

History of Logic from Aristotle to Gödel (www.historyoflogic.com)

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Selected Bibliography on the Megarians and the Dialectical School

Ediitons of the Fragments

1. Döring, Klaus. 1972. *Die Megariker. Kommentierte Sammlung Der Testimonien*. Amsterdam: B. R. Grüner.
Inhaltsverzeichnis: Vorbemerkungen IX-XII; (T = Testimonien; K = Kommentar).
I. Euklid und sein Kreis.
1. Euklid T = 3; K = 73; 2. Diokleides T = 4; K = --; 3. Dionysios aus Chalkedon T = 14; K = 99; 4. Ichthyas T = 15; K = 100; 5. Kleinomachos T = 15; K = 101;
II. Eubulides und sein Krei
1. Eubulides T = 16; K = 102; 2. Euphantos von olynth T = 20; K = 114; 3. Memnon (?) T = 21; K = --; 4. Alexinos T = 21; K = 115;
III. Diodor und sein Kreis.
1. Apollonios Kronos T = 28; K = --; 2. Diodor T = 28; K = 124; 3. Philon T = 45; K = 138; 4. Panthoides T = 45; K = 139; 5. Die Töchter Diodoros T = 45; K = --;
IV. Stilpon und sein Kreis.
1. Pasikles von Theben T = 46; K = --; 2. Thrasymachos von Korinth T = 46; K = --; 3. Stilpon T = 46; K = 140; 4. Philippos der Megariker T = 61; K = --; 5. Simmias von Syrakus T = 61; K = --; 6. Alkimos, Aristeides, Diphilos, Kleitarch, Metrodor, Myrmex, Paioneios, Phrasidemos, Timagoras T = 61; K = --;
Anhang: Bryson und sein Schüler Polyxenos.
Bryson T = 62; K = 157;
Polyxeons T = 67; K = 166;
Stemma der Lehrer-Schüler-Verhältnisse 171; Verzeichnis der wichtigen Literatur 172; Stellenregister 175.
2. Giannantoni, Gabriele, ed. 1990. *Socratis Et Socraticorum Reliquiae*. Napoli: Bibliopolis.
Second revised and expanded edition (4 volumes).
The first edition, titled *Socraticorum reliquiae*, was published at Roma, Edizioni dell'Ateneo, 1983-1985.
Vol. I gives the testimonies for Socrates and testimonies and fragments of Euclides and the Megarians, Phaedo and Menedemus; vol. II for the Cyrenaicans, Cynics, Aeschines and other Socratics; vol. III contains the bibliography and indices; vol. IV notes on various subjects.
The testimonia on Philo the Dialectician and Diodorus Cronos are in vol. I, p. 414-435; that on Diodorus can also be found in Klaus Döring, *Die Megariker*, Amsterdam: Grüner, 1972.
For a possibly Philonian theory of signs see: Hermann Diels, *Doxographi Graeci*. Berlin: Reimer, 1879, p. 605 (Pseudo-Galen, *Historia philosophica* c. 9).
3. Montoneri, Luciano. 1984. *I Megarici. Studio Storico-Critico E Traduzione Delle Testimonianze Antiche*. Catania: Università di Catania.
Indice generale: Premessa 7; Parte prima I Megarici. Studio storico-critico 13; Introduzione: I discepoli di Socrate e le loro scuole 15; I. Euclide e la sua scuola 39; II. Eubulide e seguaci 93; III. Diodoro Crono e seguaci 123; IV. Stilpone e seguaci 207; Stemma della *diadoche* megarica 226; Parte Seconda: I Megarici. Le testimonianze 227; Indice dei nomi antichi 323; Indice degli autori moderni 329; Indice delle fonti 333-345.

La presente ricerca "vuole essere un primo tentativo unitario e globale di ricostruzione e interpretazione delle fondamentali problematiche speculative dei pensatori megarici, condotto sulla scorta di un'attenta ricognizione critica del lavoro storiografico degli ultimi due secoli." p. 8

"Veniamo ora a illustrare la struttura dell'opera, che è bipartita.

Abbiamo articolato la prima parte -- che ha carattere monografico -- in quattro capitoli, dedicati rispettivamente alle grandi figure dei "capiscuola" del Megarismo: Euclide, Ebulide, Diodoro Crono e Stilpone.

La seconda parte comprende invece la traduzione delle testimonianze sui Megarici, ed è anch'essa strutturata in quattro sezioni (I. Euclide e la sua scuola; II. Ebulide e seguaci; III. Diodoro Crono e seguaci; IV. Stilpone e seguaci), corrispondenti ai quattro capitoli della prima parte.

Diversamente da Döring che le raccoglie a parte (cf. *Anhang: Bryson und sein Schüler Polyxenos*, pp. 62-70), noi abbiamo incorporato nella sezione I le testimonianze su Brisone e Polisseno, conformemente al nostro punto di vista espresso nel capitolo I.

In ciascuna sezione abbiamo raggruppato le fonti -- secondo la partizione adottata da Döring -- in: Testimonianze sulla vita (A), sugli scritti e la dottrina (B) e (soltanto per Euclide) sulla scuola (C). Abbiamo inoltre inserito -- quando ci è parso utile a una maggiore perspicuità di lettura -- titoli supplementari (in corsivo), con intento classificatorio e, insieme, chiarificatore del contenuto delle testimonianze.

Per quanto riguarda la traduzione italiana, valgano le seguenti avvertenze:

1. Sono state tradotte tutte le testimonianze comprese nella raccolta di Döring, a eccezione di alcune poche (precisamente quelle corrispondenti ai fr. 21, 22, 23, 58, 69, 72, 200, 201), che sono state omesse o perché prive di senso compiuto (fr. 21, 22, 23), o perché non interpretabili, trattandosi di testi papiracei assai lacunosi dai quali si ricavano non più che nomi e termini isolati. In ogni caso, Si tratta -- a nostro avviso -- di testimonianze praticamente irrilevanti dal punto di vista del loro contenuto storico-filosofico.

Viceversa, abbiamo ritenuto utile inserire la traduzione di alcune testimonianze non comprese nella raccolta di Döring, e che sono quelle contrassegnate dai nn. 44, 48, 166, 174L del nostro ordinamento.

2. Nella traduzione abbiamo di norma seguito il testo critico riprodotto da Döring, esplicitamente dichiarando i pochi casi nei quali abbiamo preferito una diversa lezione.

Nella traduzione abbiamo disposto le testimonianze secondo un ordine di lettura che ci è parso coerente con le caratteristiche e le conclusioni della trattazione monografica. Per facilitare i riscontri col testo greco, abbiamo fatto seguire, al nostro numero d'ordine della testimonianza, quello corrispondente nella numerazione Döring, riportato in parentesi.

Al fine di renderne più perspicuo al lettore il senso complessivo, abbiamo tradotto alcune testimonianze in una citazione più ampia rispetto a quella riportata da Döring. Esse sono state contrassegnate da un asterisco (*) posto accanto al nostro numero d'ordine della testimonianza." pp. 10-11.

4. Muller, Robert. 1982. *Les Mégariques. Fragments Et Témoignages*. Paris: Vrin. Traduction et commentaire.

Table des matières: Introduction 7; Les fragments et témoignages (I. Euclide, II. Ebulide, III. Diodore, IV. Stilpon, V. Appendice: Bryson et son élève Polyxène) 19; Annexe I 75; Annexe II 91; Commentaire 95; Notes 183; Bibliographie 229; Index des sources 237; Index locorum 247-253.

"Introduction. I. Les textes Mégariques.

On s'accorde volontiers à reconnaître que les Mégariques sont parmi les plus mal connus des philosophes de l'Antiquité, assurément les plus insaisissables, alors même que les éléments de leur doctrine ressurgissent régulièrement dans les travaux des interprètes de Platon et d'Aristote ou dans ceux des historiens de la logique, et après que plusieurs d'entre eux eurent joui auprès des Anciens d'une célébrité égale à celle des plus grands. A cela il y a d'abord une raison simple, la quasi-absence de

textes: des originaux il ne subsiste en effet que quelques courts *fragments* difficiles à exploiter, et les *témoignages* des Anciens sont dans l'ensemble peu nombreux, souvent brefs, dispersés, et donc d'un accès malaisé. Cette situation défavorable n'est certes pas réservée aux seuls Mégariques, puisque bon nombre de Présocratiques, les Cyniques ou les Cyrénaïques, pour ne citer qu'eux, ne sont apparemment pas mieux lotis. Pour tous ceux-là, cependant, le lecteur moderne a à sa disposition, parfois depuis longtemps, des recueils regroupant l'essentiel ou la totalité des textes subsistants (1), alors que pour les Mégariques il lui aura fallu attendre le dernier tiers du XXe siècle: ce n'est qu'en 1972, en effet, qu'est paru le livre de K. Döring qui réunit pour la première fois l'ensemble des fragments et témoignages qui les concernent (2). Les qualités de ce travail, jointes à la commodité que constitue le fait d'avoir enfin regroupés et ordonnés la quasi-totalité des textes intéressant les Mégariques font qu'il est en passe de devenir classique, les historiens de la philosophie et de la logique s'y référant de plus en plus volontiers. On ne pouvait donc mieux faire, quand il s'est agi de proposer au lecteur français la documentation la plus complète et la plus sûre sur la pensée mégarique, que de prendre le livre de Döring comme base de travail, et de traduire la totalité des fragments et témoignages rassemblés par lui en respectant sa numérotation et la disposition générale de son ouvrage.

Il est bien connu cependant que les difficultés du genre empêchent presque fatalement un recueil de ce type d'être réellement exhaustif et de se suffire à lui-même. Il faut d'abord sélectionner et découper les textes pertinents, ce qui exige qu'on se donne des critères à la fois rigoureux et maniables, mais qui ne seront jamais totalement à l'abri de la contestation. Il faut ensuite tenir compte du fait qu'un extrait isolé de son contexte peut être inintelligible, ou interprété à contresens; de même la juxtaposition de fragments d'auteurs et de siècles différents, parfois très éloignés les uns des autres, peut avoir des conséquences malheureuses.

Il faut reconnaître que sur le premier point le travail de Döring ne suscite que peu de réserves: ayant adopté le principe de ne retenir que les textes où apparaît formellement le nom des Mégariques en général ou de l'un au moins des membres présumés du groupe, l'auteur ne fait donc pas figurer dans son recueil les divers passages où la critique moderne a cru déceler des allusions aux Mégariques. Si cette prudence peut sembler excessive à certains, elle a du moins le mérite de la clarté et de la rigueur en proposant un minimum de textes incontestables: dans la mesure où il est difficile de trancher sur la base de simples critères externes dans les querelles opposant à ce sujet les spécialistes, elle laisse aux interprètes la responsabilité de leurs choix. Tout au plus pourrait-on remarquer que Döring est infidèle à son principe à une ou deux reprises -- en omettant telle phrase où figure pourtant le nom d'un Mégarique(3), ou en incluant un fragment dans lequel aucun nom n'est cité (4) -- et que parfois le mauvais découpage d'un extrait interdit d'en saisir clairement la signification.

La deuxième difficulté, quant à elle, ne peut guère être tournée qu'en joignant aux fragments et témoignages une introduction ou un commentaire, dont l'objet serait de restituer aussi souvent que nécessaire les divers contextes, et de mettre en lumière la cohérence conceptuelle des principaux éléments de la doctrine, ou, à défaut, de faire apparaître au moins l'unité d'inspiration de l'ensemble. Bien que l'auteur ait complété son travail par un commentaire assez fourni (une centaine de pages), il ne paraît pas que cette reconstruction de la pensée mégarique ait été pour lui un objectif prioritaire: tous ses soins sont allés à la réunion et à l'établissement des textes, les éclaircissements qui les accompagnent étant plutôt de nature historique et philologique.

C'est en tenant compte de ces difficultés et de cet état de fait que nous avons conçu notre propre travail. Les mérites du livre de Döring étant reconnus, on devait seulement chercher à le compléter pour pallier les inconvénients qu'on vient de relever. Pour combler les rares lacunes de sa collection, mais surtout pour éclairer par les sources anciennes elles-mêmes le contenu de quelques fragments elliptiques ou allusifs, un certain nombre de textes complémentaires ont été ajoutés en Annexes, ainsi qu'une brève liste des allusions probables ou possibles proposées par

divers spécialistes; d'autre part, pour corriger dans la mesure du possible les effets négatifs de l'extrême dispersion de nos sources et de la brièveté de la majorité d'entre elles, on s'est efforcé d'éclairer par un Commentaire la signification littérale et la portée philosophique des divers fragments, la place occupée par ce commentaire se justifiant par la rareté, dans notre langue, des travaux consacrés aux Mégariques: hormis deux ou trois études déjà anciennes (6), on ne dispose en effet à ce jour que de quelques courts chapitres inclus dans les histoires générales de la philosophie et d'articles spécialisés sur telle ou telle question particulière de logique (7), ce qui est manifestement insuffisant quand on cherche à acquérir une vue cohérente sur la nature exacte et l'étonnant destin de la doctrine mégarique. Étrange destin, en effet, que celui des philosophes de Mégare. Les caractères particuliers de la documentation, que l'on vient de rappeler (sources indirectes, fragmentaires, longtemps difficiles à consulter), n'expliquent sans doute pas à eux seuls la méconnaissance dont ils sont encore partiellement victimes. Car il faut savoir qu'une certaine ambiguïté a marqué leur réputation dès l'origine: si on leur reconnaissait volontiers des talents hors pair, principalement dans le domaine de la dialectique, si on saluait la personnalité exceptionnelle à tous égards d'un Stilpon, on ne manquait pas de dénoncer d'autre part les dangers que présentait l'usage de ces mêmes talents, ou de souligner la vanité de leurs prétendus tours de force. Pour comprendre ces jugements contrastés -- auxquels font curieusement écho les appréciations contradictoires des historiens de la logique des XIXe et XXe siècles (8) -- et pour éviter les risques de méprise, il est indispensable de donner d'abord, à qui voudrait entreprendre la lecture des textes, une vue plus précise sur la situation historique de l'École de Mégare; on tentera ensuite, pour les mêmes raisons, de restituer quelque chose de l'unité d'une pensée souvent réduite à quelques thèses disparates et paradoxales." pp. 7-9

Bibliography

1. Allen, James. 2001. *Inference from Signs. Ancient Debates About the Nature of Evidence*. New York: Oxford University Press.
 Study III: *The Stoics on Sign-Inference and Demonstration* pp. 147-193, Appendix: *The Evidence for a Dialectical Origin of the Stoic Theory of Signs* (pp. 188-193).
 "The existence of a Dialectical school distinct from the Megarian school is controversial. The case in favour is made by D. Sedley,(33) doubts have been raised by K. Döring.(34) I am not concerned here with this wider controversy, but only with T. Ebert's contention that the Stoic theory of the sign had its origin in the Dialectical school.
 The principal piece of evidence for this thesis is a passage in chapter 9 of the pseudo-Galenic *Historia philosopha*, where, as we have already had occasion to observe, a definition of the sign essentially the same as that in Sextus is preserved, but commemorative and indicative signs are represented as species of the genus sign determined by this definition." (pp. 188-189)
 (...)
 "But the burden of my argument in this study is that the distinction and the definition do not form a unity and that, if we must look for the origin of the distinction outside the Stoa, the most likely place is not the Dialectical school but in medicine. If this is right, it is possible to agree with Ebert that the distinction between commemorative and indicative signs is not Stoic without agreeing that it must be Dialectical or that its source and that of the definition of the sign must be sought in the same place." (p. 193)
2. ———. 2019. "Megara and Dialectic." In *Dialectic after Plato and Aristotle*, edited by Bénatouil, Thomas and Ierodiakonou, Katerina, 17-46. Cambridge: Cambridge University Press

"I spoke of the philosophers traditionally regarded as members of a Megaric school. In a 1977 article on Diodorus Cronus, David Sedley argued (among other things) that, instead of the single Megaric school of tradition, there were at least two distinct schools, the Megaric and the Dialectical (and possibly a third, the Eristical).(10) After setting out this view, I shall rehearse some objections to it and eventually sketch a position that can, I think, be viewed as one of tentative and qualified agreement.

This is the occasion for another caution, however. Suppose that a certain amount of cold water is thrown on the idea of a distinct Dialectical school.

It would be a mistake, I maintain, to think that that there ought to be a presumption in favour of the traditional one-school view. Questions about whether and in what way there was such a thing as a Megaric school can and have also been raised.(11) Doubts about the existence of a distinct Dialectical school should not necessarily be seen as confirming the traditional conception of a unitary Megaric school. In an effort to avoid prejudging the issue, I shall refer to a 'dialectical group'." (p. 21)

(10) Sedley 1977, summary and comments in Giannantoni 1990 *SSR* 4.46-8 (possibly anticipated by Schmid, whose view I know only from the summary in Giannantoni 4.43).

(11) Cambiano 1977; Giannantoni 1990 *SSR* 4.45-6. Cautions about the use of the term 'school': Döring 1972, 1989; Muller 1985: 9-10 (Muller 1988 is, however, more sympathetic to the idea of a Megaric school).

References

Cambiano, G. (1977) 'Il problema dell' esistenza di una scuola Megarica', in *Scuole socratiche minori e filosofia ellenistica*, ed. G. Giannantoni. Bologna: 1977.

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Giannantoni, G. (ed.) (1983-1990) *Socratis et socraticorum reliquiae*. 4 vols. Naples.

Muller, R. (trans.) (1985). *Les Mégariques. Fragments et témoignages*, with comm. Paris.

_____ (1988) *Introduction à la pensée des Mégariques*. Paris and Brussels.

Sedley, D. (1977) 'Diodorus Cronus and Hellenistic philosophy' *PCPS* 23: 74-120.

3. Barnes, Jonathan. 1993. "A big, big D?" *The Classical Review* no. 63:304-306. Reprinted with the title: *Logic and the dialecticians* as Chapter 16 of J. Barnes, *Logical Matters: Essays in Ancient Philosophy II*, edited by Maddalena Bonelli, Oxford: Clarendon Press 2012, pp. 479-484.

"As Aristotle invented predicate logic, so Chrysippus invented propositional logic. Unlike Aristotle, Chrysippus had precursors; but his debt to them was slight — and in any event we know little or nothing about them.(1)

Thus, in caricature, an orthodoxy. Theo Ebert has urged heresy: Chrysippus, he suggests, owed a very great deal to his precursors — and we can itemize at least some parts of the debt. For substantial parts of Chrysippean logic were based, directly or indirectly, on the work of the Dialecticians (Diodorus Cronus, Philo, and their associates), and it is the Dialecticians whom we should honour as the inventors of propositional logic.(1) In doing so we shall not merely pay just tribute to the eminent dead: we shall come to a better understanding of the course and career of logic itself.

Ebert's thesis is sustained by meticulous analyses of familiar texts, most of them in Sextus; and a thorough consideration of it would occupy a volume here — *ολίγα από πολλών* — I voice two general doubts and sketch two particular disagreements." (p. 479 of the reprint)

(...)

"In sum, Ebert has not yet converted me to his heresy.** Nonetheless, I give his book four hearty cheers. It is a rattling good read; it is lucid and open and honest; it essays sharp and subtle interpretations of texts which other scholar have merely blustered through; and in the course of discussing the theories of signs and of proof,

- the classification of types of proposition, the analyse of fallacies and sophisms, it often throws new and brilliant light on a portfolio of documents which are central to our understanding of Hellenistic logic." (p. 484 of the reprint)
- (1) Ebert denies any share of honour to Theophrastus and the Peripatetics: pp. 15-19, 73 n. 8.
- * A review of T. Ebert, *Dialektiker und friihe Stoiker bei Sextus Empiricus: Untersuchungen zur Entstehung der Aussagenlogik*, Hypomnemata 95 (Gottingen, 1991) originally published in *CR* 43, 1993, 304-306, under the title 'A big, big D?'. (Some readers of which forgot that the answer to the question, is: 'Well, hardly ever'.)
- ** He has replied to the chief parts of this review on pp. 283-293 of his 'Defence'. [T. Ebert, *In Defence of the Dialectical School*, in: Francesca Alesse (ed.), *Anthropine Sophia. Studi di filologia e storiografia filosofica in memoria di Gabriele Giannantoni*, Napoli: Bibliopolis 2008, pp. 275-293.]
4. Bobzien, Susanne. 1993. "Chrysippus' Modal Logic and its Relation to Philo and Diodorus." In *Dialektiker und Stoiker. Zur Logik der Stoa und ihrer Vorläufer*, edited by Döring, Klaus and Ebert, Theodor, 63-84. Stuttgart: Franz Steiner.
- On Philo the Dialectician: "Philo's modal definitions are the least well reported and their exact meaning cannot be reconstructed with certainty. Only Boethius gives all four Philonian modal definitions (*in Int* . 234.10-22). The other three sources, all Aristotle commentators as well (Alex. Aphr. *in APr* . 183f; Phlp. *in APr* . 169; Simp. *in Cat* . 195f), confine themselves to Philo's notion of possibility, contrasting it with others; and it is not always clear what is part of the definition and what is part of the contrast. I will rely primarily on Boethius. According to his report, a proposition is Philonian possible, iff it is capable of truth according to the proposition's own nature or as far as the proposition itself is concerned; otherwise it is impossible. Thus, it seems, what is required for Philonian possibility is some sort of intrinsic consistency of the proposition. The propositions '(this) piece of wood bums' (Simp. *in Cat* . 196.1), 'Diodes is alive', 'it is night' would all be consistent in this sense.
- The evidence is too sparse and heterogeneous to allow one to give a clear account of the type of consistency Philo had in mind. As it is also not essential for what follows, I leave the concept of consistency uninterpreted.
- Consistency seems to be a common and reasonable criterion for possibility; still, due to the temporalized concept of truth, it works a little differently for Hellenistic propositions than for atemporal propositions." (p. 67, notes omitted)
- On Diodorus Cronus: "As in the case of Philo, for Diodorus the full set of modal definitions is only reported by Boethius (*in Int* . 234.22-6). Yet, the definition of possibility is confirmed in some other sources (Alex. Aphr. *in APr* . 183f.; Phlp. *in APr* . 169; Simp. *in Cat* . 195; Boeth. *in Int* . 412), and we have further valuable information about Diodorus' modal theory in Epictetus, Cicero, and Plutarch (Epict. *Diss.* 2.19.1-5; Cic. *De fato* 12, 13, 17 and *Fam.* 9.4; Plu. *De Stoic. rep.* . 1055E-F). For Diodorus, a proposition is possible iff it either is true or will be true."(p. 69, note omitted)
5. ———. 1998. *Determinism and Freedom in Stoic Philosophy*. Oxford: Clarendon Press.
- Chapter 3.1.2 *Diodorus and necessitarianism*, pp. 102-108.
- "We can hence conclude—fully in accord with the surviving passages—that Diodorus' modal notions were not criticized for leading to universal necessitarianism, i.e. to the theory that 'everything is necessary'—for that it is day, for instance, is not Diodorean necessary. Rather what was found unacceptable was that whatever in fact never happens is impossible (or alternatively that all false propositions about what happens in the future are impossible). This was the only straightforward way, within Hellenistic logic, to express the thought that Diodorus' modalities preclude counterfactual possibilities. But this is surely enough to worry not only a libertarian but also a 'soft determinist' such as Chrysippus. So Chrysippus, since he wanted to retain 'counterfactual possibilities', had to reject

- Diodorus' modal concepts. And he did this, as is well known, by attempting to refute the Master Argument, i.e. the argument with which Diodorus established his notion of possibility as the (only) right one.(26) Still, the question remains: what concept of possibility should Chrysippus adopt instead? One choice he had was Philo's." (p. 108)
 (26) For Chrysippus' refutation of this argument see e.g. Bobzien 1986 [*Die stoische Modallogik* (Würzburg)], 105-13.
6. ———. 1999. "Logic. II. The 'Megarics'." In *The Cambridge History of Hellenistic Philosophy*, edited by Algra, Kempe, Barnes, Jonathan, Mansfeld, Jaap and Schofield, Malcolm, 83-91. Cambridge: Cambridge University Press.
 "Apart from the various logical puzzles and sophisms, there are only two topics on which we can be sure of a positive contribution to logic(25) by the 'Megarics' .(26) These are the positions of Diodorus Cronus and of Philo on the theory of conditionals and on modal logic. Why the discussion of these topics came down to us, we can only divine. Certainly both involve notorious difficulties. Again, they were topics which were extensively and intensely discussed in Hellenistic logic; so much so that the disputes became part of the general knowledge of the intelligentsia of the time (e.g. Sextus Empiricus *M* [*Adversus mathematicos*] 1.309–10). In addition, the theory of modalities was believed to have far-reaching results for other areas of philosophy." (p. 83)
 (25) Logic in the narrow sense, i.e. not including contributions to the study of ambiguity.
 (26) On the extent to which it is legitimate to speak of a 'Megaric' (or Dialectical), 'school', see above, p. 47 n. 105.
 P. 47, note 105: On the existence and name of this school, cf. Cambiano 1977 and Sedley 1977. Against this, see Döring 1989. Like Giannantoni 1990, iv 41–50, I am inclined to accept Sedley's hypothesis regarding the 'Dialectical' school. For the chronology of these philosophers I follow Sedley 1977, 107 n. 23. Cf. also the useful chronological table *ibid.* 82.
 References
 Cambiano, G. (1977) 'Il problema dell' esistenza di una scuola Megarica', in *Scuole socratiche minori e filosofia ellenistica*, ed. G. Giannantoni. Bologna: 1977.
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 Giannantoni, G. (ed.) (1983–1990) *Socratis et socraticorum reliquiae*. 4 vols. Naples.
 Sedley, D. (1977) 'Diodorus Cronus and Hellenistic philosophy' *PCPS* 23: 74-120.
7. Bochenski, Joseph. 1951. *Ancient Formal Logic*. Amsterdam: North-Holland.
 Chapter V. *The Stoic-Megaric School*, pp. 77-102.
 "The development of formal logic in Antiquity reached its peak in the works of the thinkers belonging to the Megaric and Stoic Schools. Unfortunately, none of those works are preserved and our information concerning them supplied by later sources is desperately scarce. It is sufficient, however, to show that among both Megaricians and Stoics there were very great logicians and that the general level of the formal rigour obtained by those schools was remarkable - indeed, superior in some respects to that of our own today. Among the discoveries which may safely be attributed to them, are the following: invention and statement in form of an axiomatic system (which seems to have been both consistent and complete) of a logic of propositions; invention of truth-tables and thorough discussions of the meaning of implication; subtle semiotical doctrines, including a sharp distinction between the logical laws and the metalogical rules of inference, and a clear distinction between intension and extension.
 We shall expound here, after a historical survey (13), their logic in four chapters, dealing respectively with semiotics (14), the theory of propositional functors (15) the rules of inference or syllogisms (16) and the paradoxes, including the famous Liar (17)." (p. 77)
8. ———. 1961. *A History of Formal Logic*. Notre Dame: Indiana University Press.

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Reprinted New York, Chelsea Publishing Co., 1970.

Chapter III. *The Megarian-Stoic School* , pp. 105-133.

"In reading the Megarian-Stoic fragments one's first impression is that here is something different from Aristotelian logic: terminology, laws, the very range of problems, all are different. In addition we are confronted with a new technique of logic. The most striking differences are that the Megarian-Stoic logic is firstly not a logic of terms but of propositions, and secondly that it consists exclusively of rules, not of laws - as does the *Prior Analytics* . The question at once arises, what was the origin of this logic.

The answer is complex. First of all one cannot doubt that the Megarians and Stoics, who as we have seen (cf. 18.03) found an only too frequent delight in refutation, had a tendency to do everything differently from Aristotle. Thus for example they introduce quite new expressions even where Aristotle has developed an excellent terminology.

Yet it should not be said that their logical thought could have developed uninfluenced by Aristotle. On the contrary, they appear to have developed just those ideas which are last to appear in the *Organon* . We find, for instance, a more exact formulation of the rules which Aristotle used in axiomatizing the syllogistic, and himself partially formulated. Nor can it be denied that they developed his theory of 'syllogisms from hypotheses', chiefly on the basis of the preparatory work of Theophrastus. And generally speaking they everywhere show traces of the same spirit as Aristotle's, only in a much sharper form, that spirit being the spirit of formalized logic." (p. 108)

9. Ciuni, Roberto. 2009. "The Search for the Diodorean Frame." *Humana Mente* no. 3:47-65.

Abstract: " *Diodorean modalities* are logical notions that specify, in a precise way, how sentences may be true with respect to time: a sentence is diodoreanly necessary at a given instant iff it is true since that instant on.

Arthur Prior has treated them as sentential operators and built up a logic for such modalities (DIOD) conjecturing that the frame for such a logic (the "diodorean frame") was the frame for S4. The Conjecture was soon proved false, through a number of counterexamples that played a role in the research on modal logics between S4 and S5. The present paper aims at showing that (i) the search for the diodorean frame benefited from such a research, and that (ii) there has been a mutual interaction between the search of the diodorean frame and some characterisation results. The paper is divided into five parts. In section 1, I will introduce diodorean modalities, while in Section 2 I will be focusing on Prior's reconstruction of the Master Argument and his characterisation of DIOD. In section 3, I present a conjecture Prior advanced about the characterisation of DIOD and some counterexamples to it. The notions of "frame" and "frame for" will be also introduced. In section 4 I summarise the connections between the search of the diodorean frame and some researches in modal logic. Section 5 presents a short conclusion."

References

Prior Arthur N. (1955), *Diodoran Modalities* , The Philosophical Quarterly, 32/8: 226-230.

Prior Arthur N. (1958), *Diodorus and Modal Logic: a Correction* , The Philosophical Quarterly, 20/5: 205-213.

10. Crivelli, Paolo. 1994. "The Stoic Analysis of Tense and of Plural Propositions in Sextus Empiricus, *Adversus Mathematicos* X 99." *Classical Quarterly* no. 44:490-499.

" *Adversus Mathematicos* (*M.*) x is the second book dedicated by Sextus to the discussion of the physical doctrines put forward by dogmatic philosophers. An extensive section (*M.* X 85-120) deals with Diodorus Cronus' arguments concerning movement.

M. X 99 occurs within the report of a debate on motion and time between Diodorus and some unnamed opponents. The passage is probably corrupt (as was already noticed by Heintz) and contains some observations on plural propositions and tense which have not yet been satisfactorily explained. In this paper I argue that Diodorus' critics are Stoics, propose a new emendation of the text, and attempt a plausible account of the remarks on plural propositions and tense. Thereby some light is shed on a hitherto unexplored region of Stoic logic." (p. 490)

References

W. Heintz, *Studien zu Sextus Empiricus* (Halle, 1932; Schriften der Königsberger Gelehrten Gesellschaft - Sonderreihe, 2).

11. Denyer, Nicholas. 1981. "The atomism of Diodorus Cronus." *Prudentia* no. 13:33-45.
12. ———. 1998. "Philoponus, Diodorus, and Possibility." *Classical Quarterly* no. 48:327.
 Abstract: "The definition here ascribed to Philo [*] is entirely in line with what we know of Philo from else where: Alexander Aphrodisensis, in *Analityca Priora* 184.6–10; Simplicius, in *Categorias* 195.33–196.5; Boethius, in *de Interpretatione* 234.10–15. The same is not true of the definition here ascribed to Diodorus. For Diodorus, we are told elsewhere, defined the possible as that which either is or will be so: Cicero, *de Fato* 13, 17; Plutarch, *De Stoicorum repugnantiis* 1055d-e; Alexander Aphrodisensis, in *Analityca Priora* 183.42–184.5; Boethius, in *de Interpretatione* 234.22–4, 412.16–7. Something has therefore got garbled." [*] Phlp. in *APr.* 169.17-21. This is fr. 136 in the collection of K. Döring, *Die Megariker* (Amsterdam, 1972); and part of fr. II F 27 in the collection of G. Giannantoni, *Socratis et Socraticorum Reliquiae* (Naples, 1990). Both Döring, pp. 39-43, and Giannantoni, i.429-33, reprint all the other passages here cited.
13. ———. 2002. "Neglected Evidence for Diodorus Cronus." *Classical Quarterly* :597-600.
 "There are two standard compilations of the evidence relating to Diodorus Cronus and the Megaric school of philosophers.(1) Neither contains Eustathius, *Ad Hom. Od.* 28.46–29.2, part of his note on *Odyssey* 1.107." (p. 597)
 (...)
 "The second thing we learn about Diodorus Cronus from this neglected passage is that as early as c. A.D. 100 someone—Suetonius—actually called him a Megaric. This is without parallel in our other sources. When other sources apply to Diodorus what might be a label for his school, they uniformly call him *διαλεκτικός*, and the *διαλεκτικοί* (perhaps it should be printed with a capital delta) were rivals from whom Megarics are reported to have recruited pupils (D.L. 2.113). It has been proposed in consequence that we should abandon the recent practice of describing Diodorus as a Megaric, and call him a Dialectician instead(2) The proposal can still be adopted, even though we now have direct evidence of someone in antiquity calling Diodorus a Megaric. For supporters of the proposal can maintain that Suetonius too fell victim to the same confusion that has led more recent scholars to describe Diodorus as a Megaric rather than as the Dialectician that in fact he was. Nevertheless, in the light of the neglected passage of Eustathius, the proposal is perhaps less attractive than it originally looked." (p. 598)
 (2) D. Sedley, 'Diodorus Cronus and Hellenistic philosophy', *PCPS* 203 (n.s. 23) (1977), 74–120, at 74–7. Sedley's proposal was rejected by Giannantoni, who placed Diodorus testimonia in his section on Megarics. It was treated with some disdain by K. Döring, 'Gab es eine Dialektische Schule?', *Phronesis* 34 (1989) 293–310, and taken up enthusiastically by Theodor Ebert, *Dialektiker und frühe Stoiker bei Sextus Empiricus: Untersuchungen zur Entstehung der Aussagenlogik* (Göttingen, 1991) = Hypomnemata 95, and N. Denyer, 'Diodorus Cronus', in E. J. Craig (ed.), *The Routledge Encyclopedia of Philosophy* (London, 1998), 2.83–6.

- The most recent discussion is F. De Mattia, ' *Diodoro Crono: testimonianze antiche ed esegesi moderna* ', unpublished dissertation (Bologna, 2000), 15–39.
14. Döring, Klaus. 1989. "Gab es eine Dialektische Schule?" *Phronesis* no. 34:293-310. English abstract: "Until recently, students of ancient philosophy have generally believed that Diodorus Cronus was a member of the Megarian school founded by Socrates' pupil Euclides of Megara. In 1977, however, David Sedley claimed that Diodorus should be associated with the so-called Dialectical school. The article argues against this view. The main results are (1) There are no testimonies which suggest that we should distinguish between Megarians and Dialecticians. (2) The so-called Dialectical school never existed; it is a construct of ancient historians of philosophy."
"Ich fasse zusammen.
Die Sichtung der Zeugnisse hat vor allem zu den folgenden beiden Ergebnissen geführt: 1. Weder aus der Zeit um 300 noch aus späterer Zeit gibt es Zeugnisse, die dazu zwingen oder es auch nur nahelegen, in Zukunft anders, als es bisher üblich war, zwischen Megarikern und Dialektikern zu unterscheiden und Stilpon den Megarikern und Diodor den Dialektikern zuzuordnen. 2. Versteht man unter einer philosophischen Schule, wie wir dies bewußt oder unbewußt üblicherweise tun, eine über mehrere Generationen hin durch bestimmte institutionelle Bindungen, vor allem aber durch einen Fundus gemeinsamer Grundüberzeugungen zusammengehaltene Gemeinschaft philosophisch interessierter und gebildeter Personen, dann hat es eine Megarische Schule nie gegeben." (p. 309)
(...)
"Liegen die Dinge so, wie ich sie gerade skizziert habe, dann können wir Diodoros Kronos und seinen Schüler Philon in unseren Philosophiegeschichten und die sie betreffenden Testimonien in unseren Textsammlungen guten Gewissens an dem Ort belassen, an dem sie bis jetzt gestanden haben, bei den Megarikern. Wir müssen nur darauf achten, daß wir mit der Bezeichnung "Megariker" keine falschen Vorstellungen verbinden." (p. 310)
15. Döring, Klaus, and Ebert, Theodor, eds. 1993. *Dialektiker und Stoiker. Zur Logik der Stoa und ihrer Vorläufer*. Stuttgart: Franz Steiner.
Inhaltsverzeichnis: Vorwort 7; Abkürzungsverzeichnis 8; Teilnehmerverzeichnis 9; Wolfram Ax: Der Einfluss des Peripatos auf die Sprachtheorie der Stoa 11; Mariano Baldassarri: Ein kleiner Traktat Plutarchs über stoische Logik 33; Jonathan Barnes: Meaning, Saying and Thinking 47; Susanne Bobzien: Chrysippus' Modal Logic and Its Relation to Philo and Diodorus 63; Walter Cavini: Chrysippus on Speaking Truly and the Liar 85; Theodor Ebert: Dialecticians and Stoics on the Classification of Propositions 111; Urs Egli: Neue Elemente im Bild der stoischen Logik 129; Michael Frede: The Stoic Doctrine of the Tenses of the Verb 141; Gabriele Giannantoni: Die Philosophenschule der Megariker und Aristoteles 155; Karlheinz Hülsler: Zur dialektischen und stoischen Einteilung der Fehlschlüsse 167; Katerina Ieorodiakonou: The Stoic Indemonstrables in the Later Tradition 187; Fritz Jürss: Zum Semiotik Modell der Stoiker und ihrer Vorläufer 201; Mario Mignucci: The Stoic *Themata* 217; Luciano Montoneri: Platon, die Ältere Akademie und die stoische Dialektik 239; Luciana Repici: The Stoics and the *Elenchos* 253; Andreas Schubert: Die stoischen Vorstellungen 271; Gerhard Seel: Zur Geschichte und Logik des *therizon logos* 291; Hermann Weidemann: Zeit und Wahrheit bei Diodor 319; Literaturverzeichnis 331; Register 343-361.
16. Ebert, Theodor. 1987. "The Origin of the Stoic Theory of Signs in Sextus Empiricus." *Oxford Studies in Ancient Philosophy* no. 5:83-126.
"In his critical discussion of the dogmatic philosophers Sextus Empiricus expounds a Stoic doctrine which has conveniently been labelled 'the theory of signs'. This chapter of Stoic philosophy offers a blend of logic and epistemology, a mixture bound to attract the interest of present-day 'ancient philosophers'. Hence, with the growing discussion focusing on the philosophy of the Hellenistic period, this part of Stoicism was to get a fair share of attention. Controversy has been flourishing over

the merits and weaknesses of this theory; it has been compared with tenets about the topic of signs held by earlier and later philosophers, yet in these discussions it has almost universally been taken for granted that there is a single theory of signs and that it can be attributed unqualifiedly to the Stoics. (2)

Part of what I want to do in this paper is to challenge this assumption. I shall argue that the material relating to the theory of signs which is preserved in Sextus does not reflect Chrysippian teaching, but goes back to Stoics antedating Chrysippus. To have a convenient term, I shall refer to the pre-Chrysippian Stoics as 'early Stoics'. I shall further argue that the theory of signs of the early Stoics was a harvest not grown in the fields of Stoic philosophy, but that it originated from the 'Dialecticians', a group of philosophers confused for a long time with the Megarians and rediscovered as a group in its own right by David Sedley.(4) I shall further try to point out some modifications which this theory underwent as it was integrated into the epistemology of the early Stoics. I shall not discuss the doctrine of signs advocated by the opponents of the Epicureans in Philodemus' *de Signis* - almost certainly Stoic philosophers - a doctrine which has been ably discussed by David Sedley in a recent paper.(5)" (pp. 83-84, two notes omitted)

(2) The only exception known to me is D. Sedley who wants to 'put into abeyance the widespread belief that Stoic doctrine is under discussion by Sextus Empiricus throughout *M VIII*. 141-298 and *PH II*. 97-133 (Sedley, 'On Signs', in *Science and Speculation: Studies in Hellenistic Theory and Practice*, ed. Barnes et al. (Cambridge/Paris, 1982), 239-72.

(4) Cf. D. Sedley, 'Diodorus Cronus and Hellenistic Philosophy', *Proceedings of the Cambridge Philological Society*, CCIII, NS 23 (1977), 74-120.

(5) Cf. D. Sedley, 'On Signs', cit.

17. ———. 1991. *Dialektiker und frühe Stoiker bei Sextus Empiricus. Untersuchungen zur Entstehung der Aussagenlogik*. Göttingen: Vandenhoeck & Ruprecht. Inhalt: Einleitung 13; I. Teil: Der Ursprung der Stoischen Theorie des Zeichens 29; Erstes Kapitel: Die stoische Theorie des Zeichens bei Sextus Empiricus 29; Zweites Kapitel: Die stoische Theorie des Zeichens vor dem Hintergrund der Berichte bei Diogenes Laertius 54; Drittes Kapitel: Dialektiker und frühe Stoiker zur Theorie des Zeichens 66; II. Teil: Die Dialektiker bei Sextus Empiricus 83; Viertes Kapitel: Die Dialektische Klassifikation der Aussagen bei Sextus Empiricus 83; Fünftes Kapitel: Die Dialektische Klassifikation der Aussagen als Vorstufe der stoischen 108; Sechstes Kapitel: Die Dialektische und die stoische Klassifikation der Fehlschlüsse bei Sextus Empiricus 131; Siebtes Kapitel: Die Dialektiker über Trugschlüsse und ihre Auflösung 176; III. Teil: Der Ursprung der Stoischen Theorie des Beweises; Achtes Kapitel: Der frühstoische Charakter der Theorie des Beweises bei Sextus Empiricus 219; Neuntes Kapitel: Übereinstimmungen und Unterschiede in den Referaten des Sextus zur stoischen Beweistheorie und das genetische Verhältnis ihrer Quellen 232; Zehntes Kapitel: Von den Dialektikern zu Chrysipp - der Weg einer Theorie in der Alten Stoa 287; Anhang: Texte aus Sextus Empiricus zu den Dialektikern und den Stoikern 311; Literaturverzeichnis 329; Register: 337.
18. ———. 1993. "Dialecticians and Stoics on the classification of propositions." In *Dialektiker und Stoiker. Zur Logik der Stoa und ihrer Vorläufer*, edited by Döring, Klaus and Ebert, Theodor, 111-127. Stuttgart: Franz Steiner. "In his discussion and refutation of the logical theories of dogmatist philosophers in *Adversus Mathematicos* (M.) 8, Sextus Empiricus treats us, among other things, to an account of a classification of propositions (*M* . 8.93-129). The doctrine reported on here is usually taken to form part of Stoic logic.(1) Together with its apparent counterpart in Diogenes Laertius (D.L.) 7.68-76, this Sextian report is used to reconstruct a theory supposedly held by Stoic philosophers. In what follows I shall try to refute this view and I shall argue that Sextus' report encapsulates a doctrine worked out not by the Stoic, but by the Dialectical school whose most prominent members seem to have been Diodorus Cronus and Philo.(2) First I shall try to show that the two reports by Sextus and by Diogenes resp. are quite different indeed as to their systematic content and that, therefore, both reports

must be drawn from different sources. In a second step it is then argued that Sextus' account is based on Dialectical material. Finally, I shall compare the Dialectical classification to be found in Sextus to the Stoic one in Diogenes with an eye to exploring these two divisions as different phases within the development of propositional logic." (p. 111)

(1) Cp. Mates (1953) 30f., 54, Kneale (1962) 146, 148f., Mignucci (1965) 131, Egli (1967) 37f., Mueller (1969) 185, Frede (1974a) 49-62 passim, Brunschwig (1984) 9ff.; already v. Arnim put this text, omitting some parts, among the logical fragments of Chrysippus: SVF fr. 205, 211, 216.

(2) Cp. D. Sedley (1977).

References

H. v. Arnim, *Stoicorum Veterum Fragmenta* . 3 Bde. Leipzig 1903-1905; Bd. 4: Indices v. M. Adler. Leipzig 1924

Brunschwig, J. (1984). *Remarques sur la théorie stoïcienne du nom propre*. In: Histoire, Épistémologie, Langage 6 (1984) 3-19

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19. ———. 2008. "In Defence of the Dialectical School." In *Anthropine Sophia. Studi di Filologia e Storiografia Filosofica in Memoria di Gabriele Giannantoni* , edited by Alesse, Francesca, Aronadio, Francesco, Dalfino, Maria Cristina, Simeoni, Luca and Spinelli, Emidio, 275-293. Napoli: Bibliopolis.

"In 1977, David Sedley published a paper in which, among other things, he argued that the Dialectical and the Megarian school were not, as had hitherto been assumed, two names for the same sect, although at different periods, but that both were distinct groups of Hellenistic philosophers.(1) The received opinion, attacked by Sedley, based its claim on a passage in Diogenes Laertius (Diog. Laert.) concerning the disciples of Euclides of Megara, one of the minor Socratics: His followers were called Megarians after him, then Eristics, and at a later date Dialecticians, that name having first been given to them by Dionysius of Chalcedon ... (Diog. Laert. II 106 = Giannantoni, SSR II A 22)(2)

The source of this text is probably Alexander Polyhistor, whose *Successions of Philosophers* is mentioned in the sentence preceding the one just quoted. Alexander lived around 100 B.C. Against this passage Sedley draws attention to a different piece of evidence in Diog. Laert., namely a *verbatim* quotation from Philippus the Megarian, who gives a list of people whom Stilpo won over to his own school, i.e. the Megarians; after having mentioned two persons whom Stilpo had made to secede from Theophrastus and two more who came from Aristotle the Cyrenaic philosopher, Philippus continues:

From the Dialecticians he won over as devoted disciples Paeonius from Aristides, moreover Diphilus of Bosphorus, the former follower of Euphantes as well as Myrmex the son (or "follower") of Exaenetus, both of whom had come to refute him (Diog. Laert. II 113 = SSR II O 3).

Sedley concluded from this text that Megarians and Dialecticians could hardly be the same sect; the competition presupposed in this quotation from a contemporary of Stilpo clearly shows, thus Sedley, that Megarians and Dialecticians were seen as distinct schools by their contemporaries. As to the passage in Diog. Laert. II 106, this is, as Sedley argues, probably a doxographical construction of a διαδοχή, a succession of philosophers; it is not the description of a school, or αἵρεσις (4)." (pp. 275-276, note 3 omitted)

(...)

"The claim made by Sedley distinguishing the Dialecticians from the Megarians and the one made by me attributing source material in Sext. Emp. which had been used for the Stoics to the Dialectical school, in general met with a friendly reception(6). Yet neither claim has gone undisputed. Klaus Döring, to whom we owe our first comprehensive collection of the material relating to the Megarians(7), launched an attack on Sedley's contention(8); Döring sees no need to think of the Dialecticians as a separate school, distinct from the Megarians.(9) Even before Döring's 1989 paper, Robert Muller did not accept Sedley's separation of the Dialecticians from the Megarians (9). The attribution of the material in Sext. Emp. to the Dialecticians, for which I had argued, was flatly denied by Jonathan Barnes (10). Hence, it may be worthwhile to look at the available evidence again in order to see whether Sedley's and my original contentions can survive the criticisms of Döring and Barnes." (p. 277)

(1) D. Sedley, *Diodorus Cronus and Hellenistic Philosophy*, "Proceedings of the Cambridge Philological Society", 203, N.S. 23 (1977) pp. 74-120.

(2) I quote from the second edition of Gabriele Giannantoni's monumental collection: *Socratis et Socraticorum reliquiae*, Napoli 1990, abbreviated as *SSR*.

(4) D. Sedley, *Diodorus Cronus*, cit., p. 75

(6) Thus, Giannantoni states that Sedley's conclusions "sono meritevoli della massima considerazione" [are deserving of the utmost consideration] (*SSR* IV p. 48). As to my monograph, cf. the reviews by A. Graeser, "Zeitschrift f. philos. Forschung", 46 (1992) pp. 443-447; K. Hulser, "Phronesis", 38 (1993) pp. 337-344; and in particular R. Chiaradonna, "Elenchos", 16 (1995) pp. 387-400.

(7) K. Döring, *Die Megariker, Kommentierte Sammlung der Testimonien*, Amsterdam 1972.

(8) K. Döring, *Gab es eine Dialektische Schule?*, "Phronesis", 34 (1989) pp. 293-310.

(9) R. Muller, *Introduction à la pensée des Megariques*, Paris 1988, p. 44 n. 24.

(10) J. Barnes, in his review of Th. Ebert, *Dialektiker*, cit., "Classical Review", 43 (1993) pp. 304-306 (quoted as Barnes).

20. Ettari, Dario. 2002. "La polemica sul possibile nel IV secolo a.C. [Aristotele, Filone, Diodoro Crono, Crisippo] in una interpretazione moderna." *Metalogicon* no. 15:27-32.

"Il passo aristotelico sopra riportato [Aristotele, *Metaphysica*, 1046b – 1047a] polemicamente indirizzato contro una tesi "megarica" non meglio precisata, mentre da un lato conferma il convincimento del suo autore circa il sussistere di uno stadio particolare dell'essere – vale a dire quello dell'essere-in-potenza come divenire, movimento – dall'altro lato offre un importante "aggancio" teorico per una comprensione della concezione aristotelica – ed indirettamente di quella megarica – del possibile, intorno al quale sorse nel IV secolo a. C. un fervido dibattito i cui protagonisti possono individuarsi appunto in Aristotele, nei Megarici (in particolare Diodoro Crono e Filone di Megara) e nel grande stoico Crisippo, ma la cui eco giunse fino a personaggi molto posteriori quali Alessandro di Afrodisia, Cicerone, Boezio, che ce ne lasciano importanti testimonianze."

(...)

"È comunque prassi storiografica comune attribuire appunto a Diodoro la tesi confutata da Aristotele, tesi che è formulabile all'incirca nei termini seguenti: *possibile è soltanto ciò che è o sarà* (3) laddove viceversa ciò di cui non si dà mai il caso avrebbe la caratteristica della impossibilità." (p. 28)

21. Giannantoni, Gabriele. 1980. "Aristotele, Diodoro Crono e il moto degli atomi." *Siculorum Gymnasium* :125-133.

22. Goldblatt, Robert. 1980. "Diodorean Modality in Minkowski Spacetime." *Studia Logica* no. 39:219-236.

Abstract: "The Diodorean interpretation of modality reads the operator \square as "it is now and always will be the case that". In this paper time is modelled by the four-

dimensional Minkowskian geometry that forms the basis of Einstein's special theory of relativity, with "event" y coming after event x just in case a signal can be sent from x to y at a speed at most that of the speed of light (so that y is in the causal future of x).

It is shown that the modal sentences valid in this structure are precisely the theorems of the well-known logic S4.2, and that this system axiomatises the logics of two and three dimensional spacetimes as well.

Requiring signals to travel slower than light makes no difference to what is valid under the Diodorean interpretation. However if the "is now" part is deleted, so that the temporal ordering becomes irreflexive, then there are sentences that distinguish two and three dimensions, and sentences that can be falsified by approaching the future at the speed of light, but not otherwise."

23. Grote, George. 1885. *Plato and the Other Companions of Sokrates*. London: John Murray.
Vol. 1, Chapter III. *Other companions of Sokrates : Diodorus Kronus*, pp. 140-146. From the pains which Aristotle takes (in the "treatise 'De Interpretatione' and elsewhere) to explain and vindicate his own doctrine about the Potential and the Actual, we may see that it was a theme much debated among the dialecticians of the day. And we read of another Megaric, Diodorus Kronus, perhaps contemporary (yet probably a little later than Aristotle), as advancing a position substantially the same as that of Eubulides. That alone is possible (Diodorus affirmed) which either is happening now, or will happen at some future time. As in speaking about facts of an unrecorded past, we know well that a given fact either occurred or did not occur, yet without knowing which of the two is true - and therefore we affirm only that the fact may have occurred: so also about the future, either the assertion that a given fact will at some time occur, is positively true, or the assertion that it will never occur, is positively true: the assertion that it may or may not occur some time or other, represents only our ignorance, which of the two is true. That which will never at any time occur, is impossible." (pp. 140-141)
(...)
"In what manner Diodorus stated and defended his opinion upon this point, we have no information. We know conclusion only that he placed affirmations respecting the future on the same footing as affirmations respecting the past: maintaining that our potential affirmation - *May or May not be* - respecting some future event, meant no more than it means respecting some past event, viz.: no inherent indeterminateness in the future sequence, but our ignorance of the determining conditions, and our inability to calculate their combined working." (pp. 143-144)
24. Hurst, Martha. 1935. "Implication in the Fourth Century." *Mind* no. 44:484-495. "Modern analyses of the nature of necessary connection have given rise to more paradoxes than they have solved. A familiarity with the controversy between Diodorus and Philo which took place in the Fourth Century B.C. might perhaps have made unnecessary the anguish which modern logicians have suffered." (p. 484)
(...)
"The problem with which Diodorus and Philo were concerned was the definition of the "if . . . then" relation, or the discovery, as Sextus puts it, of the "criterion of following" (τῆς ακολουθίας εκτίθενται κριτήρια).(1) Philo's(2) definition is this: "there is a case of true fastening together when we have not a true antecedent and a false consequent".(3) This corresponds to the symbolic form - (p - q), and is equivalent to the definition of material implication.(4) The definition of Diodorus is: "that is a case of true fastening together which did not and does not admit the possibility of the antecedent being true and the consequent false".(6) This is practically equivalent to Lewis's definition of strict implication.(6)
(1) *Adv. Math.*, VIII, 113.
(2) Sextus gives Philo's views first and this is the natural order of exposition, as Diodorus succeeded in refuting Philo, while, as far as we know, Philo did not refute Diodorus. It may also be the chronological order of development, in spite of what

- was said above as to the relation of the two men; for Diodorus may have made his views explicit only in answer to the criticisms of his pupil.
- (3) Sextus, *Adv. Math.*, VIII, 113: οἷον ἂν μὲν Φίλων ελεγεν ἀληθές γίνεσθαι τὸ συνημμένον ὅταν μὴ ἀρχηται ἀπ' ἀληθοῦς καὶ λήγη ἐπὶ ψεύδος [Thus Philo declared that "the hypothetical is true whenever it does not begin with what is true and end with what is false" (tr. Bury, vol. II, p. 297)]
- (4) Peirce, *Collected Papers*, 3, 374; Russell, *Principles of Mathematics*, 16, p. 14; Russell, *Introduction to Mathematical Philosophy*, p. 147, *Principia Mathematica*, I, p. 94.
- (5) Sextus, *Adversus Mathematicos*, VIII, 115: Διόδωρος δε ἀληθές εἶναι φησι συνημμένον ὅπερ μήτε ἐνεδέχεται μήτε ἐνδέχεται ἀρχόμενον ἀπ' ἀληθοῦς λήγειν ἐπὶ ψεῦδος. [But Diodorus asserts that "the hypothetical proposition is true which neither admitted nor admits of beginning with truth and ending in falsehood." (tr. Bury, vol. II, p. 299)]
- (6) Lewis, *Survey of Symbolic Logic*, p. 239: impossible that p is true and q false.
- References
R. G. Bury, *Sextus Empiricus in four volumes*, Cambridge, Harvard University Press, 1933.
25. Kneale, William, and Kneale, Martha. 1962. *The Development of Logic*. Oxford: Clarendon Press.
Reprinted 1975 with corrections.
Chapter III: *The Megarians and the Stoics*, pp. 113-176.
"Throughout later antiquity two great schools of logic were distinguished, the Peripatetic which was derived from Aristotle, and the Stoic which was developed by Chrysippus from the teaching of the Megarians. It is tantalizing that tradition has preserved so little of the work of these latter philosophers; for what remains suggests that they were highly intelligent and deserving of better treatment than they have received from historians." (p. 113)
(...)
"The Megarians made three important contributions to the development of logic, the invention of a number of interesting paradoxes, the re-examination of the modal notions, and the initiation of an important debate on the nature of conditional statements." (p. 114)
(...)
"The most original theory is that of Diodorus Cronus. The only authority who gives us a complete account of it is Boethius, but what he says agrees with earlier incomplete accounts, in particular that of Cicero, and we may regard him as trustworthy. He tells us:
'Diodorus defines the possible as that which either is or will be (*quod aut erit aut erit*), the impossible as that which, being false, will not be true (*quod cum falsum sit, non erit verum*), the necessary as that which, being true, will not be false (*quod cum verum sit, non erit falsum*), and the nonnecessary as that which either is already or will be false (*aut jam est aut erit falsum*).'(2)" (p. 117)
(2) *Commentarii in Librum Aristotelis Περὶ Ἑρμηνείας* Secunda Editio, ed. Meiser, p. 234-
26. Kneale, William Calvert, and Kneale, Martha. 1972. *Storia della logica*. Torino: Einaudi.
A cura e con una premessa di Amedeo G. Conte.
Capitolo III: *I megarici e gli stoici*, pp. 131-207.
"Mentre la teoria logica d'Aristotele sembra sia stata promossa soprattutto dalla riflessione sopra la dimostrazione quale ricorre, ad esempio, in geometria, sembra invece che i megarici abbiano concentrato l'attenzione sulla dialettica di Zenone e su quelle dispute di ogni giorno onde nacque ciò che Platone ed Aristotele chiamano eristica. O almeno, è facile vedere come le caratteristiche delle argomentazioni dei megarici possano essere nate

dall'aver essi concentrato l'attenzione su ciò, ed è attestata un'ascendenza eleatica. Euclide, fondatore della scuola megarica, sembra abbia studiato le opere di Parmenide,(1) e Diodoro Crono, uno dei membri più eminenti della scuola, sembra abbia costruito argomenti contra la possibilità del movimento.(2) Ed è significativo che la logica stoica fosse chiamata dialettica.(3)" (p. 131)

(...)

"I megarici apportarono tre contributi importanti allo sviluppo della logica: l'invenzione di numerosi interessanti paradossi, il riesame delle nozioni modali, l'inizio d'un importante dibattito sulla natura degli asserti condizionali." (p. 138)

(1) Diogene Laerzio, II, 106.

(2) Sesto Empirico, *Adv. Math.* X, 85.

(3) Diogene Laerzio, VII, 43.

27. Kurzová, Helena. 2009. "What worried the crows in Callimachus' epigram." *Studia minora Facultatis Philosophicae Universitatis Brunensis. Series archaeologica et classica* no. 14:125-129.

Abstract: This paper deals with the Callimachus' epigram devoted to Diodorus Cronus and attesting his great popularity as dialectician. New interpretation of the second croak of crows is proposed, according to which the crows worry about their future: "what will be with us further?". Thus both croaks of the crows are connected with the most important part of Diodorus' teaching, i. e. his theory of modality expressed in the so called "Master Argument".

"The following fragment of Callimachus' epigram Fr. 393 Pfeiffer relates to Diodorus Cronus, the prominent representative of the Megarian School, whose main centre of interest was dialectics, the discipline corresponding to the contemporary logic and philosophy of language. The epigram was probably written during Diodorus' stay in Alexandria, which is supposed to have occurred during the 80s of the 3rd century B.C.:

αὐτὸς ὁ Μῶμος

ἔγραφεν ἐν τοίχοις 'ὁ Κρόνος ἐστὶ σοφός'. [Blame (*Momus*) himself wrote on the walls "Cronus is wise]

ἦνίδε κοὶ κόρακες τεγέων ἐπι "κοῖα συνῆπται"

κρώζουσιν καὶ "κῶς αὔθι γενησόμεθα". [And here the crows are, squawking from the rooftops "what conclusions follow?" or "how will we become again?]

Surely, the epigram is one of the testimonies of Diodorus' popularity. The fragment 393 consists in fact of two fragments, which were connected together by Bentley. The first two lines are quoted by Diog. Laert. II, 10, 7. The sense and interpretation of this part is quite obvious. "Momus himself used to write on the walls 'Cronus is wise.'" *Kronos* is the nickname of Diodoros, inherited probably from his teacher Apollonius Cronus." (p. 125, English translation added)

(...)

"The third and fourth lines come from Sextus Empiricus' book for Grammarians (*Adversus Mathematicos* I, 309–312)." (p. 126)

(...)

"Sextus admits that even the grammarians are able to understand the first part of what the crows are croaking on the rooftops: 'κοῖα συνῆπται;' "what follows from what?" This is an allusion to the ability of the great dialectician to judge the validity of implication." (p. 126)

(...)

"I argue that the second croak of the worrying crows, like the first one, relates to the most prominent activity of Diodorus in dialectics. It is his view on the possible and the necessary which is in play here and which was formulated in his "Master Argument". (p. 127)

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Rudolfus Pfeiffer (ed.), *Callimachus. Volumen I. Fragmenta* , Oxford: Clarendon Press 1949.

28. Leith, David. 2014. "Causing doubts: Diodorus Cronus and Herophilus of Chalcedon on causality." *The Classical Quarterly* no. 64:592-608.
 "My aim in this paper is to move this discussion on by filling out some of the historical and philosophical background to Herophilus' doubts about the existence of causes, and to re-evaluate the significance of these doubts in the context of his scientific project.
 I shall try to show that the arguments which Galen records in connection with Herophilus' doubts were in fact propounded by the philosopher Diodorus Cronus, and that Herophilus must have encountered them through personal contact with Diodorus in Alexandria before the latter's death c. 284 B.C. Hence Herophilus' sceptical views on the existence of causes are very much tied to these particular arguments and to the personality of Diodorus. This allows us to reassess Herophilus' attitude to causes to an extent, and I shall offer some observations on the nature of his reaction, maintaining that it need not be indicative of a more wide-ranging sceptical attitude. It is hoped that this analysis will help first to locate Herophilus' medicine more firmly within the context of early Alexandrian intellectual currents, and secondly to expand our knowledge of Diodorus' dialectical challenges and their influence in particular upon contemporary science." (p. 593)
29. López-Astorga, Miguel. 2015. "Diodorus Cronus and Philo of Megara: Two Accounts of the Conditional." *Rupkatha. Journal On Interdisciplinary Studies in Humanities* no. 7:9-16.
 Abstract: "Diodorus Cronus and Philo of Megara presented criteria for identifying true conditionals. Diodorus' criterion has been said to be a version of that of Philo requiring that the conditional is always true.
 However, in this paper, based on the mental models theory and its analysis of possibilities, I try to show that those two interpretations are very different and that they do not refer to the same combinations of possibilities. In my view, Philo's account can be linked to the material interpretation of the conditional.
 Nevertheless, Diodorus' explanation can be related to that very interpretation and, in addition, to three different combinations of possibilities, none of them being that corresponding to the material interpretation."
30. ———. 2019. "The semantic method of extension and intension and the four criteria of the conditional described by Sextus Empiricus." *Revista de Filosofía* no. 44:253-261.
 Abstract: "In this paper an analysis is conducted of the debate about the most suitable way to understand the conditional, which took place in the 4th century B.C. This is done using the extension and intension method provided by Rudolf Carnap to study the meaning of expressions. The results seem to show that, according to Sextus Empiricus, although the debate was about four different criteria to understand the conditional, three of those criteria actually appear to be the same and have a very clear common logical form under Carnap's framework."
31. Marko, Vladimir. 1995. "Callimachus' puzzle about Diodorus." *Organon F* no. 2:342-367.
 Abstract: "The author tends to emphasize that there are almost the three reasons to analyse Callimachus' epigram about Diodorus (Pfeiffer fr.393, 14): *First of all, the date of this epigram* shows us that it represents the earliest information about Diodorus doctrine. *Second*, another support of its authenticity could be found in fact that this epigram *expressing part of the atmosphere* following, and also remaining after, discussing the Diodorian topics. *Third*, its *philosophical relevance*, usually minimised in classical literature, could be found in those facts that it could show the way out in many today dilemmas about his philosophical claims and support some of our contemporary assumptions about its logical conception, as well as that of space, time, and meaning of statements. The author

- defends a position that it is necessary to develop *well-grounded* and *methodologically relevant base* covering the historical reconstruction and the interpretation of ancient logical theories."
- "In fact, this is not a story about M.A. [Master Argument] Possibly, just partly. We would like to introduce one Callimachus' epigram that could have a reference to Diodorus' logical and temporal conception, and to form its adequate interpretation. It follows:(3)
- (Even) Momos (himself) used to write on the walls: "Cronos is wise."
Look, even the ravens on the rooftops are craving: "What follows (from what)?"
and "How shall we come to be hereafter?" (p. 344)
- (3) Döring [(1972): *Die Megariker Kommentierte Sammlung der Testimonien. Amsterdam*], frs. 96, 128; D.L., ii 111; S.E. *M* i 309, p. 672 Bekk.; Pfeiffer [(1949): *Callimachus. Oxford*]: fr. 393, 1-4, *Epigrammatum fragmenta*, i.
32. Marko, Vladimír. 2011. "Looking for the Lazy Argument Candidates (1)." *Organon F* no. 18:363-383.
- Abstract: "The Lazy Argument, as it is preserved in historical testimonies, is not logically conclusive. In this form, it appears to have been proposed in favor of part-time fatalism (including past time fatalism). The argument assumes that free will assumption is unacceptable from the standpoint of the logical fatalists but plausible for some of the nonuniversal or part-time fatalists. There are indications that the layout of argument is not genuine, but taken over from a Megarian source and later transformed. The genuine form of the argument seems to be given in different form and far closer to logical fatalism and whose purpose is not to defend laziness. If the historical argument has to lead to the logically satisfactory solution, some additional assumptions and its additional tuning are needed."
- [The oldest form of the Lazy Argument]: "These and others like them are the absurdities that follow if it is necessary for every affirmation and negation (either about universals spoken of universally or about particulars) that one of the opposites be true and the other false, and that nothing of what happens is as chance has it, but everything is and happens of necessity. So there would be no need to deliberate or to take trouble, thinking that if we do this, this will happen, but if we do not, it will not." (Aristotle, *de interpretatione* 18b26-33)"
- [See also Cicero, *De fato*, XII, 28-29]
33. Mates, Benson. 1949. "Diodorean Implication." *The Philosophical Review* no. 58:234-242.
- "Diodorus Cronus a Megarian logician greatly renowned in antiquity, is known to students of the history of logic chiefly for his part in the ancient controversy over the truth-conditions for hypothetical propositions." (p. 234)
- (...)
- "The present paper(5) attempts to give as clear and correct an account as possible of Diodorean implication(6) and of its relation to the other types of implication which were advocated by the several participants in the ancient controversy. Perhaps this account will not be uninteresting to students of modern logic, for Diodorus managed to define a plausible sense of "implication" that is stronger than Material implication and weaker than Strict implication—a feat requiring no little skill."
- (5) This paper is based on a portion of the author's doctoral dissertation, *The Logic of the Old Stoa* (1948, typescript, University of California Library). [published as *Stoic Logic*, Berkeley: University of California Press, 1953 (second revised edition 1961).]
- (6) The term "Diodoran" was coined by C. S. Peirce; I prefer "Diodorean."
34. ———. 1961. *Stoic Logic*. Berkeley: University of California Press. Second revised edition; first edition 1953.

"In this section we shall investigate what remains of the ancient treatment of the problem just mentioned [*the problem of implication*]. We know that the controversy was begun by Diodorus and Philo in the Megarian school and was taken up and enlarged by the Stoics. Most of the latter seem to have adopted the position of Philo,(4) although at least three other views were represented. In modern times, C. S. Peirce was the first competent logician to comment on the ancient dispute.(5) He was struck by the fact that Philo's notion of implication was exactly the same as the modern so-called "material implication," which also has provoked much debate. Other authors have mentioned this same point of similarity, (6) and today it is probably the best-known fact about Stoic logic." (p. 43)

(4) *Hyp. Pyrrh.* 11,104; *Adv. Math.* VIII, 245.

(5) *Collected Papers*, vol. 2, p. 199; vol. 3, pp. 279-280.

(6) See, for example, the articles by Hurst, Chisholm, Lukasiewicz (" *Zur Geschichte der Aussagenlogik* "), Bochenski (*De Consequentis*, p. 3), and Reymond. See also De Lacy, *Philodemus: On Methods of Inference*, p. 159, note 8; Stock, *Stoicism*, pp. 22-23; A. Tarski, *Introduction to Logic* (New York, Oxford, 1941), p. 27, note 3; W. V. Quine, *Mathematical Logic* (New York, Norton, 1940), p. 18.

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---. "Points de contact entre la logique stoïcienne et la logique russellienne," *International Congress for the Unity of Science*. Paris, 1936.

Stock, St. George. *Stoicism*. London, Constable, 1908.

35. Mondini, Ugo Carlo Luigi. 2017. "La preoccupazione filosofica dei corvi nel fr. 393 Pf. di Callimaco." *Acme. Annali della Facoltà di studi Umanistici dell'Università degli Studi di Milano* no. 1:61-72.

Abstract: "Riguardo alle due domande poste dai corvi nel fr. 393 Pf. di Callimaco la critica moderna ha proposto varie interpretazioni, suscitate in parte dal commento di Sesto Empirico al passo. Corroborando la tesi già sostenuta da H. Kurzová [*], questo contributo cerca di spiegare le due domande come allusione al più conosciuto argomento dialettico di Diodoro Crono, il κυριεύων λόγος. Inoltre si tenterà di capire la fonte da cui Sesto ha tratto il distico, per valutare il suo strano commento."

[*] *What worried the crows in Callimachus' epigram* (2009).

Callimaco fr. 393 Pfeiffer:

αὐτὸς ὁ Μῶμος

ἔγραφεν ἐν τοίχοις 'ὁ Κρόνος ἐστὶ σοφός'.

ἦν ἴδε κοῖ κόρακες τεγέων ἔπι 'κοῖα συνήπται'

κρώζουσιν καὶ 'κῶς αὖθι/αὖθις γενησόμεθα'.

"Momo stesso scriveva sui muri: «Crono è sapiente»" (Diogene Laerzio, libro II, 111, tr. Reale, p. 261)

"Senti come anche dai tetti i corvi gracchiano: «Quante Cose si sono congiunte?» e «Come di nuovo vivremo?»" (tr. Russo, p. 102)

Sesto Empirico, (*Adv. math.* 1,309-312 = test. 128 Döring = SSR ii F 18)

36. O'Toole, Robert R., and Jennings, Raymond E. 2004. "The Megarians and the Stoics." In *Handbook of the History of Logic, Vol. 1: Greek, Indian and Arabic Logic*, edited by Gabbay, Dov and Woods, John, 397-522. Amsterdam: Elsevier. "The Megarian School was founded by Euclides, a pupil of Socrates (DL 2.47) and a native of Megara on the Isthmus (DL 2.106). He was succeeded as head of the school first by Ichthyas and later by Stilpo, also a native of Megara in Greece (DL 2.113). Evidently, since Diodorus can trace his philosophical lineage back to Euclides through Apollonius Cronus and Eubulides (DL 2.110-11), it has been generally thought that he also was a member of the Megarian school; hence, the Megarian connection with respect to the source of Zeno's logical doctrines would seem assured. Sedley, however, has presented what seems to us a convincing argument to the effect that Diodorus belonged rather to a rival school which was called the Dialectical School (Sedley, [1977, pp. 74-75]; cf. Sandbach, [1985, p. 18]).
- At 2.106 Diogenes reports that the followers of Euclides were called Megarians after his birthplace. Later they were called Eristics, and later still, Dialecticians. Sedley argues for the possibility that these remarks should not be interpreted, as they usually are, to mean that this was one and the same school known at different times by different names, but rather that these names designated splinter groups whose *raison d'être* were different enough from that of the Megarian School to warrant viewing them as distinct schools [Sedley, 1977, p. 75]. According to Sedley, several sources inform us that the Dialecticians recognised Clinomachus of Thurii, a pupil of Euclides, as the founder of their school [Sedley, 1977, p. 76]. However, since the name 'Dialectician' was first coined for the school by Dionysius of Chalcedon (DL 2.106), an "approximate" contemporary of Diodorus (Sedley [1977, p. 76]), it seems more likely not that Clinomachus actually founded the school, but rather that he was recognised by its members as the source of the ideas foremost in their teachings [Sedley, 1977, p. 76]." (p. 406)
- References DL = Diogenes Laërtius, *Lives of Eminent Philosophers* [Sandbach, 1985] F.H. Sandbach. *Aristotle and the stoics*. In Supplementary volume 10 of The Cambridge Philological Society. Cambridge UP, 1985.
- [Sedley, 1977] David Sedley. *Diodorus Cronus and hellenistic philosophy*. In Proceedings of the Cambridge Philological Society, volume 23, pages 74-120, 1977.
37. Pelucchi, Marco. 2016. "Callimaco, il Fedone e la scuola filosofica cirenaica nell'epigramma per Cleombroto (Call. 23 Wil.)." *Acme. Annali della Facoltà di studi Umanistici dell'Università degli Studi di Milano* no. 69:93-109.
- Abstract: "Muovendo dall'epigramma per Cleombroto (AP 7,471 = 23 Wil. = 53 G.-P.), l'articolo si propone di rivalutare la posizione di Callimaco rispetto a un autentico interesse per la filosofia. Contro le interpretazioni più recenti, che hanno letto l'epigramma alla luce di una polemica innanzitutto "metacomunicativa", si cerca di mostrare come l'intento ironico dei versi possa essere compreso pienamente solo ammettendo una simpatia di Callimaco per la scuola cirenaica. L'epigramma sembra dunque presupporre una critica alle tesi sostenute nel *Fedone*, in effetti incompatibili con le dottrine dei Cirenaici, che non dovevano condividere la lettura platonica dell'insegnamento di Socrate, almeno per come questa emerge nel dialogo. È così possibile riconoscere la *pointe* dell'epigramma nell'intenzione di mostrare le tensioni interne al *Fedone*, specificamente in merito alla questione del suicidio."
38. Prior, Arthur Norman. 1955. "Diodoran Modalities." *The Philosophical Quarterly* no. 5:205-213.
- "The Megaric logician Diodorus defined the possible as that which either is or at some time will be true, the impossible as that which neither is nor ever will be true, and the necessary as that which both is and always will be true. These definitions assume-as ancient and medieval logic generally assumes-that the same proposition may be true at one time and false at another; Dr. Benson Mates has accordingly remarked, in his recent study of Stoic logic, that Diodoran 'propositions' are not

- 'propositions' in the modern sense, but something more like propositional functions, and he represents them as such in his symbolic treatment of the Diodoran definitions of the modal operators.(1)
- I propose here to do something a little different, namely to employ the ordinary propositional variables 'p', 'q', 'r', etc., for 'propositions' in the Diodoran sense, and to use certain operators which take such propositions as arguments, and which form functions taking such propositions as values." (p. 205)
- (1) B. Mates, *Stoic Logic*, University of California Press, 1953, pp. 36-37. It has been pointed out to me by Mr. W. W. Sawyer that the Diodoran view that whatever is possible either is or will be true is very like the ergodic hypothesis in the kinetic theory of gases.
39. ———. 1958. "Diodorus and Modal Logic: A Correction." *The Philosophical Quarterly* no. 8:226-230.
 "In the course of a sketch, published in the *Philosophical Quarterly* for July 1955, of a modal system based on the Diodorean definition of the possible as 'what is or will be true', I showed that this system contains all the laws of the Lewis system S4. Whether it contains further modal theses beside those of S4, I went on to say in the same paper, "is a question which remains to be investigated"; it being clear, nevertheless, that the Diodorean system "does not contain the characteristic theses of the main modal system known to be stronger than S4, namely S5". In my *Time and Modality* this question is again referred to, but unhappily with less caution. The Diodorean definition being translated into a 'matrix', I state on p. 23 that this matrix is 'characteristic' for S4, i.e. verifies all those and only those formulae which are theorems of S4. And this is a mistake. I should like, therefore, to set out such facts as are now clear to me about the actual relation of the Diodorean modal system, which I shall call D, to S4." (p. 226)
40. ———. 1967. *Past, Present, and Future*. Oxford: Clarendon Press.
 Chapter II: *The search for the Diodorean modal system*, pp. 20-31.
41. Rüstow, Alexander. 1910. *Der Lügner. Theorie, Geschichte und Auflösung*. Leipzig: Teubner.
 Reprint: New York, Garland, 1987.
42. Sedley, David. 1977. "Diodorus Cronus and Hellenistic Philosophy." *Proceedings of the Cambridge Philological Society* no. 23:74-120.
 Reprinted in: Terence Irwin (ed.), *Hellenistic Philosophy* (Classical Philosophy Collected Papers vol. 8), New York: Routledge, 1995, pp. 270-315.
 "During the last four decades historians of ancient logic have become increasingly aware of the importance of Diodorus Cronus and his pupil Philo as pioneers of the propositional logic which came to flourish in the Stoa. Their direct influence has so far been recognised in two main areas of Hellenistic controversy -- the validity-criteria for conditional propositions, and the definition of the modal terms 'possible' and 'necessary'. But some broader questions have not been satisfactorily answered. What were Diodorus' own philosophical allegiances and antecedents? What is his place in the history of Greek philosophy? How far-reaching was his influence on the post-Aristotelian philosophers?
 There was little chance of tackling these questions confidently until 1972, when Klaus Döring published for the first time the collected fragments of Diodorus, in his important volume *Die Megariker*. Meagre though they are, these fragments confirm my suspicion that Diodorus' philosophical background has not been fully explored, and also that his influence on the three emerging Hellenistic schools -- the Stoics, Epicureans, and Sceptics -- was far wider than has hitherto been recognised. There has been much discussion as to which earlier philosophers played the most decisive part in shaping Hellenistic philosophy, and the respective claims of the Platonists and of Aristotle have never lacked expert advocacy. In all this, the claims of so obscure a figure as Diodorus have been underrated." (p. 74)

43. Sorabji, Richard. 1983. *Time, Creation and the Continuum: Theories in Antiquity and the Early Middle Ages*. London: Duckworth.
Chapter 2: *Solutions from Diodorus to Augustine*, pp. 17-32.
"Diodorus delighted in paradoxes, many of which he took from Aristotle.
Several will be discussed in later chapters, and it will be seen that he sometimes used atomist theory in order to deal with them. It is not certain whether he tried to solve Aristotle's paradoxes of time. But there is a certain likelihood that he did, since many of the paradoxes he is known to have tackled are related to Aristotle's. For example, there is a connexion between Aristotle's paradox of the ceasing instant and Diodorus' question when a wall ceases to exist - while it is intact, or after it has disintegrated.(2) I shall only claim, however, that Diodorus' atomism gave him the *materials* for solving the paradoxes of time. And in this chapter I shall discuss his atomism only so far as is necessary for showing that it supplied these materials. Diodorus ideas on atomism are recorded by Sextus Empiricus. An atom, in Greek thought, differs from a geometrical point in that, although it is indivisible is supposed to have a positive size. (We shall see eventually that some Islamic and fourteenth-century Western thought differed in this regard)." (p. 17)
(2) ap. Sextum, *M* 10.347-9.
44. Temple, George. 1977. "Inference without Axiom of Paradoxes." In *Logic Colloquium 76*, edited by Gandy, Rob Oliver and Hyland, John Martin Elliott, 221-233. Amsterdam: North-Holland.
"The study of formal, propositional logic has known three great periods - the Greek, the Mediaeval Scholastic and the Modern, which are, respectively, commonly associated with the names of their reputed founders: Philo of Megara, Abelard and Frege.
In each period a number of different theories of implication have been advanced of which the most important are
(1) the theory of material implication;
(2) the theory of incompatibility, and
(3) the theory of inclusion.
All three of these theories are attributed to the logicians of the Greek school of Megara in the treatise by Sextus Empiricus ("Outlines of Pyrrhonism", Book ii, 110-112, ca. A.D. 200). Philo is credited with the theory of material implication, according to which, a proposition p always implies a proposition q unless p is true and q is false. An unnamed Stoic, perhaps Chrysippus, is said to have introduced the notion that implies q if p is incompatible with the negation of q . And some who have not been identified are said to define the implication $p \rightarrow q$ to mean that q is virtually included in p ." (p. 221)
(...)
"The purpose of this note is to show that a careful analysis of these three theories shows that they are not merely mutually compatible, but essentially the same, the superficial differences exhibiting only a shift of emphasis.
Philonian Implication We do not possess any of the original works of the Megarian logicians and therefore do not know for certain how they formulated the theory of material implication, but it seems indubitable that they initiated the study of unanalyzed propositions, which were classified as either "True" or "False" accordingly as they corresponded or did not correspond with reality.
This unique scheme of valuation was fatal to their theory of inference.
Philo of Megara (ca. 300 B.C.) recognised three varieties of valid inference, *viz.* from a true antecedent to a true consequent, from a false antecedent to a false consequent, and from a false antecedent to a true consequent. This is undoubtedly a complete classification, but it is difficult to believe that it was accepted as a definition of inference.
I cannot believe that any Greek politician, barrister or tradesman can ever have sought to persuade his adversary, his judge or his client that a false proposition implies any proposition (true or false), and that a true proposition is implied by any proposition (true or false).

- In fact what is called "Philonian" implication is completely ineffective as a definition, and the Megarian logicians used in its place various schemes of inference. Which we should undoubtedly recognise today as completely satisfactory and sometimes of surprising subtlety.
- They also used the unique valuation of propositions as true or false to characterise disjunction and conjunction, but there is no evidence that they were under the illusion that they had provided formal definitions of these connectives." (p. 222)
45. Uckelman, Sara, and Uckelman, Joel. 2007. "Modal and temporal logics for abstract space–time structures." *Studies in History and Philosophy of Science Part B: Studies in History and Philosophy of Modern Physics* no. 38:673-681.
Abstract: "In the 4th century BC, the Greek philosopher Diodoros Chronos gave a temporal definition of necessity. Because it connects modality and temporality, this definition is of interest to philosophers working within branching time or branching spacetime models. This definition of necessity can be formalized and treated within a logical framework. We give a survey of the several known modal and temporal logics of abstract space-time structures based on the real numbers and the integers, considering three different accessibility relations between spatio-temporal points."
46. Verde, Francesco. 2013. *Elachista. La dottrina dei minimi nell'Epicureismo*. Leuven: Leuven University Press.
"The three chapters of this work provide a philological analysis of the primary sources (Epicurus, *Epistle to Herodotus*, 56-59 / Lucretius, *De rerum natura* I 599-634; II 481-499) concerning the theory of minima (Ch. 1); an analysis of the likely historical background to this theory (Xenocrates, Aristotle and Diodorus Cronus – Ch. 2); and a study of the development of this doctrine within the Garden, based on an examination of the question whether it is legitimate to speak of an "Epicurean geometry" (Ch. 3). The research thus seeks to provide a broad, detailed and comprehensive overview of the Epicurean theory of minima." (English summaries, p. 329)
"Al di là del dibattito sulla sua appartenenza filosofica, a Diodoro Crono vengono attribuite alcune argomentazioni nella forma di veri e propri "paradossi" concernenti *stricto sensu* non tanto l'esistenza del movimento (tema specifico, invece, dei paradossi di Zenone), quanto la sua "attualità". La fonte privilegiata per la ricostruzione di questi argomenti è il II libro del *Contro i fisici* di Sesto Empirico (MX 85-118)441. La comprensione di due di tali argomentazioni si fonda necessariamente su una dottrina che alcune fonti attribuiscono a Diodoro, ossia l'esistenza di "enti" minimi e indivisibili che, in quanto principi, costituirebbero la materia, lo spazio e (forse) il tempo. La questione se Diodoro abbia teorizzato questi minimi come una propria dottrina oppure solo a fini dialettici (considerata anche la sua affiliazione filosofica, dialettica o megarica che sia) è stata al centro del dibattito moderno(442). La maggior parte della critica ha ritenuto che l'ammissione di minimi privi di parti sia essenzialmente a scopo dialettico, disserendi causa, dunque: Diodoro avrebbe concesso l'esistenza di minimi per confutare dottrine (fisiche) avversarie che evidentemente si basavano su quell'attualità del movimento che le argomentazioni diodoree andavano, per l'appunto, a negare." (p. 214)
(442) Per un'agile ricostruzione dei principali contributi a tale dibattito, cfr. Montoneri 1984, pp. 126-8; si consulti anche Döring 1998, pp. 224-5.
Riferimenti
K. Döring, *Sokrates, die Sokratiker und die von ihnen begründeten Traditionen*, in H. Flashar (Hrsg.), *Grundriss der Geschichte der Philosophie*, Begründet von F. Ueberweg, völlig neubearbeitete Ausgabe, *Die Philosophie der Antike*, Band 2/1: *Sophistik-Sokrates-Sokratik-Mathematik-Medizin*, Basel 1998, pp. 139-364.
L. Montoneri, *I Megarici: Studio storico-critico e traduzione delle testimonianze antiche*, Catania 1984.
47. ———. 2015. "Diodorus Cronus on Perceptible Minima." In *From the Socratics to the Socratic Schools: Classical Ethics, Metaphysics and Epistemology*, edited by

- Zilioli, Ugo, 134-148. New York: Routledge.
 "The main textual evidence illustrating Diodorus' interest in perceptible minima is constituted by two passages from Alexander of Aphrodisias' commentary on Aristotle's *On Sense and Sensibilia* ." (p. 134)
 "Although they have not, to my knowledge, been the subject of any specific scholarly treatment, Diodorus' perceptible minima have been variously interpreted. As Alan Towey(19) suggests, the range of interpretations may usefully be divided into two. On the one hand, some interpreters (Mau, Denyer, Sedley) have thought of perceptible minima as an idea used by Diodorus in order to "draw an analogy between perceiving something and conceiving of it." On this view, Diodorus will have accepted that something that can be perceived as lacking parts, although actually divisible, cannot be conceived of as having parts. On the alternative view (Sorabji's), Diodorus used the idea in connection with the problem "that a smallest visible size and a largest invisible size differ from each other by an atomic magnitude."(20)" (p. 140)
 [I: Alexander of Aphrodisias, *On Aristotle's De sensu* 122 16–23 Wendland (= SSR II F 9, part); II: n Aristotle's *De sensu* 172 28–173 10 Wendland (= SSR II F 9). English translation: Towey, A. (ed.) (2000), *Alexander of Aphrodisias: On Aristotle's "On Sense Perception,"* Ithaca/New York, Cornell University Press.]
 (19) Towey (2000), *Alexander of Aphrodisias: On Aristotle's "On Sense Perception,"* Ithaca/New York, Cornell University Press. 188 n. 523.
 (20) Sorabji (1983), *Time, Creation and the Continuum: Theories in Antiquity and the Early Middle Ages* , Ithaca/New York, Cornell University Press, 345–348.
48. Weidemann, Hermann. 1993. "Zeit und Wahrheit bei Diodor." In *Dialektiker und Stoiker. Zur Logik der Stoa und ihrer Vorläufer* , edited by Döring, Klaus and Ebert, Theodor, 319-329. Stuttgart: Franz Steiner.
49. ———. 2000. "Diodor. Logik und Common Sense." In *Philosophen des Altertums, Band. I: Von der Frühzeit bis zur Klassik* , edited by Erler, Michael and Graeser, Andreas, 182-190. Darmstadt: Primus Verlag.
50. ———. 2008. "Aristotle, the Megarics, and Diodorus Cronus on the Notion of Possibility." *American Philosophical Quarterly* no. 45:131-148.
 "One of the most remarkable traits of the fragmentary picture which our sources allow us to draw of the philosophy of the Megarics is the conception of possibility ascribed to them by Aristotle. The well-known passage in Aristotle's *Metaphysics* in which this ascription is made, namely the beginning of the third chapter of book IX (Θ), is, if we leave aside the commentary on this passage which has falsely been attributed to Alexander of Aphrodisias, our only evidence for the Megaric doctrine in question. Aristotle does not content himself with giving an account of this doctrine, but subjects it to a severe criticism, which he underpins by an exact definition of what, in his opinion, it is for something to have a certain possibility. This definition is fundamental not only to his criticism of the Megaric position, but also to his rejection of a view which is opposed to it in the extreme. He criticizes this extreme anti-Megaric conception of possibility in the first half of chapter 4 of *Met. Θ*. In my essay I shall first concentrate on this chapter and the chapter preceding it, in order to show that by means of his definition of the notion of possibility Aristotle is able to strike a happy medium between the Megaric position which he attacks in chapter 3 and the extreme anti-Megaric position which the target of his criticism in chapter 4. Then I shall try to show that even in chapter 5, in which at first sight he seems to adopt the view of his Megaric opponents himself, Aristotle firmly sticks to his own conception of possibility. Since this conception is seriously challenged by the famous Master Argument of Diodorus Cronus, who modified the Megaric conception of possibility, I shall finally try to show that this argument is not damaging to Aristotle's position at all, because it fails to be sound." (p. 131)
51. White, Michael J. 1979. "An S5 Diodorean Modal System." *Logique et Analyse* no. 88:477-487.

- "As is now well known, the alethic modalities were normally conceived in temporal terms by the ancients (1). In particular the Megarian logician Diodorus Cronos defined a possible proposition as one that either is now or will be true, an impossible proposition as one that is now false and will always be false, a necessary proposition as one that is now true and will always be true, and a nonnecessary proposition as one that either is now false or will be false (2). The research — both historical and logical — of Arthur Prior has proven especially fruitful in the contemporary analytical study of «Diodorean modalities.»" (p. 477)
52. ———. 1985. *Agency and Integrity: Philosophical Themes in the Ancient Discussions of Determinism and Responsibility*. Dordrecht: Reidel. Chapter Three: *Diodorean Fatalism*, pp. 69-96. "The basic elements of Diodorus' view are not difficult to ascertain. He retains a "positivistic" or "extensional" conception of the modalities but modifies slightly the conception attributed to the "Megarians" by Aristotle. According to Aristotle's account, the Megarian doctrine apparently is that "what is possible," from the present temporal perspective, is equivalent to "what is *now* actually the case." There is, however, what I believe is a natural tendency to interpret "what is, at present, possible" in such a way that "present" has "widest scope": and, as a consequence, we tend to apply the phrase "what is, at present, possible" not only to what might be happening at the *present moment*, but also to what might happen in the future relative to the present time. There is, in other words, a temporally *prospective* aspect to the modality of possibility, or at least to some ordinary conceptions of possibility. (27) It is this temporal prospectivity that lends credibility to the premise Aristotle invokes against the Megarians in *Metaphysics* 9.3. Note that without the implicit assumption of the temporal prospectivity of possibility, the fact that the occurrence of an event is impossible now, at the present moment, is apparently irrelevant to the question of whether that event shall occur or fail to occur at some *future time*." (p. 73) (2/) Hintikka makes essentially the same point in his discussion of the passage (*Time and Necessity*, pp. 197-199). However, far from being a "rather peculiar concept of possibility" (ibid. p. 197), the concept being exploited in the passage by Aristotle strikes me as a very commonly encountered concept."
53. ———. 1986. "What Worried the Crows?" *The Classical Quarterly* no. 36:534-537. "A well-known epigram by Callimachus on the philosopher Diodorus Cronos (fr. 393 Pfeiffer) reads as follows:
 ἀὐτὸς ὁ Μῶμος
 ἔγραφεν ἐν τοίχοις 'ὁ Κρόνος ἐστὶ σοφός'. [Blame (*Momus*) himself wrote on the walls "Cronus is wise]
 ἦνίδε κοὶ κόρακες τεγέων ἔπι "κοῖα συνηπται"
 κρώζουσιν καὶ "κῶς αὖθι γενησόμεθα". [And here the crows are, squawking from the rooftops "what conclusions follow?" or "how will we become again?]
 The question of the third line, while perhaps recondite from a contemporary perspective, was clear in antiquity. The crows are asking 'What follows (from what)?', in allusion to the Hellenistic disputes concerning the truth conditions of conditional propositions (συνημμένα), disputes in which the views of Diodorus figured prominently.(1)
 I agree with Sedley that the question of the last line is 'much more problematic'.(2)
 The common interpretation has been to read the αὖθι as a form of αὖθις and to interpret it temporally. The result, in Pfeiffer's estimation, is 'quomodo posthac erimus?'.(3)" (p. 534)
 (...)
 "The crows' how-question is particularly apposite, then. Because of Diodorus' doctrine of temporal and spatial minima, the 'natural' answer cannot be given to their question how they will come to be at that very place they will later occupy. That is, Diodorus cannot admit that the crows get from one place to an adjacent

minimal place by means of a continuous process or κίνησις moving (κινεῖσθαι) that results

in the crows' gradually occupying less and less of the first place while occupying more and more of an adjacent minimal place. Rather, the crows simply are at rest in the first place during one time atom and, during the next time atom, they find themselves at rest at the adjacent minimal place. The crows' question, natural though it may be, is a question that Diodorus cannot answer." (p. 537)

(1) Sextus Empiricus, *PH* 2.110-12 and the discussion in B. Mates, *Stoic Logic* (Berkeley and Los Angeles, 1961), pp. 45-7.

(2) Sedley, 'Diodorus Cronus and Hellenistic Philosophy', *Proceedings of the Cambridge Philological Society* 20 (1977), 108 n. 35.

(3) Pfeiffer, *Callimachus* (Oxford, 1949), i.35.

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