

Deduction in *Sophistici Elenchi* 6

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Aristotle's logical theory is centrally concerned with deductions (συλλογισμοί). A deduction, for Aristotle, is 'an argument in which, certain things being assumed, something else than what has been assumed results of necessity through what has been assumed'. This definition is from the opening chapter of the *Topics*. Similar definitions are given at the beginning of the *Prior Analytics*, *Sophistici Elenchi*, and *Rhetoric*. In none of these passages, however, does Aristotle explain in any detail what the definition and its individual parts mean. Instead, his most extensive discussion of the definition of deduction is to be found, perhaps unexpectedly, in chapter 6 of the *Sophistici Elenchi*. This chapter has received relatively little attention in the recent scholarly literature. Nevertheless, it has important implications concerning the nature of deductions—or so I will argue. My aim here is to explore what we can learn from the chapter about Aristotle's conception of deduction.

The *Sophistici Elenchi* deals with apparent refutations, that is, with arguments which appear to be refutations but are not refutations. In chapters 4 and 5 of the treatise, Aristotle identifies thirteen kinds of apparent refutations. In chapter 6 he states that these thirteen kinds can ultimately be reduced to one of them, namely to *ignoratio elenchi* (see Section 1 below). In order to prove this, he argues that all apparent refutations violate some condition laid down in the definition of refutation. Since refutations are a kind of deduction, his argument also appeals to the definition of deduction (Section 2). Aristotle explains why various apparent refutations violate some condition in this latter definition. In doing so, he appeals to two conditions which are not explicitly included in the standard definition of deduction quoted above. Thus Aristotle extends the standard definition by two new conditions which he does not state elsewhere (Section 3).

One of these new conditions concerns the premises of deductions. Aristotle requires that premises be simple predicative sentences consisting of a single predicate and a single subject (*SE* 6 169a6–18). He thereby excludes complex premises such as ‘If it is day, the sun is above the earth’. The other new condition to which Aristotle appeals in *Sophistici Elenchi* 6 concerns the linguistic form of deductions more generally. He introduces it in connection with arguments such as (i) and (ii):

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|--|--|
| (i) Every robe is a cloak.
Every cloak is useful.
Therefore, every robe is useful. | (ii) Every robe is a cloak.
Every mantle is useful.
Therefore, every robe is useful. |
|--|--|

The latter argument differs from the former in that the second occurrence of the term ‘cloak’ has been replaced by its synonym ‘mantle’. Clearly (i) is a deduction, that is, a valid deductive argument. But although ‘cloak’ and ‘mantle’ are synonyms, Aristotle denies that (ii) is a deduction (*SE* 6 168a26–33). In his view, (ii) violates a condition laid down in the definition of what a deduction is. This shows that, contrary to what is sometimes thought, Aristotle took deductions to be of an essentially linguistic nature. He does not say which condition it is that is violated by (ii). I will argue that the condition in question ultimately relies on schemata of deductions such as the following:

- (iii) Every C is B.
Every B is A.
Therefore, every C is A.

For Aristotle, I argue, (i) is a deduction because it conforms to the schema in (iii), whereas (ii) fails to be a deduction because it does not conform to this or another schema of deduction. Of course, schemata of deductions formulated by means of schematic letters such as ‘A’, ‘B’, and ‘C’ do not occur in the *Topics* and *Sophistici Elenchi*. Aristotle introduces them only later, in the *Prior Analytics*, and it is unlikely that they were available to him at the time he wrote the

former two works. Nevertheless, by denying that (ii) is a deduction Aristotle is gesturing toward a schematic account of deduction in the *Sophistici Elenchi* (Section 4). Finally, I will argue that, by Aristotle's lights, the argument of *Sophistici Elenchi* 6 goes some way towards establishing the correctness of his extended definition of deduction (Section 5).

1. The thesis of *Sophistici Elenchi* 6

In the opening sentence of the *Sophistici Elenchi*, Aristotle states that the treatise is concerned with certain fallacies called sophistical refutations:

Let us now discuss sophistical refutations, i.e., what appear to be refutations but are really fallacies instead.¹ (*SE* 1 164a20–2)

Sophistical refutations are arguments which appear to be refutations but are not refutations. They are apparent refutations. In chapters 4 and 5 of the treatise, Aristotle identifies thirteen kinds of apparent refutations. He classifies six of them as being 'due to language' (παρὰ τὴν λέξιν), and seven as being 'outside of language' (ἔξω τῆς λέξεως):

due to language (*SE* 4):

homonymy

amphiboly

composition

division

accent

form of expression

outside of language (*SE* 5):

accident

secundum quid

ignoratio elenchi

consequent

begging the question

non-cause as cause

many questions

¹ περὶ δὲ τῶν σοφιστικῶν ἐλέγχων καὶ τῶν φαινομένων μὲν ἐλέγχων, ὄντων δὲ παραλογισμῶν ἀλλ' οὐκ ἐλέγχων, λέγωμεν. I read καὶ in this sentence as expegetical, following Forster (1955: 11), Barnes (1984: 278), Dorion (1995: 119), Schreiber (2003: 192), Fait (2007: 99), and Hasper (2012: ad loc.).

Aristotle takes this to be an exhaustive classification of all apparent refutations.² A special role in the classification is played by *ignoratio elenchi*; for Aristotle will argue in chapter 6 that all thirteen kinds of apparent refutations can be reduced to *ignoratio elenchi*. He characterizes this kind of apparent refutation as follows:

Those [apparent refutations] which arise because it has not been defined what a deduction is or what a refutation is come about due to (παρά) falling short of the definition [of deduction or refutation].³ (SE 5 167a21–2)

This passage refers to the definitions of deduction and refutation. As we will see shortly, refutations are a special kind of deduction, namely deductions which refute a given thesis. The definition of deduction is therefore included in the definition of refutation, and falling short of the former entails falling short of the latter. Thus, Aristotle’s characterization of *ignoratio elenchi* in effect relies on the condition of falling short of the definition of refutation.⁴ More precisely, an apparent refutation falls under the heading of *ignoratio elenchi* just in case it comes about due to falling short of the definition of refutation.

What is it for an apparent refutation to come about due to falling short of that definition? First of all, the argument which constitutes the apparent refutation should violate

² See SE 4 165b23–30, 166b20–7, 8 170a9–11.

³ οἱ δὲ παρά τὸ μὴ διωρίσθαι τί ἐστὶ συλλογισμὸς ἢ τί ἔλεγχος παρά τὴν ἔλλειψιν γίνονται τοῦ λόγου. I omit ἀλλὰ after ἔλεγχος, following Barnes (1984: 282), Dorion (1995: 238), Schreiber (2003: 212), and Fait (2007: 12).

⁴ The phrase ἔλλειψις τοῦ λόγου at 167a22 may be taken to mean either ‘defect in the definition of refutation’ (e.g., Forster 1955: 29, Edlow 1977: 19 n. 17; Schreiber 2003: 88), or ‘falling short of the definition of refutation’ (Dorion 1995: 238–9). The translation given above prefers the latter option (cf. the phrase ὑπερβολή τε καὶ ἔλλειψις τοῦ μέσου at NE IV.8 1128a3–4, which refers to an excess and a deficiency as compared with the mean). On the first option, Aristotle states that in instances of *ignoratio elenchi*, the interlocutors implicitly rely on a deficient definition of refutation, and therefore take an argument which is not a refutation to be a refutation. In this case, too, the apparent refutation can be taken to come about due to falling short of the *proper* definition of refutation.

one of the conditions laid down in the definition of what a refutation is. But in addition, the preposition ‘due to’ (παρά) introduces a causal aspect. Elsewhere Aristotle indicates such an aspect by speaking explicitly of a cause of apparent refutations:

If the refutation is merely apparent, the cause (τὸ αἴτιον) will be either in the deduction or in the contradiction [. . .], while sometimes it is in both. (SE 10 171a5–7)

The cause referred to here seems to be a cause which explains, or contributes to explaining, why a given argument is an apparent refutation. Now, apparent refutations are arguments which appear to be refutations but are not refutations. So we may distinguish between a cause which explains why the argument is not a refutation, and a cause which explains why it appears to be a refutation. In scholastic terminology, these causes are called *causa non existentiae* and *causa apparentiae* respectively.⁵ The passage just quoted seems to refer to the former cause.⁶ In the case of *ignoratio elenchi*, it is doubtful whether an argument’s not satisfying the definition of refutation can constitute a *causa apparentiae*, but it clearly can constitute a *causa non existentiae*.⁷ I will have more to say about the way in which it is a *causa non existentiae* for an apparent refutation. For now, it suffices to note that every apparent refutation which falls under the heading of *ignoratio elenchi* is required to meet two conditions: first, that it violate the definition of refutation; and secondly, that this violation constitute a *causa non existentiae* for the apparent refutation.

Let us now turn to chapter 6 of the *Sophistici Elenchi*. There Aristotle argues that all thirteen kinds of apparent refutations introduced in chapters 4 and 5 can be reduced to one of them, namely to *ignoratio elenchi*:

⁵ See Ebbesen 1987: 115–17, Fait 2007: xix–xx. The former cause is also called *causa defectus*.

⁶ Thus, τὸ αἴτιον at 171a6 is translated as ‘cause of falsity’ (Forster 1955: 57), ‘reason of the falsity’ (Barnes 1984: 290), or ‘cause de l’erreur’ (Dorion 1995: 144 and 272).

⁷ Fait 2007: xx.

We should either classify apparent deductions and refutations as just described [in chapters 4 and 5], or else reduce them all to ignorance of what a refutation is, and make this our starting-point; for it is possible to analyse all the aforesaid modes of apparent refutations into the definition of refutation. (SE 6 168a17–20)

Aristotle's thesis is that every apparent refutation which falls under one of the thirteen kinds is an instance of *ignoratio elenchi*. Since the classification into the thirteen kinds is meant to be exhaustive, his thesis is that all apparent refutations fall under the heading of *ignoratio elenchi*. Given Aristotle's characterization of *ignoratio elenchi*, this implies, first, that every apparent refutation violates the definition of refutation.⁸ In other words, the definition of refutation is extensionally correct with respect to the class of apparent refutations, in the sense that no apparent refutation satisfies the definition. We may call this the thesis of extensional correctness. Secondly, Aristotle's thesis implies that for every apparent refutation, its violating the definition of refutation is a *causa non existentiae* for it. In other words, the violation is a cause which explains why the argument in question is not a refutation. Call this the causal thesis.

The causal thesis implies, or presupposes, the thesis of extensional correctness. One might think that the latter thesis also implies the former, on the grounds that every violation of the definition of refutation constitutes a *causa non existentiae*. I will argue below, in Section 5, that this is not so, and that Aristotle had in mind a more specific notion of *causa non existentiae* which does not include any arbitrary violation of the definition of refutation. But for now, let us have a look at the definitions of refutation and deduction employed by Aristotle in his argument for the thesis of chapter 6.

2. Defining refutation and deduction

In the first chapter of the *Sophistici Elenchi*, Aristotle defines refutation as follows:

⁸ Dorion 1995: 89.

A refutation is a deduction (συλλογισμός) together with the contradictory (μετ' ἀντιφάσεως) of the conclusion. (SE 1 165a2–3)

This means that a refutation is a deduction whose conclusion is the contradictory of a thesis endorsed by one's opponent in a debate; the purpose of the deduction is to refute that thesis.⁹ Thus, every refutation is a deduction.¹⁰ Since the definition of refutation relies on the notions of deduction and contradiction, let us consider these in turn. In the first chapter of the *Sophistici Elenchi*, deduction is defined as follows:

A deduction is from certain things which have been assumed, in such a way as to necessarily lead to the assertion of something else than what has been assumed, through what has been assumed.¹¹ (SE 1 164b27–165a2)

This is a version of Aristotle's standard definition of deduction, which is also found at the beginning of the *Topics*, *Rhetoric*, and *Prior Analytics*.¹² The definition imposes at least three conditions on deductions:¹³

- C1 The conclusion follows necessarily from the premises (*necessitas consequentiae*).
- C2 The conclusion is not identical with any of the premises.
- C3 The conclusion follows through the premises.

⁹ See Crivelli 2004: 140. Elsewhere, Aristotle simply says that a refutation is a 'deduction of the contradictory' (SE 6 168a36–7, 9 170b1–2, *AnPr.* II.20 66b11).

¹⁰ SE 10 171a2–3, see also 6 168b4–5.

¹¹ ὁ μὲν γὰρ συλλογισμὸς ἐκ τινῶν ἐστὶ τεθέντων ὥστε λέγειν ἕτερον ἐξ ἀνάγκης τι τῶν κειμένων διὰ τῶν κειμένων.

¹² *Top.* I.1 100a25–7, *Rhet.* I.2 1356b16–18, *AnPr.* I.1 24b18–20.

¹³ In addition, the plural phrase 'from certain things' seems to indicate a fourth condition, to the effect that deductions have more than one premise (see Frede 1974: 20, Striker 2009: 79–80). Unlike C1–3, this condition plays no role in SE 6, and can therefore be set aside for present purposes.

Condition C2 is comparatively straightforward. The precise import of conditions C1 and C3 is less clear, and we will consider them later.

As for the notion of contradiction, Aristotle does not explicitly define it in the *Sophistici Elenchi*; but he does so in the *De Interpretatione*, as follows:

Let a contradiction (ἀντίφασις) be this: an affirmation and a denial which are opposite. I speak of sentences as opposite when they (C4) affirm and deny the same thing of the same thing—(C5) not homonymously, (C6) together with all other such conditions that we add to counter the troublesome objections of sophists. (*Int.* 6 17a33–7)

Contradictions consist of an affirmation and a denial. Affirmations and denials are linguistic expressions.¹⁴ They are sentences. An affirmation is a sentence affirming something of something, and a denial is a sentence denying something of something. That which is affirmed or denied is called the predicate of the sentence; that of which it is affirmed or denied is called the subject of the sentence. Like sentences, their subjects and predicates are linguistic expressions.¹⁵

Aristotle's C4 seems to require that in a pair of contradictory sentences, the same predicate is denied and affirmed of the same subject. This means that the same linguistic expression serves as the predicate in both sentences, and likewise for the subject.¹⁶ In addition, Aristotle requires that the predicates (and subjects) of the two sentences not be merely homonyms (C5). Finally, he mentions 'all other such conditions that we add to counter the troublesome objections of sophists' (C6). He does not specify these conditions in the *De*

¹⁴Affirmations and denials are λόγοι (*Int.* 5 17a8–9). A λόγος, in turn, is a 'significant spoken sound' (φωνή σημαντική, *Int.* 4 16b26). Thus, affirmations and denials are significant spoken sounds (*Int.* 5–6 17a23–6), and hence linguistic expressions.

¹⁵ See Crivelli 2012: 113–15.

¹⁶ See Ammonius, who takes Aristotle at 17a33–7 to require that the predicate of both sentences be the same term (ὅρος), and likewise for the subject (Ammonius *In Int.* 84.13–27). It is clear that Ammonius regards terms (ὅροι) as linguistic expressions (see, e.g., *In Int.* 7.32–3, 10.1–17).

Interpretatione; but he does specify them in the *Sophistici Elenchi*, in an extended definition of refutation that he gives in chapter 5:

A refutation is a contradictory¹⁷ (C5) of one and the same item, not merely of the name but of the object, (C4) and of a name which is not synonymous but the same name¹⁸—(C1) a contradictory which follows necessarily from the premises granted, (C2) without including in the premises the original point to be proved—(C6) a contradictory in the same respect and relative to the same thing and in the same manner and at the same time. (*SE* 5 167a23–7)

The additional conditions mentioned in *De Interpretatione* 6 are specified at the end of the passage.¹⁹ The passage also shows that Aristotle endorses C4 and C5 in the *Sophistici Elenchi*. In his formulation of C4, he makes it clear that the subjects (and predicates) of a pair of contradictory sentences are required to be the same linguistic expression. Even if they are synonyms, the sentences will not be contradictory. For example, ‘A mantle is useful’ and ‘A cloak is not useful’ are not contradictory, even if ‘mantle’ and ‘cloak’ are synonyms.

In C5 Aristotle requires that in addition to being the same linguistic expression, the subjects (and predicates) of the two sentences signify the same object. He thereby excludes homonymous subjects (and predicates). For example, the sentences ‘Ajax fought against Hector’ and ‘Ajax did not fight against Hector’ are not contradictory if ‘Ajax’ is taken to signify Ajax the Greater in one of them and Ajax the Lesser in the other.

In sum, the three requirements imposed on contradictions in refutations can be stated as follows:

¹⁷ This is to say that a refutation is a deduction whose conclusion is the contradictory of the opponent’s thesis.

¹⁸ ἔλεγχος μὲν γὰρ ἐστὶν ἀντίφασις τοῦ αὐτοῦ καὶ ἑνός, μὴ ὀνόματος ἀλλὰ πράγματος, καὶ ὀνόματος μὴ συνωνύμου ἀλλὰ τοῦ αὐτοῦ. This is one of the few places where Aristotle uses συνώνυμος to mean ‘synonymous’, picking out expressions that differ in linguistic form but have the same meaning (see Bonitz *Index Arist.* 734b54–8, Dorion 1995: 239, Schreiber 2003: 212, Fait 2007: 120).

¹⁹ See Weidemann 2002: 200–1.

- C4 The predicate of the refutation's conclusion is the same linguistic expression as the predicate of the opponent's thesis—and likewise for the subject.
- C5 The predicate of the refutation's conclusion signifies the same object as the predicate of the opponent's thesis—and likewise for the subject.
- C6 The refutation's conclusion and the opponent's thesis affirm and deny the predicate of the subject in the same respect, relative to the same thing, in the same manner, and at the same time.

In his formulation of C4 and C5 in *Sophistici Elenchi* 5, Aristotle draws a clear distinction between names (ὀνόματα) and objects (πράγματα). Thus he distinguishes between linguistic and non-linguistic items. This distinction is not prominent in Aristotle's discussion of deductions in the other works of the *Organon*; indeed, it is often thought that Aristotle is unclear or confused about it. But the distinction is prominent in the *Sophistici Elenchi*, as is shown, for example, by the following passage from the first chapter:

It is not possible to discuss by bringing in the objects (πράγματα) themselves, but we use names (ὀνόμασιν) as symbols instead of objects [. . .]. Names are finite and so is the number of phrases, while objects are infinite in number. Necessarily, then, the same phrase and a single name signifies many [objects]. (*SE* 1 165a6–13)

Since the number of linguistic expressions is finite and the number of objects is infinite, there are cases in which one expression signifies many objects. This potential ambiguity of linguistic expressions constitutes a cause (αἰτία, 165a4, 165a18) of apparent refutations, especially of those under the heading of homonymy and amphiboly. Hence it is important for Aristotle in the *Sophistici Elenchi* to attend to the distinction between linguistic and non-linguistic items. In this context, his endorsement of C4 shows that he takes contradictions, and hence refutations, to depend essentially on the linguistic items involved. As we will see, his argument in chapter 6 shows that he holds a corresponding view about deductions, too.

3. Two additional conditions on deduction

As we saw above, Aristotle's thesis in chapter 6 implies the thesis of extensional correctness, that every apparent refutation violates one of the conditions in the definition of refutation. Aristotle's proof of this latter thesis relies on conditions C1–6, which are stated in chapters 1 and 5. In addition, however, the proof relies on two other conditions that are not stated in chapters 1–5. Both of these conditions concern deductions. One occurs in Aristotle's discussion of apparent refutations due to many questions. The other occurs in the discussion of apparent refutations due to composition, division, and accent. I will first briefly consider the former condition; the bulk of this and the next section will then be devoted to the latter.

In the course of establishing the thesis of extensional correctness, Aristotle argues that apparent refutations due to many questions violate the definition of what a premise is:

Those apparent refutations which arise because several questions are made into one consist in our failure to articulate the definition of premise. For a premise is concerned with one item about one item. [. . .] If, then, a single premise is a premise which claims one item of one item, a premise, without qualification, will be the putting of a question of that kind. (*SE* 6 169a6–12)

According to this passage, premises are questions which ask whether a single item holds of a single item. The first of these items is the predicate of the premise, or what is signified by the predicate. The latter item is the subject or what is signified by it. Each of these items is required to be one, not many. Questions that meet this requirement may be called simple predicative questions.

Apparent refutations due to many questions contain would-be premises which fail to be simple predicative questions, and therefore violate the definition of what a premise is (169a12–18). For present purposes, it is not necessary to consider why these apparent refutations violate the definition of premise. What is important is the fact *that*, for Aristotle, they violate it. From this Aristotle infers that they violate the definition of refutation, and that

they fall under the heading of *ignoratio elenchi*. Thus he seems to regard the condition that premises be simple predicative questions as part of the definition of deduction and refutation. Call this condition C7.

In the *Prior* and *Posterior Analytics*, premises are taken to be declarative sentences rather than questions. Specifically, they are taken to be simple declarative sentences, in which something is affirmed or denied of something.²⁰ According to the *De Interpretatione*, every single affirmation and denial affirms or denies a single item of a single item.²¹ In view of this, C7 may be extended as follows:

C7 The premises of every deduction are simple predicative questions or simple declarative sentences.

This condition excludes declarative sentences that are not simple. For example, it excludes compound sentences composed of two or more simple ones, such as ‘If it is day, the sun is above the earth’ or ‘Either it is day or it is night’. Given C7, such sentences cannot, by definition, serve as premises of deductions.²² In his formulation of C4 and C5, Aristotle implicitly assumed that the conclusion of any refutation is a simple declarative sentence. He now makes the same assumption for the premises of any deduction.

Alexander and other commentators in antiquity thought that C7 is already implicit in Aristotle’s standard definition of deduction. This definition states that ‘a deduction is from certain things which have been assumed’. Alexander and others took the word ‘assumed’ (τεθέντων) to imply that the premises are simple declarative sentences.²³ However, their view

²⁰ Cf. *AnPr.* I.1 24a16–17, *Int.* 5–6 17a20–6; see also Alexander *In AnPr.* 11.6–9, Barnes 2007: 135.

²¹ *Int.* 8 18a12–13, 10 19b6–7, 11 20b12–15.

²² Barnes (2007: 135–6) argues that one and the same sentence can be analysed as having the form of a simple and of a compound sentence. In this case, C7 may be taken to require that premises of deductions *be analysed* as having the form of simple declarative sentences (or simple predicative questions).

²³ See Alexander *In AnPr.* 17.5–10, 348.29–32, 350.16–18, *In Top.* 8.8–14. Alexander says ‘predicative’ (κατηγορικός) instead of ‘simple declarative’ (ἀπλοῦς ἀποφαντικός or ἀπλή ἀπόφανσις); the two expressions are equivalent, see Ammonius *In Int.* 73.35–74.1, *In AnPr.* 17.26–9, Bobzien 2002: 364 n. 18.

is open to question, and it is rejected by Ammonius (*In AnPr.* 27.6–14, 28.13–20). If Ammonius is right, then C7 adds new content to Aristotle’s standard definition of deduction. Nevertheless, the passage from *Sophistici Elenchi* 6 shows that Alexander is correct in thinking that Aristotle regarded C7 as part of the definition of what a deduction is.

Let us now turn to the other additional condition imposed on deductions in chapter 6. Aristotle introduces it in his discussion of the six kinds of apparent refutations that he classifies as being due to language: homonymy, amphiboly, form of expression, division, composition, and accent. The first three kinds are due to an ambiguity of linguistic expressions (παρὰ τὸ διττόν, 168a24). That is, they are due to the fact that different occurrences of the same linguistic expression in them signify different things. By contrast, the other three kinds of apparent refutations are not due to an ambiguity. Instead, Aristotle claims, they are due to the fact that two distinct, though similar, linguistic expressions in them signify different things.²⁴ For example, consider the following apparent refutation due to accent, in which the two expressions οὗ (‘where’) and οὐ (‘not’) signify different things (*SE* 21 177b37–178a3):

- A1 A house is where you lodge (τὸ οὗ καταλύεις οἰκία).
 ‘You do not lodge’ is a denial (τὸ οὐ καταλύεις ἀπόφασις).
 Therefore a house is a denial (ἡ οἰκία ἄρα ἀπόφασις).

This argument is a merely apparent deduction because it lacks a single middle term. For the predicate of the first premise (τὸ οὗ καταλύεις) is not the same linguistic expression as the subject of the second premise (τὸ οὐ καταλύεις). Likewise, apparent refutations due to composition and division are caused by the distinctness of linguistic expressions.²⁵ In order to show that these three kinds of apparent refutations violate a condition in the definition of refutation, Aristotle writes:

²⁴ *SE* 6 168a26–8; see Dorion 1995: 245, Schreiber 2003: 57–8, Fait 2007: 125.

²⁵ Aristotle has in mind here distinctness in oral language, not necessarily in written language (*SE* 20 177b1–9; see Kirwan 1979: 43–4, Schreiber 2003: 60–76, *pace* Hasper 2009: 137–46).

Composition and division and accent arise because the phrase is not the same, or because the name which is different is not the same. For this also would be required, just as it is required that the object be the same, if a refutation or deduction is to be effected. For example, if a mantle is under consideration, you must not deduce a conclusion about a cloak but about a mantle. For the former conclusion is also true, but it has not been deduced, and there is a further need for a question whether it signifies the same thing in response to the one who asks the reason why.²⁶ (SE 6 168a26–33)

The apparent refutations under consideration in this passage violate the definition of refutation because certain linguistic expressions in them are not the same. If this defect occurs in the supposed contradiction, the apparent refutation will typically violate C4 (the condition that the predicate of the refutation's conclusion be the same linguistic expression as the predicate of the opponent's thesis, and likewise for the subject). However, when this defect occurs within the supposed deduction, as it does in A1, then the apparent refutation is not excluded by C4.

Aristotle seems to describe such a defective deduction in the second half of the passage just quoted. There he indicates an example which involves the words 'mantle' and 'cloak'. For Aristotle, these two expressions signify the same object (*Top.* I.7 103a9–10, 25–7). They are synonyms. It is not entirely clear what role these synonyms play in Aristotle's example. Two different interpretations have been proposed in the secondary literature. On one interpretation, the pair of synonyms occurs in the supposed contradiction; on the other, it occurs in the supposed deduction. According to the former interpretation, the opponent's thesis contains the word 'mantle'. Aristotle's point would be that this thesis cannot be refuted

²⁶ ἡ δὲ σύνθεσις καὶ διαίρεσις καὶ προσωδία τῶ μὴ τὸν αὐτὸν εἶναι τὸν λόγον ἢ τὸ ὄνομα τὸ διαφέρον. ἔδει δὲ καὶ τοῦτο, καθάπερ καὶ τὸ πρᾶγμα ταυτόν, εἰ μέλλει ἔλεγχος ἢ συλλογισμὸς ἔσεσθαι, οἷον εἰ λώπιον, μὴ ἱμάτιον συλλογίσασθαι ἀλλὰ λώπιον. ἀληθὲς μὲν γὰρ κάκεινο, ἀλλ' οὐ συλλελόγισται, ἀλλ' ἔτι ἐρωτήματος δεῖ εἰ ταυτόν σημαίνει, πρὸς τὸν ζητοῦντα τὸ διὰ τί.

by means of a deduction whose conclusion contains the word ‘cloak’ instead of ‘mantle’ (Poste 1866: 19, Schreiber 2003: 90). Even if this deduction is flawless, it would not constitute a refutation of the original thesis. For example, if the opponent’s thesis is ‘A mantle is useful’, it cannot be refuted by means of a deduction whose conclusion is ‘A cloak is not useful’. The person mentioned at the end of the passage who ‘asks the reason why’ would be the opponent asking why one should think that his thesis has been refuted by the deduction.

However, this interpretation is in tension with Aristotle’s remark ‘for the former conclusion (κάκεῖνο) is also true, but it has not been deduced’. As I have translated it, the pronoun κάκεῖνο refers to the incorrect conclusion containing the word ‘cloak’ instead of ‘mantle’. Accordingly, the remark states that this conclusion has not been deduced.²⁷ This is incompatible with the interpretation under consideration, on which the incorrect conclusion containing ‘cloak’ has been properly deduced, but merely fails to contradict the opponent’s thesis. Hence, commentators who endorse this interpretation take κάκεῖνο to refer to the correct conclusion containing ‘mantle’.²⁸ They take the remark to say that, given the truth of the premises, the conclusion containing ‘mantle’ would be true as well as the other one, but that that conclusion has not been deduced (simply because no attempt was made to deduce it).

Now, this reading of κάκεῖνο is less natural than the other. For the pronoun ἐκεῖνο typically refers to the item that is more distant in the preceding text. According to this rule, κάκεῖνο should refer to the conclusion containing ‘cloak’ instead of ‘mantle’.²⁹ On this reading,

²⁷ I take it that in the phrase ἀληθὲς μὲν γὰρ κάκεῖνο, ἀλλ’ οὐ συλλελόγισται, the pronoun κάκεῖνο is the grammatical subject of οὐ συλλελόγισται. Pace Forster (1955: 37) and Colli (1955: 660), who translate ἀλλ’ οὐ συλλελόγισται as ‘but the reasoning is not complete’.

²⁸ Poste 1866: 19, Schreiber 2003: 90. See also the translation of 168a30–1 in Barnes 1984: 284: ‘if the point concerns a doublet, then you should deduce about a doublet, not about a cloak. For the former conclusion also would be true, but it has not been deduced’.

²⁹ This interpretation of κάκεῖνο is preferred by Michael of Ephesus *In SE* 57.25–31, Anonymus *In SE* 18.16–17, von Kirchmann (1883: 12), Rolfes (1918: 13), Forster (1955: 37), Colli (1955: 660), Dorion (1995: 133), and Hasper (2012: ad loc.). Of course, it is not impossible that κάκεῖνο refers to the correct conclusion containing ‘mantle’. But such an interpretation also leads to a problem with the καί in κάκεῖνο. The καί implies that the conclusion which is not referred to by ἐκεῖνο is true, and that its truth can be taken for granted in the context under consideration. Given the preceding sentence, the conclusion which is salient in the context is the correct

Aristotle's point is that the conclusion containing 'cloak' cannot be properly deduced from the premises adduced because the premises contain the word 'mantle' instead of 'cloak'. This is the traditional interpretation of the passage given by Michael of Ephesus and the anonymous paraphrase of the *Sophistici Elenchi* edited in CAG 23.4.³⁰ The author of the paraphrase, who is believed to be Sophonias, gives the following example:

- A2 Every mantle is preventive of frost and heat.
 Everything preventive of frost and heat is useful.
 Therefore, every cloak is useful.

According to this interpretation, the pair of synonyms occurs not in the supposed contradiction, but in the supposed deduction. Because 'mantle' and 'cloak' are two distinct expressions, A2 fails to be a deduction, and hence does not constitute a refutation of the thesis 'A cloak is not useful'. The person mentioned at the end of the passage who 'asks the reason why' is the opponent asking why the conclusion of A2 follows from the premises adduced.

In view of the problems the other interpretation has with the pronoun κακεῖνο, the traditional interpretation of the example at 168a30–3 seems preferable. Still, both interpretations of 168a30–3 are perfectly in accordance with Aristotle's intentions in the passage at 168a26–33 as a whole. The first sentence of the passage indicates that Aristotle is concerned with the identity of certain linguistic expressions in refutations. The second sentence states that this identity is required 'if a refutation or deduction is to be effected'. The fact that deductions are mentioned here strongly suggests that Aristotle is concerned with the identity of linguistic expressions not only within the contradiction of a refutation, but also within the deduction. Thus, even if it were the case that the subsequent example about

conclusion containing 'mantle'; for this conclusion is recommended by Aristotle while the other is dismissed. If ἐκεῖνο referred to the correct conclusion, καί would imply the truth of the incorrect conclusion dismissed in the preceding sentence. In this case, the connection to the preceding sentence would be less smooth than on the other interpretation, on which καί implies the truth of the correct conclusion containing 'mantle'.

³⁰ Michael of Ephesus *In SE* 57.15–31, Anonymus *In SE* 18.8–18; the interpretation is also given by von Kirchmann (1883: 12) and Rolfes (1918: 13).

‘mantle’ and ‘cloak’ focuses on defective contradictions such as ‘A mantle is useful’ vs ‘A cloak is not useful’, the passage as a whole would still take into account defective deductions such as A2.

It seems clear, then, that in 168a26–33 Aristotle denies A2 the status of a deduction.³¹ Given this, he should also deny the status of a deduction to arguments that have a pair of synonyms instead of a single middle term, such as the following:

A3 Every robe is a cloak.
 Every mantle is useful.
 Therefore, every robe is useful.

The fact that Aristotle rejects A2 and A3 shows that he takes deductions, like contradictions, to depend for their success on the identity of the linguistic expressions involved. Deductions are not preserved by substitution of synonyms. For example, A4 below is a correct deduction; but when the second occurrence of ‘cloak’ in it is substituted by ‘mantle’, the result (i.e., A3) is not a deduction.

A4 Every robe is a cloak.
 Every cloak is useful.
 Therefore, every robe is useful.

These results are in tension with some claims that Alexander of Aphrodisias makes about Aristotle’s views on deduction. Alexander claims that unlike the Stoics, Aristotle does

³¹ Here I am in agreement with Crivelli (2012: 139 and 147 n. 5). At the end of *SE* 6, Aristotle claims that all apparent refutations due to language have their defect in the contradiction (169a18–21; see Michael of Ephesus *In SE* 65.25–66.1). However, this claim is simply not true (Poste 1866: 115–16, Dorion 1995: 250, Fait 2007: 130–1). Elsewhere Aristotle recognizes apparent refutations due to language whose defect is only in the deduction; for example, he recognizes them under the heading of accent (see A1 above; *SE* 21 177b37–178a3) and under the heading of homonymy (see A5 below; *SE* 10 171a9–11, *AnPo*. I.12 77b27–33). Thus, it makes sense for him to address such apparent refutations at 168a26–33.

not attend to linguistic expressions in his account of deduction. Discussing certain arguments which the Stoics called ‘subsyllogistic’, he writes:³²

They [the Stoics] do not call such arguments deductions since they attend to language and expression, whereas Aristotle, where the same object is signified, looks to what is signified and not to the expressions. (Alexander *In AnPr.* 84.15–17)

Accordingly, Alexander attributes to Aristotle the following view:

A deduction has its being not in the words but in what is signified by the words.
(Alexander *In AnPr.* 372.29–30)

As we said, a deduction comes about through what is signified by the words, not through the words. (Alexander *In AnPr.* 373.16–17)

According to Alexander, Aristotle took deductions to depend not on words, but only on what is signified by words. On this view, given that synonyms signify the same object, deductions should be preserved by substitution of synonyms, contrary to what we saw with A3 and A4.³³

Alexander’s claims may be motivated, in part, by the fact that Aristotle often does not pay attention to the precise linguistic formulation of deductions. In the *Sophistici Elenchi*, however, the distinction between linguistic expressions and what is signified by them is of importance, and in this context Aristotle’s rejection of A2 and A3 makes it clear that he did take deductions to depend on the identity of the linguistic expressions involved. Thus, Alexander does not, in the above passages, adequately represent Aristotle’s views on deduction.

³² On subsyllogistic arguments, see Barnes 2007: 314–21.

³³ Moreover, Alexander claims that ‘He has a dagger’ is the same premise (πρότασις) as ‘He has a poniard’ (*In Top.* 12.11–15). Thus, he should also hold that ‘Every mantle is useful’ is the same premise as ‘Every cloak is useful’. Again, this would make it difficult to explain why A3 is not a deduction while A4 is.

Given that A2 and A3 are not deductions, the definition of deduction should contain a condition that is violated by them. It is not immediately clear what kind of condition this might be. In what follows, I will argue that none of the three conditions we have seen so far (C1–3) is, by itself, sufficient to exclude A2 and A3. Thus, the definition of deduction needs to be extended by an additional condition which excludes these two arguments.

4. Synonyms in deductions

Among the conditions laid down in the definition of deduction, the most important is C1, that the conclusion follow necessarily from the premises.³⁴ However, Aristotle does not explain what this condition means. Rather, he treats the relation of following necessarily as an undefined primitive in his logical writings.³⁵ It is therefore not always obvious which arguments he takes to satisfy C1 and which not. Nevertheless, many cases are reasonably clear. For example, an argument such as A5, which involves a homonymous middle term, presumably does not satisfy C1.³⁶

A5 Homer's poem is a circle.
 Every circle is a figure.
 Therefore, Homer's poem is a figure.

It is less clear whether arguments such as A2 and A3, which involve a pair of synonyms, satisfy C1. But there is reason to think that Aristotle took them to satisfy C1. This can be seen as follows. Aristotle states that in arguments such as A2 and A3 'there is a further need for a

³⁴ This is the first condition to which Aristotle appeals in his proof of the thesis of *SE* 6 (168a19–23).

³⁵ See Lear 1980: 2–14.

³⁶ In addition to violating C1, Aristotle seems to think that arguments which contain a homonymous subject or predicate violate C7 (*SE* 17 175b39–176a18; see Bobzien 2005: 258–64 and 2007: 301–12).

question whether it signifies the same thing in response to the one who asks the reason why' (168a31–3). By this he seems to mean that if the opponent asks why the conclusion follows from the premises in these arguments, one should ask him whether 'cloak' signifies the same thing as 'mantle'. The implication is that if the answer is affirmative, there will be a genuine deduction. Thus, Aristotle seems to hold that A2 and A3 can be turned into genuine deductions by adding a premise to the effect that 'cloak' signifies the same thing as 'mantle'; but as long as such a premise is missing, they are not deductions.

Now, Aristotle holds that some arguments satisfy C1 although premises are missing in them.³⁷ He gives an example of such an argument in *Prior Analytics* I.32:

A6 A substance is not destroyed by the destruction of what is not a substance.
 If the things out of which something is composed are destroyed, then what
 consists of them must also perish.
 Therefore, any part of a substance is a substance.

Aristotle comments on this argument as follows:

When these [i.e., the two premises of A6] have been assumed, it is necessary that any part of a substance be a substance; yet it has not been deduced through what has been assumed, but premises are missing.³⁸ (*AnPr.* I.32 47a26–8)

A6 satisfies C1: its conclusion follows necessarily from the premises. Nevertheless, A6 fails to be a deduction (47a31–5), because one or more premises are missing in it. Aristotle does not specify which premises are missing in it. Alexander suggests that it is a premise such as 'A

³⁷ *AnPr.* I.32 47a22–35. See Alexander *In AnPr.* 21.28–30, 344.9–345.12, 346.27–8, Philoponus *In AnPr.* 320.16–322.18, 323.18–27, Frede 1974: 20–3.

³⁸ τούτων γὰρ τεθέντων ἀναγκαῖον μὲν τὸ οὐσίας μέρος εἶναι οὐσίαν, οὐ μὴν συλλελογίσται διὰ τῶν εἰλημμένων, ἀλλ' ἐλλείπουσι προτάσεις. In this passage, ἐλλείπειν can be taken to mean 'be missing' (Mueller 2006: 30, Ebert & Nortmann 2007: 78, Striker 2009: 52). For this meaning of ἐλλείπειν, see Bonitz *Index Arist.* 238b5–11.

whole is composed of its parts'.³⁹ In any case, whichever premise or premises are missing in A6, their truth does not seem to be more obvious than the truth of the premise which is missing in A2 and A3, that 'cloak' signifies the same thing as 'mantle'. Hence, given that A6 satisfies C1, it is natural to conclude that A2 and A3, too, satisfy it.

If the two arguments satisfy C1, they may still violate C3, the condition that the conclusion follow through the premises.⁴⁰ What does it mean to 'follow through the premises'? In the *Topics*, Aristotle takes this condition to exclude arguments that contain superfluous premises (*Top.* VIII.11 161b28–30). But in the *Prior Analytics*, he also seems to take it to exclude arguments in which premises are missing. In the first chapter of the *Prior Analytics*, he explains the import of C3 as follows: 'no further term is needed from outside in order for the necessity to come about' (24b20–2). This can be taken to mean that all premises necessary to deduce the conclusion are present.⁴¹ If so, then given that a premise is missing in A2 and A3, these two arguments violate C3.

However, C3 does not explain why a premise is missing in the two arguments, nor does it imply that one is missing in them. Consequently, C3 alone does not suffice to establish that they are not deductions. In general, it is not at all clear whether and, if so, which premises are missing in a given argument. For example, Aristotle regards A4 as a deduction, in which no premise is missing. But the Stoics deny this, and insist that a premise is missing in order for A4 to be a deduction (e.g., a premise such as 'If every robe is a cloak and every cloak is useful, then every robe is useful').⁴² Conversely, someone might hold that no premise is missing even in A2 and A3: based on Alexander's contention that 'a deduction has its being not in the words but in what is signified by the words', she might argue that these two arguments satisfy C3, and are deductions without the addition of further premises.

³⁹ Alexander *In AnPr.* 347.5–7. For alternative suggestions, see Ebert & Nortmann 2007: 800–5, Striker 2009: 214.

⁴⁰ Aristotle expresses this condition in various ways: διὰ τῶν κειμένων *SE* 1 165a2, *Top.* I.1 100a26–7; διὰ ταῦτα *Rhet.* I.2 1356b16, *AnPr.* I.1 24b20; τῶ ταῦτα εἶναι *Rhet.* I.2 1356b17, *AnPr.* I.1 24b20, see also *SE* 6 168b24, *Top.* VIII.11 161b30.

⁴¹ See Frede 1974: 22, Ebert & Nortmann 2007: 227, Striker 2009: 81.

⁴² See Mueller 1969: 179–80, Frede 1974: 4–5 and 10, Barnes 1990: 114–16.

How can Aristotle defend his view that premises are missing in A2 and A3? A promising strategy would be to appeal to the schemata of deduction that he introduces in the *Prior Analytics*. These schemata contain schematic letters like ‘A’ and ‘B’ in place of concrete expressions like ‘mantle’ and ‘useful’. A typical example is the following:

A7 Every C is B.
 Every B is A.
 Therefore, every C is A.

Aristotle takes the schemata introduced in the *Prior Analytics* to be applicable to a wide range of deductions. In fact, he claims that any deduction whatsoever ‘comes about through’ one of these schemata (*AnPr.* I.23 40b20–2, 41b1–5). Thus, Aristotle might argue that due to the distinctness of the expressions ‘mantle’ and ‘cloak’, A2 and A3 do not fit the pattern of A7 or of another schema of deduction, and therefore fail to be deductions. To make them fit a schema of deduction, a premise such as ‘Every cloak is a mantle’ would need to be added. Aristotle’s opponent, however, may still disagree. She might contend that whether or not an argument fits a schema of deduction should be determined not with respect to linguistic expressions, but with respect to what is signified by them.⁴³ Since ‘mantle’ signifies the same thing as ‘cloak’, she might argue, A2 and A3 both fit the pattern of A7, so that no premise is missing in them.

At this point, it is instructive to consider a parallel disagreement between two more recent logicians, namely Bolzano and Tarski. Bolzano (1837) would accept that in arguments

⁴³ Such a view is sometimes attributed to Aristotle himself. For example, Morison (2012: 182) argues that when Aristotle formulates schemata such as A7, he ‘articulates the *semantic* content of the premisses and conclusion in question. He does not give any hints as to how they should be expressed in Greek’. Similarly, Barnes (1996: 187) holds that ‘when Aristotle says “If A is predicated of every B...” he is not offering a schema in accordance with which categorical sentences may be regimented. Rather, the schema indicates the semantic structure which an appropriate categorical sentence must display’. This is in tension with Aristotle’s denial that arguments such as A2 and A3 are deductions. However, it is beyond the scope of this paper to enter into a detailed discussion of Morison’s and Barnes’s views.

such as A2 and A3 the conclusion is logically derivable from the premises, whereas Tarski (1936) would deny this.⁴⁴ Bolzano takes his relation of logical derivability to obtain not between sentences, but between certain non-linguistic items signified by sentences (see 1837: §155). He calls these items ‘sentences-in-themselves’, and they can be thought of as the propositional content of sentences. Two distinct sentences may signify the same sentence-in-itself. For example, ‘Every cloak is useful’ and ‘Every mantle is useful’ signify the same sentence-in-itself, say: EVERY GARMENT IS USEFUL. Consequently, the three sentences in A3 signify exactly the same three sentences-in-themselves as those in A4:

A8 EVERY ROBE IS A GARMENT.
 EVERY GARMENT IS USEFUL.
 EVERY ROBE IS USEFUL.

In A8, the third sentence-in-itself is logically derivable from the first two. Now, Bolzano does not explain how his relation of logical derivability can be extended from sentences-in-themselves to linguistic sentences. But it is natural to assume that a given sentence is logically derivable from a plurality of sentences if and only if the sentence-in-itself signified by it is logically derivable from the sentences-in-themselves signified by the members of that plurality.⁴⁵ If this is correct, then there is no difference in logical derivability between A3 and A4: in both arguments, the conclusion is logically derivable from the premises. Likewise for A2.

Unlike Bolzano, Tarski takes his relation of logical consequence to obtain between sentences, that is, between expressions of a given language. In order to decide whether the conclusion of an argument is a logical consequence of the premises, he proceeds in two steps. First, the argument is transformed into an argument form. This is done by replacing every non-logical expression in it by a variable, in such a way that all occurrences of the same non-logical expression are replaced by the same variable, and different expressions are replaced by

⁴⁴ This disagreement between Bolzano and Tarski has been pointed out by Siebel (1996: 204–7 and 2002: 593–4).

⁴⁵ Siebel 1996: 196–7 and 2002: 586.

different variables (1936: 8). Tarski does not, in his 1936 paper, explain how the distinction between logical and non-logical expressions might be drawn. Still, it is clear that A4 contains exactly three non-logical expressions, namely ‘robe’, ‘cloak’, and ‘useful’. When A4 is transformed into an argument form, each of these expressions is replaced by a distinct variable. The resulting argument form contains three distinct variables, much like A7 (except that A7 employs schematic letters instead of variables). By contrast, the argument in A3 contains a fourth non-logical expression, namely ‘mantle’, so that the resulting argument form contains four distinct variables.

As a second step, Tarski determines whether the resulting argument form is valid (he does so by means of his notion of satisfaction). If it is valid, the conclusion of the original argument is a logical consequence of the premises. Now, the argument form obtained from A4, which contains three distinct variables, is valid. On the other hand, the argument forms obtained from A2 and A3 contain four distinct variables and are not valid. Hence, for Tarski, the conclusion of A2 and A3 is not a logical consequence of the premises.

Aristotle’s denial that these two arguments are deductions is in line with Tarski’s approach. Of course, Aristotle did not have Tarski’s conception of an argument form. Instead, he employed schemata of deductions in the *Prior Analytics*. Moreover, Aristotle and Tarski do not agree on exactly which schemata, or forms, should be regarded as valid. They do, however, seem to agree that deduction, or logical consequence, depends on the identity of the linguistic expressions involved and on their being arranged in certain patterns. Thus, Aristotle may be taken to reject A2 and A3 on the basis of a condition closely akin to Tarski’s account, such as the following:

- C8 Any deduction can be obtained from a schema of deduction by replacing every occurrence of a given schematic letter by the same linguistic expression.

Clearly, A4 can be obtained by such a substitution from the schema in A7. By contrast, A2 and A3 cannot be obtained in this way from this or another schema of deduction. Hence,

given that C8 is part of the definition of deduction, the latter two arguments are not deductions.

C8 does for deductions what C4 does for contradictions, namely to require that linguistic expressions be arranged in certain patterns. In C4 the pattern is given by the subject-predicate structure of simple sentences; in C8 it is given by Aristotle's schemata of deductions. It must be acknowledged, however, that C8 is a rather strong condition. Aristotle is far from explicitly formulating it in the *Sophistici Elenchi*. In fact, he would arguably not be in a position to do so in this treatise. Schemata of deductions formulated by means of schematic letters are introduced in the *Prior Analytics*, but they are absent from the *Topics* and *Sophistici Elenchi*. It is generally agreed that these two works were written before the *Prior Analytics*, and it is unlikely that the concept of a schema of deduction was already available to Aristotle at the time he wrote them. Nevertheless, by denying that A2 and A3 are deductions he is gesturing toward a schematic account of deduction in *Sophistici Elenchi* 6. Had he been pressed to explain why these two arguments are not deductions, I submit, he would ultimately refer to a condition very much like C8.

5. Causes of (not) being a refutation

As we have seen, apparent refutations due to composition, division, and accent fail to be refutations because certain linguistic expressions in them are not the same. If this defect occurs in the supposed contradiction, then C4 is violated; if it occurs in the supposed deduction, C8 is violated. However, these apparent refutations not only fail to be refutations because of the distinctness of certain expressions, they also fail to be refutations because these expressions do not signify the same object.⁴⁶ For example, consider the apparent refutation due to accent given in A1 above: it fails to be a deduction not only because the expressions 'where you lodge' (τὸ οὗ καταλύεις) and 'You do not lodge' (τὸ οὐ καταλύεις) are distinct, but also because they do not signify the same object. If this kind of defect occurs in the supposed

⁴⁶ See Schreiber 1983: 89–90, Fait 2007: 126–7. Aristotle can be taken to express this view at *SE* 7 169a25–9 (see Fait 2007: 126) and *SE* 20 177a33–5, 177b1–4 (see Dorion 1995: 341–2 n. 295).

contradiction, then C5 is violated. If the defect occurs in the supposed deduction, as it does in A1, then the apparent refutation will presumably violate C1 (just as arguments that involve homonyms, like A5, violate C1).

Given this, every apparent refutation due to composition, division, and accent violates either C1 or C5. These two conditions suffice to prove that those apparent refutations violate the definition of refutation. Conditions C4 and C8 are not needed, nor are they used elsewhere in chapter 6 to establish that other apparent refutations violate the definition of refutation. Consequently, the latter two conditions are not necessary to establish the thesis of extensional correctness, that every apparent refutation violates the definition of refutation.⁴⁷

Why, then, does Aristotle introduce C4 and C8 in *Sophistici Elenchi* 5 and 6? He does not need them to establish the thesis of extensional correctness. But given that he does not introduce them without reason, a natural explanation is that he needed them to establish the causal thesis: that for every apparent refutation, its violating the definition of refutation is a *causa non existentiae* for it, i.e., a cause that explains why it is not a refutation. On this view, the violation of C1 or C5 is not a *causa non existentiae* for apparent refutations due to composition, division, and accent. It does not constitute a specific defect characteristic of

⁴⁷ If A2 and A3 counted as apparent refutations, C8 would be needed to establish that they violate the definition of refutation. However, these two arguments are presumably not apparent refutations, since they do not *appear* to be refutations in the appropriate way. Because the synonyms ‘mantle’ and ‘cloak’ are very different linguistic expressions, A2 and A3 lack the deceptive appearance typical of the thirteen kinds of apparent refutations introduced in *SE* 5 and 6. Aristotle takes the thirteen kinds to provide an exhaustive classification of apparent refutations (cf. n. 2 above); but A2 and A3 do not seem to fall under any of them. A similar point can be made for arguments that violate C4 without violating C5. One might object that arguments such as A2 and A3 would count as apparent refutations if the synonyms in question are sufficiently similar in linguistic form, e.g. if they were similar in the same way as οὐ and οὐ̃ are similar to each other (I am grateful to Pieter Sjoerd Hasper for pointing this out to me). One might argue that such arguments are apparent refutations for the same reason for which A1 is. However, such arguments seem to be of little use for the purposes of a sophist. Now, the *Sophistici Elenchi* seems to be concerned only with those apparent refutations that would typically be used by sophists. Given this, arguments of the kind in question are not under consideration in the *Sophistici Elenchi*. Thus, C4 and C8 are not needed to establish that all apparent refutations that are under consideration in the *Sophistici Elenchi* violate the definition of refutation.

these apparent refutations, and therefore does not provide the proper explanation of why they are not refutations. Rather, such a defect is constituted by the non-identity of certain linguistic expressions, i.e., by the violation of C4 or C8.

If this is correct, then Aristotle's argument in chapter 6 crucially relies on the assumption that each of the conditions C1–8 is part of the definition of refutation, and in particular that C1–3 and C7–8 are part of the definition of deduction. This assumption is not uncontroversial. Those who follow Alexander and Bolzano would deny that C4 and C8 are part of the definition of refutation or deduction. Others might reject other conditions. For example, the Stoics would reject C7, the condition that the premises of deductions be simple predicative sentences. Also, the Stoics would reject C2, the condition that the conclusion be not identical with any of the premises.⁴⁸ In view of this, Aristotle's appeal to C1–8 may seem unwarranted and *ad hoc*. Thus, Poste criticizes Aristotle's argument in chapter 6 as follows:

We only give a semblance of unity to the theory of fallacies by lumping them all together under the definition of confutation, for the elements of that definition are obtained by no systematic subdivision, and form, as far as appears, a purely arbitrary and incoherent agglomeration. (Poste 1866: 116)

In the remainder of this paper, I want to indicate a possible way for Aristotle to reply to this objection. I will argue that the proof of the causal thesis in chapter 6 itself provides such a reply.

Aristotle's proof of the causal thesis aims to show that for any apparent refutation, there is a condition among C1–8 such that the violation of this condition constitutes a *causa non existentiae* for it. In other words, for any argument that is an apparent refutation, there is a condition among C1–8 such that the argument's violating that condition is a cause of its not being a refutation. Given this, it is natural to say that for any argument that is an apparent

⁴⁸ See Alexander *In Top.* 10.6–12, *In AnPr.* 18.14–18, Ammonius *In AnPr.* 27.35–28.8, Frede 1974: 23.

refutation, its violating C1–8 is a cause of its not being a refutation.⁴⁹ Violating C1–8 is such a cause inasmuch as violating a specific member of C1–8 is such a cause. Since ‘violating’ here simply means ‘not satisfying’, we have: for any argument that is an apparent refutation, its not satisfying C1–8 is a cause of its not being a refutation.

Now, Aristotle holds that if not being A is a cause of not being B, then being A is a cause of being B:

For example, why does the wall not breathe? Because it is not an animal. For if this were a cause of not breathing, then being an animal would have to be a cause of breathing: i.e. if the denial is a cause of not holding, then the affirmation is a cause of holding. Thus if the hot and cold elements’ being imbalanced is a cause of not being healthy, their being balanced is a cause of being healthy. (*AnPo.* I.13 78b15–20)

If not being an animal were a cause of not breathing, then being an animal would be a cause of breathing. (Aristotle denies that being an animal actually is a cause of breathing, 78b21–3.) If the hot and cold elements’ not being balanced is a cause of not being healthy, then their being balanced is a cause of being healthy. Likewise, if not satisfying C1–8 is a cause of not being a refutation, then satisfying C1–8 is a cause of being a refutation.

There is a question as to what it means to say, in this context, that being A is a cause of being B. Jonathan Barnes takes it to mean that for anything that is B, its being A is a cause of its being B. More precisely, everything that is B is A, and its being A is a cause of its being B. Likewise for the negative case. Thus, Barnes (1994: 157) takes Aristotle to state the following principle in the passage just quoted:

If for anything that is not B, its not being A is a cause of its not being B,
then for anything that is B, its being A is a cause of its being B.

⁴⁹ Part of the reason why this is natural is that none of the conditions C1–8 is superfluous, but each of them is used by Aristotle in his proof of the causal thesis.

As we saw above, for any argument that is an apparent refutation, its not satisfying C1–8 is a cause of its not being a refutation. This does not imply that the same is true for any item that is not a refutation. What about arguments that do not appear to be refutations, or items that are not arguments at all? What is a cause of their not being a refutation? Perhaps for some of them such a cause consists in not satisfying one of the conditions C1–8. For others such a cause may consist in not satisfying another, additional condition. Assuming that the number of these additional conditions is finite, let C1–n be the conjunction of C1–8 and the additional conditions. So, for anything that is not a refutation, its not satisfying C1–n is a cause of its not being a refutation. It follows by Aristotle’s principle that for anything that is a refutation, its satisfying C1–n is a cause of its being a refutation.

Satisfying C1–n is a cause which explains why a given argument that is a refutation is a refutation. Now, Aristotle holds that causal explanation is closely connected to definition and essence. Consider, for example, the following passage from the second book of the *Posterior Analytics*:

In all these cases it is clear that what it is and why it is are the same. What is an eclipse? Privation of light from the moon by the screening of the earth. Why is there an eclipse? or Why is the moon eclipsed? Because the light leaves it when the earth screens it.

(*AnPo.* II.2 90a14–18)

The answer to the question what an eclipse is is the definition of eclipse, that is, a specification of its essence. The answer to the question why the moon is eclipsed is a cause of its being eclipsed. According to Aristotle, the two answers are identical: the definition of eclipse is identical with a cause of the moon’s being eclipsed.

As we saw above, Aristotle suggests that for anything that is healthy, its having the hot and cold elements balanced is a cause of its being healthy. At the same time, he takes ‘balance of hot and cold elements’ to be the definition (ὁρισμός) of health.⁵⁰ Thus, the answer to the

⁵⁰ *Top.* VI.6 145b7–8, see also VI.2 139b20–1, *Phys.* VII.3 246b4–5.

question what health is is the same as the answer to the question why anything that is healthy is healthy.

For anything that is a refutation, the answer to the question why it is a refutation is that it satisfies C1–n ($n \geq 8$). This answer should be the same as the answer to the question what a refutation is. So we may conclude that C1–n constitute the definition of refutation. Consequently, C1–8 are part of the definition of refutation, and, in particular, C1–3 and C7–8 are part of the definition of deduction.

If this line of reasoning is correct, then Aristotle's proof of the causal thesis in *Sophistici Elenchi* 6 provides the resources for establishing that C1–8 are part of the definition of refutation. Thus, chapter 6 not only adds two new conditions, C7–8, to the definition of deduction, it also goes some way towards justifying that these conditions, along with C1–3, should in fact be included in the definition of deduction. One might even speculate that it was through the argument of *Sophistici Elenchi* 6 that Aristotle was led to include C7 and C8 in this definition. The latter of these two conditions relies on the concept of a schema of deduction—a concept that is otherwise absent from the *Topics* and *Sophistici Elenchi*, but constitutes one of Aristotle's significant achievements in the field of logic. This concept, then, might have an origin in Aristotle's reflection on the specific defects of apparent refutations due to composition, division, and accent. But whether or not this is so, I hope to have shown that Aristotle's discussion of apparent refutations in *Sophistici Elenchi* 6 sheds new light on his account of what a genuine refutation and deduction is.⁵¹

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