

Aristotle and Alexander on Perceptual Error

Mark A. Johnstone

Department of Philosophy, McMaster University, 310A University Hall,
1280 Main Street West, Hamilton, Ontario L8S 4K1, Canada
mjohnst@mcmaster.ca

Abstract

Aristotle sometimes claims that (i) the perception of special perceptibles by their proper sense is unerring. This claim is striking, since it might seem that we quite often misperceive things like colours, sounds and smells. Aristotle also claims that (ii) the perception of common perceptibles (e.g. shape, number, movement) is more prone to error than the perception of special perceptibles. This is puzzling in its own right, and also places constraints on the interpretation of (i). I argue that reading Alexander of Aphrodisias on perceptual error offers an understanding of Aristotle that can help us to make good sense of both of Aristotle's claims.

Keywords

Aristotle – Alexander of Aphrodisias – sensation – perception – error

I

In *De Anima* 2.6, Aristotle famously divides the objects of sense perception into three distinct kinds. First, there are the 'special perceptibles' (*idia*

* Earlier versions of this paper, or parts of it, were presented at the annual meeting of the Pacific Division of the American Philosophical Association, San Francisco, March 2013; the Canadian Colloquium for Ancient Philosophy, University of British Columbia, May 2-4, 2014; and at McMaster University. I am grateful to members of these audiences—especially Victor Caston, Jan Szaif, Klaus Corcilius, Giulia Bonasio and Nicholas Griffin—as well as to Rochelle Johnstone and an anonymous reviewer for this journal, for their helpful questions, comments and advice.

aisthēta), for example colours, sounds and odours, which can be perceived by only one sense.¹ Secondly, there the ‘common perceptibles’ (*koina aisthēta*), for example shape, number and movement, which can be perceived by more than one sense.² Finally, there are the ‘incidental perceptibles’, which are not perceived in their own right (*kath’ hauta*) at all, but only incidentally (*kata sumbebēkos*).³ In *DA* 3.3, Aristotle maintains that our perception of these three different kinds of sense object varies in its susceptibility to error. Most prone to error is the perception of common perceptibles, followed by the perception of incidental perceptibles, then finally the perception of special perceptibles (*DA* 428b17-25). In fact, Aristotle sometimes claims that our perception of the special perceptibles is free from error. This claim is initially surprising; for it might seem we quite often misperceive colours, sounds and smells. What did Aristotle have in mind when he made this claim? Is there a way to understand his claim on which it turns out to be neither trivially true nor obviously false? Furthermore, can Aristotle’s view about infallibility in the perception of *special* perceptibles be reconciled with his further claim that the perception of *common* perceptibles is quite often subject to error?

In this paper, I first offer an interpretation of Aristotle on which his claims about error in the perception of special perceptibles turn out to be substantive and plausible, and then show how this view can be reconciled with his claims about error in the perception of common perceptibles. The inspiration for my interpretation of Aristotle comes from the writings of Alexander of

1 The special perceptibles are colours (perceptible in their own right only by sight), sounds (hearing), odours (smell), flavours (taste), and tactile qualities (touch). In *DA* 2.11, 422b17-33, Aristotle considers and rejects the possibility that touch could turn out to be multiple different senses, due to the fact that it discerns multiple pairs of opposites: for example hot and cold, dry and wet, rough and smooth.

2 Aristotle’s examples of common perceptibles in *DA* 2.6 are motion, rest, number, shape and magnitude. He includes unity (*hen*) among the common perceptibles at *DA* 3.1, 425a14-16 (at least in the most reliable manuscripts). He includes roughness, smoothness, sharpness and bluntness at *DS* 4, 442b4-7. He suggests time should be included among the common perceptibles at *De Mem.* 1, 450a9-14.

3 Aristotle’s favored examples of ‘incidental perceptibles’ are particular people, such as the son of Diares (*DA* 2.6, 418a20-3) or the son of Cleon (*DA* 3.1, 425a24-7). I take it that on his view such things are perceptible not insofar as they are what they are, but only insofar as they have certain features that *are* perceptible in their own right. For example, while the son of Diares *is* perceptible (it is possible to perceive him), he is perceptible not insofar as he is the son of Diares, but only insofar as he has a certain colour, size, shape, sound of voice, and so on. I return to this idea below.

Aphrodisias. In his major work on the soul, also called *De Anima*,⁴ Alexander adopts Aristotle's division of the objects of perception into special, common and incidental. However, Alexander appears to modify Aristotle's view about perceptual error, when he claims that perception of special perceptibles *can* err when it occurs under certain non-standard conditions. In the first half of this paper, I argue that there is excellent reason to think Aristotle's view on this point was essentially the same as Alexander's. In particular, as I show (Section II), Aristotle clearly accepted that perception of special perceptibles by their proper sense *can* err when it occurs under certain conditions. Furthermore, as I also show, Aristotle's own examples all involve the very same kinds of non-standard conditions specified by Alexander. I then argue (Section III) that this shared view is neither trivially true nor obviously false, but rather interesting and substantive, as Aristotle apparently intended it to be.

However, if this is accepted a further puzzle remains. Both Aristotle and Alexander insist that the perception of common perceptibles is considerably more prone to error than the perception of special perceptibles. But why should this be so? Why shouldn't the perception of these two kinds of object be equally fallible, assuming it occurs under the very same conditions? In Section IV, I approach this question by first examining Alexander's claims about the relationship between common and special perceptibles. In particular, I argue that Alexander's remarks on the nature of common perceptibles, and concerning their relation to special perceptibles, suggest an appealing way of explaining why error is more frequent in the perception of the former than in the perception of the latter, even when the perception of both occurs under the very same conditions. I then argue (Section V) that there is good reason to suppose Aristotle's view on this point was (again) essentially the same as Alexander's. I defend this interpretation of Aristotle by arguing that it is consistent with what he wrote, charitable to him, and helps to resolve various puzzles raised by his remarks on the perception of the three different kinds of perceptible object.

4 Alexander's *De Anima* is not a commentary on Aristotle's *De Anima*, as might be supposed, but rather an original philosophical treatise systematically presenting and defending a broadly Aristotelian view about the nature of the soul and its powers. It was most likely written around 200 AD. A translation of the entire text into English, with an extensive accompanying philosophical commentary, is currently in progress as part of the 'Ancient Commentators on Aristotle' series (translation and commentary by Victor Caston). The first volume of this two-volume work was published in 2012; the second is forthcoming at the time of writing.

II

In various places, Aristotle claims that the perception of special perceptibles by their proper sense is unerring, without qualifying this claim in any way. The most important such passages are the following:

T1. By 'special object' of perception I mean whatever cannot be perceived by another sense, *and concerning which it is not possible to be in error*, e.g. sight has color, hearing sound, and taste flavour, while touch has many different objects; at any rate, each [sense] draws distinctions concerning these [objects]—it does not err about the fact that there is colour or sound, but rather as to what the coloured thing is or where it is, or as to what the sounding thing is or where it is. (DA 2.6, 418a11-16)⁵

T2. The motion which arises as a result of the activity of sense perception will differ insofar as it comes from each of these three kinds of perception [sc. of special, common and incidental perceptibles]: *the first is true whenever perception is present*, while the others can be false both when perception is present and when it is not, and most of all when the object perceived is far away. (DA 3.3, 428b25-30)⁶

T3. *Just as the seeing of a special object of sight is always true*, but [seeing] whether the white [thing] is a human being or not is not always true, so too for things without matter. (DA 3.6, 430b29-30)⁷

T4. That is why the senses are liable to err concerning these objects [sc. the common sensibles], *but not concerning the special sensibles*, for example sight concerning colour or hearing concerning sounds. (DS 4, 442b8-10)⁸

5 λέγω δ' ἴδιον μὲν ὃ μὴ ἐνδέχεται ἐτέρῳ αἰσθήσει αἰσθάνεσθαι, καὶ περὶ ὃ μὴ ἐνδέχεται ἀπατηθῆναι, οἷον ὄψις χρώματος καὶ ἀκοή ψόφου καὶ γεύσις χυμοῦ, ἢ δ' ἀφή πλείους ἔχει διαφοράς, ἀλλ' ἐκάστη γε κρίνει περὶ τούτων, καὶ οὐκ ἀπατάται ὅτι χρῶμα οὐδ' ὅτι ψόφος, ἀλλὰ τί τὸ κεχρωσμένον ἢ ποῦ, ἢ τί τὸ ψοφούν ἢ ποῦ. Unless otherwise noted, I use Ross's text of the *De Anima, Parva Naturalia* and *Metaphysics*.

6 ἢ δὲ κίνησις ἢ ὑπὸ τῆς ἐνεργείας τῆς αἰσθήσεως γινομένη διοίσει, ἢ ἀπὸ τούτων τῶν τριῶν αἰσθήσεων, καὶ ἢ μὲν πρώτη παρουσίας τῆς αἰσθήσεως ἀληθῆς, αἰ δ' ἔτεροι καὶ παρουσίας καὶ ἀπουσίας εἶεν ἂν ψευδεῖς, καὶ μάλιστα ὅταν πόρρω τὸ αἰσθητὸν ᾖ.

7 ὥσπερ τὸ ὄραν τοῦ ἰδίου ἀληθές, εἰ δ' ἀνθρωπος τὸ λευκὸν ἢ μὴ, οὐκ ἀληθές αἰεὶ, οὕτως ἔχει ὅσα ἄνευ ὕλης.

8 διὸ καὶ περὶ μὲν τούτων ἀπατῶνται, περὶ δὲ τῶν ἰδίων οὐκ ἀπατῶνται, οἷον ἢ ὄψις περὶ χρώματος καὶ ἢ ἀκοή περὶ ψόφων.

T5. Regarding the nature of truth, we must maintain that not everything which appears is true. Firstly, *even if sensation—at least of the object special to the sense in question—is not false*, still appearance is not the same as sensation. (*Metaph.* 4.5, 1010b1-3)⁹

A few brief remarks. On the basis of the final lines of T1, it might be thought that Aristotle wished to make only the relatively trivial point that one cannot be mistaken about the fact that one is perceiving a colour, as opposed to, say, a sound.¹⁰ However, the remaining passages clearly show that Aristotle had a stronger claim in mind. For one thing, if this were all Aristotle wished to say, it would be hard to explain his contrast between perceiving the special and common perceptibles in T2: for we seem no more inclined to mistake e.g. shapes for movements than we are to mistake colours for sounds. Rather, as his engagement with the Protagorean view in T5 also implies,¹¹ Aristotle seems to be making the stronger claim that the perception of a special sensible by its proper sense is *accurate*: we *correctly* discern not only that there is some colour or sound, but also what colour or sound it is, even if we may be mistaken about where it is or to what or whom it belongs (T1, T3).¹² I defend this way of

9 περὶ δὲ τῆς ἀληθείας, ὡς οὐ πᾶν τὸ φαινόμενον ἀληθές, πρῶτον μὲν ὅτι οὐδ' <εἰ> ἡ αἴσθησις <μὴ> ψευδῆς τοῦ γε ἰδίου ἐστίν, ἀλλ' ἡ φαντασία οὐ ταῦτόν τῃ αἰσθήσει.

10 As claimed for example by Hamlyn 1968, 106. Hamlyn attempts to generalize this way of understanding Aristotle's infallibility claims to all five of the passages listed here. On my view, as noted, Aristotle had something stronger and more interesting in mind in these passages than Hamlyn maintained.

11 Aristotle's opponent here is someone who maintains that 'all appearances are true' on the basis of cases in which different perceivers have different perceptual experiences using the *same* sense modality in relation to the same object (e.g. the same food tastes sweet to one perceiver and bitter to another). The opponent claims that there is no principled reason to prefer one perceiver over the other. Aristotle rejects this claim, as I note below, on the basis that there *is* a way to determine who perceives correctly: the perceiver whose sense organs are healthy and who perceives under normal conditions should be the judge. The important point for present purposes is that Aristotle argues here that non-perceptual appearances (I take it he has in mind dream images, hallucinations and the like) are not always true; nor (by implication) are perceptions of objects other than the special perceptibles. For this to make sense in context, he must have in mind by 'true' something like 'accurate' or 'corresponding to mind-independent reality'.

12 These errors are not of the kind I am interested in in this paper, since they involve mistakenly predicating something else of the colour (or other special perceptible) that is perceived, rather than errors in the perception of the special perceptible itself. For reasons of length, I cannot enter into the complex debate surrounding Aristotle's views on incidental perception, for example on the question of whether the kind of predication

understanding Aristotle's main point below, especially against the important charge that Aristotle cannot have thought something so obviously false.

Like Aristotle, Alexander sometimes appears to endorse the view that perception of special perceptibles by their proper sense is free from error. For example, in his commentary on Aristotle's *De Sensu*, Alexander seems happy to accept the view, which he attributes to Aristotle, that 'each of the senses speaks the truth concerning the special perceptibles' (αἱ αἰσθήσεις ἐν τοῖς ἰδίοις ἐκάστη αἰσθητοῖς ἀληθεύει, 84.9 Wendland), and that 'sight is not deceived about colours' (ὄψις οὐκ ἀπατωμένη περὶ τὰ ἴδια χρώματα, 84.23-4). Similarly, in his commentary on Aristotle's *Metaphysics*, in discussing Aristotle's case against the view that all appearances are true, Alexander claims that only the perception of special perceptibles is 'in every case true' and 'free from falsehood'.¹³ Nevertheless, Alexander's own view was clearly not that the perception of special perceptibles by their proper sense can *never* err, strictly speaking. Rather, Alexander is clear in his *De Anima* that on his view such perception *can* be in error if it occurs under certain conditions (41.13-42.3 Bruns; trans. based on Caston, emphasis added.):

[The senses] are most true with regard to special perceptibles, *as long as they preserve the conditions in which they have the capacity to be aware of these perceptibles*. These are, first, that the perceptual organs are healthy and in their natural state; second, the position of the perceptible (for sight cannot have awareness of what is located behind oneself); and third, the commensurateness of the distance, since an awareness of perceptibles does not occur at just any distance from the perceptual organs. Beyond these conditions, the medium through which there is awareness of perceptibles must also be in a suitable condition for transmission to the perceptual organs; for it is not possible to see if the transparent [medium] is not illuminated. Finally, [the medium] must not be disturbed by anything; for one cannot hear what one wishes when loud sounds create a disturbance.¹⁴

involved is purely an matter of perception, or necessarily involves some kind of thought. For discussion of Aristotle on incidental perception—and a defense of the idea that some kinds of predication were for Aristotle purely perceptual—see Cashdollar, 1973.

- 13 ὁ δὲ λέγει ἐστὶν ὅτι μηδὲ ἡ αἰσθησις ἐν πάσιν ἀληθής, ἀλλ' ἐν τοῖς ἰδίοις μόνοις· τοῦ γὰρ ἰδίου οὐκ ἔστι ψευδής· ὥστε εἰ καὶ ταῦτόν ἦν αἰσθησις τε καὶ φαντασία, οὐ πάσα φαντασία γίνεται ἀληθής, ἀλλὰ ἡ τῶν ἰδίων καὶ οἰκείων ἐκάστη αἰσθήσει (*in Metaph.* 311.31-4 Hayduck; cf. 313.20-1).
- 14 περὶ δὲ τὰ ἴδια αἰσθητὰ ἀληθεύουσι μάλιστα, ὅταν αὐταῖς φυλάσσεται ταῦτα, μεθ' ὧν εἰσὶν αὐτῶν ἀντιληπτικά. ὦν πρῶτον μὲν ἂν εἴη τὸ ὑγιαίνειν τε καὶ κατὰ φύσιν ἔχειν τὰ αἰσθητήρια,

Among the conditions under which perception of special perceptibles *can* be in error, according to Alexander, are those in which (i) the sense organ is damaged or defective, (ii) the object of perception is located so as to be obscured (Alexander mentions an object located behind the perceiver), (iii) the object of perception is at a great distance from the perceiver, and (iv) the perceptual medium is not in a good condition for perception to occur through it (e.g. the medium of sight is not fully transparent, or the medium of hearing is disturbed). On the basis of this passage, it is clear that for Alexander perception of special perceptibles by their proper sense is fallible when it occurs under certain 'non-standard' conditions. Although Alexander is not explicit on the point, I take it he wished to claim that the senses err concerning special perceptibles *only* under such conditions. In other words, if this is right, Alexander's view was that the perception of special perceptibles by their proper sense is infallible when it occurs under standard conditions,¹⁵ but becomes fallible when it occurs under non-standard conditions of the kinds he describes.

I shall return to consider this view shortly. First, it is important to note that in advancing it Alexander may be best understood, not as deviating from Aristotle, as it might at first seem, but rather as clearly and explicitly presenting a view Aristotle himself already held. Admittedly, as noted, Aristotle sometimes claims that perception of special perceptibles by their proper sense is infallible, without qualifying this claim in any way. However, at *DA* 3.3, 428b18-19 Aristotle *does* explicitly qualify this claim, when he states that perception of special perceptibles by their proper sense 'is true *or has the least possible amount of falsehood*' (ἡ αἴσθησις τῶν μὲν ἰδίων ἀληθής ἐστίν ἢ ὅτι ὀλίγιστον ἔχουσα τὸ ψεῦδος). In adding this qualification, Aristotle clearly implies that in at least some such cases error *can* occur. It is difficult to imagine what else the point of the qualification could be. In particular, I take it that, in saying that perception of special perceptibles 'has the least possible amount of falsehood', Aristotle does *not* mean that it always contains a tiny amount of falsehood, but rather that it is very occasionally false.¹⁶ But if this is right, Aristotle, like Alexander,

δεύτερον δὲ ἡ θέσις τοῦ αἰσθητοῦ (οὐ γὰρ τοῦ ὀπισθεν κειμένου ἢ ὀψις ἀντιληπτική), τρίτον ἢ τοῦ διαστήματος συμμετρία. οὐ γὰρ ἀπὸ παντὸς διαστήματος τοῖς αἰσθητηρίοις ἢ τῶν αἰσθητῶν ἀντίληψις γίνεται. καὶ ἐπὶ τούτοις δεῖ τὸ μεταξὺ, δι' οὗ ἢ τῶν αἰσθητῶν ἀντίληψις, ἐπιτηδείως ἔχειν πρὸς τὸ τοῖς αἰσθητηρίοις διακονεῖσθαι (οὐ γὰρ οἶόν τε ὄραν μὴ ὄντος τοῦ διαφανοῦς πεφωτισμένου), ἔτι ὑπὸ μηδενὸς ἐνοχλεῖσθαι. οὐ γὰρ οἶόν τε ἀκούειν οὐ τις βούλεται, ὅταν ἐνοχλώσιν ψόφοι μείζονες.

15 Thus Alexander claims elsewhere that things appear as they are most of all to the perceiver 'who is in a natural state' (*in Metaph.* 312.29).

16 I take up the question of what it means for a perception to be false below.

was *not* of the view that the perception of special perceptibles by their proper senses is *always* and *strictly* infallible.¹⁷

Furthermore, there is considerable textual evidence, scattered throughout the Aristotelian corpus, for the view that Aristotle, like Alexander, believed that perception of (e.g.) colours by sight, sounds by hearing or flavours by taste can be mistaken when it occurs under certain conditions. In fact, although Aristotle is not explicit on the point, there are good reasons to think that he recognized the very same kinds of non-standard conditions that Alexander did, and that he regarded the perception of special perceptibles as fallible when it occurs under any of them. These conditions can be reduced to three basic kinds: (i) the *sense organ* is defective or damaged, (ii) *the object of perception* is located far away or obscured or (iii) *the medium* is causing disruption or interference. I present the textual evidence as it bears on each of these possibilities in turn.

I begin with the condition of the sense organs. In *Metaphysics* Γ, Aristotle argues that it is as absurd to ask whether the true size or colour of a thing is as it appears to a sick person or to a healthy person as it is to ask whether things are as they appear to one who is awake or to one who is asleep—the healthy person, he claims, should be the judge (*Metaph.* 1010b3 ff.). This implies that a sick person can misperceive colour, a special perceptible. Later in the same discussion, Aristotle argues that changes in the perceiver's body can change the way one and the same thing (e.g. a wine) tastes (*Metaph.* 1010b21-3)—presumably Aristotle has in mind here changes in the sense organs affecting the person's perception of flavour. Similarly, in *De Anima*, Aristotle argues that a sick person is an unreliable judge of the true flavour of a thing, since to such a person everything will tend to taste bitter (*DA* 2.10, 422b7-10).¹⁸

17 Burnyeat (2002, 45 n. 45) argues that 'we should not make too much of the solitary qualification' at *DA* 428b19. He suggests that Aristotle probably had in mind here the idea he had earlier expressed in *DA* 2.9, 421a9-26, where he claimed that humans are bad at discriminating smells, much as 'hard-eyed' animals are bad at discriminating colours. However, this strikes me as highly implausible: Aristotle's claim in *DA* 2.9 was surely that a human being's sense of smell fails to draw fine distinctions among odours, not that we systematically perceive odours 'falsely'; yet in *DA* 3.3 it is precisely falsehood that is at issue. For further criticism of Burnyeat on this point, see Polansky 2007, 253-4 n. 4. Burnyeat also greatly understates the textual evidence that Aristotle recognized cases in which the perception of a special perceptible by its proper sense can be in error; or so I contend, and go on to show.

18 Victor Caston has suggested to me in conversation a way of accommodating Aristotle's example of the sick person with a distempered palate: one might maintain that the coating of bitter moisture Aristotle describes on the tongue of this person alters the object of

Remaining with the example of flavour, in *Metaphysics* K Aristotle even goes so far as to claim that one and the same thing ‘will never appear sweet to some and bitter to others’ unless in one case the tongue has been ‘perverted and injured’, implying that damage or defect in the sense organs can cause the same thing to taste different to different perceivers (*Metaph.* 1062b36-1063a3). More generally, Aristotle claims that ‘movements’ (*kinēseis*) in the sense organs created by prior perception can affect current perception, as for example when we are deafened by a loud noise or blinded by a bright light, or when, after perceiving a strong odour, our sense of smell is impaired (*Insomn.* 459b 3-23; cf. *DA* 424a28 ff., 429a29 ff.).

These examples all concern the state of the sense organs. In addition, there is also considerable textual evidence that Aristotle thought error possible in the perception of special perceptibles when it occurs over a great distance, or when the medium is in poor condition or interferes. Beginning again with *Metaphysics* Γ, Aristotle claims that it is absurd to ask whether colours are as they appear to the person close at hand or to the person at a distance—the perceiver close at hand should be the judge (*Metaph.* 1010b5-6). This implies that on his view colours can be misperceived due to distance. Similarly, in *Meteorology* 3 Aristotle claims that the power of sight is weakened by distance, such that ‘everything at a distance appears blacker’ (*Meteor.* 374b14-15; cf. 18-19). These effects may in fact be due to interference from the medium (in which case (ii) above blurs into (iii)). Aristotle acknowledges in multiple places that such interference can occur, and that it can cause a special perceptible to appear other than it is. For example, in *De Sensu* he claims that the atmosphere surrounding a thing can cause its apparent colour to change (*DS* 439b5-6), while in *Meteorology* 3 he maintains that a bright white thing seen through a black (or dark) medium appears red (*Meteor.* 374b10-11), and that embroiderers have an increased tendency to make mistakes specifically concerning colours when working with poor illumination, such as by lamplight (*Meteor.* 375a26-8). Finally, again in *De Sensu*, Aristotle remarks that a sound can be ‘transformed’ by disturbances in the medium through which it is perceived (*DS* 446b6-9).

This accumulated textual evidence strongly supports attributing to Aristotle the view that perception of special perceptibles by their proper sense is not

taste *before* they taste it, during the process of liquefying it, and that the sick person then perceives the resulting flavored liquid accurately. However, it seems a stretch to say that for Aristotle the sick person in this condition is perceiving flavour accurately. Rather, it is surely both simpler and more charitable to Aristotle to understand him as acknowledging here (as elsewhere) that a defective sense organ can lead to misperception, even of special perceptibles.

strictly infallible in *all* circumstances, but rather becomes fallible when it occurs under non-standard conditions; indeed, under the very same kinds of condition listed by Alexander.¹⁹ In those passages where Aristotle claims without qualification that our perception of special perceptibles is infallible, he should therefore be understood as speaking ‘for the most part’—that is, as setting aside as irrelevant, or as an unnecessary complication in that context, the possibility that the episode of perception in question might occur under non-standard conditions. Attributing this view to Aristotle is supported by the weight of the textual evidence, as I have argued. It is also charitable to him, as I shall now show.

III

Let us examine the view I am attributing to Aristotle and Alexander more closely. Is there a non-circular, non-trivial way of specifying what ‘standard’ conditions are in this context? And is it plausible to think that the perception of special perceptibles is strictly infallible under them? The first thing to note is that the salient notion of ‘standard conditions’ is clearly not a purely statistical one: to say that perception of special perceptibles is infallible under standard conditions is not simply to say that it is infallible under those conditions that most commonly obtain. Rather, the basic idea seems to be that this kind of perception is infallible when nothing is *wrong*, that is, that the perception of special perceptibles is unerring in the *absence* of certain *non*-standard conditions. Furthermore, these non-standard conditions can be specified non-trivially. Indeed, as noted, Alexander provides a basic list. As I understand the view of Aristotle and Alexander, so long as none of these conditions obtain, and assuming that the perceiver is awake and alert, perception of special perceptibles by their proper sense will be unerring. This account is non-circular, since it provides an independent (albeit negative) specification of what count as standard conditions; and it is non-trivial, since it is open to counter-example and could well turn out to be false.²⁰

19 Others who have interpreted Aristotle in basically the way I do here—that is, as maintaining that the perception of special perceptibles is infallible only under standard conditions—include Block 1961, Ben-Zeev 1984 and Gaukroger 1981 and 1990, although none have developed and defended the view in quite the way offered in this paper.

20 Note that the project here is not that of defining so-called secondary qualities in terms of physical properties by means of response-dependence, as for example if one were to define ‘yellowness’ as the physical property that causes a suitably constituted and placed perceiver to have an experience of perceiving yellow under standard conditions. The

At this point, a critic might raise the opposite concern: that the view I am attributing to Aristotle and Alexander, to the extent that it is indeed substantive and non-trivial, clearly *is* false. On the present interpretation, the perception of special perceptibles by their proper sense is strictly infallible in the absence of any of a non-circularly specifiable set of non-standard conditions. But is it really plausible to think that the perception of special perceptibles (e.g. colours, sounds and smells) is strictly infallible, even under such conditions? In order to assess this claim, we need a clearer account of what it is for perception to be in error. Aristotle undoubtedly held that there *are* such things as perceptual errors: he is explicit about this for common and incidental perceptibles, and also allows for error in the perception of special perceptibles under certain conditions (or so I have argued). In this respect, he differs from (e.g.) Protagorean relativists, Epicureans and some more recent 'sense-data' theorists about perception, all of whom have (in one way or another, for one reason or another) maintained that *all* perceptions are true.²¹ Moreover, Aristotle insisted that perceptual error can arise and persist even in direct conflict with a firmly held true belief, as for example when the sun perceptually appears to us to be quite small even when we *know* it is very large.²² Nevertheless, while

question Aristotle and Alexander have here is not what colours are and how they fit into the world, but rather whether and under what circumstances our perception of them is accurate (i.e. veridical). For criticism of the former project, see e.g. Goldman 1975, Hardin 1983.

- 21 For the Protagorean relativist, as depicted for example in Plato's *Theaetetus*, all appearances are true, where 'appearances' include not only sense perceptions and quasi-perceptual images but also beliefs. The Epicureans, by contrast, maintained that beliefs can be false but that all perceptions are free from error, apparently because error enters in only when we draw mistaken conclusions about what the world is like on the basis of what we perceive (e.g. Epicurus, *ad Hdt.* 50-1). On the Epicurean claim that 'all perceptions are true', see e.g. Striker 1977, Taylor 1980, Everson 1990. In more recent times, the view that perception is infallible has enjoyed some favour among 'sense-data' theorists of perception, for whom what we immediately (and infallibly) perceive are our own sensations. The basic idea was well articulated by Bertrand Russell, when he wrote in *The Problems of Philosophy* that 'there are in fact no illusions of the senses but only mistakes in interpreting sensational data as signs of things other than themselves' (Russell 1948, 83). That this was not Aristotle's view is clear, not only from the fact that he did not regard all perception as infallible, but also from the basic structure of his theory of perception, on which a sense object (e.g. a colour) exists at distance from the perceiver and acts on that perceiver through a medium.
- 22 Aristotle claims that, even when people are in excellent health, and know the facts of the case perfectly well, 'the sun nevertheless appears to them to be only a foot wide' (*Insomn.*

we can say with confidence that for Aristotle there *are* perceptual errors, and that they cannot simply be reduced to errors in belief, it remains less clear *what* exactly he thought perceptual errors are.

On this question—the question of what perceptual error is—Alexander is clearer and more explicit than Aristotle. In his *De Anima*, Alexander defines perceptual error (*aisthēseōs diamartia*) as follows (*De Anima* 41.12-13; trans. based on Caston):

Perceptual error consists in just this: due to certain circumstances, the modification that occurs in the sense is of a different sort than and unlike that from which it arose.²³

In order to understand this claim, it will be useful to begin by recalling that, for any Aristotelian, sense perception minimally involves three distinct things: (a) a sense object, (b) a perceiver, with the capacity to perceive the relevant kind of sense object and (c) a perceptual medium separating the two, through which the object is perceived.²⁴ On the Aristotelian view, perceiving occurs when a sense object acts *on* a perceiver *through* a medium, so as to make itself be perceived. As with any causal interaction on an Aristotelian theory, this involves an agent (in this case, the sense object) acting on a patient (in this case, some part or aspect of the perceiver) in order to assimilate the patient to itself: it makes the perceiver *like* itself, and in so doing *causes* itself to be perceived.²⁵ The details of how this happens—and of precisely what kinds of change occur in the perceiver when it does—are controversial and have provoked much dispute in the recent and historical interpretation of Aristotle,

458b29-30). In *De Anima* 3.3, he uses the same example to generalize the claim: ‘things can also appear falsely even when we have a true supposition about them; for example, the sun appears to be a foot across, although we believe it to be bigger than the inhabited world’ (428b2-4).

23 αὕτη γὰρ αἰσθήσεως διαμαρτία τὸ διὰ τινὰ περίστασιν ἄλλοιον αὕτῃ γίνεσθαι τὸ πάθος καὶ μὴ ὅμοιον τῷ ἀφ’ οὗ γίνεται.

24 On Aristotle’s view, some kind of medium is essential to the perception of *all* special perceptibles, including even the objects of touch. Thus in *DA* 2.11 (423b17-26) we learn that the contact-senses too operate through a medium, since the flesh serves as an internal medium with the true organ of touch lying further within. Alexander appears sympathetic to the same view in his *De Anima* (58.2-13).

25 For detailed discussion of Aristotle’s conception of causation as an interaction of agent and patient in which the former assimilates the latter to itself, focusing on Aristotle’s general treatment of this topic in *Physics* 3.3, see Coope 2004.

and of later Aristotelians.²⁶ For present purposes, these disputes can be set aside. What matters here is that on an Aristotelian account a perceiver can truly be said to be perceiving some object *x* only if he/she is currently being acted on causally by *x*, and is perceiving *x accurately* only if it is successfully making him/her *like* itself in the relevant way.²⁷

According to Alexander, perceptual error occurs when the modification (*pathos*) in the sense is of a different sort than, and unlike, that from which it arose. This requires that two distinct conditions be met. First, there must be an episode of perception: this requires that the perceiver is actually currently being modified in the relevant way by the action of a perceptible object. Secondly, the sense must fail to become altogether *like* the object perceived.²⁸

26 For example, there has been much debate over what part or aspect of the perceiver is assimilated to the sense object, and what kind of change it undergoes. Those who deny that the perceiver's sense organ need undergo any kind of ordinary, material change for perception to occur are commonly known as 'spiritualists'; those who insist that the perceiver's becoming 'like' the sense object is a matter of their sense organ literally taking on the same perceptible quality as the object (e.g. the eye jelly turns red when one sees a red object) are commonly known as 'literalists'; while there are also those who claim that the perceiver's sense organs must undergo *some* ordinary, material change in perception (against the spiritualist), while also denying that this need consist in the sense organ literally taking on the same perceptible quality as the object (against the literalist). The most prominent recent advocate of spiritualism is Myles Burnyeat (1992, 1995, 2001 and 2002); the most prominent recent advocates of literalism are Sorabji (1974, 1992 and 2001) and Everson (1997); while advocates of 'third way' alternatives to both literalism and spiritualism include for example Lear 1988, Modrak 1988, Silverman 1989, Bradshaw 1997, Caston 2007, Lorenz 2007, Polansky 2007. While my own sympathies lie with this third group (see Johnstone 2012 and 2013), this issue can safely be bracketed for present purposes. A closely related issue concerns the question of whether for Aristotle a perceptual faculty can serve as the proper subject of a change brought about by a perceptible object acting as such. For an extended argument that it can, see Lorenz 2007.

27 It is perhaps worth adding that the resulting perceptual state will also be *about* its cause. Since for Aristotle every causal interaction involves an agent acting on a patient to make the patient like itself, but not every causal interaction results in a state of the patient that is *about* the agent that caused it (e.g. when a hot element heats some water, the water does not enter a state that is *about* the element), many interpreters have concluded that the changes involved in cognition (perceptual or intellectual), in which a cognizer becoming 'like' the object cognized, must be of a special kind. See e.g. Coho 2013 for a recent statement of such a view.

28 When Aristotle and Alexander speak of perceptions as 'true' and 'false', they must I think be understood as using these terms to denote a kind of 'match' or 'mismatch' between the relevant feature of the (mind-independent) object and the change occurring in the perceiver—something not requiring a combination of elements with a proposition-like

Note that what philosophers typically call hallucinations do not meet the first of these conditions, and hence do not count as instances of perceptual error on an Aristotelian account, for the simple reason that they are not episodes of perception at all, properly speaking (this remains the case even though they can be subjectively indistinguishable from episodes of perception).²⁹ Rather, perceptual error must involve what contemporary philosophers of perception tend to call 'illusion'. In cases of illusion, as contrasted with hallucination, there really is a perceptible object causing me to perceive it, yet I nevertheless perceive it as other than it is.

Alexander, like Aristotle, claims that perceptual error happens fairly often in the perception of *common* perceptibles: 'The senses make mistakes with regard to common perceptibles, since the senses are not modified [by them] in such a way as to be like the corresponding objects' (*De An.* 41.10-12). By contrast, according to both Alexander and Aristotle, when a *special* perceptible acts on a perceiver under standard conditions it *unfailingly* makes its proper sense be like itself in the relevant way. Thus the basic Aristotelian position, as I am arguing it should be understood, can be succinctly stated as follows: our perception of special perceptibles by their proper sense is never subject to perceptual illusion, except when it occurs under certain non-standard conditions.³⁰

structure to arise in the perceiver. Compare Aristotle's use of 'true' in this context with our use of the word 'veridical', as in the phrase 'veridical perception'.

- 29 For both Aristotle and Alexander, dreams and hallucinations do not result from a current causal interaction between sense object, medium and perceiver, but rather arise through the action of *phantasia*. I follow Caston (1996 and 1998) in understanding *phantasia* as a quasi-perceptual power giving rise to 'echoes' of past episodes of perception, movements that remain in the sense organs after the perception is over, the content of which can diverge over time from that of the perception which was their original cause.
- 30 Victor Caston appears to understand Aristotle's basic position somewhat differently, while sharing my interpretation of Alexander (Caston 2012, 150-1 n. 368). In particular, Caston attributes to Aristotle the view that our perception of special perceptibles by their proper sense is *never* subject to perceptual illusion, *except* when it is adulterated by other mental processes (1996, 53; 1998, 272 with n. 56). However, it seems to me that Caston specifies the range of circumstances under which perceptual error can occur for Aristotle too narrowly. As I understand Aristotle, his account of what perceptual errors are was essentially the same as Alexander's: the modification that occurs in the sense is unlike that from which it arose. While this deviation *can* be caused by the influence of some other psychic power, especially *phantasia* (as Caston stresses), it can *also* for Aristotle be caused by (say) a defect in the relevant sense organ, or by interference from the perceptual medium. I have already argued in support of this claim. I should add here that I see no principled reason why Aristotle could not admit that perceptual error is possible under such circumstances; for this requires only that the appropriate kind of causal interaction occurs

This claim is substantive and non-trivial. It is also not obviously false; for most of the most familiar examples of perceptual illusion, including those Aristotle explicitly considers, and also those that are most famous and widely discussed in the history of philosophy, involve either common perceptibles or clear cases of non-standard conditions. As examples of the former, we might consider Aristotle's (already mentioned) example of the sun appearing to be only a foot across (*DA* 428b3-4; *Insomn.* 460b18-20), or the standard examples of a stick appearing to be bent in water or a square tower appearing round at a distance.³¹ As examples of the latter, we might consider Aristotle's case of a sweet thing appearing bitter to a person with a distempered palate (*DA* 422b7-10; cf. *Metaph.* 1062b36-1063a3), or the standard (albeit inaccurate) example of white things appearing yellow to a person with jaundice (e.g. Lucretius, *De Rerum Natura* 4.332 ff.). None of these cases present any problem for Aristotle or Alexander on the present interpretation, for the reasons noted. This is not to say that no counter-example to their view could be found. For example, certain perceptual illusions produced by colour constancy effects might provide interesting cases.³² However, these cases are not perceptual illusions of the most familiar kind, and it would be unsurprising if Aristotle and Alexander were unaware of them.

IV

To this point, I have focused on understanding Aristotle's claim that the perception of special perceptibles by their proper sense is infallible. I have argued

(the sense object acts on the perceiver so as to make the perceiver like itself), but that the resulting assimilation of sense to sense object is imperfect or otherwise incomplete. This by no means renders Aristotle's (or Alexander's) claims about infallibility trivial, for the reasons noted.

31 E.g. Plato, *Republic* 602c (the bent stick); Lucretius, *De Rerum Natura* 4.353 ff. (the square tower).

32 An example is the Mach Bands illusion, in which the differences between neighbouring areas of slightly differing shades of gray appear exaggerated along their boundaries. This (robust) illusion functions to enhance edge-detection by vision. Such illusions can be explained by reference to the context-sensitive way in which the brain processes certain kinds of visual information. Since they occur even under 'standard conditions' (there is nothing wrong with the perceiver's sense organs or the intervening medium, while the object perceived is not at a great distance or obscured), I am inclined to think they represent counter-examples to the Aristotelian claim that the perception of special perceptibles is strictly infallible under standard conditions—although, as noted, these are not illusions of the most familiar kind.

that for both Aristotle and Alexander the perception of special perceptibles by their proper sense is infallible under standard conditions, but becomes fallible under certain kinds of non-standard condition, involving for example defective sense organs or interference from the medium. I have also argued that their shared view, when understood in the way I have urged, is non-trivial, indeed substantive, and considerably more plausible than it might at first appear to be. However, if this is correct, further questions quickly arise. In particular, according to both Aristotle and Alexander our perceptions of common perceptibles (e.g. shape, size, movement, number) are significantly more prone to error than our perceptions of special perceptibles (e.g. colours, sounds, smells).³³ But why should this be so, on their accounts? Given that we perceive both common perceptibles and special perceptibles ‘in their own right’ (*kath’ hauta*, *DA* 2.6, 418a9-10), why shouldn’t perceptions of both kinds of perceptible object be equally fallible (or infallible) when they occur under the same conditions?

Unfortunately, Aristotle says very little to explain why he thinks our perception of common perceptibles is more prone to error than our perception of special perceptibles. The closest he comes to providing such an explanation is in the following passage from *De Sensu* 4 (442b4-10), the first part of which was quoted above:

Moreover, they [sc. Democritus and most of the natural philosophers who speak about sense perception] treat the objects that are common to all the senses as proper to one; for magnitude and shape, roughness and smoothness, and moreover the sharpness and bluntness found in solid bodies are all common to all the senses, or if not to all of them, rather to sight and touch. *That is why the senses are liable to err concerning these objects, but not concerning the proper sense objects, for example sight concerning colour or hearing concerning sounds.*³⁴

33 In *DA* 3.3 (428b17-25), Aristotle provides a rank ordering of the different kinds of perceptible objects in terms of the susceptibility of their perception to error. On his view, perception of special perceptibles is least liable to be false, followed by perception of incidental perceptibles, while perception of common perceptibles is most liable to error. Alexander provides the exact same rank ordering in his *De Anima* (41.10-42.3). In what follows, I focus only on the claim that the perception of common perceptibles is more susceptible to error than the perception of special perceptibles.

34 ἔτι δὲ τοῖς κοινοῖς τῶν αἰσθήσεων πασῶν χρώνται ὡς ἰδίους· μέγεθος γὰρ καὶ σχῆμα καὶ τὸ τραχὺ καὶ τὸ λεῖον, ἔτι δὲ τὸ ὄξυ καὶ τὸ ἀμβλὺ τὸ ἐν τοῖς ὄγκοις, κοινὰ τῶν αἰσθήσεων ἔστιν, εἰ δὲ μὴ πασῶν, ἀλλ’ ὄψεώς γε καὶ ἀφῆς. διὸ καὶ περὶ μὲν τούτων ἀπατώνται, περὶ δὲ τῶν ἰδίων οὐκ ἀπατώνται, οἶον ἢ ὄψις περὶ χρώματος καὶ ἢ ἀκοή περὶ ψόφων.

In this passage, Aristotle claims that we are more prone to error in perceiving common perceptibles *because* these kinds of perceptibles are perceived by more than one sense. However, this hardly answers the question at issue: for why should the fact that we can perceive the common perceptibles with multiple senses make our perception of them more prone to error?

One possible answer to this question, which I mention here only to set aside, rests on the supposition that for Aristotle perceiving common perceptibles always requires binding together the inputs of several different senses. If that were so, we might suppose that this further process of perceptual binding, together with the fact that the inputs of multiple senses are involved, introduces new possibilities for error. However, Aristotle's view was clearly that the common perceptibles *can* be perceived by more than one sense, not that we *need* to use more than one sense to perceive them. For example, he maintains that we *can* perceive (e.g.) shape or size by sight without using any other sense, even though we can *also* perceive them by touch.³⁵ In fact, given that (say) shape can be perceived by sight, it might seem that the fact that it can *also* be perceived by touch should make our perception of it *less* prone to error, due to the possibility this introduces of using one sense to cross-check the accuracy of the other.³⁶

35 In *DA* 3.1, 425a29-30, Aristotle remarks that if we had a sixth special sense for perceiving common perceptibles, we would perceive them only incidentally by sight, in the way we now perceive the son of Cleon incidentally by sight. However, it was clearly not Aristotle's view that we need to utilize more than one of the five senses to perceive the son of Cleon. Note that this suggests only that none of the other *special senses* need be involved, not that *no* other power of the soul need be involved (since further powers surely are involved in the perception of incidental perceptibles). Cf. 435a5-10.

36 In *DA* 3.1, 425b4-11, Aristotle asks why we need multiple senses rather than just one. The answer he provides is that having multiple senses makes it less likely that the common perceptibles that accompany the special perceptibles will escape our notice (ἢ ὅπως ἦττον λαμβάνη τὰ ἀκολουθοῦντα καὶ κοινά, οἷον κίνησις καὶ μέγεθος καὶ ἀριθμὸς; 425b5-6). As Gregoric 2007, 73 notes, this phrasing implies only that it would be harder to perceive the common perceptibles if we had only a single sense, not that it would be impossible to do so. Gregoric cites this passage in support of his claim that no perceptual power need be involved in the perception of common perceptibles besides a single sense (e.g. the sense of sight). However, it remains possible that *some* further power is required to separate out the common perceptibles from the special perceptibles they 'come along with' or 'accompany' (ἀκολουθεῖν). This would be a higher-order perceptual power, not one of the other five individual senses. In fact, that such a further power is required was precisely Alexander's view, as I explain below. In what follows, I argue (against Gregoric) that it was Aristotle's view as well.

A more promising approach to explaining and justifying Aristotle's claim that the perception of common perceptibles is more prone to error than the perception of special perceptibles involves appealing to his teleology. Aristotle concludes *De Anima* 2.6 with the following remark (418a24-5):

Of the things that are perceptible in their own right, the special objects of perception are perceptible primarily, and the essence of each sense is naturally relative to these.³⁷

In this passage, Aristotle claims that the special perceptibles, but not the common perceptibles, are the objects of perception 'primarily' (*kuriōs*). Furthermore, he claims, the 'essence' (*ousia*) of each sense is naturally 'relative to' (*pros*) the special perceptibles. In effect, Aristotle is claiming here that the natures of the five senses are to be understood in terms of the objects proper to each: sight just is the power to perceive colour, and an eye just is an organ that serves this purpose.³⁸ Perhaps, then, Aristotle reasoned as follows: by its very nature, sight is *for* perceiving colour, so as long as nothing interferes or goes wrong it will fulfill this purpose; but sight is not *for* perceiving shape; hence perception of shape by sight is more prone to error than perception of colour by sight.³⁹

This seems to me plausible as far as it goes: given that each of the five senses is primarily for perceiving a certain kind of special perceptible, it is not surprising that it is less prone to error with respect to them than with respect to the common perceptibles, to which no one sense has any particular connection. However, as it stands this account falls short of providing a satisfactory answer to our question. The problem is that this appeal to teleology at most explains why Aristotle might *want* to maintain that our perception of colour by sight is less prone to error than our perception of shape by sight, but not why he was entitled to do so. We would surely like to have, in addition, some

37 τῶν δὲ καθ' αὐτὰ αἰσθητῶν τὰ ἴδια κυρίως ἐστὶν αἰσθητά, καὶ πρὸς ἃ ἡ οὐσία πέφυκεν ἐκάστης αἰσθήσεως.

38 It is well known that Aristotle distinguishes the five senses in terms of their different special objects, rather than (say) in terms of the different sense organs involved or differences in what it is like to perceive by means of each of them (see e.g. Sorabji 1971). Thus for example Aristotle claims that the organ of smell just is whatever part of its body an animal uses to perceive odour—the organ may vary greatly in constitution and location in different kinds of animals (see e.g. *PA* 2.16, 659b13-17; *DS* 444b15). This reflects his general strategy of differentiating different powers of the soul in terms of differences in the objects with which they are concerned (*DA* 2.4, 415a14-22; cf. 1.1, 402b9-16).

39 So e.g. Block 1961.

principled *psychological* explanation for the difference in question. Can Aristotle's claim that our perception of common perceptibles is more prone to error than our perception of special perceptibles be justified and explained, within an Aristotelian framework, by appeal to the different psychological powers and processes involved in the perception of each kind of object?

The key to answering this question lies, I think, in better understanding the relationship between special and common perceptibles, and the way in which they are perceived together. Here, once again, the writings of Alexander can prove helpful and illuminating. In his commentary on Aristotle's *De Sensu*, Alexander remarks that 'each perception of the common perceptibles comes about through and with the special perceptibles'.⁴⁰ This idea—that the common perceptibles are perceived 'through and with' (*dia kai meta*) the special perceptibles—is developed more fully in *De Anima* 65.10-21. There, Alexander writes that the common perceptibles are 'carried together with' the special perceptibles to the seat of the common perceptual power, through the agency of the individual sense organs (συναναφέρεται μὲν γὰρ ἕκαστον αὐτῶν τοῖς ἰδίῳις ἐκάστης αἰσθήσεως αἰσθητοῖς διὰ τῶν οἰκείων αὐτοῖς ὀργάνων, *De An.* 65.11-12). This is able to occur, he explains, because the special object of sight, colour, exists in external perceptible things 'together with' (*meta*) size, shape, rest or motion and number (12-14). Presumably, Alexander's basic idea is that any actual coloured thing will always also have a size, shape, be of a certain number and be either in movement or at rest; and that the same will go for sounding things, odorous things, flavored things, hot things and so on. Since the common perceptibles exist together with the special perceptibles in the world in this way, Alexander claims, they are received together with the special perceptibles by the sense organs and borne together with them to the seat of the common perceptual power, a power which he later refers to as the 'common sense' (14-16).⁴¹

These remarks by Alexander suggest that he is operating with roughly the following picture. Each of the five individual senses is primarily responsible

40 διὰ γὰρ τῶν ἰδίων αἰσθητῶν καὶ μετὰ τούτων ἢ τῶν κοινῶν αἰσθησις ἐκάστη γίνεται (*in De Sensu* 11.16-17). Alexander adds that hearing perceives magnitude, number and movement only *in* sound (and that the same basic point holds for each of the other senses and their proper objects) (11.17-19). I take him to be claiming that hearing perceives only sound in its own right, and that it perceives the common perceptibles only by means of perceiving sound, which they 'come along with'.

41 For Alexander, the 'common sense' is a higher-order perceptual power distinct from the five individual senses. He introduces the phrase *koinē aisthēsis* to refer to it in *De Anima* 62.20 ff. He defends the view that this power has its seat in (or in the vicinity of) the heart in *De Anima* 94-7. He attributes to it various functions the individual senses cannot perform on their own, as noted below.

for perceiving its own proper object. However, since these proper objects—the special perceptibles—always exist in the world together with various common perceptibles, the senses continually and inevitably receive information about common perceptibles together with information about special perceptibles.⁴² None of the individual senses is able to actually discriminate (*krinei*, 65.16) the common perceptibles.⁴³ However, all five senses are capable of passing on information about the common perceptibles to the seat of the common perceptual power. This power performs various functions that cannot be performed by any one sense alone; for example, according to Alexander, it is responsible for binding together the inputs of the five senses, distinguishing their different special objects from one another (e.g. telling sweet from white), and furnishing us with awareness that we are currently perceiving. In addition, on his view, it is responsible for ‘teasing out’ information about the common perceptibles from the information conveyed to it from the five individual senses—a further step, beyond what a special sense operating alone can achieve.⁴⁴

So how does Alexander’s account of the process by which common perceptibles are perceived—and its relationship to the process by which special perceptibles are perceived—help explain why the perception of the former is more prone to error than the perception of the latter? Although Alexander is not explicit on the point, his account provides room for an explanation. First, on his view, the common sense is responsible for performing many different functions, only one of which is extracting information about common perceptibles from the inputs of the individual senses. By contrast, each of the special

42 Although Alexander does not use any word that could be translated as ‘information’, I believe the way he describes the processes involved justifies attributing some such notion to him without anachronism. Thus, as noted, Alexander speaks of the common perceptibles being ‘borne together with’ (*sunanapheretai*, *De An.* 65.11) the special perceptibles to the seat of the common perceptual power: presumably it is not the common perceptibles themselves (which exist in the world independently of the perceiver), but rather their effects on the perceiver, that are borne from the sense organs in this way. The idea that on Alexander’s view information is transmitted from sense organs to common sense is also suggested by his striking characterization of the senses as ‘transmitters’ or ‘messengers’ (*diakonoï*, *De An.* 41.3) for the common perceptibles, ‘relaying’ them (*poietai diadosin*, 41.4-5) to the common sense. For further discussion of this terminology, see Caston 2012, 146-7.

43 Alexander explains this by noting that, while the work of sight is to discriminate colours and the work of hearing is to discriminate sounds, the common perceptibles can accompany *all five* kinds of special perceptibles, showing that it is not the work of any one sense to discriminate *them* (65.16-21).

44 Alexander discusses all of these functions of the common sense at *De Anima* 60-6.

senses is concerned *only* with a single kind of object and is authoritative over it.⁴⁵ As a result, the common sense is less specialized for the task of perceiving common perceptibles than the special senses are for perceiving special perceptibles. Secondly, on his view the common sense must work in conjunction with one or more of the special senses to perform this function; the need for coordination between two distinct powers introduces new ways for things to go wrong. Finally, on his view the process of perceiving common perceptibles contains more stages, which creates more opportunities for error. In particular, the need for a further cognitive step, performed in the vicinity of the heart, makes it possible for error to occur even when the sense organ and perceptual medium are in perfect condition.

This account captures and explains what Alexander has to say about the perception of common perceptibles, and about the susceptibility of such perception to error. I now return to Aristotle. I will argue that there is good reason to think that Aristotle's view on this point was essentially the same as Alexander's—if not in every detail, then at least in its basic structure. The key idea is that perceiving the common perceptibles requires an additional stage of cognitive processing, and hence that error can occur even when nothing has gone wrong in the sense organ or perceptual medium. Although Aristotle was not explicit about these matters, I defend this interpretation on the basis that it is (i) charitable to him, (ii) consistent with what he wrote and (iii) able to make good sense of some otherwise puzzling things he *does* say.⁴⁶

V

The view I wish to attribute to Aristotle is roughly as follows. Objects in the world existing apart from perceivers have certain kinds of perceptible quality (the special perceptibles), which are capable of acting on the sense organs

45 Alexander, in *Metaph.* 313.20-32. In this passage, Alexander claims that each sense has authority over its special objects, about which it reports truly, but not over 'extraneous' objects (*allotria*), and that common perceptibles are in a way 'extraneous to each sense' (30).

46 In what follows, I do not base my case for attributing this view to Aristotle solely on his remark in *DA* 3.1 that 'for the common perceptibles we have [a] common sense (*aisthēsin koinēn*), not incidentally' (425a27-8). This is because it is at least possible, as Gregoric 2007, 74-5 has argued, that Aristotle is using the phrase *aisthēsis koinē* in this passage to denote not a further perceptual power, but rather simply a power that all five individual senses share in common. Nevertheless, this remark of Aristotle's is certainly consistent with the interpretation defended here and, if anything, provides further support for it.

of suitably constituted perceivers in such a way as to make themselves be perceived. These special perceptibles are perceived primarily, and are also perceived accurately, so long as there is nothing wrong with the sense organs or perceptual medium. Absent certain very special circumstances, information about the special perceptibles is then conveyed to the heart; and it is conveyed unaltered, without being further worked on or processed in any way.⁴⁷ Information about the common perceptibles is conveyed to the heart together with the special perceptibles.⁴⁸ However, further cognitive processing is then required to tease out the common perceptibles from the special perceptibles they accompany. This further step is needed because perceiving a single common perceptible always requires perceiving multiple special perceptibles; for example, perceiving a shape or movement requires perceiving multiple colours, or a change in colour over time. It therefore requires comparisons and contrasts between and among distinct special perceptibles (e.g. between two distinct colours). Because perceiving common perceptibles requires this further stage of cognitive processing, it is prone to error even when the sense organs and perceptual medium are in immaculate condition.

Although this proposed interpretation is (unavoidably) speculative, it makes good sense of Aristotle's claim that perception of common perceptibles is more prone to error than perception of special perceptibles. It also makes good sense of some other potentially puzzling things he says. First, this account makes good sense of Aristotle's claim that common perceptibles are perceptible 'in their own right' (*kath' hauta*) but not 'primarily' (*kuriōs*) (*DA* 2.6, 418a8-11, 24-5). I take it that an object is perceptible in its own right, for Aristotle, if (and only if) it is capable of acting on a perceiver's perceptual powers in virtue of being the kind of thing that it is. In other words, things are

47 I take it to have been Aristotle's view that changes occurring first in the peripheral sense organs are normally transmitted, unaltered, from them to the central sense organ (the heart), often through 'channels' (*poroi*). In several places, Aristotle characterizes the heart as the center of perception: for example, he describes it as 'the sense organ common to all the peripheral sense organs' (*Juv.* 1, 467b28) and 'the master sense organ to which all the sense organs lead' (*Somn.* 2, 455a33-4). The motions leading from the peripheral sense organs to the heart are clearly characterized as changes of an ordinary kind at *Insomn.* 2, 459b1-7. For fuller defense of this view, and further discussion of the relevant texts, see Corcilius and Gregoric 2103, 57-60. The basic picture is nicely illustrated by Aristotle's example of soldiers who go blind when the *poroi* behind their eyes are severed by a blow: in such a case, the eye itself is undamaged yet no perception by sight occurs (*DS* 2, 438b12-16).

48 Aristotle describes the common perceptibles as 'accompanying' or 'following upon' (*akolouthounta*) the special perceptibles at *DA* 3.1, 425b5-6.

perceptible in their own right just in case they are capable of *causing* perception insofar as they are what they are.⁴⁹ This is uncontroversially true of the special perceptibles, for Aristotle, which act as agents in the change that is the perceiver's perceiving them by (in some way) assimilating the perceiver to themselves. Crucially, it is also true of the common perceptibles, on the proposed interpretation: for things in the world act on our senses (and on the perceptual medium) not only insofar as they are (e.g.) coloured or odorous, but also insofar as they have a certain size, shape and rate of movement.⁵⁰ By contrast, incidental perceptibles are not like this: the son of Diaries does not act on the senses at all insofar as he is the son of Diaries, but only insofar as he has a certain colour, shape, sound of voice and the like.⁵¹ This explains why the common perceptibles, unlike the incidental perceptibles, are perceived in their own right. At the same time, it makes perfect sense for Aristotle to claim that common perceptibles are not perceived 'primarily', since information about them is received only as a kind of 'concomitant' or 'accompaniment' to the special perceptibles with which each of the senses is primarily concerned.

Secondly, the proposed interpretation offers an appealing way of understanding Aristotle's potentially puzzling remark that the common perceptibles are perceived only 'incidentally' (*kata sumbebēkos*) by each of the five senses (*DA* 3.1, 425a14-16). This remark has troubled many readers because it appears to contradict Aristotle's earlier claim, in *DA* 2.6, that common perceptibles are perceived in their own right.⁵² However, if (as argued here) perceiving common

49 *DS* 6, 445b4-8; cf. *DS* 3, 439a17, *DA* 2.6, 418a23-4.

50 Thus for example Aristotle claims in *DA* 3.12 that both the perceiver and the intervening medium of air are 'affected' (*paschein*) by *both* shape and colour (435a5-8).

51 To be clear, this is *not* to deny that the son of Diaries is perceived at all. Rather, as I read Aristotle, the son of Diaries *is* a perceptible object (it is possible to perceive him)—but he is perceived not insofar as he is the son of Diaries, but only because he has certain qualities that *are* perceptible in their own right.

52 A great deal has been written on this issue. Some interpreters have tried to eliminate the apparent conflict by taking Aristotle to be claiming in *DA* 3.1 that the common perceptibles are *not* perceived incidentally by each of the senses, contrary to the way it appears. Two main strategies have been employed to achieve this result. The first involves simply inserting a negation in front of *kata sumbebēkos* in line 425a15 (e.g. Torstrik 1862, Block 1988). However, this emendation has only weak support from a small number of (exclusively late) manuscripts and one Latin text (William of Moerbeke's translation), and as a result is widely regarded as untenable. The second strategy involves reading the line in which Aristotle says that each sense perceives common perceptibles incidentally as part of the view Aristotle wishes to *reject*. This way of reading the passage enjoyed some support among ancient commentators (e.g. Themistius, in *DA* 182.38-183.4 Heinze; Philoponus, in *DA* 454.5-13 Hayduck; Simplicius, in *DA* 81.18-35 Hayduck), and has also

perceptibles requires, in addition to at least one of the five special senses, the involvement of a further perceptual power located in the heart, the appearance of contradiction dissolves. This is because, on this account, the common perceptibles are not perceived by a special sense alone, but rather by this sense operating in conjunction with this further perceptual power; a power that Aristotle, like Alexander, recognizes and sometimes calls the common sense.⁵³

found favor with some modern interpreters (e.g. Kahn 1966, 53 n. 24, Owens 1982, 235-6, Gregoric 2007, 69-82). However, it requires a far from straightforward reading of the text (if it did not, the appearance of contradiction would hardly have been felt so acutely by so many readers).

On both of these approaches, it was Aristotle's considered position that the common perceptibles *are* perceived in their own right by *each* of the senses, just as special perceptibles are. By contrast, proponents of a third strategy maintain that for Aristotle common perceptibles are perceived only incidentally by each of the senses, but that he uses the phrase *kata sumbebēkos* slightly differently in the different places (Trendelenburg 1877, 427-30, followed by e.g. Ross 1961, 270). However, as critics have noted, it is at least unattractive to suppose that Aristotle equivocates in this way. Furthermore, Owens 1988, 226 and 233-4 argues that for Aristotle the phrase *kata sumbebēkos* has a narrow and quite specific meaning whenever it is applied to perception: to say that an object is perceived *kata sumbebēkos* just is to say that it does not affect the sense organs in its own right. If Owens is right about this, the third strategy is in serious trouble, since (as Owens points out) Aristotle *does* seem to think that common perceptibles are capable of affecting the sense organs in their own right (so e.g. *DA* 3.12, 435a5-8).

My own view resembles the third strategy listed here, in that on it Aristotle *did* maintain that the common perceptibles are perceived only incidentally by each of the individual senses. However, I deny that reading the text in this way requires positing any equivocation on Aristotle's part in the use of the phrase *kata sumbebēkos*. Against Owens, there is simply no reason in the text to suppose that for Aristotle being perceived *kata sumbebēkos* simply *means* having no effect on the sense organs. Rather, it seems that for Aristotle something is perceived *kata sumbebēkos* if and only if it is perceived by means of perceiving something else, which it accompanies non-essentially, and which is perceived in its own right. This is true of the common perceptibles on the present interpretation, which are received by the individual senses only as an accompaniment to the special perceptibles which each sense perceives primarily. If this is correct, there is no contradiction between the two passages: Aristotle says exactly what he *should* say, which is that the common perceptibles are perceived by the individual senses only as an accompaniment to the special perceptibles they perceive primarily, but in their own right by the perceptual system as a whole, where this includes the work of a higher-order perceptual power operating in conjunction with one or more of the special senses. For similar views, see e.g. Hicks 1907, 426-7; Everson 1997, 156.

- 53 There is no doubt that Aristotle, like Alexander, sometimes invokes a higher-order perceptual power to explain various perceptual operations that cannot be performed by the individual senses in isolation, even though (unlike Alexander and other later authors)

To be clear, my claim is not that for Aristotle the common perceptibles are perceived in their own right 'by' the common sense, in much the way that (e.g.) colour is perceived by the sense of sight: for this would make the common sense function as if it were a sixth special sense, something Aristotle explicitly denies.⁵⁴ Nor do I wish to deny that for Aristotle the common perceptibles are perceived using the five senses, individually and severally. Rather, my claim is that for Aristotle no common perceptible is discerned by sight *alone*—not because other special senses must be involved, but rather because the additional work of a further perceptual power is *also* required. This further power is required by Aristotle, on the proposed interpretation, for the same reason Alexander includes it: because the individual senses receive information about the common perceptibles only as a kind of 'accompaniment' to the special perceptibles they perceive primarily, information that must be sorted out by a subsequent operation of the power of perception located in the heart. In this way, the common perceptibles are perceived in their own right by the perceiver, but only incidentally by each of the five senses considered individually.

Thirdly, the present account suggests an appealing way of understanding Aristotle's potentially puzzling claim, also in *De Anima* 3.1, that we perceive all of the common perceptibles through movement or change (*kinēsis*, 425a14-15). Why did Aristotle single out just one of the common perceptibles for special treatment in this way? On the proposed interpretation, it becomes possible to answer this question. The key idea is that information about the common perceptibles is received by the individual senses in the form of patterns of special perceptibles. For example, it is plausible to suppose that we perceive shape, size and number by sight only when we register changes and contrasts

he rarely actually refers to it as 'the common sense'. These operations include binding together the inputs of the different special senses and distinguishing their special objects from one another (e.g. distinguishing sweet from white) (*DA* 3.2, 426b8-427a16), and also (arguably) perceiving that we are currently (e.g.) seeing or hearing (425b12-25). The question at issue here is whether such a power is also necessarily involved in the perception of common perceptibles. For Alexander, the answer is 'yes' – I argue the same is true for Aristotle.

- 54 I agree with Kahn 1966, 52 that we should not be misled by labels to think that the 'common sense' perceives the 'common perceptibles' much as the 'special senses' perceive the 'special perceptibles'. However, in contrast to Kahn I argue that a higher-order perceptual power (sometimes called the 'common sense') *is* necessarily involved in the perception of common perceptibles for Aristotle. My suggestion is simply that it plays this role only in conjunction with at least one of the five special senses, not on its own, as it were: it is therefore *not* correct to say that for Aristotle the common perceptibles are perceived 'by' the common sense, as if it were a kind of sixth sense.

in perceived colour: edges, for instance, at the point where the perceived colour changes, or movement and rest as we notice changes of shade or of areas of colours in relation to each other. A similar account could be given for perceiving common perceptibles by perceiving changes in sounds, odours, flavours and temperatures. By contrast, as Aristotle points out, if we had *only* the sense of sight, and if our sight could detect *only* one colour—the colour white—we would not be able to discern the common perceptibles at all, since ‘colour and magnitude inevitably accompany one another’ (*DA* 3.1, 425b4-11). These remarks support the present account, since if we perceived only the colour white we would perceive no changes (of colour or anything else), and hence no shapes, sizes, or any of the other common perceptibles.

Finally, I should emphasize once more that the proposed interpretation allows for a way of explaining Aristotle’s otherwise puzzling claim, which he shares with Alexander, that the perception of common perceptibles is more prone to error than the perception of special perceptibles. The greater susceptibility to error in the perception of common perceptibles is explained, on the present account, by the fact that a further stage of perceptual processing is involved in perceiving them. This further stage of processing involves ‘teasing out’ information about the common perceptibles from the inputs of the five special senses—work that is performed by a ‘common’ perceptual power, operating in the vicinity of the heart. The need for this additional stage of cognitive processing allows for error to arise even when there is nothing wrong with the sense organs or perceptual medium—something that cannot occur (I have argued) in the perception of special perceptibles. In this way, the present account is charitable to Aristotle: it shows that his claim that the perception of common perceptibles is more prone to error than the perception of special perceptibles has a solid basis in his psychology.⁵⁵

55 Gregoric 2007, 73 argues that interpreting Aristotle along the general lines favored here—that is, in attributing to him a view on which a further perceptual power plays a role in perceiving the common perceptibles—actually renders *inexplicable* Aristotle’s claim that perception of common perceptibles is more prone to error than perception of special perceptibles. Gregoric seems to reason as follows: if common perceptibles are perceived only incidentally by each of the special senses, they must be perceived in their own right by the common sense; and if that were so, Aristotle would have no principled reason for thinking the common sense perceiving common perceptibles should be any more prone to error than a special sense perceiving special perceptibles, since it would effectively be functioning as a sixth sense. I explained above why this consequence does not follow on the present account. Gregoric’s own view is that the common perceptibles are perceived in their own right by *each* of the five senses, and that no perceptual power beyond these five is required for discriminating them (he is followed in this by Johansen 2012, 176-9). He

I began this paper by claiming that Alexander's work on perception can help resolve two puzzles raised by Aristotle's remarks on the possibility of perceptual error. The first puzzle was raised by Aristotle's claim that our perception of special perceptibles is never in error. The second was raised by Aristotle's claim that the perception of common perceptibles is more prone to error than the perception of special perceptibles. I have offered interpretations of Alexander that show how he is able to explain and defend these claims. Furthermore, I have argued, Alexander does this not by presenting an alternative to Aristotle's view, but rather by developing, more clearly and systematically than Aristotle ever managed, views Aristotle himself may also have held. The result is an interpretation of Aristotle that is charitable to him, consistent with the texts, and able to resolve various further problems raised by his remarks on the perception of the different kinds of perceptible object, and on the liability of each of these kinds of perception to error.

Bibliography

- Ben-Zeev, A. (1984), 'Aristotle on Perceptual Truth and Falsity', *Apeiron* 48: 118-25.
- Block, I. (1961), 'Truth and Error in Aristotle's Theory of Sense Perception', *The Philosophical Quarterly* 11: 1-9.
- . (1988), 'Aristotle on the Common Sense: A Reply to Kahn and Others', *Ancient Philosophy* 8: 235-49.
- Bradshaw, D. (1997), 'Aristotle on Perception: The Dual-Logos Theory', *Apeiron* 30: 143-61.

explains the fact that we are liable to err in perceiving the common perceptibles by invoking the fact that none of the five senses is *exclusively* for perceiving any of them (2007, 32-3). However, this move by Gregoric is puzzling. The main problem with his account is that on it the special perceptibles lose their *priority* over the common perceptibles. This is because on his account we perceive shape and colour in the same way, with the same power and by the same process. If we suppose (as I do) that for Aristotle animals have the power of perception at least in part for perceiving common perceptibles, then on Gregoric's view each sense must be for perceiving *both* special *and* common perceptibles in their own right. Indeed, on his account it really does become puzzling why the fact that we can perceive common perceptibles with multiple senses should make the perception of them *more*, rather than *less*, prone to error, given the possibility of cross-checking. In contrast to Gregoric's view (and all such accounts), the proposed interpretation ascribes a strong kind of priority to the special perceptibles: the five individual senses are for perceiving them primarily, while the common perceptibles are received only as a kind of concomitant or accompaniment to the special perceptibles, in the manner described.

- Burnyeat, M. (1992), 'Is an Aristotelian Philosophy of Mind Still Credible? A Draft' in M. Nussbaum and A.O. Rorty (eds.), *Essays on Aristotle's De Anima* (Oxford): 15-26.
- . (1995), 'How Much Happens when Aristotle Sees Red and Hears Middle C? Remarks on *De Anima* 2.7-8' in M. Nussbaum and A.O. Rorty (eds.), *Essays on Aristotle's De Anima*, 2nd edn. (Oxford): 421-34.
- . (2001), 'Aquinas on 'Spiritual Change' in Perception' in D. Perler (ed.), *Ancient and Medieval Theories of Intentionality* (Leiden / Boston / Cologne): 129-53.
- . (2002), '*De Anima* II 5', *Phronesis* 47: 28-90.
- Byrne, A. (2009), 'Experience and Content', *Philosophical Quarterly* 59: 429-51.
- Cashdollar, S. (1973), 'Aristotle's Account of Incidental Perception', *Phronesis* 18: 156-75.
- Caston, V. (1996), 'Why Aristotle Needs Imagination', *Phronesis* 41: 20-55.
- . (1998), 'Aristotle and the Problem of Intentionality', *Philosophy and Phenomenological Research* 58: 249-98.
- . (2007), 'The Spirit and the Letter: Aristotle on Perception' in R. Salles (ed.), *Metaphysics, Soul and Ethics in Ancient Thought: Themes from the Work of Richard Sorabji* (Oxford): 245-320.
- . (2012) (tr.), *Alexander of Aphrodisias, On the Soul*. Part 1: *Soul as Form of the Body, Parts of the Soul, Nourishment, and Perception*. London.
- Cohoe, C. (2013), 'Why the Intellect Cannot Have a Bodily Organ: *De Anima* 3.4', *Phronesis* 58: 347-77.
- Coope, U. (2004), 'Aristotle's Account of Agency in *Physics* 111.3', *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 20: 201-21.
- Corcilius, K. and Gregoric, P. (2013), 'Aristotle's Model of Animal Motion', *Phronesis* 58: 52-97.
- Everson, S. (1990), 'Epicurus on the Truth of the Senses' in Everson (ed.), *Epistemology: Companions to Ancient Thought* (Cambridge), 161-83.
- . (1997), *Aristotle on Perception*. Oxford.
- Gaukroger, S. (1981), 'Aristotle on the Function of Sense Perception', *Studies in History and Philosophy of Science* 12: 75-89.
- . (1990), 'Introduction' in A. Arnaud and S. Gaukroger (tr.), *On True and False Ideas: New Objections to Descartes' Meditations; and Descartes' replies* (Manchester), 1-41.
- Goldman, A. (1975), 'Criteriological Arguments in Perception', *Mind* 84: 102-5.
- Gregoric, P. (2007), *Aristotle on the Common Sense*. Oxford.
- Hamlyn, D.W. (1968) (tr.), *Aristotle, De Anima Books II and III with Passages from Book I*. Oxford.
- Hardin, C. (1983), 'Colours, Normal Observers and Standard Conditions', *The Journal of Philosophy* 80: 806-13.
- Hicks, R.D. (1907) (ed. and tr.), *Aristotle, De Anima*. Cambridge.
- Johansen, T.K. (2012), *The Powers of Aristotle's Soul*. Oxford.

- Johnstone, M. (2012), 'Aristotle on Odour and Smell', *Oxford Studies in Ancient Philosophy* 43: 143-83.
- . (2013), 'Aristotle on Sounds', *British Journal for the History of Philosophy* 21: 631-48.
- Kahn, C. (1966), 'Sensation and Consciousness in Aristotle's Psychology', *Archiv für Geschichte der Philosophie* 48: 43-81.
- Lear, J. (1988), *Aristotle: The Desire to Understand*. Cambridge.
- Lorenz, H. (2007), 'The Assimilation of Sense to Sense-Object in Aristotle', *Oxford Studies in Ancient Philosophy* 33: 179-220.
- Modrak, D. (1987), *Aristotle: The Power of Perception*. Chicago.
- Owens, J. (1982), 'Aristotle on Common Sensibles and Incidental Perception', *Phoenix* 36: 215-36.
- Polansky, R. (2007), *Aristotle's De Anima*. Cambridge.
- Ross, W.D. (1955) (ed.), *Aristotle: Parva Naturalia*. Oxford.
- . (1961) (ed.), *Aristotle: De Anima*. Oxford.
- Russell, B. (1948), *Human Knowledge*. New York.
- Silverman, A. (1989), 'Colour and Colour-Perception in Aristotle's *De Anima*', *Ancient Philosophy* 9: 271-92.
- Sorabji, R. (1971), 'Aristotle on Demarcating the Five Senses', *Philosophical Review* 80: 55-79.
- . (1974), 'Body and Soul in Aristotle', *Philosophy* 49: 63-89.
- . (1992), 'Intentionality and Physiological Processes: Aristotle's Theory of Sense-Perception', in M. Nussbaum and A.O. Rorty (eds.), *Essays on Aristotle's De Anima* (Oxford): 195-226.
- . (2001), 'Aristotle on Sensory Processes and Intentionality: A Reply to Myles Burnyeat' in D. Perler (ed.), *Ancient and Medieval Theories of Intentionality* (Leiden / Boston / Cologne): 49-61.
- Striker, G. (1977), 'Epicurus on the Truth of Sense-Impressions', *Archiv für Geschichte der Philosophie* 59: 125-42.
- Taylor, C.C. W (1980), 'All Perceptions are True' in M. Schofield, J. Barnes and M. Burnyeat (eds.), *Doubt and Dogmatism* (Oxford), 105-24.
- Torstrick, A. (1862) (ed.), *Aristotelis De Anima*. Berlin.
- Trendelenburg, F. (1877) (ed.), *Aristotelis De Anima*. 2nd edn. Berlin.