Egypt in the Third Century B.C. [Madison 1922]) to have been hypodioiketes: P.S.I. 524 line 3, P.Cair.Zen. 59359 lines 20-21, P.Cair.Zen. 59367 lines 4, 12, P.Cair.Zen. 59368 lines 8, 21 (should we identify the writer of the letter P.S.I. 364, addressed to Zenon, with this man? Note in line 21 of P.Cair.Zen. 59368 οὐκονόμος ταύτη παρὰ Ζηνόδωροι; the Zenodorus of P.S.I. 364 mentions an athletic victory of his brother Dionysios). Perhaps also P.Tebt. III.1 703 line 1 (reading insecure). The Zenodorus who was οὐκονόμος of the lower and Thmoisepho toparchies of the Oxyrhynchite nome between 251 and 244 b.c. (P.Hamb. 183 lines 4, 16; P.Hib. 59 line 1, P.Hib. 60 line 1, P.Hib. 107 line 5, P.Hib. 124-27, P.Hib. 210 lines 4-5; P.Jen. inv. 900=SB 8.9841) may conceivably be the same man at an earlier stage of his career: note that the latest dated document mentioning the οὐκονόμος (P.Hib. 107) belongs to the third year of Euergetes (244 b.c.), while the earliest mentioning the hypodioiketes (?) (P.Cair.Zen. 59359) belongs to the fifth year.

33 The Δωδεκάτος Ζηνοδόρου Πέρας τῆς ἐπιγυνής (P.Oxy. 269 line 1; the names are guaranteed by line 15) is no exception, for at this late date (a.d. 57) the Πέρας τῆς ἐπιγυνής, whatever the historical origin of the term, include men of a variety of ethnic backgrounds.

34 See n.32 for examples. Another (?) Zenodorus appears, apparently as a minor police official, in P.Tebt. III.1 748 line 12 (mid-third century).

35 The clearest example is the Zenodorus of P.Tebt. I 64a line 82 (and several other places in P.Tebt. I, see index), a κάτωκος at Cerceosiris of the mid-second century b.c. (Prosopographia Ptolemaica no.2644, II p.92). This man’s father and son were both called Βρομερός, a name occurring otherwise, to my knowledge, only in P.Tebt. III.2 890 (see below) and as the father of a chieftain in Lyncestis, Thuc. 4.83.1 (see Hoffmann, op.cit. [supra n.18] 166). Cf. also Ζηνόδωρος Αντιπατροῦ Μικᾶ, P.Tebt. III.2 890 lines 7, 9 (second century b.c.). The appellation ‘Mysian’ probably refers not to his ethnic origin but to his membership in a section of the army called the ‘Mysians’ (see M. Launey, Recherches sur les armées hellénistiques I [Paris
that the comparative frequency of the name in Ptolemaic Egypt may possibly reflect the settlement of Macedonians there. On the other hand, I know of no example of the name in Macedon itself, nor any Zenodorus who is explicitly called a Macedonian.

Otherwise, apart from Attica (for which see below) the name is of extreme rarity. In Asia Minor, for example, I have found only two occurrences: the dubious [Ζ]νόδωρος Ὁρνάκκειος (Halicarnassus, late fifth century B.C.)36 and the magistrate Ζηνόδωρος Ἀναξαγόρου on bronze coins of Erythrai from the first half of the third century B.C.37 The occurrence of the name at Erythrai is one of many links between this city and Chios, where I have found two examples of the name: a magistrate on a bronze coin of the second or first century B.C.38 and Λαυρίπτης Ζηνόδωρου on an inscription in the city of Chios of unknown date.39 In the islands otherwise only Ζηνόδωρα at Samothrace,40 for most of the occurrences at Delos are either Semites (see n.19) or Athenians (see below); of uncertain origin, but probably not Delians, are Ζηνόδωρος Μάκικος [Κούμτου] (i.e. libertus?) of the second or first century B.C.,41 and the graffiti Ζηνόδωρος in the gymnasium.42 Elsewhere only two examples, both from a late period: Ἰούλιος Ζενόδωρος, Panticapaeum, A.D. 221,43 and C. Curtius Zenodorus, a lenuncularius at Ostia, A.D. 192.44

1949] 444-46). He could well be of Macedonian descent, which is consistent with, though not proven by, his father's name. It is interesting that the rare Macedonian name Βρομερός occurs in this same papyrus, line 98. For another possibly Macedonian example see n.18.

36 SIG3 no.46.
37 R. Münsterberg, "Die Beamtennamen auf den griechischen Münzen, II," NZ 45 (1912) 26 (for the dating see Robert, BCH 57 [1933] 477-81). This example too might appear dubious, for Münsterberg (p.27) evidently read the name as Μηνόδωρος Ἀναξαγόρου, naming the example Wien 29016). Head, BMC Ionia p.140, nos.203-06, read all four pieces as ZHNOD[POΣ] ANAΣAI[POY], but the first part of the name is illegible on the plate (pl.xvi.8). The first letter is also illegible on the example Sylloge Copenhagen, Ionia pt.II, pl.16 no.724. I have examined the example in the collection of the American Numismatic Society, however, and report that ZHNODΩ is absolutely certain.
38 Münsterberg, op.cit. (supra n.37) 45; BMC Ionia p.333 no.50, Sylloge Copenhagen, Ionia pt.III, pl.35 no.1561.
39 G. Ι. Zolotas, Χιακών καὶ Ἕβρου ἀνδρῶν ἐπιγραφῶν εὐσεβείᾳ (Athens 1908) 252 no.101.
40 IG XII.8 199.
41 Inscr. Délos 1739 line 6 (cf. 1738).
43 Corpus Inscriptionum Regni Bosporani (Moscow 1965) no.99, lines 11-12.
44 CIL XIV 251 vi 34. Cf. also Domitia Zenodora at Puteoli, CIL X 2373. These two may both be of Semitic origin. There was a large community of Tyrians at Puteoli during the
Unless we are to entertain the hypothesis that the mathematician Zenodorus was a Hellenized Semite, the comparative rarity of the name in other parts of the Greek world confirms Crönert’s identification. On the basis of the evidence assembled above, one might guess that the mathematician was a Cyrenaean or a resident of Ptolemaic Egypt, or conceivably from Chios or Erythrai. But, as we shall see, there is one other place where the name Zenodorus is, though not common, at least attested several times, namely Attica. And here the evidence of the Philonides papyrus is significant: in both passages where the name Zenodorus occurs or has been plausibly restored in the papyrus, the events are evidently taking place at Athens, though the context is too lacunose to make continuous sense. The relevant passages, as printed by Crönert, are as follows:

fr.31 lines 1–6 (Crönert pp.953–54):

\[
\text{fr.31 lines 1–6 (Crönert pp.953–54):}
\]

\[
\text{fr.34 lines 1–5 (Crönert p.954):
}
\]

\[
\text{fr.34 lines 1–5 (Crönert p.954):}
\]

\[
\text{early empire (see the well-known inscription, OGIS 595, a letter of the Tyrian community at Puteoli to the city of Tyre, dated A.D. 174, esp. lines 7–9, οὐτὴς πάλαι μὲν ἐπεμελοῦτο οἱ ἐν Ποταμίοις κατοικοῦσις Τύρωι{οι} πολλοὶ δύνες καὶ πλοῖα. νῦν δὲ εἰς ὀλίγους ἡμᾶς περιέστη τὸν ἄριθμὸν. The evidence for men of Palestinian or Syrian origin residing at Ostia is less striking, but see R. Meiggs, Roman Ostia (Oxford 1960) 215–16.}
\]

\[
\text{This is not in itself implausible. An example of a mathematician from about the same time who was a Hellenized Semite is \textit{Baccleidos} ὁ Τύρων (Hypsicles, [Euclid.] Elem. XIV, ed. Heiberg, V [BT, Leipzig 1888] p.2; on \textit{Baccleidos} as a typical adoptive Greek name of Phoenicians see Masson, op.cit. [supra n.23] 690–91). Furthermore, Philonides came from Lao­dicea πρὸς \textit{θαλάσση} in Syria (see n.47), and a \textit{Ζηνόδωρος} θαλάσση is attested from that very city (see n.19), though from a much later period. Therefore it is possible that Zenodorus in the papyrus was a fellow-countryman whom Philonides was introducing to Athens. Even if we adopt this interpretation, the identity of the mathematician and the acquaintance of Philonides is still assured. But it entails a strained reading of the passages in the papyrus, and there is no certain example of a Semite being named Zenodorus as early as this.}
\]
Philonides himself came from Laodicea πρὸς θαλάσση; but he was an honorary Athenian citizen, as we learn from an Eleusinian decree. Thus he had plenty of reason to visit Athens, quite apart from his interest in Epicureanism. Nevertheless, the mention of Zenodorus in connection with both visits to Athens which can be inferred from the papyrus may be significant. It is worth investigating the possibility that Zenodorus was an Athenian.

The name Ζηνόδωρος occurs, to my knowledge, eight times in Attic inscriptions and can be plausibly restored in one other place. Two of the eight occurrences can be discounted, as they refer to non-Athenians. But we can add two occurrences of Athenians in inscriptions at

48 αὐτὸν is equally possible, as is remarked by R. Philipsson, s.v. Philonides 5, RE 20 (1941) 67 (the article Philonides 7 by K. Orinsky, ibid. col.74, is worth quoting in its entirety as a curiosity: "P. wird von Apollonios von Perge [s. Hultsch o. Bd. II S. 151ff.] als Mathematiker angeführt. Er war Epikureer und brach durch seine Interessen als Mathematiker eigentlich die epikureische Tradition [Usener Kl. Schr. III 188ff.]. Seine Heimat und seine Lebenszeit sind uns nicht bekannt.") Philipsson interprets the two passages mentioning Zenodorus in the sense that Philonides introduced Zenodorus to Athens. This is not impossible (see n.45), but rests on supplements to the papyrus which the author describes (col.63) as "meist nur Versuche" and which would be better described as exercises in fantasy.

47 Both the city of his origin and his Athenian citizenship are known not from the papyrus but from inscriptions. The facts were pointed out by U. Köhler, "Ein Nachtrag zum Lebenslauf des Epikureers Philonides," SBBerl 1900.2 pp.999–1001. The most recent editions of the relevant inscriptions (all unknown to Philipsson, op.cit. [supra n.46], who quotes only Köhler and CIA) are: IG II² 1236 (decrees of the Eumolpidai and Kerykes honoring Philonides, his brother Dicaearchus and their father Philonides); OGIS 241 (decrees of the Delphians honoring Dicaearchus, known only from a copy by Cyriacus of Ancona); BCH 45 (1921) 1ff, IV 78–80 (the well-known Delphian list of θεουρόδωκοι, in which Philonides and Dicaearchus are named as θεουρόδωκοι at Laodicea).

46 The only other place where it can even possibly be restored is IG II² 1039 line 90, which reads ζηνόδωρος Ζηνοδ[. . .]ov - - -Iου (one of a list of ephesii of the tribe Aegaei in the archonship of Apollodorus, ca. 80 B.C.). Mitsos, however, in his republication of the inscription, ArchEph 1964, opp. p.44, reads ζηνόδωρος Ζηνωνίλος Ἐρχεσίτος. In the context, Μηνόδωρος seems more likely than Ζηνόδωρος, cf. lines 86–88: [Κ]ανον Μηνόδωρου Κ[α]λαλυτείς | Σ[ο]κλάλυτος Μηνοδώρου Κ[α]λαλυτείς | [Μ]ηνόδωρος Μηνοδώτου Ε[ρ]χεσίτος. Kirchner, PA no.6193, lists this as a Ζηνόδωρος, but the five Ζηνόδωρος entries in Kirchner, like the rest of the book, are hopelessly antiquated. Thus Kirchner's 6197 is certainly a false restoration. The republication of the relevant inscription, now IG II² 2707, reads ὄρος χωρίς | πεπαμελεῖον | ὕπατος ἱδίων | . . . διώρων | [Στειρεία]τε. Thus there is too little space for Ζηνοδώρως.

49 IG II² 2810 (see n.19), a Zenodorus from Ascalon; ibid. 9125 (see n.29), a Cyrenaean.
Delos, making nine in all. The bearers of the name came from several different demes: Eupyridai, from a late period; Paiania (plausibly restored); Marathon and Trikorythos (see n.50). But the other five occurrences, which include the earliest examples, refer to men from the same deme and, as examination of the inscriptions shows, from the same family. The most informative inscription is IG II² 2332, a list of contributors for some unknown purpose in the archonship of Hermogenes (183/2 B.C.). Lines 26–36 read: Ζηνόδωρος Λαμπτρεύς | καὶ ὑπὲρ τῶν ἄδεια(λφῶν) | Ζηνοδότου Λαμπτρέως | καὶ ὑπὲρ Ἀφροδίσιος Λαμπτρέως | καὶ τοῦ θυὸς Ζηνοδώρου[v] | καὶ ὑπὲρ Κάμωνος Λαμπτρέως | καὶ τοῦ θυὸς Ζηνοδώρου[v] | καὶ ὑπὲρ Ποσειδώνιον Λαμπτρέως | καὶ τῶν ύδων αὐτοῦ Ποσειδώνιον | καὶ Ἡρακλείδου -Δ. IG II² 6652, as corrected ArchEph 1957 p.165, the gravestone of the above-mentioned Δάμων, supplies us with the name of his father: Δάμων | Ζηνοδώρου | Λαμπτρεύς. The younger Ποσειδώνιος appears as an inscription of about 150 B.C. (IG II² 1938 line 59), and two of his sons, Ποσειδώνιος Ποσειδώνιον and -ος Ποσειδώνιον, were ephebes in the archonships of Agathocles (106/5) and Echecrates (102/1 ?) respectively. Finally IG II² 2338, of the archonship of Areios (late first century B.C.) provides us with three more members of the same family, including another Zenodorus. This most interesting inscription is a list of the members of the γένος of the Amyndridai, of whom we know nothing except that they exercised some priestly

---

50 Inscr. Délos 1953, Ζηνόδωρος Ἡρακλείδου Μαραθώνιος νυκήσας Ἀθήνας τήν λαμπάδα τῶν παιδῶν (138/7 B.C.); ibid. 2136 ἐπὶ τοῦ θεοῦ Τρικοροῦ (between 166 and 158/7), cf. P. Roussel, Les cultes égyptiens à Délos (Paris–Nancy 1915–16) 118 no.65.

51 IG II² 6147, Ἰδάρα Ζηνοδώρου | οὐ κατείχε. There is no doubt that Zenodoros is Hilara’s father (not her husband), and hence that this Zenodoros is from Eupyridai. Robert, REG 80 (1967) 454, points out that a woman’s name plus genitive alone always indicates a daughter. The rule is amply confirmed by examination of the inscriptions adjacent to this in IG II².

52 S. Dow, Prytaneis (Hesperia Supp. I, 1937) no.116 line 28 (under Πιανείς): Διονύσιος Ζηνόδωρον. In the photograph, ibid., neither the ι before the missing δ nor the ω after it are clearly visible, but no other restoration is plausible. This inscription belongs to the archonship of Demeas, which Dow puts at ca. 20 B.C. The inscription is in any case from the second half of the first century B.C.

53 The Ποσειδώνιος Ποσειδώνιον ephebe under Agathocles, Fouilles de Delphes III.2 25 col. iii line 4, is not qualified by demotic, but the likelihood that he is to be identified as the eldest son of Ποσειδώνιος (2) of Lamptrai is increased by the appearance of another son of that Poseidonius (duly identified by demotic), a very few years later, in IG II² 1028.
function. Line 22 reads: Ζηνόδωρος 'Αφροδίς[?]ου Λαμπτραίς, Παμμένης, νιός. Thus we can construct the stemma shown in Figure 1.

If the mathematician Zenodorus was an Athenian, then it is a plausible guess that he belonged to the family of Lamptrai, amongst whom the name was hereditary. And if he did belong to that family, then he must be identified with Ζηνόδωρος (2) of the stemma. What little we know of the family and the man is at least compatible with the identification. The family was fairly wealthy, as is shown by Ποσειδώνιος (2) being a ἱεροποιός, and by his sons being ephebes at a time when service was voluntary and a matter of social distinction. Since the

![Stemma of the Zηνόδωροι of Lamptrai](image)

Figure 1. Stemma of the Ζηνόδωροι of Lamptrai

---

64 It is not certain whether the Παμμένης Λαμπτρεύς (no patronymic) who was a theoros at Delphi in the archontship of Euthydorus (Fouilles de Delphes III.2 57 line 9) is to be identified with Pammenes the son of Zenodorus (5). According to W. B. Dinsmoor, The Archons of Athens in the Hellenistic Age (Cambridge [Mass.] 1931) 285, Euthydorus was archon in 42/1 B.C. The archontship of Areios falls early in the reign of Augustus but later than 28/7 (see Graindor, BCH 38 [1914] 412 n.1). If we make the identification, then Zenodorus (5) must have been an old man at the time of the engraving of IG II² 2338, and Aphrodisius (2) was the son, rather than the great-grandson, of Zenodorus (3). The former is the relationship adopted in Fig.1, though the latter cannot be ruled out.

65 On this aspect of the Athenian ephebate in the Hellenistic period see W. S. Ferguson, Hellenistic Athens (London 1911) 128; C. Pélékidis, Histoire de l'ephebie attique (Paris 1962) 169–70. In the year when the younger son of Poseidonius was ephebe there were only 138 ephebes altogether, and 36 of these came from other cities such as Miletus, Cyrene, Rome and Naples (Pélékidis p.184).
family belonged to the priestly γένος of the Amynandridai, it was
descended from the old Athenian aristocracy. The background is ap-
propriate for one with the education and the leisure to become a
mathematician and a philosopher. A further inference can be made
from IG II² 2232 concerning the status of Ζηνόδωρος (2). Since he makes
contributions on behalf of the other relations, he is clearly the head
of the family, i.e. the oldest of the brothers. Three of his brothers have
sons, but no son of his own is mentioned. It is a certain inference that
he had no male children, and a probable one that he was unmarried.
Epicurus is known to have discouraged marriage and the begetting of
children, and though many of his sect did not follow him in this par-
ticular, it is conceivable that Zenodorus’ childlessness was a conse-
quence of his Epicureanism.

Clearly the identity of the mathematician Zenodorus and the
Lamptran of IG II² 2232 remains unproven, but I hope to have shown
that it is at least plausible. The identity of the mathematician and the
acquaintance of Philonides seems to me proven beyond reasonable
doubt, and the floruit of Zenodorus the mathematician is thus estab-
lished as early second century B.C.

This dating is important when we come to examine a hitherto un-
published passage mentioning a Zenodorus which occurs in the intro-
duction to the work of the mathematician Diocles On Burning Mirrors.
Until recently this treatise was known only from two extracts in Euto-
cius’ commentary on Archimedes’ Sphere and Cylinder. Now, how-
ever, the complete work is available in Arabic translation, of which I
have prepared an edition to be published shortly. I give a literal ver-
sion of the opening passage:

"The book of Diocles on burning mirrors. He said: Pythion the
geometer, who was of the people of Thasos, wrote a letter to Conon
in which he asked him how to find a mirror surface such that when it
is placed facing the sun the rays reflected from it meet the circumfer-
ence of a circle. And when Zenodorus the astronomer came down to
Arcadia and was introduced(?) to us, he asked us how to find a mirror
surface such that when it is placed facing the sun the rays reflected

---

54 Clem.Alex. Strom. 2.138.3, ed. Stählin p.189, 15-18: Δημόκριτος δὲ γάμοι καὶ παιδοποιίαν
παρατείνει διὰ τὰς πολλὰς εἰς αὐτῶν ἁγιὰς τὶς καὶ ἀφολλὰς ἀπὸ τῶν ἀναγκαστικῶν. εἰσηκατα-
tάτεται δὲ αὐτῷ καὶ Ἐπίκουρος.
56 Meshed, Shrine Library, ms. 392/5593 pp.106-07.
from it meet a point and thus cause burning. So we want to explain
the answer to the problem posed by Python and to that posed by
Zenodorus; in the course of this we shall make use of the premises
established by our predecessors. One of those two problems, namely
the one requiring the construction of a mirror which makes all the
rays meet in one point, is the one which was solved practically by
Dositheus. The other problem, since it was only theoretical, and there
was no argument worthy to serve as proof in its case, was not solved
practically. We have set out a compilation of the proofs of both of
these problems and elucidated them."

This passage provides a good deal of new and interesting historical
information, which cannot however be discussed here. Two points
must be made about the occurrences of the name Zenodorus in it.
The first is that both occurrences are my emendations. The text is
found in two manuscripts, of which one (Chester Beatty Arabic 5255)
is a direct copy of the other (Meshed, Shrine Library 392/5593). Thus
only the latter comes into consideration. It is written in a Persian
hand, and dated A.H. 867 (= A.D. 1462/3). The two occurrences of the
name in it are reproduced in Figure 2. One would transcribe these as

\[ \text{Figure 2. Arabic Transcriptions of the Name 'Zenodorus' in Meshed, Shrine Library ms. 392/5593} \]

Greek name. In this script, however, the resemblance of alif to ra or
\(\varepsilon\) is very great, and the corruption from زينودورس or زينودرس is easily
explained. I regard the emendation as certain. The second point is that
Zenodorus is referred to as 'the astronomer' (al-munajjim). This is in
itself no bar to identification with the mathematician. It was common
practice in antiquity for those whose primary work was in mathe­
matics to take an interest in astronomy also. Notable examples from
near the period of Diocles and Zenodorus are Archimedes and Apol­
lonius. Furthermore, we have independent testimony of the existence

\[ ^{59} \text{One might rather expect زينودورس, but I have observed that Arabic transcriptions of}
\text{Greek names frequently use a long vowel to represent the Greek accented syllable rather}
\text{than a Greek long vowel. This no doubt reflects contemporary Greek pronunciation (like}
\text{the \(\dot{\alpha}\) for the \(\delta\) of Ζηνόδωρος).} \]
of an ‘astronomer’ Zenodorus. In a catalogue of *oı́ ἐπὶ τοῦ πόλου συντάξων* (where ἐπὶ τοῦ πόλου is to be interpreted ‘concerning the heavens’), found in ms. Vat.Gr. 381 and published by Maass,\(^{60}\) occurs the name *Ζηνόδωρος*. This man was tentatively identified by Maass (*Aratea* p.163) with the mathematician. The identification appears certain in the light of the new evidence.

One important conclusion that can be drawn from the mention of Zenodorus in the introduction to Diocles’ treatise concerns the date of Diocles. Since Diocles reports that he had personal contact with Zenodorus, his *floruit* must coincide with that of Zenodorus, namely, early second century B.C. Until now it has been generally assumed that Diocles was later than Apollonius (see n.10). We can now say that Diocles was a contemporary of Apollonius (we have the link Apollonius–Philonides on the one hand, and Philonides–Zenodorus–Diocles on the other). This is completely consistent with what we should conclude from an examination of Diocles’ treatise, which in form belongs to the pre-Apollonian tradition of conic sections.\(^{61}\)

Brown University

March, 1972

---

\(^{60}\) First in *Hermes* 16 (1881) 388; a better version in his *Aratea* (Berlin 1892) 123.

\(^{61}\) I must defer a discussion of the difficult question of whether Diocles was at all acquainted with Apollonius’ work to the introduction to my forthcoming edition of Diocles’ treatise. To D. M. Lewis, O. Neugebauer, P. J. Parsons, A. J. Sachs and Nancy Waggoner I am grateful for assistance with various points in this essay.

Addendum to p.179 n.16 supra: To those authorities ignorant of the evidence for Zenodorus’ date must now be added the article *Zenodorus* 5, *RE* 10A (1972) 18, by K. Ziegler, published while this article was in proof. The multiple omissions and the inextricable confusion in references to the sources for Zenodorus’ treatise make the article quite useless. The only reference to the chronological problem is “anscheinend nicht viel jünger als Archimedes,” which is derived, I suspect, solely from the discussion of Hultsch, *op.cit.* (supra n.1) III 1190 (“non multo post Archimodem”), in a work published in 1878.