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Aristotle on Dialectic and First Principles

António Pedro Mesquita[1]

ABSTRACT

Over time, several authors have argued that, for Aristotle, dialectic is a method of discovery or establishment of the principles of science in general. In this article, I will present four arguments against this view and propose a deflationary view of the role of dialectic in this regard. According to this view, such a role consists only in the defence of common principles against potential eristic attacks.

Keywords: Science, dialectic, first principles, common principles, proper principles.

I

Over time, several authors have defended that, for Aristotle, dialectic is a method of discovery or establishment of the principles of science in general.[2]

In my view, four reasons speak against this thesis.

The first is that while, for Aristotle, each science, besides the common principles it shares with other sciences, has certain principles that are proper to it, he never interprets dialectic as a method for discovering, establishing or even justifying proper principles of particular sciences. Rather, dialectic is simply a method for discussing (and sometimes upholding) common principles.

The second is that if dialectic were a general method of discovery or establishment of the principles of all sciences, it would have to discover or posit not only their common principles, but also those that are proper to each science. And since the task of discovering or positing the proper principles of each science belongs to the science to which the principles are proper, dialectic would become the science to which all principles are proper and therefore a "common" or "universal" science. However, the fact is that Aristotle is adamant that there cannot be a common science and that, specifically, dialectic is not such a common or universal science.

The third reason has to do with the very special sense under which, according to Aristotle, a universal character can be attributed to dialectic. This sense is the following: dialectic, albeit not a universal science, has nonetheless a universal scope insofar as it addresses matters about which everybody knows and on which everyone may give an opinion. Hence, only when it addresses issues of which everyone has some knowledge and can speak – that is to say, only when it addresses such issues at a level that everyone can access and in such a way that everyone can give their opinion – can dialectic have a universal character. Now, principles are by their very nature "more knowable in themselves than they are for us";[3] thus, it is not by discovering or establishing the principles of science, which few people know about and toward which no inexpert opinions count, that dialectic is acknowledged by Aristotle as a comprehensive and transversal, all-encopassing (and, in this sense, universal) method.

[1] Centro de Filosofia da Universidade de Lisboa. Faculdade de Letras da Universidade de Lisboa, Alameda da Universidade, 1600-214, Lisboa, Portugal. E-mail: apmesquita@netcabo.pt

[2] See, for example: Weil (1975); Owen (1961); Irwin (1977); Nussbaum (1986); Frede (1987). It should be highlighted that only the first principles of demonstative science (ἐπιστήμη ἀποδεικτικός) are here taken into account, with the exception, therefore, of those of non-demonstrative sciences (as, for instance, the practical and productive sciences).

[3] See, among many occurences of this lemma: *APo*. A2, 71b19–72a8; *Top*. Z4, 141a23–142a21; *EN* Z3, 1139b31–35.

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The fourth and last reason to reject the view that dialectic is a method of discovery or establishment of the first principles of science in general is the following: Aristotle repeatedly mentions the process by which (proper) principles of science are posited and such process is not dialectic, but rather experience. It is therefore quite clear that for him the discovery or establishing of principles is not to be included under the scope of dialectic's tasks.

In what follows, I will expose these four arguments at greater length and, in a final, more positive section, disclose and defend my own view on the role of dialectic in this matter, namely that this role consists in the defence of common principles against potential eristic attacks.

II

As is well known, according to Aristotle, each science has, besides the common principles it shares with other sciences, or with a wide group of other sciences (τὰ κοινά, τὰ ἀξιώματα), certain principles that are proper to it (τὰ ἴδια) (cf. *APo*. A10.76a37–b11; *APo*. A32.88b27–29; *SE* 11.172a36–b1; but also see *APr*. A30.46a17–22, *APo*. A32.88a30–b6, e *De an*. A1.402a18–22). Now, Aristotle never interprets dialectic as a method of discovery, postulation or even justification of proper principles of particular sciences, but rather simply as a method of discussion of *common principles*. And even if it is true that dialectic may also be applied, by extension, to proper principles of sciences, it can only be so under very restricted terms.

In effect, dialectic is repeatedly described by Aristotle as a special discipline which, since it has no proper genus as its object (cf. *APo*. A11, 77a26–35; *SE* 11, 172a11–15; 11, 172a27–30; *Rh*. A1, 1355b8–9; A 2, 1356a30–34), but rather discusses problems in any domain (cf. *Top*. A1, 100a18–24; *SE* 11, 172a27–30; 34, 183a37–b8; cf. *SE* 11, 172a36–b1; *Metaph*. Γ2, 1004b17–26; *EE* A8, 1217b16–19; *Rh*. A1, 1354a1–3) – not based on true premises either, as it occurs with particular sciences, but on "reputable" or "accepted opinions" (τὰ ἔνδοξα) (see *Top*. A1, 100a18–24, and *SE* 34, 183a37–b8; cf. *APr*. A27, 43b1–17; *APo*. A33, 88b30–89a4; B19, 100b5–17; *Metaph*. Γ2, 1004b17–26) – has the special ability of crossing over with all sciences through the principles common to all of them (cf. *APo*. A 11, 77a26–35; *SE* 9, 170a20–b11; 11, 171b6–7; 11, 172a27–30; 11, 172a36–b1). It is this ability that grants it the possibility (and sometimes the mission) of defending such common principles,[4] as well as – and here are the specific terms that preside over its extension to proper principles of sciences, which Aristotle recognises only once[5] – of carrying out a preliminary examination or discussion of the principles proper to each science, based on the "accepted" or "reputable" opinions about the matters covered by these sciences.

These are Aristotle's own words in this regard:[6]

> *For if we reason from the principles appropriate to the science in question, it is impossible to make any statement about these (since these principles are the first of them all) and it is by means of accepted opinions about each that is necessary to discuss them. But this task is proper, or at any rate most appropriate, to dialectic: for since its ability to examine applies to the principles of all studies, it has a way to proceed (Top. A2, 101a37-b4).*

The role attributed to dialectic in this text clearly conforms to the description above. It consists in listing and analyzing the ἔνδοξα which have implications on each science and in discussing their principles in the light of those ἔνδοξα, no more general conclusion being justifiably drawn from it.[7]

Moreover, this is what Aristotle himself does in several of his scientific treatises, when he precedes the scientific discussion of the object with a list of received or generally accepted opinions[8] and with the presentation of the problems that the analyzed tradition has left pending (τὰ ἀπορούμενα) (as for example in *Ph*. A8, Γ4, Δ1, Δ6, Δ10, Ζ9, Θ2; *De an*. A1, 402a10–403b19; *Metaph*. B1–6; *EN* Ε11–12, Η3).

In no way do these necessary but preliminary moments replace the scientific discussion which is consequently developed, as would be the case if the methodology of science, and especially the postulation of first principles, were of an exclusively dialectic nature.

Closer observation allows us to set out the six following points:

(i) The intervention of dialectic on first principles is always confined to common principles, with the well-defined exception referred to above.

[4] Cf. *SE* 9, 170a20–b11 (on the contrary, the defence of proper principles is expressly attributed to particular sciences).

[5] *Top*. A2, 101a37–b4 (quoted below, in the text). Of all references to dialectic in association with the principles (*APo*. A11, 77a26–35; *Top*. A2, 101a36–b4; *SE* 9, 170a20–b11; 11, 171b6–7; 11, 172a27–30; 11, 172a36–b1), this is indeed the only passage that concerns proper principles.

[6] All translations of the *Topics* by Smith (1994), with some adaptations in the key concepts.

[7] Along the same lines, see Smith: "All that the present passage says is that such critical examinations are 'useful' in 'discussing' scientific starting-points, and that falls far short of claiming that dialectic either establishes or discovers those starting-points. Finally, given Aristotle's repeated claims in the *Topics* and *On Sophistical Refutations* that dialectical argument cannot establish *anything*, it would be more than a little surprising for him to hold that it can establish what scientific demonstrations cannot" (Smith, 1994, p. 54).

[8] For example, in *Physics* (A2–4, 9, and as a rule at the onset of the discussion on each new topic), in *De anima* (A2–5), in *Metaphyics* (A3–10) or in *Nicomachean Ethics* (A3–4, A8–9, H3, H12, K2). This is a procedure which Aristotle himself theorises: see *Cael*. A10, 279a5–12, as well as *Metaph*. α1, 993a30–b19, and B1, 995a24–b4.

(ii) The relationship between dialectic and common principles is not one of discovery, postulation or justification.
(iii) Common principles are not thought of as the preferred object of dialectic, but only as that by which dialectic relates to all sciences.
(iv) Common principles as such only become the object of dialectic when they need to be defended against an eristic attack.
(v) Therefore, in no way can dialectic be regarded as a general science of the ἀξιώματα, but only as a method of defending common principles (moreover, for reasons related to the very nature of common principles themselves, as will be discussed later).
(vi) The universality of dialectic, as a discipline capable of discussing problems in any given field whatsoever, is not to be attributed to any special relationship with common principles (since such a relationship, as previously mentioned, is confined to its defence in the event of an eristic attack), but rather to the specific nature of dialectic as a discipline with no material object.

There is no evidence, thus, to sustain the thesis that dialectic constitutes a general science of principles, or that it is the only or favored method to access first principles of science. Rather, the available data point in the opposite direction.

III

However, not only does Aristotle not say that dialectic is, in any sense of the expression, a science of principles or a method of accessing principles, but his theory of science would also clearly prevent him from doing so – a fact that Aristotle himself explicitly observes.

In fact, if dialectic were the general method of discovery, postulation or justification of the principles of all sciences, it would be so with regard to not only the common principles of all sciences, but also those proper to each one of them. And since this task belongs to the science to which the principles are proper (cf. *APr*. A30, 46a17–22), dialectic would *ex hypothesi* become the science to which all principles are proper and therefore would become a common or universal science. Nonetheless, the fact is that Aristotle is very clear that there cannot be a common science, as each science studies a single genus and each genus falls under certain principles, which are the proper principles to that science (cf. *APo*. A7; A9, 75b37–76a15; A12, 77a36–b15; A28, 87a38–b4; A32; *SE* 9, 170a20–b11; 11, 172a11–15; *GA* B8, 747b27–748a15; see also *APr*. A30, 46a17–22; *De an*. A1, 402a18–22; *Metaph*. B2, 997a18–25; K3, 1060b31–36; K7, 1063b36–1064a4). For dialectic to be a common science, it would be necessary for all genera to lead to an overall genus, whose principles would be the proper principles of the common science and the common principles of all particular sciences, which is not the case.[9] Or dialectic would have to be the superordinate science of all particular sciences, a condition that does not obtain either, as there cannot be, for the reason given above, a single science to which all other sciences are subordinate.[10]

That is why it is also not legitimate to think that dialectic deals indirectly with proper principles simply because it deals with common principles in the first place. In fact, this would imply admitting that proper principles are, up to a certain point, subordinate to common principles and that they may be deduced from them. For Aristotle, on the contrary, the ἀξιώματα are not principles from which everything can be deduced, given that the supreme genera under which all beings fall (the categories) are different and only with the contribution of proper principles of each of these genera can actual conclusions be drawn.[11]

Furthermore, this would, once again, make dialectic a universal science, which, as we have seen, is prevented by the plurality of genera irreducible to each other and to an (illusory) common primary genus, as well as by the corresponding plurality of particular sciences irreducible to each other and to an (illusory) primary science.

That is why Aristotle emphatically and repeatidly underlines that dialectic is not a common or a universal science[12] – not only, by the way, for the reasons set out above, but primarily for the more basic reason that dialectic is not even a science, since it does not operate κατ' ἀλήθειαν, but only κατὰ δόξαν (cf. *APr*. A1, 24a22–b15; A30, 46a3–10; *APo*. A2, 72a8–14; A19, 81b18–23; *Top*. A1, 100a25–b23; A14, 105b30–31; Θ1, 155b3–16; Θ3, 159a11–14; *SE* 2, 165a38–b11; *SE* 11, 172a36–b1; *Metaph*. Γ2, 1004b17–26; see also *De an*. A1, 402b25–403a2).

[9] The maxima genera are themselves plural (the then categories): cf. especially *APr*. A27, 42b20–43; *APo*. A9-22; A32, 88a36–b3.

[10] The only exception to the rule of one genus corresponding to one science is, in fact, the case of the subordinate sciences (see again *APo*. A7; A9, 75b37–76a15; A28, 87a38–b4; and also: *APo*. A13, 78a22–79a16; A15, 98a24–34). But even this exception is more apparent than real, as the principles of subordinate sciences are common to the superordinate ones and only to this extent are they shared by both (cf. *APo*. A9).

[11] Cf. *APo*. A32, 88a36–b3, freely paraphrased here. This thesis is obviously in line with the statement in the same treatise, according to which the principles of non-contradiction and of excluded middle only take part of the premises of a demonstration under exceptional circumstances (in the first case, when the conclusions are instances of the principle of non-contradiction; and, in the second case, when the demonstration is made *per impossibile*: cf. *APo*. A11, 77a10–25.

[12] Cf. *SE* 9, 170a20–b11, and 11, 172a11–15. For the general thesis that there is no universal science, see especially *Metaph*. A9, 992b18–993a7, and *EE* A8, 1217b25–1218a1, and cf. *EN* A4, 1096a23–29.

This is then the second major reason why dialectic cannot be the universal method of establishing the first principles of sciences. In short: there cannot be, in general, a universal science; and dialectic, in particular, is not that science.

IV

This leads us to the third major reason.

The universality of dialectic, on which rests its ability to discuss problems in any domain, far from requiring its intervention in the realm of first principles, is due to three motives that partially exclude it.

Firstly, its material emptiness: it is because dialectic does not have any genus as its proper object, that it can universally resort to cover all genera, and as a result crossover with all sciences (see *APo*. A11, 77a26–35; *SE* 11, 172a27–30; and cf. *SE* 11, 172a11–15).

Secondly, the circumstance that, also for this reason, dialectic is not a science, but only a method or "a capacity for furnishing arguments" (δυνάμεις τινὲς τοὺ πορίσαι λόγους) – and precisely for furnishing arguments *in any field*.[13]

Thirdly, the fact that dialectic addresses topics about which, by definition, everybody knows and anyone can give an opinion (cf. *Rh*. A1, 1354a1–3), a fact that constitutes not only a justification of its universality, but also *a restriction in the meaning to be given to such universality*.

Generally, one can say that the first point prevents dialectic from being a science, the third excludes it from being the general method for establishing first principles, and the second explains exactly in what sense dialectic has a universal nature.

Given that enough has been said about the first point and the third one is the most fundamental for the present discussion, let us begin with the second point.

What does it imply for each one of the particular sciences to declare that dialectic is "a capacity for furnishing arguments" in any field?

To "furnish arguments" (naturally of a dialectical nature) in any field, and therefore for any science, surely cannot mean submitting to particular sciences the general argumentative schemes they would be allowed to use, regardless of any compliance with their proper principles, in their strictly scientific routine. This would be indeed unacceptable in two respects: firstly, science can only proceed demonstratively from its proper principles; and, secondly, scientific demonstration is based on true premises, whereas dialectical arguments are by definition based on premises which are simply "accepted" as true, i.e., on ἔνδοξα.

If we bear in mind Aristotle's actual practice in his own scientific treatises, then to furnish dialectical arguments to the particular sciences must rather mean to provide them with an introductory counterbalance of theses and reasons previously set forth on a certain topic of inquiry – a counterbalance which scientists should be acquainted with and take into due account when proposing an explanatory theory for that topic.[14] The advantage of this preliminary counterbalance is that it allows the scientist to pick up the *pros* and *contras* that, according to the "accepted" opinions, are raised in relation to each problem and thus map out the difficulties that, in his actual scientific investigation, will have to be taken into account and resolved.

It is interesting that, of the three utilities that Aristotle assigns to dialectic (*Top*. A2, 101a25–36), two have a direct link with this application to science: the record of ἔνδοξα; and the habit of testing an aporia in both senses (πρὸς ἀμφότερα διαπορῆσαι) in order to be able to easily distinguish true from false in every topic.[15]

Undoubtedly, this doctrine explains the already mentioned fact that Aristotle's own investigations in his scientific treatises are often introduced by an exhaustive conspectus of the tradition and by a detailed study of the difficulties to be faced and resolved.

Let us now look at the third ground for the universality of dialectic and the reason why it implies that dialectic *cannot* establish first principles: dialectic addresses matters which everybody knows about and on which everyone may give an opinion.

This certainly gives an argument for the universality of dialectic. However, it also shows *in what exact sense* one can speak of dialectic being universal.

In effect, if dialectic is universal because it addresses objects which everyone knows, it is also *only while* it addresses objects that everyone knows, that is, only while it addresses such objects at a level which everyone can access, and in such a way that everyone can give their opinion, that dialectic is universal.

[13] *Rh*. A2, 1356a33–34. Note that this characterisation derives from the canonical definition of dialectic: see *Top*. A1, 100a18–24, and *SE* 34, 183a37–b8; but cf. also *Top*. A2, 101a28–30 (and note: μέθοδον γὰρ ἔχοντες ῥᾷον περὶ τοῦ προτεθέντος ἐποχειρεῖν δυνησόμεθα), as well as Θ14, 164b1–7. Evans summarizes perfectly this point when he states: "Dialectic is indeed concerned with everything about everything, as first philosophy is not; but the price which it pays for this universality is that, unlike first philosophy, it is not scientific in character" (Evans, 1977, p. 48). To this note of generality, the *Eudemian Ethics* adds another note: dialectical arguments are not only common (κοινοί), but also fundamentally destructive (ἀναιρετικοί); cf. *EE* A8, 1217b16–19.

[14] That is why Aristotle frequently precedes the analytical consideration of a problem (i.e., its consideration in accordance with proper principles of the science in question) with a dialectical approach (λογικῶς, i.e., general and abstract, because it is independent from the principles proper to any science and therefore applicable to all fields), or prefixes to the development of scientific arguments a number of merely "logical" arguments: see paradigmatically *APo*. A22, 82b37–84a30; A24, 85b23–86a30; A32, 88a19–b7; *Ph*. Γ5, 204b4–205a7; *Metaph*. Ζ4, 1029b13–1030b3; cf. *Cael*. A7, 275b12–276a17, *Metaph*. A2, 982a4–b10, and the long interregnum καθόλου in *Cael*. A10–12, 280a32–283b9.

[15] The first, of a "gymnastic" nature, consists precisely in the ability to argue about any topic.

When Aristotle declares, in the *Sophistical Refutations*, that from common principles *qua* common dialectic can become an "investigation of all things" and sets itself as a "certain art",[16] this statement should probably be understood in the same vein, thus implying that such an investigation will only proceed to the extent of the knowledge of common people and in the proportion of the general opinion. And, no doubt, it is with this precept in mind that Aristotle declares in the *Metaphysics* that dialectic discusses all topics, but *in a merely inquisitive fashion* (πειραστική) and *not with a view to knowledge* (γνωριστική).[17]

Now, this quite obviously excludes dialectic from being an art of principles, as they are by nature more knowable in themselves than for us and therefore necessarily inaccessible to common knowledge as suchv (see *APo*. A2, 71b19–72a8; *Top*. Z4, 141a23–142a21; *EN* Z3, 1139b31–35; cf. *APr*. B16, 64b28–65a9; *Top*. A1, 100a25–29; A1, 100a30–b21; Θ1, 155b3–16; Θ3, 159a11–14; Θ11, 161b30–33). But, at the same time, *it does not exclude* the possibility for it to include in its goal, as a "certain art", the defence of common principles, in a way yet to be deciphered.

Once again, we are led to conclude, therefore, that for Aristotle dialectic is not the general method of establishing the principles of science – but that the defence of common principles against potential eristic attacks may fall under the scope of its mission.

V

The fourth and final reason for this conclusion is trivial. It is nevertheless important to recall it, given that some defenders of the thesis under analysis appear to forget it at times.

Aristotle repeatedly mentions the process by which (proper) first principles are established and this process is not dialectic, but rather (some kind of) *experience* (see, for instance: *APr*. A30, 46a17–22; *APo*. A18, 81a38–b9; A31; B2, 90a24–30; B19, 99b20–100b5; *Cael*. Γ7, 306a5–9; *GC* A2, 316a5–14; *HA* A6, 491a7–14; *GA* Γ10, 760b27–33; *EN* A7, 1098b3–4; Z9, 1142a16–20).

Regardless of how we wish to interpret this doctrine, what seems to be an inescapable fact is that for Aristotle the establishing of the first principles of science is not within the powers of dialectic.

VI

It is time to sum up.

If our account is right, dialectic plays no role whatsoever in the discovery, postulation or justification of the proper principles of particular sciences. Concerning these principles, the task of dialectic is limited to its examination and discussion in the light of ἔνδοξα.

The role of dialectic is therefore limited, in principle, to ἀξιώματα.

But what exactly *is* this role?

Let us first recall what it *is not*.

Surely, it is not up to dialectic to discover or postulate them. It is not up to dialectic to discover them, since it does not discover anything. Dialectic discusses *given* propositions, in order to confirm or refute them, according to the role that is assigned to the dialectician in the question/answer exercise, based on accepted opinions, recognised as such by both parties.[18]

But it is not up to dialectic to postulate them either. In fact, the confirmation or refutation of given propositions that results from the dialectical exercise, supported as they are on purely endoxic premises, only have value within the framework determined by the dependence from these premises. And since the ἔνδοξα are, by definition, only *accepted* as true, and may in fact be false,[19] no reasoning based on ἔνδοξα can *truthfully* establish anything at all, and therefore no reasoning based on ἔνδοξα can establish common principles, which are principles of demonstration and therefore *true* principles (cf. *APo*. A2, 71b19–33; A9, 75b37–76a15; A19, 81b18–23; *Top*. A1, 100a25–29).

What, then, is the role of dialectic regarding common principles?

That role has already been suggested. The role of defending common principles from an eristic attack, that is, from a malicious attack, made only *victoriae gratia*.[20]

In fact, contrary to proper principles, common principles are, according to Aristotle, necessary in virtue of them-

[16] "Εστιν ἐκ τούτων περὶ ἁπάντων πεῖραν λαμβάνειν καὶ εἶναι τέχνην τινά" (*SE* 11, 172a39–b1).

[17] Cf. *Metaph*. Γ2, 1004b17–26. The *Eudemian Ethics*, as we have seen (above, n. 13), would even add: in a merely *destructive* way (cf. A8.1217b16–19).

[18] Cf. *Top*. Θ14, 164b1–7, and Θ1, 155b3–16; but see also: *APr*. A1, 24a22–b12; *APo*. A11, 77a31–35; A2, 72a8–14; *Top*. Θ2, 158a14–21; *SE* 10, 171a38–b2; 11, 171b3–6; 11, 172a15–21. The criteria for an opinion to be "accepted", in the technical sense, are clearly defined at the beginning of the *Topics*: accepted opinions [ἔνδοξα] are those "which seem so [true and primary] to everyone, or to most people, or to the wise – to all of them, or to most, or to the most famous and estemed [τοῖς μάλιστα γνωρίμοις καὶ ἐνδόξοις]" (*Top*. A1, 100b21–23). For similar descriptions of ἔνδοξα, see: *Top*. A14, 105a34–b12, and Γ1, 116a13–20.

[19] Cf. especially *Top*. Θ12, 162b27: εἰ μὲν γὰρ ἐκ ψευδῶν ἐνδόξων δέ, λογικός; but see also *APo*. B19, 100b5–7.

[20] As Aristotle underlines in *SE* 11, 171b22–34, eristic is moved by the desire to win the discussion at any cost (although it may also be accompanied by the desire to monetarily profit from it, in which case it should be properly called "sophistic"). That is why, for Aristotle, the eristic contender is, by definition, a disloyal quarreller who uses any means to give the appearance of having won. The means that he uses and the way of recognising them and to denounce them as *eristic* are the object of the *Sophistical Refutations*.

selves *and recognized as such*.[21] Now, if common principles are so, surely they can only be questioned on the basis of an eristic argument. Dialectic is therefore required, since it is its task to reduce sophistical refutations.[22]

A good example of this dialectical defence of a common principle in the *corpus* is the discussion of the principle of non-contradiction in book Γ 3-8 of *Metaphysics*. In this text, Aristotle clearly explains the status of such a defence: it consists in refuting the rejection of the principle of non-contradiction *by showing the impossibility of such a negation* (cf. *Metaph*. Γ4, 1006a11–28).

In short: proper principles of sciences are known in a non-dialectical way, by a procedure that somehow involves experience; common principles are acknowledged by each particular science with the particular content that applies to that science,[23] even if dialectic may defend them from any attempt of an eristic attack.

The conclusion is not, therefore, that dialectic has no function as regards the principles of science. It is, rather, that its intervention is much more limited and modest than those campaigning for the thesis under analysis believe, as that function is primarily limited to common principles and only consists of supporting, and not discovering or establishing, them. In the case of proper principles, dialectic is only required in a supplementary way, for the preliminary analysis of the received opinions and the acknowledgment of the ἀπορίαι which result from them and which the scientific investigation will have to face.

References

BEKKER, I. (ed.) 1831. *Aristotelis Opera*, I-II. Berlin, Königlichen Preussischen Akademie der Wissenschaft, 789 + 673 p.

EVANS, J.D.G. 1977. *Aristotle's Concept of Dialectic*. Cambridge, Cambridge University Press, 150 p.

FREDE, M. 1987. The Unity of the General and Special Metaphysics: Aristotle Conception of Metaphysics. *In:* M. FREDE, *Essays in Ancient Philosophy*. Minneapolis, Minneapolis University Press, p. 81-95.

IRWIN, T.H. 1977. Aristotle's Discovery of Metaphysics. *Review of Metaphysics*, **31**:210-229.

NUSSBAUM, M.C. 1986. Saving Aristotle's Appearances. *In:* M.C. NUSSBAUM, *The Fragility of Goodness*. Cambridge, Cambridge University Press, p. 240-263.

OWEN, G.E.L. 1961. Tithenai ta phainomena. *In:* S. MANSION (ed.), *Aristote et les problèmes de méthode. Communications présentées au Symposium Aristotelicum*. Louvain/Paris, Publications Universitaires de Louvain/Éditions Béatrice-Nauwelaerts, p. 83-103.

ROSS, W.D. (ed.) 1949. *Aristotle's Prior and Posterior Analytics: A Revised Text with Introduction and Commentary*. Oxford, Clarendon Press, 690 p.

SMITH, R. (ed.) 1994. *Topics Books I and VIII*. Oxford, Clarendon Press, 246 p.

WEIL, E. 1975. La place de la logique dans la pensée aristotélicienne. *In:* J. BARNES; M. SCHOFIELD; R. SORABJI (eds.), *Articles on Aristotle. I*: *Science*. London/New York, Duckworth/St. Martin's Press, p. 88-112.

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[21] Οὐκ ἔστι δ' ὑπόθεσις οὐδ' αἴτημα, ὃ ἀνάγκη εἶναι δι' αὐτὸ καὶ δοκεῖν ἀνάγκη (*APo*. A10, 76b23–24). Although the expression ἀξίωμα does not explicitly occur in this passage, the context clearly indicates that it refers to them; see Ross (1949, p. 541).

[22] Cf. *SE* 9, 170a20–b11; 34, 183a37–b8. Hence, again, its predominantly destructive nature (*EE* A8, 1217b16–19).

[23] This is at least what seems to result from *Metaph*. Γ3, 1005a23–27 (axioms are used in all sciences but only within the framework of the genus where heir demonstrations operate), and, more generically, from *APo*. A10, 76a37–b11 (axioms are only κοινὰ κατ' ἀναλογίαν, given that their application differs depending on the science in which they intervene and the genus to which they apply).