

## 12 Intentionality and Physiological Processes: Aristotle's Theory of Sense-Perception

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### I

The most valuable aspect of Aristotle's theory of sense-perception is, I believe, one which has been relatively neglected. It lies in his redrawing the map in which perception is located in a debate which is still being conducted in contemporary controversy on perceptual content. I shall discuss this in Section I of this chapter. It has to do with the formal cause of perception. What has been most discussed recently is what I believe to be the material cause. I shall turn to that in Section II, because the formal cause and material cause together complete the definition of perception, as explained at the opening of the *De Anima*.<sup>1</sup>

Perception for Aristotle is not to be viewed as a rudimentary reaction with little content, as is suggested by Plato. Nor on the other hand is it the work of reason and thought (*dianoia, noein, nous*), as was claimed by Aristotle's rebellious successor Strato.<sup>2</sup>

It is a half-way house between the two.

Plato's position has been very well described by others: he argues in the *Theaetetus* that the soul uses the senses as channels to perceive sense qualities like whiteness, but cannot use them for distinguishing and comparing qualities, or for hitting on something's being the case (*ousia*) or the truth (*alētheia*); for that requires reasoning (*sullogismos*) and belief (*doxazein*).<sup>3</sup>

Reasoning is described in turn as the silent dialectical debate of the soul with itself, and belief either as the conclusion of this debate, or as a silent affirmation, negation, or answer in the debate.<sup>4</sup>

Plato's distinction of reasoning and belief from perception reflects Alcmaeon's earlier distinction of perception from understanding and thought (*xunhienai, phronein*).<sup>5</sup>

But Plato greatly narrows the role of perception. This narrowing only becomes critical when Aristotle revives the other half of what Alcmaeon says by denying

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<sup>1</sup> *DA*, 403<sup>a</sup> 25-39. I shall be returning to the subject of the first section in Sorabji, *Mind and Morals, Man and Beast*, in preparation.

<sup>2</sup> Strato *ap. Plut. De Sollertia Animalium* 961 A; *ap. SE. M.* 7. 350; *ap. Porph. Abst.* 3. 21; *ap. Epiphan. Against Heresies in Dox. Gr.* p. 592, 16-18.

<sup>3</sup> Plato, *Theaetetus* 184 D-187 B. See the illuminating accounts by Burnyeat (1976) and Frede (1987b) and before that Cooper (1970).

<sup>4</sup> Plato, *Theaetetus* 189 E-190 A, *Sophist* 263 E ff., *Philebus* 38 C-E.

<sup>5</sup> Alcmaeon *ap. Theophr. De Sensibus* 25. Alcmaeon also distinguishes belief (*doxa*) from perception, if it is his theory that Plato reports at *Phaedo* 95 B, as the reference to the brain has been taken to suggest.

reasoning and belief (*logos, dianoia, nous, logismos, doxa*, in Aristotle) to animals other than man.<sup>6</sup>

Aristotle is then obliged enormously to expand the content of perception beyond the rudimentary level to which Plato had reduced it. Typically, an animal that follows a scent does not merely perceive the scent in isolation, but perceives it as lying in a certain direction, and otherwise would not go in the right direction for it. But this already involves *predication*: the scent is *connected* with a direction. We can put this by saying that the animal perceives that the scent comes from that direction, or perceives it as coming from there. If animals lack reason and belief, these predications must be something that their perception can carry out.

Plato did not have to face this problem. For even when he is tempted to deny the reasoning part of the soul to animals (and this is a subject on which he wavers to the end)<sup>7</sup>, he is still not obliged to deny them belief (*doxa*), since he is perfectly ready to associate belief with the lower, non-reasoning parts of the soul.<sup>8</sup>

I know of only two exceptions. One occurs in the *Theaetetus* and related dialogues, where one (not the only) definition of *doxa* makes it the outcome of *reasoning* (references above).<sup>9</sup>

The other occurs also in the *Theaetetus*, where the denial of reasoning to some (not all) animals may in the context imply a denial to those same animals of belief.<sup>10</sup>

But the *Laws*, written later, does not take any of this as settled.

Aristotle does three things. First, he tidies up the concept of reason (*logos*) in the direction of the *Theaetetus*, by bringing all of *doxa* (belief) under it (*DA* 428<sup>a</sup>19-24, see below). Secondly, he gives to perceptual content one of the most massive expansions in the history of Greek philosophy. Thirdly, despite expanding the role of perception, he maintains Plato's denial that perception involves belief or is a function of reason. As regards the expansion of perceptual content, not only does he incorporate in perception the one function recognized by Plato, perception of whiteness and other sense-qualities perceptible by only one sense, but he adds perception of the common qualities (*koina*) perceptible by more than one sense: movement, rest, shape, extension, number, unity.<sup>11</sup>

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<sup>6</sup> See *DA* 414<sup>b</sup>18-19, 428<sup>a</sup>19-24, 434<sup>a</sup>5-11, *PA*, 641<sup>b</sup>7; *EE* 1224<sup>a</sup>27, *Pol.* 1332<sup>b</sup>5: Alcmaeon *ap.* Theophrast. loc. cit.

<sup>7</sup> Contrast Plato, *Timaeus* 77 A-C, 91 D-92 C, *Statesman* 263 D, *Republic* 620 A-D, *Phaedo* 81 D-82 B, *Phaedrus* 249 B, *Laws* 961 D with *Republic* 441 A-B, *Symposium* 207 A-C, *Laws* 963 E (cf. *Theaetetus* 186 B-C, discussed below).

<sup>8</sup> e.g. Plato *Republic* 442 B-D, 574 D, 603 A, *Phaedrus* 255 E-256 A, *Timaeus* 69 D, *Laws* 644 C-D, 645 A. In *Timaeus* 77 A-C it is plants, not animals, which are distinguished as lacking *doxa*.

<sup>9</sup> Another account of belief, which fits some but not all of the cases, is that it results not from reasoning, but from fitting a memory imprint to a current perception, *Theaetetus* 193 B-195 E.

<sup>10</sup> Plato *Theaetetus* 186 B-C. I thank Myles Burnyeat for the reference.

<sup>11</sup> *DA* 418<sup>a</sup>17-18, 425<sup>a</sup>16, *Sens.* 442<sup>b</sup>5.

These are overlooked by Plato when he says that you cannot perceive through one sense what you perceive through another.<sup>12</sup>

Moreover, the common properties (*koina*) which Plato does recognize, such as likeness and difference, and which he (Plato) assigns to the province of reason,<sup>13</sup> are assigned by Aristotle to that of perception.<sup>14</sup>

This already involves perceiving a proposition, in other words, *that* something is the case—that the qualities differ. It has been shown by Stanford Cashdollar how much propositional perceiving Aristotle recognizes. One can perceive that the approaching thing is a man and is white, that the white thing is this or something else, whether the white thing is a man or not, what the coloured or sounding thing is, or where, that one is perceiving, walking, thinking, living, existing, that one is sleeping, that something is pleasant, whether this is bread, whether it is baked, 'this is sweet' and 'this is drink'. The lion perceives that the ox is near.<sup>15</sup>

It would be wrong to suppose that this propositional perception really involves an inference of reason<sup>16</sup> merely on the ground that sense-qualities, like colour, are said to be essential (*kath' hauto*) objects of perception, whereas the son of Diares and the son of Cleon, who enter into propositions, are said to be coincidental sense-objects (*kata sumbebēkos*). Coincidental does not mean inferential. I have argued elsewhere that the reason why colour is said to be essential to sight is that sight is *defined* as the perception of light, shade, and colour.<sup>17</sup>

By contrast the son of Diares is not essentially related to colours seen, and hence not to sight. It is this that accounts for his being called a coincidental object of perception. There is no suggestion that he is perceived only indirectly by way of inference.

Propositions are also involved in *phantasia*, which in Aristotle's *De Anima* is perceptual and post-perceptual appearance.<sup>18</sup>

Examples of post-perceptual appearances would be imagination, dreams, and memory, all due to prior perception. An example of perceptual appearance given by Aristotle is the appearance that the sun is quite small, only a foot across. This appearance too is due to (*hupo*) the perceiving.<sup>19</sup>

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<sup>12</sup> Plato, *Theaetetus* 184 E-185 A.

<sup>13</sup> Ibid. 184 D-187 B.

<sup>14</sup> Arist. *DA*, 426<sup>b</sup> 12-427<sup>a</sup> 14, 431<sup>a</sup> 20-4<sup>b</sup> 1, *Somn. Vig.* 455<sup>a</sup> 17-18.

<sup>15</sup> Arist. *DA* 418<sup>a</sup> 16, 428<sup>b</sup> 21-2, 430<sup>b</sup> 29-30, *EN* 1113<sup>a</sup> 1, 1147<sup>a</sup> 25-30, 1149<sup>a</sup> 35, *MA* 701<sup>a</sup> 32-3, cit. Cashdollar (1973). Also *EN* 1118<sup>a</sup> 20-3, 1170<sup>a</sup> 29-<sup>b</sup> 1; *DA* 425<sup>b</sup> 12, *Insomn.* 1, 458<sup>b</sup> 14-15, 462<sup>a</sup> 3. I am not quite convinced by Cashdollar's examples from *DA* 418<sup>a</sup> 21-3, 425<sup>a</sup> 25-7.

<sup>16</sup> This view is rejected by Hamlyn in Aristotle (1968) and Cashdollar (1973), who cites J. I. Beare, W. D. Ross, Irving Block, and Charles Kahn.

<sup>17</sup> Sorabji (1971).

<sup>18</sup> *DA* 3. 3.

<sup>19</sup> *DA* 428<sup>b</sup> 26.

The word *phantasia* is used in connection with perception, propositional or otherwise, just so long as we want to talk of things appearing. Plato and Aristotle in their discussions explicitly connect *phantasia* with the verb 'to appear' (*phainesthai*).<sup>20</sup> To mark the connection of *phantasia* with appearing, and to bring out the continuity between different texts, I shall use the translation 'appearance', although readers should be aware that some translators will render the same word as 'imagination' or as 'impression'. A perceptual appearance is typically an appearance *that* something is the case, or, as we would sometimes prefer to say, an appearance *as of* something's being the case. I shall call both of these appearances propositional, meaning by that no more than that something is a *predicated* of something. There is not merely an appearance of whiteness, but of whiteness as belonging to something or as being located somewhere. Aristotle grants perceptual appearance to animals, even though he seems uncertain whether it belongs to all animals<sup>21</sup>, as the Stoics were to insist. It cannot detract from the clear example of a propositional appearance that the sun is only one foot across that Aristotle later goes on to contrast appearance with affirming or denying as not being true or false, because it involves no combination of concepts (*sumplokē noēmātōn*, 432<sup>a</sup>10-12; cf. 431<sup>a</sup>8-16). We are free to assume that Aristotle is talking here of another kind of appearance, that involved in imaging (431<sup>a</sup>15). We need not therefore resort to the interesting device suggested by Irwin (1988), who concedes that for Aristotle a dog cannot have an appearance with the structure 'that it's red', but urges that we can still describe its appearance that way, because the unstructured appearance explains the dog's behaviour in the same way as would a structured belief.

The propositional content of perception and appearance answers another problem. It has been thought that Aristotle oscillates wildly on the mental capacities he allows to animals. Having distinguished animals from men as lacking reason in the *De Anima*, he none the less allows the lion to entertain propositions about the ox he is going to eat in the *Nicomachean Ethics*. Moreover, there and in the biological works he allows animals emotions, which are elsewhere treated as involving belief (*doxa*) in past or future harm or benefit.<sup>22</sup>

I think it can now be seen that this suggested oscillation is apparent rather than real. Perception was all along treated in the *De Anima* as admitting a propositional content. As for emotions, Aristotle (admittedly not out of any concern for animals) defines anger and fear as involving an *appearance* (*phantasia*) of past or future harm, as often as he mentions belief (*doxa*).<sup>23</sup>

<sup>20</sup> Plato, *Sophist* 264 A-B; Arist. *DA* 3. 3, 428<sup>a</sup>13-14.

<sup>21</sup> Contrast *DA* 415<sup>a</sup>11, 428<sup>a</sup>10, 22, 24 with 433<sup>b</sup>28, 434<sup>a</sup>1-5.

<sup>22</sup> Fortenbaugh (1971). He has quite correctly put to me that some of the beliefs involve a *moral* judgement that the harm is unjustified. Even so, that is not true of fear, while pity is not ascribed to animals and anger is defined in terms of a moral belief only in the legal context of the *Rhetoric*, not in the biological context of *DA* 403<sup>a</sup>25-<sup>b</sup>9, nor yet in that of the *Topics*.

<sup>23</sup> A. *Rh.* 1378<sup>a</sup>31, 1382<sup>a</sup>21-2, *Top.* 156<sup>a</sup>32-3.

And the Aristotelian Aspasius (again for independent reasons) later recommends that this become the preferred definition of emotions.<sup>24</sup>

Admittedly, *post*-perceptual appearance, mere *imaging* of terrible things, does not provoke fear, according to Aristotle.<sup>25</sup>

But there is no reason why *perceptual* appearance should not. There need, then, be no change in the concept of emotion when this is ascribed to animals who lack belief. Had there really been an oscillation, I do not think that Aristotle could have been protected from the charge of confusion by saying that he used different explanatory frameworks in different places. For he is not an anti-realist, who believes that explanations are helpful devices which need not correspond to the real nature of things.

We can now see how generous a content Aristotle gives to sense-perception compared with most other Greek philosophers. I have already commented on Plato's parsimony. The Platonist author of the *Didaskalikos* sharpens Plato's point when he says that even sense-qualities like whiteness are discriminated (*krinein*) not without a certain empirically based type of reason associated with belief (*ouk aneu doxastikou logou*).<sup>26</sup>

The Cyrenaics hold that one can only be aware of one's own experiences.<sup>27</sup>

The Epicureans allow all perceptual appearances to be true, but all true only the films of atoms impinging on the sense-organs, which may not faithfully represent the external causes.<sup>28</sup>

The Pyrrhonian sceptics express perceptual appearances as propositions: 'honey is sweet'. But on one interpretation this is no more than a statement of, on another a mere reaction to, how the perceiver is himself perceptually affected.<sup>29</sup>

As for the Stoics, although they allow a generous content to perceptual appearances in humans, I shall have to return to the question how much content they allow to perceptual appearances in animals or infants.

Having expanded perceptual content, Aristotle is faced with his remaining task. He needs to show that this expansion does not after all turn perception into belief, or make it a function of reason. For he agrees with Plato that this would be wrong. One of Aristotle's devices for distinguishing perception from belief (*doxa*) is to call it a kind of discriminating (*krinein, kritikē*). It has been argued by Theo Ebert that *krinein* does not in the Greek of Aristotle's time yet mean judgement.<sup>30</sup>

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<sup>24</sup> Aspasius, in *EN* 44. 33-45, 10 (Heylbut). So also, for different reasons again, Posidonius in Galen, *PHP* (De Lacy).

<sup>25</sup> A. *DA* 427<sup>b</sup> 21-4.

<sup>26</sup> Albinus (?), *Didaskalikos* 156. 2-10 Hermann. In requiring this type of reason (which is described as a set of acquired, as opposed to innate conceptions), the author diverges from Plato, but in a way that sharpens Plato's view of how little perception can achieve on its own.

<sup>27</sup> Plut. *Col.* 1120 C; cf. Eusebius, *PE* 14. 19. 2-3.

<sup>28</sup> S. E. *M.* 7. 206-10, Plut. *Col.* 1121 A-B.

<sup>29</sup> S. E. *PH* 1. 13, 1. 19-24.

<sup>30</sup> Ebert (1983): except in the sense of a legal judgment.

If not, there should be no danger of confusing it with *doxa* (belief). But it can cover a wide range of activities short of belief, from the perception of colour to the perception of propositions. It can cover, for example, the kind of activity in which a bird engages in selecting some feathers for its nest while discarding others. Aristotle has a further device for making perception fall short of belief, but this one commits him to disagreeing with Plato. Plato had defined perceptual appearance (*phantasia*) as a belief formed through sense perception (*doxa di' aisthēseōs*).<sup>31</sup> Aristotle denies that perceptual appearance is belief, and he produces an excellent argument for his denial: we can have the perceptual appearance that the sun is quite small, only a foot across, but we may believe that it is very large.<sup>32</sup> The argument enables Aristotle to treat perception and perceptual appearance as only a half-way house on the way to *doxa*. His argument has been much repeated in the modern literature against the view that perception is some function of belief.<sup>33</sup> Plato by contrast had classified illusion as a case of *doxa*.<sup>34</sup>

end p.199

Aristotle has two more arguments, separated by a 'furthermore' (*eti*), to show that what animals possess does not amount to belief (*doxa*).<sup>35</sup> First, belief involves being convinced (*pistis, pisteuein*), which animals cannot be. Conviction is more passive than the assent (*sunkatathesis*) later required by the Stoics, but it plays a similar role in the argument that animals cannot be said to have beliefs. Aristotle's other claim involves something slightly closer to assent: belief involves being open to persuasion (*pepeisthai, peithō*), which in turn implies possessing reason (*logos*). This has been called a 'rhetorical' criterion for belief, on the grounds that persuasion involves dialogue with *others*.<sup>36</sup> But I think that what Aristotle actually has in mind is Plato's definition of belief in the *Theaetetus* and *Sophist* as the outcome of a silent dialectical conversation (*logos*) within the soul.<sup>37</sup>

Plato says explicitly that others are not involved, and I assume that correspondingly Aristotle would allow his persuasion to be self-persuasion, while complaining that animals are not capable even of this.

So much for Aristotle's distinction of perception from belief. But a difficulty may be felt about his idea that sense-perception enables animals to make predications, for example, to perceive sweetness as belonging to something. How can they perceive anything so complex, if they do not have concepts? To this Aristotle might find two

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<sup>31</sup> Plato, *Sophist* 263 E-264 D.

<sup>32</sup> *DA* 428<sup>b</sup> 3-10.

<sup>33</sup> It is recognized as a difficulty by Armstrong (1968, relevant section reprinted in Dancy 1988), and it is urged as a difficulty against theories such as those of Armstrong and Pitcher (1971) by Jackson (1977), Fodor (1983) and Crane (1988, 1989).

<sup>34</sup> Plato, *Republic* 603 A.

<sup>35</sup> *DA* 428<sup>a</sup> 19-24.

<sup>36</sup> Labarrière 31-4.

<sup>37</sup> Plato, *Theaetetus* 189 E-190 A, *Sophist* 263 E ff.

answers. First, some animals may perhaps have concepts. Secondly, Aristotle might take comfort from certain modern discussions which purport to show that perceptual content can be predicational without the use of concepts being implied.

To take the second point first, a number of discussions have urged that perception requires no conception.<sup>38</sup>

A person can perceive a building as eight-sided, for example, and generally be able to recognize eight-sided buildings, without having the concept of eight, or other relevant concepts. He may not even be able to count. It may be a controversial claim that his recognitional capacity would not itself amount to his having a concept of eight-sidedness.<sup>39</sup>

But there is a more formal argument for perceptual predication without concepts, which can be expressed in terms of an example of Aristotle's already mentioned. The argument is that if you can rationally wonder with regard to the perceived length of a foot-rule and the perceived diameter of the sun whether these two lengths are really the same, you must be conceptualizing them differently—even if you are conceptualizing each as 'that length'. For after all no one can rationally wonder whether A is A, where A is one and the same concept, but only whether A is B. None the less, even though you are conceptualizing the two lengths differently, you may be perceiving them in exactly the *same* way and (*inter alia*) as the same length, which implies that your *perceiving* them does not involve conceptualizing.<sup>40</sup>

end p.200

There are other modern arguments too of the same general type.<sup>41</sup>

The upshot of these arguments is that, although perceiving the sun as a foot across doubtless involves the use of concepts, perceiving it as matching something else in size, or as small, does not necessarily do so. The argument is like Aristotle's in attempting to locate perception on the map somewhere short of belief.

Aristotle's other recourse might be to argue that some animals do in any case have concepts. He does discuss the issue of whether perception involves concepts, in a passage, *APo.* 2. 19, which may again be in the tradition of Alcmaeon.<sup>42</sup>

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<sup>38</sup> See Evans (1982), Peacocke (1986 and forthcoming), Crane (1988), Millar (1985-6); Irwin (1988).

<sup>39</sup> See Geach (1957) and contrast Peacocke (1989), Irwin (1988).

<sup>40</sup> Example adapted from Peacocke (1986 and forthcoming).

<sup>41</sup> Crane (1988) appeals to the possibility of conflicting appearances within sense-perception. An analogous argument applied to the case of a conflict between sense-perception and belief might say that the same subject (the sun) cannot rationally be simultaneously believed to be large and believed to be not large, so long as it is conceived in terms of the same concepts (conceived as the sun) and largeness is conceived in the same way. When therefore we simultaneously believe that the sun is large and *perceive* it as small, this suggests that perception differs from belief in not *conceptualizing* the sun or largeness at all. The simplest reply, as Crane's retraction (1989) makes clear, is that it is perfectly rational simultaneously to *believe* that my bank balance is small and to *wish* that it were large, employing concepts in both cases. So whatever may be the case about two opposite *beliefs*, it remains to be shown what is irrational about an opposition between belief and such *different* states as wishing or perceiving (Cf. Plato, *Republic* 436 A-439 E, 602 E).

<sup>42</sup> The passage is in the tradition of the developmental psychology which is described by Plato at *Phaedo* 95 B, and often attributed to Alcmaeon on the basis of the reference to the brain.

The passage is sometimes taken as a treatment of our acquisition of universal concepts and sometimes as a treatment of our acquisition of universal truths. In fact there is no conflict: to acquire one is to acquire the other, as a preceding discussion in *APo.* 2. 8-11 shows. To acquire the universal truth that lunar eclipse is some kind of lunar loss of light, or that it is a lunar loss of light due to the earth's screening of the sun, *is* to acquire an (increasingly scientific) concept of lunar eclipse. Aristotle firmly argues that sense-perception must chronologically precede (so that it does not presuppose) the formation of universal concepts. On this both Stoics and Epicureans would agree. Perception for them precedes, and cannot pre-suppose, the formation of conceptions (*ennoiai*) and preconceptions (*prolēpseis*).<sup>43</sup>

Aristotle does not deny, however, that those who do have concepts may bring them to bear in perception. Does this include animals? That depends on how we take his remarks on experience (*empeiria*: compare our 'empirical'). Although he says that animals have little experience<sup>44</sup>, this presumably implies *some*, rather than, as the commentator Alexander followed by Asclepius half suspects, none. And does experience involve having universal concepts? This may seem the easiest way to read Aristotle's words, 'experience or the whole universal stabilized in the soul', since it is difficult (not impossible) to take the second of these two descriptions ('the whole universal') as referring to something *distinct* from the first ('experience').<sup>45</sup>

Moreover, when an illustration is offered of experience in humans, the man of experience is described as knowing that eating fowl is good for health, a truth which seems general enough. If he is said to know only the particular (*kath' hekasta*) rather than the universal (*katholou*), this is only because he is ignorant of the more universal and explanatory truth that light meat is easy to digest.<sup>46</sup>

On the other hand, there is evidence on the other side. For one thing, Aristotle denies that animals (*thēria*) have any universal concept (*katholou hupolēpsis*)—they have only memory and perceptual appearance (*phantasia*) of particulars.<sup>47</sup>

Moreover, in the very passage where he allows animals a little experience, he treats experience in humans rather cautiously. It seems to be a conjunctive apprehension

<sup>43</sup> See for the Stoics e.g. Cic. *Acad.* 2. 30-1, 'Plut.' (Aët.) 4. 11. 1-4 (*Dox. Gr.* 400 = *SVF* 2. 83), and for the Epicureans e.g. Diog. Laert. 10. 31, and Philodemus, *On the Gods*, col. 12, 10 (Diels): animals lack *hupolēpseis*. I doubt Diels's view in his edition (p. 63) that in Polystratus, *On Irrational Contempt*, col. 1, the words 'each of these' refer to concepts possessed by animals.

<sup>44</sup> Arist. *Metaph.* A1, 980<sup>b</sup> 26-7, with Alexander, *In Meta.* 4. 15, (Hayduck); Asclepius, *In Meta.* 7. 24 (Hayduck).

<sup>45</sup> Aristotle *APo.* 100<sup>a</sup> 6-8. The expression might instead refer, as Myles Burnyeat has pointed out to me, to technological skill (*technē*). This is uneasy, because the end of the sentence then startles us, saying as it does that what has been referred to is merely that from which comes the origin (*archē*) of technological skill. It would need to be reinterpreted as meaning that experience (*empeiria*) provides the origin of technological skill, and technological skill the origin of scientific understanding (*epistēmē*).

<sup>46</sup> Arist. *EN* 1141<sup>b</sup> 14-21.

<sup>47</sup> *EN* 1147<sup>b</sup> 5, stressed by Irwin (1988).



(*hupolēpsis*), or set of thoughts (*polla ennoēmata*) about particular cases (*kath' hekaston*), which guides action in the next case, but which does not yet involve a single universal (*mia katholou*). The man of experience knows that this remedy helped Callias when he had this illness, and similarly for Socrates and each of many others. But he has not marked off these people as belonging to a single kind, so that he can say the remedy helps all phlegmatic, or bilious, or feverish people when they have this illness. There is then some universal concept which he has not got.<sup>48</sup>

We may protest that he has other universal concepts, 'this remedy', 'this illness'; why does Aristotle not draw attention to this? Perhaps the answer is that he is here interested only in the universal concepts of *technology* and *science*. But it would be odd if those who lacked these special qualifications had no universal concepts at all. In fact, we have noticed Aristotle granting to laymen a pre-scientific concept, based on prior observation, of lunar eclipse as *some* kind of lunar loss of light. The present passage, then, is not denying the man of experience some pre-scientific and pre-technological universal concepts. And if universal concepts are in another text denied to animals, this is perhaps because that text overlooks the modest concession offered here, that animals do have a *small* share of experience.

It is not quite excluded, then, that Aristotle might grant some animals universal concepts. What is clear is that he grants them predicational perception and a little experience, and these two concessions represent two ways in which he compensates them for their lack of beliefs (*doxai*). But how, it may be wondered, does he distinguish their experiential information from belief? He tries to do so by defining experience as consisting of many memories<sup>49</sup>, and he is peculiarly insistent that memory belongs to the perceptual part of the soul to which perceptual appearance (*phantasia*) also belongs.<sup>50</sup>

More exactly, memory is the having of a mental image (*phantasma*, a cognate word) taken (*hōs*) as a copy of that of which it is an image.<sup>51</sup>

We can see how concerned Aristotle is to classify states of mind on one side or other of the perception-belief frontier. And we need not think that he has transferred memory to the wrong side of the frontier when he remarks that it involves *saying* in one's soul that one has encountered the thing before<sup>52</sup>, for such metaphorical references to saying are common enough to be discounted.<sup>53</sup>

The Stoics, some of them, would agree with Aristotle, for they too analyse experience and memory in terms of perceptual appearance (*phantasia*). Experience for them is a

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<sup>48</sup> Arist. *Metaph.* 981<sup>a</sup>5-30.

<sup>49</sup> Arist. *APo.* 100<sup>a</sup>5-6, *Metaph.* 980<sup>b</sup>29-30.

<sup>50</sup> Arist. *Mem.* 450<sup>a</sup>16-17, 22-3.

<sup>51</sup> *Ibid.* 451<sup>a</sup>15. My understanding of *phantasma* as a mental image in Aristotle, which I take to be confirmed by the very pictorial account of it throughout the *De Memoria* (see Sorabji in Aristotle 1972, *passim*), has been defended by Huby (1975).

<sup>52</sup> Arist. *Mem.* 449<sup>b</sup>22-3.

<sup>53</sup> A list is given by Cashdollar (1973), 162.

multiplicity (*plēthos*) of similar appearances from many memories,<sup>54</sup> while memory is a storing of appearances.<sup>55</sup>

Despite that, there are differences. For in humans perceptual appearance is, for the Stoics, tantamount to rational thought.<sup>56</sup>

Moreover, some Stoics deny animals learning by experience (*experisci, experimentum, usus*) in contexts where others might have ascribed it<sup>57</sup>, and some of them deny animals memory except in the sense of recognition of what is perceptually present, and treat memory proper as requiring rational reflection (*deliberatio, consideratio*).<sup>58</sup>

In another respect the Stoics are very like Aristotle. For they deny to animals reason and belief (although reason is slightly redefined)<sup>59</sup>, and so they ought, like Aristotle, to expand perceptual content, if they are to account for the ability of animals to get around in the world. Yet this time the orthodox interpretation creates a problem, since it drastically narrows the perceptual content of animals. On this interpretation, which has attracted the ablest scholars<sup>60</sup>, perceptual appearance (*phantasia*) has propositional content not in animals, but only in humans. I have therefore attempted elsewhere<sup>61</sup> to raise a doubt about the orthodox interpretation, and to suggest that the Stoics allow animal perception as much content as does Aristotle. Here I will only indicate the main lines of that counter-proposal.

One argument for the orthodox interpretation of the Stoics is that neither animals nor infants have concepts.<sup>62</sup>

The infant's mind, in a passage already cited<sup>63</sup>, is compared to blank paper. But we have now seen that the lack of concepts would not, at least in the opinion of various modern philosophers, rob animal perception of propositional (that is, predicational) content. And we cannot assume that the lack of concepts would weigh with the Stoics either.

I am also not convinced by the argument that a *lekton* (a sayable, or, roughly speaking, a proposition) is defined as corresponding only to a rational appearance<sup>64</sup>,

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<sup>54</sup> 'Plut.' (Aët.) 4. 11. 1-4 (*Dox. Gr.* 400 = *SVF* 2. 83).

<sup>55</sup> *S. E. M.* 7. 372 (*SVF* 2. 56).

<sup>56</sup> 'Plut.' (Aët.) 4. 11. 1-4 (*Dox. Gr.* 400 = *SVF* 2. 83); Diog. Laert. 7. 51, 7. 61; Stobaeus 1, p. 136. 21 Wachsmuth (both in *SVF* 1. 165); pseudo-Galen, *Def. Med.* xix. 381 Kühn (*SVF* 2. 89).

<sup>57</sup> *Sen. Ep.* 121. 19-23; Hierocles 1. 51-3. 52 (von Arnim and Schubart).

<sup>58</sup> Only recognition: *Sen. Ep.* 124. 16, *Plut. De Sollertia Animalium* 961 c; *Porph., Abst.* 3. 22. Rational reflection: Calcidius, *In Tim.* 220. Cf. the Antiochan Lucullus in *Cic. Acad.* 2. 38: memory requires assent.

<sup>59</sup> Reason is a collection of conceptions, Galen, *PHP* 5. 3, p. 421 M (*SVF* 2. 841) and as such can by the Middle Platonists be distinguished from the intellect as being its tool, 'Albinus', *Didaskalikos*, ch. 4.

<sup>60</sup> Frede (1983); Inwood (1985), 73-4; Long-Sedley (1987), 240; Labarrière (forthcoming). I thank all of them for friendly and helpful discussion.

<sup>61</sup> Sorabji (1990). Further objections are addressed there.

<sup>62</sup> Frede (1983); Long-Sedley (1987), 240.

<sup>63</sup> 'Plut.' (Aët.) 4. 11. 1-4 (*Dox. Gr.* 400 = *SVF* 2. 83).

<sup>64</sup> *S. E. M.* 8. 70; Diog. Laert. 7. 63.

that is<sup>65</sup>, to the appearance enjoyed by a rational being, as opposed to an animal. It would be wrong to infer from this that what appears to an animal cannot have corresponding to it a proposition, or sayable. For propositions are here being defined—and it is quite legitimate to define things this way—by reference to a sufficient, not a necessary, condition. What subsists in accordance with the appearance enjoyed by a rational being will be a star example of a proposition (*lekton*). But there may be other *lekta* too, and indeed we know there are. The ones that would interest us would subsist in accordance with the appearance enjoyed by an animal. But we know that there must be *lekta* which correspond to no appearances at all. For the effects of causes are all *lekta*<sup>66</sup>, whether they have ever been noticed and appeared to anyone, or not.

The interpretation for which I have argued is that in Stoicism the perceptual appearances (*phantasiai*) enjoyed by animals are (at least in many cases) verbalizable and conceptualizable by us, even though not by the animals themselves. What has not, I think, been noticed is that appearances that something is the case are repeatedly described, not as verbalized and conceptualized, but as verbalizable and conceptualizable.<sup>67</sup>

The point is that it is not said by whom. Evidence already cited suggests that in humans perceptual appearances are always conceptualized, whereas in animals they never are, which is why the *phantasiai* of humans are distinguished as rational (*logikai*) and as thoughts (*noēseis*). But that does not mean that we cannot verbalize and conceptualize how things appear to animals, and do so in propositional form. The Stoics themselves seem very ready to do so. Chrysippus describes a hunting dog that comes to a crossroads where its quarry might have gone in any of three directions. The dog sniffs the first two, perceives no scent, and takes the third *without* sniffing. It is said 'virtually' (*dunamei*) to go through a syllogism about its quarry: 'The animal went either this way, or that way, or the other way. But not this way, or that way. So that way.'<sup>68</sup>

Chrysippus is not conceding that the dog really reasons, or forms *doxai*, beliefs. It is only doing something analogous (*dunamei*). But how could there be an analogy, if its sense-perception allows it only to grasp a scent? At the least, it must perceive the *absence* of a scent and perceive it as pertaining to one direction rather than another. And this implies that its perceptual appearance involves predication.

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<sup>65</sup> Diog. Laert. 7. 51.

<sup>66</sup> S. E. *M.* 9. 211. The point is well made by Long-Sedley (1987), 201-2.

<sup>67</sup> Diog. Laert. 7. 49; 'Plut.' (Aët. 4. 12. 1) (*Dox. Gr.* 401 = *SVF* 2. 54); S. E. *M.* 7. 244, 8. 70 (*SVF* 2. 187), 8. 10 (*SVF* 2. 195).

<sup>68</sup> S. E. *PH* 1. 69; Plut. *De Sollertia Animalium* 969 A-B; Philo, *De Animalibus* 45; Porph. *Abst.* 3. 6; Aelian, *Nat. An.* 6. 59.

Also important is what the Stoics Chrysippus, Seneca, and Hierocles say about the self-preservation of animals depending on their awareness of their own persons, in relation to the surrounding environment.<sup>69</sup>

It would not be enough to secure preservation that an animal's body should appear to it without further characterization. The richest set of examples is supplied by Hierocles. Admittedly, neither he nor the others use the verb 'to appear' (*phainesthai*). But he repeatedly speaks of animals grasping (*antilambanesthai*; *katalambanein*), or being conscious (*[sun]aisthanesthai*). The frog, for example, is conscious (*sunaiasthanetai*) of how far the distance for a leap should be.<sup>70</sup>

A similar view of animals is put in the mouth of a non-Stoic character, but with the standard Stoic example of a syllogistic premise, by Plutarch:

Wolves, dogs, and birds surely perceive (*aisthanesthai*) that it is day and light. But that if it is day, it is light, nothing other than man understands.<sup>71</sup>

This passage, though not explicitly about the Stoics, gains significance from a closely related one which is. The Stoics hold that inference from signs is peculiar to man. Such inference involves syllogistic premises of an 'if. . . then' variety, like those discussed in the Plutarch passage. In reserving it for man, the Stoics concede that non-rational animals receive perceptual appearances. What then do they deny? Not, it turns out, that these appearances are propositional, although that would have clinched the case, but only that these animals have appearances arising from inference and combination (*metabatikē*, *sunthetikē*), appearances which explain (*dioper*) our having the concepts of logical implication (*akolouthia*) and sign.<sup>72</sup>

Further, in their efforts to deny reason to animals, the Stoics redefine the kinds of mental capacity available to them. Animals cannot, for example, remember what is absent, but only recognise what is perceptually present.<sup>73</sup>

Their memory therefore is merely the apprehension of a proposition (*katalēpsis axiōmatos*) in the past tense of which the present tense has been apprehended from perception.<sup>74</sup>

Here in the very act of downgrading animal capacities, the Stoics evidently concede to them the apprehension of propositions.

Exactly the same happens with one of the other Stoic redefinitions. Seneca denies that animals are capable of anger, because they are not rational<sup>75</sup>, whereas anger involves rational assent to the appearance of injustice (*species iniuriae*).<sup>76</sup>

end p.205

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<sup>69</sup> Chrysippus *ap.* Diog. Laert. 7. 85; Sen. *Ep.* 121, 7-10; Hierocles, ed. H. von Arnim, *Berliner Klassikertexte* 4 (Berlin, 1906), 1. 39-5-7.

<sup>70</sup> Hierocles 2. 37-8.

<sup>71</sup> Plut. *On the E at Delphi* 386 F-387 A. I thank Brad Inwood for the reference.

<sup>72</sup> S. E. M. 8. 276.

<sup>73</sup> Sen. *Ep.* 124, 16.

<sup>74</sup> Plut. *Sollertia* 961 C; repeated by Porph. *Abst.* 3. 22.

<sup>75</sup> Sen. *De Ira* 1. 3. 3-8, esp. 1. 3. 4.

<sup>76</sup> *Ibid.* 2. 3-4.

They merely seem to be angry because they have an appearance, albeit a muddled and confused one<sup>77</sup>, and an involuntary reaction (*impetus*), which is not, however, a rational one. Once again, in downgrading their capacities, a Stoic none the less concedes that animals entertain at least a muddled appearance. And that muddled appearance is presumably a propositional one—the appearance that injustice has occurred.

On the orthodox interpretation, the Stoics will have been inconsistent in allowing such consciousness to animals. Their official view should have led them to reject Aristotle's expansion of perceptual content. On the interpretation I have offered, they will have endorsed it. Equally, I would give an opposite answer to the interesting question that has been raised by C. Gill (1991), whether we should compare the Stoics with Donald Davidson or Daniel Dennett. Davidson (1982) would be the orthodox choice, because he denies propositional attitudes to animals. But I would prefer Dennett (1976), if a selection is to be made, because he allows the ascription of propositional attitudes to animals, provided their behaviour can be analysed *by us* in intentional terms.

Before returning to Aristotle, I should like just to consider whether the Epicurean school had any alternative strategy to enable animals to get around in the world. The Epicureans fall into two camps. Some, notably Lucretius, allow animals to have a mind or thought, whereas others deny them reason, reasoning, thinking, and belief.<sup>78</sup> Illustrating the first tendency, Lucretius goes to some length to say that animals dream<sup>79</sup>, while arguing that in dreams the mind (*mens, animus, mens animi*), the equivalent of Epicurus' thought (*dianoia*), is at work, selecting for close attention some of the many configurations of atoms that reach the dreamer.<sup>80</sup>

In fact he explicitly ascribes a mind (*mens, animus*) to horse, lion, and deer.<sup>81</sup> So he need have no problem about how animals cope.

Other Epicureans deny to animals reason and reasoning (*logos, logismos, epilogismos*).<sup>82</sup>

One denies them not only reason, but also thinking (*noēsis*—the terms are not sharply distinguished) and belief, including false belief (*doxa, pseudodoxia*).<sup>83</sup>

His method of compensating them for the loss of belief and thought is to say that they have *analogues* of belief.<sup>84</sup>

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<sup>77</sup> Ibid. 1. 3. 7.

<sup>78</sup> For the contrasting views see H. Diels (ed.) Philodemus *Über die Götter* 1, p. 63; Annas, (forthcoming) in J. Brunschwig and M. Nussbaum (eds.), *Passions and Perceptions*.

<sup>79</sup> Lucr. 4. 984-1010.

<sup>80</sup> Epicurus, *Letter to Herodotus*, ap. Diog. Laert. 10. 51; Lucr. 4. 728-31, 747-8, 750-61, 767, 803-15, 975-7.

<sup>81</sup> Lucr. 2. 265, 268, 270, 3. 299.

<sup>82</sup> Hermarchus ap. Porph. *Abst.* 1. 12 (*logos*); Polystratus, *On Irrational Contempt* col. 6 (*logismos*), col. 7 (*logismos*, at least such as ours) Indelli; Philodemus, *On the Gods*, col. 13, line 2 (*epilogismos*), 15. 28 (*logismos*) Diels.

<sup>83</sup> Philodemus 12. 17, 13. 39 (*noēsis*), 13. 6-7 (*doxa*), 14. 34 (*pseudodoxia*).

Another strategy for the Epicureans might be extrapolated from the suggestion<sup>85</sup> that they belong to the same tradition as those empiricist doctors who were called memorists. On the memorists' view, even human beings do not need reason. Thinking is a function of memory, and neither memory nor thinking is a function of reason. Reason is very narrowly conceived as performing certain deductive operations postulated by logicians. Interesting as this view is, I doubt if any of it attracted the Epicureans. For to humans they allow reason<sup>86</sup>, while to animals one, we have seen, denies not only reason, but also thinking and belief. In another author, memory is subordinated to thought (*dianoia*), because in memory thought receives likenesses of what was formerly perceived.<sup>87</sup>

Similarly, in yet another, memory is said to be in abeyance during dreams<sup>88</sup>, even while, as we have seen, thought (*dianoia*), or equivalently the mind (*mens, animus, mens animi*) is at work. I believe we find a larger role assigned to memory in such Platonist treatises as the *Didaskalikos* than we do in the empiricist treatises of the Epicureans.

If there is another strategy open to the Epicureans for compensating animals, it would lie in expanding perceptual content, like Aristotle and, I believe, the Stoics. In this some help might be provided by Epicurus. He speaks of perceptual appearances as being true<sup>89</sup>, and he gives a causal analysis of truth not unlike the subsequent Stoic analysis of what it is for a perceptual appearance to be 'cognitive' or warranted<sup>90</sup>, and not unlike certain modern accounts of what it is for primitive perceptual states to have an informational content.<sup>91</sup>

Unfortunately there are complications, for Epicurus holds that perceptual appearances are all true, but true only of the films of atoms that impinge on the sense-organs. As regards the physical objects which transmit those films, there is something that can be true or false of these, but that is *opinions* based on the appearances, not the appearances themselves.<sup>92</sup>

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<sup>84</sup> Philodemus 13. 17-18 (analogue of *prosdokia*: belief about the future). 14. 6-8 may even go further and contemplate their having analogous beliefs, rather than analogues of belief.

<sup>85</sup> Frede (1989). I thank Stephen Everson for drawing my attention to his fascinating account of the memorists.

<sup>86</sup> *Logos* in Hermarchus *ap. Porph. Abst.* 1. 12; animals are given the conventional description contrasting them with man as irrational, *aloga*.

<sup>87</sup> Diogenes of Oenoanda, new frag. 5. 3. 3-14, Smith. Admittedly, some memory at least is treated by Hermarchus as irrational (*alogos*) and contrasted with reasoning (*epilogismos*) *ap. Porph. Abst.* 1. 10.

<sup>88</sup> Lucr. 4. 765.

<sup>89</sup> S. E. M. 7. 205, 8. 63.

<sup>90</sup> Diog. Laert. 7. 46; Cic. *Acad.* 2. 77; S. E. M. 7. 248-51; 11. 183.

<sup>91</sup> Dretske (1981); Burge (1986). The debate on the viability of such analyses continues.

<sup>92</sup> S. E. M. 7. 208, 8. 63; Epicurus, *Letter to Herodotus*, in Diog. Laert., *Lives* 10. 50-1.

Nonetheless, he does not seem to deny that perceptual appearances are about the transmitting physical objects, even if they are not true or false of them. Vision sees a tower as small and round or as large and square.<sup>93</sup>

It sees not only colour, but the *distance* to the coloured thing, not only light and shade, but *where* they are.<sup>94</sup>

There is therefore predication, and the content of vision is propositional in the sense I have been using. It looks as if a perceptual appearance which is true of the impinging film is also true of how the physical object appears, though neither true nor false of how it really is. Given that the appearances are propositional, that appearance is not always a bad guide to future experience, and that memory should enable an animal to act on those appearances which are good guides, our Epicureans may be able to give animals enough perceptual content to manage in the world.

I have presented Aristotle as a catalyst in the debate on how perception relates to other capacities of mind, particularly belief and reason, a debate which was made urgent by his denial of these last capacities to animals. This denial necessitated an expansion of the content of perception and its differentiation from belief—a discussion which is still continuing today.

I can now draw a general conclusion about Aristotle's Philosophy of Mind. He does not try to reduce perception to things at a *different* level, such as physiological states, or behaviour, or the performance of functions. Rather he relates it to capacities at the *same* level, such as belief, reason, appearance, memory, experience, and concept formation. Yet many commentators have seen Aristotle as a reductionist, that is a materialist<sup>95</sup>, at a time when materialistic theories were dominant, and as a functionalist<sup>96</sup>, when theories of that kind prevailed. Some of my own earlier ideas were careless enough to suggest that I too favoured, or at least gave comfort to, a functionalist interpretation.<sup>97</sup>

But if I were now to compare Aristotle with any contemporary philosophers, I would compare him with those who are distinguishing the content of perception and thought, thus relating capacities at the same level, rather than reducing them to physiology, behaviour, or function.

I would add more: I think Aristotle's relation of sense-perception to other capacities would be seen by him as throwing light on the *formal* cause of perception, not the *material* cause. The same happens with anger, whose material cause is specified as a

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<sup>93</sup> S. E. M. 7. 208-9; Lucr. 4. 353-63.

<sup>94</sup> Lucr. 4. 379-86; anonymous Epicurean treatise on the senses Herc. Pap. 19/698, col. 25, fr. 21 Scott, translated Long-Sedley (1987), 80.

<sup>95</sup> Slakey (1961), 470; Matson (1966).

<sup>96</sup> Hartman (1977); Wilkes (1978), ch. 7; Nussbaum (1978), 61-74, drawing on Putnam (1975); Nussbaum-Putnam, 'Changing Aristotle's Mind', pre-publication version of ch. 3 above.

<sup>97</sup> Wilkes (1978); Burnyeat pre-publication version of ch. 2 (hereafter 'Burnyeat'). I argued that Aristotle supplied the materials for defining anger by reference to behaviour. But he did not do this as part of a general programme, and I think it no accident that I found no further similar examples.

physiological process, but whose formal cause relates it to another capacity: desire. For the formal cause of anger is the desire to retaliate.<sup>98</sup>

Thus I do not agree with the view that Aristotle's account of perception and anger as each composed of a material and formal aspect really boils down to a polite form of materialism, in which there is nothing more than a physiological process.<sup>99</sup>

Rather, the specification of the formal cause by reference to other capacities is meant to tell us something about what we should call the intentional aspect of anger and perception, even if he does not himself characterize it as intentional.

This brings me to the second part of the chapter. For many commentators have picked out a group of phrases (becoming like, being potentially such, receiving form without matter) which I believe describe the physiological process in sense-perception, in other words its material cause. But others have construed them as referring to some cognitive representation. One recent writer, finding this implausible, has suggested that Aristotle had not yet distinguished physiological process from cognitive representation, since he lacked understanding of the intentional character of representation.<sup>100</sup>

But I believe that these commentators have been looking in the wrong place. What we should call the intentional aspect of perception is handled in the passages we have already looked at. The passages to which I shall now turn are concerned with its physiological aspect. But the conviction has been so strong that they are concerned with something else that it will take me a little time to put the case.

## II

Controversy has centred on an interconnected group of phrases. Aristotle says that in perception the sense-organ becomes like the thing perceived, is potentially such as the thing perceived is already, and receives the form of the thing perceived without matter. Some (myself included) have taken these phrases, despite the mention of form, to refer to the material cause of perception, its physiological process. Others have taken them or at least the last phrase, to refer to the formal cause. There are two corresponding ways of construing the last phrase grammatically. I have followed the oldest interpretation according to which it means that the organ receives form without *receiving* matter. On Philoponus' rival interpretation, the reference is to receiving form without *standing to it as* matter.

My present conviction is that at least two of the phrases, and probably all three, refer to the physiological process, although the case of the 'reception of form' is slightly less certain. Moreover, I still take the physiological process to occur as follows. In vision, for example, the eye-jelly (*korē*) does not receive particles or other bits of

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<sup>98</sup> DA 403<sup>a</sup>3-<sup>b</sup>19.

<sup>99</sup> Williams (1986).

<sup>100</sup> Glidden (1984), 128-9.



*matter* from the scene observed. It simply takes on colour patches (perceptible *forms*) to match it.<sup>101</sup>

One advantage of understanding a literal taking on of colour is that this explains how shapes and sizes can be received: the coloured patches in the eye-jelly have shapes and (small-scale) sizes corresponding to those of the scene. The reception of shape and size had previously been thought to constitute a difficulty for any such literal interpretation, and it had also been thought that the literal interpretation would be 'open to devastatingly obvious attack', since we don't find people's eyes going coloured, or their ears noisy.<sup>102</sup>

But the relevant organ is deep within, as I argued. For it is the *korē* which takes on colour patches<sup>103</sup>, and the *korē* is not the pupil, as all recent English translators of the psychological works suggest,<sup>104</sup> but the eye-jelly within the eye.<sup>105</sup>

It would not have been obvious, with the instruments then available, that the eye-jelly did not go coloured, or the inside of the ear noisy.

Reactions to this literal physiological interpretation have been varied. It has been sometimes accepted and sometimes rejected<sup>106</sup>, the latter in one case on the ground that it would give essential support to the functionalist interpretation<sup>107</sup>, which I have sometimes been taken as upholding.<sup>108</sup> Among those who disagree, one interpretation of the reception of form without matter is that the organ receives a coded message, a vibration for example, not literal coloration.<sup>109</sup>

This view still takes the reception of form to be physiological. Others dissent, saying, for example, that to receive form without matter is simply to *become aware of* colour.<sup>110</sup>

Brentano adds that it is to become aware of an intentional object.<sup>111</sup>

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<sup>101</sup> Sorabji (1974/1979).

<sup>102</sup> For both points see Barnes (1971-2) 109, repr. (1979b) 38 and for the second, Hamlyn in Aristotle (1968), 104 and 113; and (1959), 9 and 11. A related objection concerning size and shape is found in Galen, *On the doctrines of Hippocrates and Plato* VII 7. 4-15, translated by Philip De Lacy in *Corpus Medicorum Graecorum*, V 4. 1-2.

<sup>103</sup> DA 431<sup>a</sup> 17-18, HA 491<sup>b</sup> 21, PA 653<sup>b</sup> 25.

<sup>104</sup> Beare, Hamlyn, Hammond, Hett, Hicks, G. R. T. Ross, Smith. Philoponus also explains that 'pupil' is only the everyday, not the technical, meaning *In DA* 366, ll. 11-14, 368, 1-3, Hayduck. His own technical meaning differs from Aristotle's.

<sup>105</sup> Arist. *Sens.* 438<sup>a</sup> 16, 438<sup>b</sup> 5-16, HA 491<sup>b</sup> 21, DA 425<sup>a</sup> 4, GA 780<sup>b</sup> 23.

<sup>106</sup> Agreement is expressed by M. Cohen (1987) and Charlton (1980). Nussbaum agreed on the need for a physiological process (1978), 147-8, but later pointed out that it would suit the functionalist interpretation if the process was variable (Nussbaum-Putnam pre-publication version of ch. 3). Robinson initially disagreed (1978), but appears not to in (1983). Disagreement is manifested by Hamlyn (1968), 104 and 113; and (1959), 9 and 11; Burnyeat; Glidden (1984); Bernard (1988); Lear (1988).

<sup>107</sup> Burnyeat.

<sup>108</sup> M. Cohen (1987) and perhaps Wilkes (1978).

<sup>109</sup> Glidden (1984), 20-1. This is also one half of Lear's interpretation, I think (1988), 116.

<sup>110</sup> Burnyeat, Robinson (1978); Lear (1988).

Another writer finds it difficult to attach any very precise meaning to the reception of form<sup>112</sup>, while another offers a non-physiological gloss, but agrees that a literal coloration process *underlies* the reception of form.<sup>113</sup>

A final variant is that the reception of form is *both* an awareness *and* a change in the organ which is not, however, a literal coloration process.<sup>114</sup>

Evidently disagreement is widespread.

I shall try to show that all these interpretations are mistaken, but one in particular deserves attention, Myles Burnyeat's, because it is the most daring and the most fully argued. It is also the most discussed, even though it has a status like that assigned by Averroës to some of Aristotle's received forms: it is between corporeal and spiritual, because it has never appeared in print, and yet it has been the subject of at least four discussions.<sup>115</sup>

Many of the authors concerned with this particular interpretation state their latest views in the present book. My knowledge is necessarily based on a pre-publication version, and I must beg forgiveness for not being able to take account of any changes that may have been made.

In his earlier version, Burnyeat endorsed an interpretation of Aristotle which he called the christian interpretation, because he found it in three Christians, Philoponus, Thomas Aquinas, and Brentano. This is the interpretation according to which to receive form without matter is simply to become aware, but Burnyeat added something of his own which was not in any of these authors. For Aristotle, he held, no physiological process at all is needed for the eye to see, and *a fortiori* not the coloration of the eye-jelly. It is just a basic fact, not requiring further explanation, that animal matter is capable of awareness. And this is why Aristotle's philosophy of mind is no longer credible. For it turns the matter of animal bodies into something pregnant with consciousness, whereas we are wedded to Descartes's conception of matter, which makes it something quite distinct from awareness, so that awareness is something whose occurrence calls for explanation.

I have three initial disagreements with this particular interpretation, the first of merely historical interest—the interpretation advocated is not particularly Christian, as we shall see. Secondly, I do not think that Aristotle can be making a physiological process unnecessary to sense-perception. For the theory of the opening chapter of the *De Anima*, a theory already referred to, is that *every* mental process, with the possible exception of intellectual thought, requires a physiological process. We have already

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<sup>111</sup> Brentano (1874/1959), translated (1973).

<sup>112</sup> Barnes (1971-2).

<sup>113</sup> Bernard has described his interpretation as being that the sense receives the definiteness of the thing perceived.

<sup>114</sup> Lear (1988), 116.

<sup>115</sup> Burnyeat; M. Cohen (1987); Nussbaum-Putnam, Charles (1988), 36-7; Lear (1988), 110-16.

encountered the illustrative example that anger requires the boiling of the blood around the heart. And perception is explicitly included in the theory.<sup>116</sup>

Thirdly, on my interpretation, Aristotle's theory comes out prosaic and commonsensical. There is nothing bizarre about the coloration of the eye-jelly. If we want a bizarre theory of matter, we should rather look to Descartes, not, admittedly, to his distinction between matter and awareness, but to his claim that matter is merely three-dimensional extension. We need to go to the further shores of physics, not to common sense, to find anything comparable with this.<sup>117</sup>

To explain my disagreement with the whole range of interpretations, I shall need to go into some exegetical detail<sup>118</sup>, and some readers may prefer to skip to the final section, where I say what I take the significance of my interpretation to be. Roughly speaking, I think it necessary to establish that Aristotle's original doctrine involved literal coloration, if we are to understand the process through which Brentano came to take the opposite interpretation, and to read into the doctrine his own idea of an intentional object.

As a preliminary, we need to note the phrases with which Aristotle expresses his theory of the perceptual process and how they are connected. He says that the organ receives form<sup>119</sup>, receives perceptible form<sup>120</sup>, receives or is affected by forms of perceptibles<sup>121</sup>; and he adds that it does so without matter.<sup>122</sup>

In several places, instead of talking of reception (*dechesthai*, *dektikon*), Aristotle talks of being affected (*paschein*) by form, as if that were a more general description of the same thing.<sup>123</sup>

He also says that the sense-organ is potentially such as the sense-object is actually.<sup>124</sup> He says further that it starts off unlike the sense-object, but becomes like it.<sup>125</sup>

These phrases are all linked together. For two are combined with an 'and' at 429<sup>a</sup>15-16, where it is said that if thinking is like perceiving, the thinking part of the soul must be able to receive form and be potentially such as its object. The rest are connected at 418<sup>a</sup>3-5, where the sentence, 'the organ is potentially such as the sense-object is already, *as has been said*', refers back to the other form of words at 417<sup>a</sup>20: 'it is while unlike that it is acted on, but once acted on, it is like.'

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<sup>116</sup> Aristotle *DA* 1. 1, 403<sup>a</sup>3-<sup>b</sup>19. Sense-perception is included, 403<sup>a</sup>7.

<sup>117</sup> Sorabji (1988), chs. 1-3.

<sup>118</sup> I previously confined the case to two footnotes: Sorabji (1974), 22 and 28 of the 1979 version.

<sup>119</sup> *DA* 429<sup>a</sup>15-16, 434<sup>a</sup>29-30.

<sup>120</sup> *DA* 424<sup>a</sup>18.

<sup>121</sup> *DA* 424<sup>b</sup>2, 427<sup>a</sup>8-9.

<sup>122</sup> *DA* 424<sup>a</sup>18-19, 424<sup>b</sup>2-3, 434<sup>a</sup>30.

<sup>123</sup> *DA* 427<sup>a</sup>8-9, 424<sup>a</sup>23, cf. 424<sup>a</sup>34, <sup>b</sup>3.

<sup>124</sup> *DA* 418<sup>a</sup>3, 422<sup>a</sup>7, 423<sup>b</sup>31-424<sup>a</sup>2, 429<sup>a</sup>16.

<sup>125</sup> *DA* 417<sup>a</sup>20.

So far it is still a little unclear what kind of likeness is involved. But there is a significant variant at 425<sup>b</sup>23, when Aristotle says that what the organ receives is *perceptibles*. These perceptibles are specified elsewhere. For when he says at 423<sup>b</sup>30-1 that the sense organ is potentially such, the 'such' refers to the 'hot, cold, dry, and fluid' at 423<sup>b</sup>28-9. A little lower at 424<sup>a</sup>7-10, he says that the organ is potentially, but not actually, white, black, hot, or cold. And this informative description is intertwined with some of the others, because it immediately follows the explanation that the organ is potentially such (i.e. hot, cold, dry, or fluid, 423<sup>b</sup>31), and that being potentially such, it is then made such as the object is in actuality (424<sup>a</sup>1-2). There may be a claim of the same kind at 3. 13, 435<sup>a</sup>23, where it is said that the organ receives hot, cold, and all the other objects of touch, but the text there is ambiguous, as we shall see.

Except perhaps for the last, all the foregoing expressions are most easily taken as referring to the same process, and they are connected with becoming black, white, hot, cold, dry, or fluid. There are two further references to a process of coloration, both of them linked to the idea of receiving form. The exact meaning is admittedly more disputable this time, but the references are most naturally understood in the same way as the others. At 425<sup>b</sup>22-4, Aristotle says that what sees is coloured in a way, and he explains this by saying that the organ receives perceptibles without matter. As I understand it, he says 'in a way', because the transparent fluid in the eye is colourless in itself<sup>126</sup>, but receives *borrowed* colour during the sensory process. At 427<sup>a</sup>8, he says that something indivisible cannot at the same time be white and black, and so cannot receive the forms of these qualities either. I take it that 'and so not either' (*hōste oude*) is not introducing a second process for which becoming white or black is prerequisite (although that would already give a significant enough role to coloration), but is rather supplying a more relevant description of the same process. I have said that it is the sense-organ that undergoes the process described. This is explicit in five passages where Aristotle refers to the organ with the word *aisthētērion*.<sup>127</sup>

In three other passages, he uses an ambiguous expression, which can, however, refer to the organ: 'that which sees' (*to horōn*, immediately glossed by reference to the organ)<sup>128</sup>, 'what is going to perceive' (*to mellon aisthēsesthai*)<sup>129</sup>, 'what can perceive' (*to aisthētikon*).<sup>130</sup>

<sup>126</sup> DA 418<sup>b</sup>26-30, 429<sup>a</sup>15-26.

<sup>127</sup> DA 422<sup>a</sup>7, 422<sup>b</sup>1, 423<sup>b</sup>30, 425<sup>b</sup>23, and the ambiguous 435<sup>a</sup>22.

<sup>128</sup> DA 425<sup>b</sup>22.

<sup>129</sup> DA 424<sup>a</sup>7-8.

<sup>130</sup> DA 418<sup>a</sup>3.

In a final passage, he starts off by saying that the *sense* receives the forms of perceptibles without matter<sup>131</sup>, but he qualifies this by saying the organ *aisthētērion* is the primary thing in which a power of that kind resides.<sup>132</sup>

It is necessary to distinguish a different doctrine, which does apply to the sense, not the organ, and which concerns not mere becoming like, but actual identity. This turns on Aristotle's general theory of causation, explained in *Ph.* 3. 3. It is there illustrated by saying that when somebody teaches a pupil, there are not two activities going on, one of teaching and one of learning, but a single activity, which is equally one of teaching and one of learning, and which is located in the learner. The application to sense-perception of this causal theory is that the activity of a sound in working on one's hearing and the activity of hearing it are not two activities, but one and the same activity<sup>133</sup>, and located not in the organ but in the sense (*en tēi kata dunamin*).<sup>134</sup> This doctrine about the activity of the *sense* tells us nothing about whether the *organ* takes on sounds.

A further preliminary point to notice is that Aristotle normally postulates only that we *receive* forms in our sense-organs, not that we *perceive* them there. The only exceptions come in the course of a dialectical argument at *DA* 425<sup>b</sup>22-5, in an argument whose conclusion is rejected at *Sens.* 447<sup>a</sup>23-7, and in a non-psychological work at *GA* 780<sup>b</sup>32.

The foregoing provides the preliminary evidence that for Aristotle sense-perception involves the sense-organ's becoming white, black, hot, cold, wet, or dry. It is not essential to my case whether 'receiving form without matter' refers, like the other phrases, to this physiological process, or, as one interpretation holds<sup>135</sup>, to some further process dependent on it. But as a matter of fact, I think the following is what actually happens: initially, the reception of form is something in which the sense-organ (*aisthētērion*) engages<sup>136</sup> and is connected with being 'potentially such'.<sup>137</sup>

In other words, it involves the literal coloration of the organ of sight. But when Aristotle compares perception with *thought*, he realizes that the desired analogy is only partial. Certainly, when a person thinks of a stone, matter is left behind, because the stone is not in his or her soul, only its form.<sup>138</sup>

But Aristotle refrains, when he gets beyond the first tentative comparison in *DA* 3. 4, from repeating the standard expressions. The stone is not described as 'matter', and

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<sup>131</sup> *DA* 424<sup>a</sup> 18-19.

<sup>132</sup> *DA* 424<sup>a</sup> 24-5.

<sup>133</sup> *DA* 425<sup>b</sup> 26-426<sup>a</sup> 26.

<sup>134</sup> *DA* 426<sup>a</sup> 4.

<sup>135</sup> Bernard (1988). The best candidate for this further process might be not Bernard's, but Lear's action of sound on the sense (425<sup>b</sup>26-426<sup>a</sup>26), which, however, I would construe somewhat differently from Lear (1988).

<sup>136</sup> *DA* 425<sup>b</sup> 23.

<sup>137</sup> *DA* 429<sup>a</sup> 15-16.

<sup>138</sup> *DA* 431<sup>b</sup> 28-432<sup>a</sup> 1.

its form is not spoken of as being 'received', probably because these words had expressed a doctrine about the sense-*organ*, and thinking does not in the same way involve an organ, in his view. Instead, the comparison is with the doctrine which concerns not the organ but the sense, that the activity of sound is in the sense and is not merely such as, but identical with, the activity of hearing.

end p.213

In this roundabout way, the idea of form, though not in so many words the idea of reception of form, gets connected with a second, non-physiological, doctrine, but only in the case of thought, not in the case of perception. It is this second, non-physiological application of the word 'form', confined to the case of thought, which has in at least one case absorbed attention and led (mistakenly, I think) to a rejection of the physiological interpretation of the reception of form for the case of perception.<sup>139</sup>

So much for preliminaries. That a literal coloration process is involved in (visual) perception can be made undeniable, I believe, by examining a virtually continuous passage, *DA* 423<sup>b</sup>27-424<sup>b</sup>18. Here Aristotle finds that there is a problem affecting the organ of touch, but no other sense. For the eye-jelly is colourless and the interior of the ear soundless. Otherwise they would obtrude their own character and interfere with the reception of form.<sup>140</sup>

But the organ of touch cannot equally be free of the qualities of heat, cold, fluidity, and dryness, for these, as explained in *On Generation and Corruption*, are the defining characteristics of the four sublunary elements (423<sup>b</sup>27-9). This creates a problem: the organ of touch cannot afford to possess already the degree of heat, cold, fluidity, or dryness which it is to perceive, since the perceptual process involves starting off merely potentially such as the sense-object, and being subsequently made such as it. The organ cannot be made to acquire in this way the temperature it already possesses (423<sup>b</sup>30-424<sup>a</sup>4). The conclusion must be that we have a blind spot for that particular temperature. And indeed that is why (*diho*, 424<sup>a</sup>2) we do in fact have a blind spot for what is as hot, cold, hard, or soft as we are (*diho tou homoiōs thermou kai psuchrou ē sklērou kai malakou ouk aisthanometha*, 424<sup>a</sup>2-3). The empirical fact is that we notice only extremes (*alla tōn huperbolōn*, 424<sup>a</sup>4). And this shows, by inference to the best explanation, that the sense organ is somewhere in the middle range of temperatures, etc., and that derivatively the sense is as it were a mid-point (*hōs tēs aisthēseōs hoion mesotētos tinos ousēs tēs en tois aisthētois enantiōseōs*, 424<sup>a</sup>4-5). Just as what is going to perceive white and black must be neither of these in actuality, but both in potentiality, so in the case of touch it must be neither hot nor cold in actuality, though both, presumably, in potentiality (424<sup>a</sup>7-10).

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<sup>139</sup> Lear (1988).

<sup>140</sup> *DA* 418<sup>b</sup>26-30, 429<sup>a</sup>15-26. No exception is provided by the fact that the ear produces an echo, for this is said to be a foreign (*allotrios*) sound, not its own (*idios*), 420<sup>a</sup>17-18.

There are three reasons why I think this first part of the passage cannot be handled by those who deny that Aristotle is referring to a literal taking on of temperatures and other qualities. First, a relevance must be supplied for the sudden reference in the middle of the *De Anima* to *On Generation and Corruption* and its doctrine that hot, cold, fluid, and dry are the defining characteristics of the four elements. Secondly, and most crucially of all, the *diho* ('that is why') at 424<sup>a</sup>2 appears to become unintelligible on other interpretations. *Diho* offers to explain why there is a *barrier* to our perceiving certain temperatures. No barrier would have been presented to our perceiving medium temperatures, if the organ merely had to receive a coded message, for example a vibration, or if we were merely being told that the organ becomes aware of temperature. The barrier arises because the organ needs to acquire the temperature to be perceived, and is debarred from acquiring the temperature it possesses already. The inability of coded messages, or of references to awareness, to supply a barrier, affects not only the present passage in 2. 11, but also the statement in 3. 4 that what is to receive forms must obtrude no interfering characteristics of its own. My case could very well rest on the single word *diho*. The third question is why Aristotle says that what is going to perceive black and white must be potentially both, and similarly for what is going to perceive hot and cold. This cannot be brushed aside as if it were the merely negative point that the thing must not be actually black or white. It means more to say that it is potentially these. I would add a fourth point, although it is not decisive, that the meaning of the word *mesotēs* (424<sup>a</sup>4) must be respected. Literally, it means something in the middle. Of course, sense is only said to be *as it were a sort of* mid-point, but some connection with the literal meaning must be retained. Admittedly, this constraint is probably no harder for others than for me, since I too must explain how senses other than touch are to be viewed as mid-points: the eye-jelly does not have a medium colour.<sup>141</sup> But it is a constraint that is seldom at present observed. Let me now give a translation of the passage:

It is the differentiating characteristics of body *qua* body which are the objects of touch. By differentiating characteristics I mean those which define the elements, namely, hot, cold, dry and fluid, about which we have spoken earlier in the work on the elements. And their organ (*aisthētērion*), which can exercise touch and in which first of all the sense called touch resides, is the part that is potentially such (*dunamei toiouton*). For perceiving is being affected in some way. So what makes a thing such (*hoion*) as it itself is in actuality makes it such (*toiouton*) because it is potentially (*dunamei*) so. And that is why (*diho*) we do not perceive what is similarly hot or cold, hard or soft, but perceive the extremes, which suggests that sense is as it were a sort of mid-point (*mesotēs*) between opposites in perceptibles. And it is for this reason that sense discriminates (*krinei*) perceptibles, for the middle is discriminating (*kritikon*), since it comes to be to each of the two extremes its opposite. And just as what is

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<sup>141</sup> Different evidence for the sense of sight being an intermediate blend (*logos*) is that extremes of dazzle or darkness impair its functioning, 424<sup>a</sup>27-32.

going to perceive white or black must be neither of them in actuality, but potentially both (*dunamei d' amphō*), and similarly too in the other cases, so also in the case of touch it must be neither hot nor cold.<sup>142</sup>

Shortly afterwards, Aristotle concludes his chapter on touch, 2. 11, and begins his survey of all five senses in 2. 12. Whereas the previous chapter had talked about being 'potentially such', the new chapter brings in another of the interlinked phrases and affirms that with all five senses the organ receives the perceptible forms without matter. It then offers to explain various phenomena on the basis of what precedes. One thing to be explained (424<sup>a</sup>32-<sup>b</sup>3) is the fact that plants do not perceive, even though they are alive and are affected (*paschein*) by heat and cold, as shown by their being warmed or cooled. The explanation is twofold: plants do not have a mid-point (*mesotēs*), and they cannot receive the forms of perceptibles, but are acted on in company with matter. The first part of this explanation, the lack of a *mesotēs*, has on some interpretations been found unintelligible<sup>143</sup>, but it is elucidated in 435<sup>a</sup>20-<sup>b</sup>3. Plants are made predominantly of earth, and the characteristic properties of earth are cold and dryness. But touch needs to be a sort of mid-point (*mesotēs*) among all the tangible qualities, and its organ has to be able to receive (*dektikon*, 435<sup>a</sup>22) not only the characteristics of earth (cold and dryness), but heat and cold and all the other tangible qualities.

If 'receive' here refers as usual to the perceptual process, there will have been some carelessness, because cold and dryness are precisely what plants, being already cold and dry, could *not* receive. If such carelessness is accepted, there will be further confirmation of my claim that the reception of perceptible form is the literal taking on of heat, cold, fluidity, and dryness, etc. Alternatively, Aristotle may be using the idea of qualities received in a less usual way to refer to the organ's standard qualities, not to those which it temporarily assumes during perception. He will be saying that the organ is standardly characterized by an intermediate blend of hot and cold, of fluid and dry, etc., and cannot just be cold and dry. That too would confirm part of what was said above, but would throw no light on what happens to the organ at the very moment of perception. The conclusion of the argument is that plants could not have the sense of touch, and without touch no other sense is possible.

There is an underlying assumption, rather contrary to the spirit of functionalism, if that is taken at its broadest to be the idea that mental processes can be defined by functions that can be realized in various different types of matter. For Aristotle is here assuming that sense-perception can only be realized in an organism with a mean temperature not too far from our own. Admittedly, Aristotle does elsewhere allow for certain other variations of mechanism. For smelling, fish use their gills,

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<sup>142</sup> DA 423<sup>b</sup>27-424<sup>a</sup>10.

<sup>143</sup> Slakey (1961).



dolphins their blowhole, and insects the middle part of their body<sup>144</sup>, the first two of which contain water, not air.<sup>145</sup>

Indeed, it is a major theme of Aristotle's biological groupings that, in different genera, parts can be analogous in function but different in structure, and a case in point is the nostrils, the gills of fish, and the middles of insects. He also entertains what we should call the conceptual possibility that colours, sounds, and odours might have been perceived through direct application of a balloon-like membrane to the thing perceived.<sup>146</sup>

Even when he argues that there could be no sixth organ to create a sixth sense, he still recognizes the epistemic possibility that there might be some unknown substance or property not possessed by anything on earth, but capable of constituting a sixth organ.<sup>147</sup>

The anti-functional restriction to mean temperatures is then perhaps the exception, rather than the rule.

end p.216

The second explanation in 2. 12 of why plants do not perceive is that they cannot receive (*dechesthai*) the forms of perceptibles, but are affected (*paschein*) in company with (*meta*) matter. The word for being affected here, as elsewhere,<sup>148</sup> stands in as a more general description of receiving. I prefer the oldest interpretation, according to which plants become warm by letting warm air or other warm matter into their systems, instead of leaving the matter behind. It has been objected that this is plainly false<sup>149</sup>, but I do not think so. Nor is there any need that it should be *plainly* true, for it is not an observation, but a hypothesis constructed to help explain the insensitivity of plants, and it would again have been difficult with the instruments available to discover whether it was true or false. The main rival interpretation takes the point to concern the matter of the plants themselves, not the matter they receive. On this view, for the plants to receive form in company with matter is for their matter to take on heat and cold, while for them to receive form without matter would be for them not to stand as matter to, but simply to become aware of, heat and cold.<sup>150</sup> But this reading gives us a tautology, instead of an explanation, because it merely tells us that plants do not become aware of heat, but grow hot instead. This does not *explain* why they don't perceive. Of course, it is part of this interpretation that Aristotle does not think it appropriate to explain such a thing. But in fact he purports to be offering an explanation (*dia ti, dia touto, aition*)<sup>151</sup> in both of the chapters where he discusses the question. The passage in 2. 12 reads:

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<sup>144</sup> PA 659<sup>b</sup> 14-19. For further details, see Sorabji (1971), 57-8, repr. (1979), 77-8.

<sup>145</sup> DA 425<sup>a</sup> 5.

<sup>146</sup> DA 423<sup>a</sup> 2-12.

<sup>147</sup> DA 425<sup>a</sup> 11-13.

<sup>148</sup> DA 424<sup>a</sup> 23, 427<sup>a</sup> 8-9.

<sup>149</sup> Burnyeat.

<sup>150</sup> Ibid.

<sup>151</sup> DA 424<sup>a</sup> 32-3, 435<sup>b</sup> 1.

And [it is clear from the preceding] why (*dia ti*) ever it is that plants do not perceive, although they have some part of the soul and are affected (*paschein*) in some way by the tactile qualities themselves. For they are heated and cooled. The explanation (*aition*) is that they do not have a mid-point (*mesotēs*), nor a principle of a sort to receive (*dechesthai*) the forms of perceptibles. Rather they are affected in company with matter (*paschein meta tēs hulēs*).<sup>152</sup>

It is difficult to see how this can fail to be offering an explanation, or how it could instead be saying that no explanation is needed, because the ability or inability to perceive is a basic fact which needs no explanation.

But there is more to come, and the point that follows has not, I think, received attention. I am not referring merely to the fact that it would be historically appropriate for Aristotle to insist that sensory reception involves leaving matter behind—although it is relevant that that would be appropriate, because so many of his predecessors had made sense-perception depend on receiving matter from the object perceived. But far more important is the little-considered question of the relevance of the rest of the chapter. Aristotle devotes the remainder to a puzzle which he finds so obviously relevant that he does not even think it necessary to state what the relevance is, merely saying: 'But someone might be puzzled.' As I see it, the relevance is in fact immediate. I have taken Aristotle's point to be that being acted on by heat without receiving air or other matter is a *necessary* prerequisite for perceiving heat, odour, etc. This at once makes relevant the question: is it also *sufficient* for perceiving heat and odour? Or, equivalently, could something that didn't perceive still be acted on by heat or odour—that is, without receiving air or other matter? It may be thought an obstacle that Aristotle does not explicitly add the words 'without receiving air or other matter'. All he says is:

Rather they are affected in company with matter. But someone might be puzzled whether something incapable of exercising smell would be affected at all (*paschein ti*) by odour, or something incapable of seeing by colour, and similarly for the other cases.<sup>153</sup>

So far my ground is only that the necessary relevance is provided, if we understand Aristotle still to have in mind what he has just been discussing: the possibility of being affected by perceptible qualities *without* receiving matter. But in fact this interpretation is strikingly confirmed. For Aristotle goes on to consider the case of something insentient, timber, being split in a thunderstorm, and he insists that this is not a case of sound acting on a body. Why not? Because it is the air accompanying the thunder that acts. The word for accompaniment is *meta*, the same word that was used when Aristotle complained that plants are affected in company with (*meta*, 424<sup>b</sup>3) matter. Evidently the subject of his puzzle is whether insentient things can be affected by perceptible qualities, rather than by the *matter* accompanying those

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<sup>152</sup> DA 424<sup>a</sup>32-424<sup>a</sup>32<sup>b</sup>3.

<sup>153</sup> DA 424<sup>b</sup>2-5.

qualities. On the alternative interpretation, no particular relevance is apparent either for Aristotle's puzzle, or for his example of air entering the timber:

And it is at the same time clear in the following way too: it is neither light and darkness, nor sound, nor odour that acts (*poiein*) at all on bodies, but rather that in which they reside. It is the air, for example, accompanying (*meta*) thunder that splits the timber.<sup>154</sup>

It is important that the entire discussion down to the end of the chapter should be shown to be relevant, and in particular the question that Aristotle goes on to ask at 424<sup>b</sup>16-17:

What, then (*oun*), is exercising smell (*osmasthanai*) besides (*para*) being affected in some way?

Let us see how the alternative interpretations fare in providing relevance. Aristotle goes backwards and forwards on whether the various perceptible qualities, as opposed to the matter accompanying them, can act on something insentient. He first puts the case on the other side, but finally decides (*alla* = 'but', 424<sup>b</sup>12) that the tactile qualities, hot, cold, fluid, and dry, and flavours can so act, and that odour and sound can so act on stuff like air, which is free-flowing. Air, for example, can be made smelly (424<sup>b</sup>12-16), and he means, I am sure, without taking on cheesy matter. This, of course, shows that being affected by odour without receiving matter is *not* sufficient for exercising the sense of smell (*osmasthanai*). His question now is not merely relevant: it cries out for an answer (424<sup>b</sup>16-17):

What, then, is exercising smell besides (*para*) being affected in some way?

The implication is that exercising smell is partly a matter of being affected by odour, but is also something else besides (*para*).

It is not only relevance that is decisive here, but also the word *para* (besides). This word implies that exercising smell has two aspects. If no physiological process were needed, as maintained by the alternative interpretation, there would be no room for two aspects. So that interpretation must reconstrue the *para* sentence. It might do so by taking the sentence in effect to be asking, 'What is exercising smell as opposed to being acted on in the way the air is?' But *para* does not mean 'as opposed to'; it means 'besides'. Furthermore, the proposed question would rob the second half of the chapter from 424<sup>b</sup>3 to 424<sup>b</sup>18 of relevance and connection of thought. The question of relevance has come up three times. First, why does Aristotle raise the puzzle whether something insentient can be acted on by perceptible qualities? Secondly, why in discussing the question does he make so much of the air accompanying the thunder as the agent that splits the timber? Thirdly, why after answering the question does he think it relevant ('what, then (*oun*), . . . ?') to ask what exercising smell is besides being acted on? I have tried to show how one point flows naturally from another.

Aristotle's answer to the question, 'what is exercising smell besides?' may be to us disappointing. He is only able to say that it is perceiving (*aisthanesthai*), thereby

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<sup>154</sup> DA 2. 12, 424<sup>b</sup>9-12.

supplying the genus, since the sense of smell is defined by genus and differentia as one kind of perception, the perception of odour. But his silence cannot lend any support to the rival interpretation, because the *para* sentence has told us that exercising smell is partly a matter of being affected by odour and partly something else. It is not in any case surprising if he does not, at the tail end of his discussion of the five special senses, and before his discussion of the generic functions of sense-perception, give us a formula to tell us more about what perceiving is. For though he has a great deal more to say about what it is, that more does not take the shape of a formula. Some of it was said in 2. 6, ch. but much is reserved for book 3 of the *De Anima*, after the discussion of the five special senses is concluded, and I have tried to bring out what it is in Section I above.

Much has been made of the fact that there is no manuscript warrant for reading *kai* (also) into Aristotle's answer, so that it tells us that exercising smell is *also* perceiving. But my interpretation rests not on Torstrik's conjecture of *kai*, but on the word *para*, 'besides'. The passage in its entirety reads as follows:

(424<sup>a</sup>32) And [it is clear from the preceding] why (*dia ti*) ever it is that plants do not perceive, although they have some part of the soul and are affected (*paschein*) in some way by the tactile [qualities] themselves. For they are heated and cooled. The explanation (*aition*) is that they do not have a mid-point (*mesotēs*), nor a principle of a sort to receive (*dechesthai*) the forms of perceptibles. Rather they are affected in company with matter (*paschein meta tēs hulēs*).

end p.219

(424<sup>b</sup>3) But someone might be puzzled whether something incapable of exercising smell would be affected (*paschein*) at all by odour, or something incapable of seeing by colour, and similarly for the other cases.

(424<sup>b</sup>5) But if the object of smell is odour, if it produces anything at all, odour produces an exercise of smelling, so that none of the things which cannot exercise smell can be affected (*paschein*) by odour, and the same story goes for the other cases too. Nor can any of the things which can exercise smell be affected by odour except in their capacity as perceivers. And it is at the same time clear in the following way too: it is neither light and darkness, nor sound, nor odour that acts (*poiein*) at all on bodies, but rather that in which they reside. It is the air, for example, accompanying (*meta*) thunder that splits the timber.

(424<sup>b</sup>12) But (*alla*) the objects of touch and flavours do act (*poiein*). For otherwise by what would inanimate things be affected (*paschein*) and qualitatively changed? So do the other sense-objects also act on things (*empoiein*)? Or rather not every body can be affected (*pathētikon*) by odour and sound, and the ones which are affected (*paschein*) lack definite boundaries and do not stay put, for example, air, for this is smelly as if it had been affected (*paschein*) in some way.

(424<sup>b</sup>16) What then (*oun*), is exercising smell besides (*para*) being affected (*paschein*) in some way? Rather, exercising smell is perceiving (*aisthanesthai*), whereas the air on being affected (*paschein*) quickly becomes perceptible (*aisthētos*).

I have now surveyed the evidence that Aristotle thinks perception requires a physiological process, that that process is one of the organ's taking on colour, temperature, and other qualities, and that that is what he is referring to by a group of interlinked phrases. I think it highly probable, although it is not essential to my case, that one of those phrases is 'receiving form without matter'. It is now necessary to consider the evidence on the other side for the view that what is being described is only a becoming aware of sense-qualities, and for the further view that no physiological process is needed. I am aware of three pieces of positive evidence. One piece of evidence, *DA* 2. 5, has, I believe, often been misunderstood. It was used by Brentano to prepare the ground for his view that in Aristotle the sense-objects, colour and temperature for example, are not, or not only, physically present in the observer, but present as objects of perception.<sup>155</sup>

It has been used as one of the arguments against the materialist interpretation of Aristotle as holding that perceiving is nothing but a physiological process.<sup>156</sup>

It has been used to show that the change involved in perception cannot be anything like becoming red or smelly<sup>157</sup>, and finally to show that no physical change at all is needed in perception.<sup>158</sup>

The relevant passage is not discussing perceiving so much as the *switch to* perceiving after one has not been using one's senses. This should either not be called being affected (*paschein*) and qualitatively changed (*alloiousthai*), or should be recognized as a distinct way of being affected or qualitatively changed. But the point is not, as supposed, that the switch is not a physical one, nor even that it is not wholly physical. The point is put in terms entirely different from that, by reference to a series of Aristotelian concepts.<sup>159</sup>

First, the change should not be called *alloiousthai*, because the literal meaning of *alloiousthai* is 'becoming other', whereas the being who switches to using his sense or intellect is rather developing more into himself (reading *eis hautō*, 417<sup>b</sup>6) and finding fulfilment (*entelecheia*, 417<sup>b</sup>7). Again, nothing has been subjected to destruction (*phthora*); rather that which was in a potential state before is preserved (*sōtēria*) by the switch to perception (417<sup>b</sup>3). The same is true, in the case of the intellect, with regard to an earlier stage of development. The learner who switches from not knowing to knowing is not switching to a privative phase (*sterētikai diatheseis*), but to a stable possession (*hexeis*), and to his real nature (*phusis*, 417<sup>b</sup>15-16). None of this is couched in terms of the switch being wholly or partly non-physical. And indeed it could not be wholly non-physical, because one of the examples given is that of a builder switching to actually building (417<sup>b</sup>9). I presume that the point could even be

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<sup>155</sup> Brentano (1867), 79-80, translated (1977), 54.

<sup>156</sup> Barnes (1971-2) 109 = (1979) 38. Barnes also cites *Ph.* 244<sup>b</sup>7-15. But I think that says only that perceptual alterations are noticed, not that they are non-physical.

<sup>157</sup> Burnyeat; Lear (1988), 111-12.

<sup>158</sup> Burnyeat.

<sup>159</sup> This is very well explained by Van Riet (1953).

extended to a purely physical switch, such as a rock's switching from its perch on a ledge to falling in the direction of its natural position, just so long as that could be viewed as a switch towards its true nature.

The second piece of positive evidence adduced comes from the opening of *DA* 2. 12, briefly discussed above, where Aristotle first states that the sense-organ receives perceptible forms without matter. In doing so, he uses the analogy of a signet-ring imprinted in wax. Plato had used the model of imprints in a wax block, it is said, to illustrate the wide gap between perception and judgement. In perception there is no awareness, just a causal interaction with sensible qualities in the environment. To judge what these qualities are, or that 'this is Theodorus', one needs to go beyond one's present perception and compare it with the imprints one has retained as if in wax. Only then do awareness and judgement come in. If Aristotle believes instead that wax imprints are an appropriate model for perception itself, he must be denying Plato's view of perception. Two inferences are drawn, the first that the reception of sensible forms must be understood in terms of *becoming aware of* colours, sounds, smells, and other sensible qualities, not as a literal physiological change of quality in the organ. The second inference is that no physiological change is needed at all.<sup>160</sup> I do not believe that these inferences are justifiable. Aristotle uses the signet-ring model in his treatise *On Memory*, where he clearly intends a physiological interpretation, explaining various different forms of memory failure by the surface imprinted being too hard, too fluid like running water, or too worn like the old parts of buildings.<sup>161</sup>

A third reason for holding that there is no *physical* difference which accounts for our perceiving, while plants do not, draws on a difficulty in Aristotle's thought, which is not particularly tied to the theory of perception. Aristotle holds that an eye is *essentially* sighted and flesh *essentially* alive, so that a dead eye and dead flesh do not even have the same definition. There is then no specifiable physiological difference which accounts for our advantage over plants, because in specifying the difference we should be forced to presuppose the very perception we wanted to explain. This difficulty has been much discussed<sup>162</sup>, and I would agree it is a real one. But I am not convinced that Aristotle's idea of the eye as *essentially* alive is part and parcel of his whole approach to perception, rather than an idea whose relation to the rest of his theory he has insufficiently considered. In any case, it has been pointed out that strictly speaking there is no disharmony with the theory of perception as I have explained it.<sup>163</sup>

For Aristotle believes that the concept of an eye can be used in different, though related, senses. An eye that is at one time alive and at another time dead can still be

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<sup>160</sup> Burnyeat.

<sup>161</sup> *Mem.* 450<sup>a</sup> 27-<sup>b</sup> 11.

<sup>162</sup> Ackrill (1972-3); Williams (1986); Burnyeat; Cohen (1987).

<sup>163</sup> Cohen (1987), drawing on Williams (1986).

referred to as an eye all right, even though it is not an eye in the fullest sense. It is an eye in this secondary sense to which we need to refer in explaining the perceptual advantage which we have over plants.

I have called these three pieces of evidence positive, because I believe the remaining evidence consists in, or depends on, objections to the alternative account which I have given. Consequently, much of it has been addressed already. But I need to consider two outstanding types of objection. One set of difficulties concerns the implausibility of the view I ascribe to Aristotle. Does my heart go hard as concrete, for example, when I feel concrete?<sup>164</sup>

I think Aristotle could answer this by reference to the idea of small-scale models which he uses in his treatise *On Memory*. We think about the relative sizes of two or more objects by having images which serve as small-scale models.<sup>165</sup>

Similarly a small-scale hardening within the heart might serve as the basis for feeling the hardness of concrete. I say that Aristotle *could* answer this way, because I do not think he did in fact think much in this context about the tactile qualities other than hot, cold, fluid, and dry. These are the four that define the four elements, and many of the others can, in his view, be reduced to them.<sup>166</sup>

What is more difficult is Aristotle's inference (and I have treated it as an inference, not an observation) that the organ in our hearts (perhaps some of the blood in it) has a medium temperature. This would not necessarily be contradicted by observation, since blood heat might be thought of as medium. But it does seem to be in conflict with Aristotle's theory in *Fuv.* and *Resp.* that the heart is the centre of vital heat and needs to be cooled by incoming air. I doubt if such a conflict of theories, however, is sufficiently improbable to discredit the interpretation. It has been overlooked by modern critics, and could have been overlooked by Aristotle.

A final objection appears to me to be mistaken. It is complained that form is not the sort of thing that could pass into my organ, or anywhere else, without being carried by a material vehicle.<sup>167</sup>

What is true is that sensible forms cannot exist without being embedded in some matter or other at every moment, and also that the transfer or spread of sensible forms is not to be viewed as a genuine case of motion (*phora*).<sup>168</sup>

That said, however, Aristotle allows all sorts of possibilities to sensible forms. We have noticed him allowing that a thing's odour can float off into the air, however much difficulty that may give the ancient commentators, when they think about the doctrine that particular qualities are inseparable from what they inhere in.<sup>169</sup>

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<sup>164</sup> Burnyeat.

<sup>165</sup> *Mem.* 452<sup>b</sup> 8-15.

<sup>166</sup> *GC* 2. 2.

<sup>167</sup> Burnyeat.

<sup>168</sup> *Sens.* 446<sup>b</sup> 28-447<sup>a</sup> 1.

<sup>169</sup> *Cat.* 1<sup>a</sup> 25. I shall discuss the commentators' treatment of this in my (1991).

In the *De Sensu* he describes the instantaneous spread of heat from one block of material to another.<sup>170</sup>

The transmission of effects through an intervening medium to an observer is different from either of these two cases, and different, as the commentators will stress, for each of the three long-distance senses, sight, hearing, and smell. Most obviously in the case of sight the intervening medium does not become coloured. But the same principle applies, that a sensible form, or its effect, located in one piece of matter can cause another instance of the same form to appear in an adjacent piece of matter.

Such are the objections to the literal physiological interpretation. Although not accepting them, I ought to qualify what I said in my original publication.<sup>171</sup>

Aristotle sometimes says that physiological explanations play a subordinate role, when there is a purposive explanation available, and tell us only how, not why (*dia ti*) something happens: they tell us only the instrument (*organon*).<sup>172</sup>

He is by no means consistent about this, and frequently allows throughout his biological works that physiology is straightforwardly explanatory (*dia, aition, aitia, diho, dihooper, gar, men oun, dihoti, hoti, hōste*), not only where purposive explanations are missing,<sup>173</sup> but also where they are available.<sup>174</sup>

However, there is one mood in which he confines them to telling how. Equally, he holds that the powers which constitute the soul, powers of growing, perceiving, and desiring, and indeed the soul itself, can *explain* growing, perceiving, and desiring.<sup>175</sup>

One way in which he thinks them explanatory is that he treats it as a *basic* fact about the universe that such powers exist. Appeal to basic facts is explanatory in a way: it can be used to explain the occurrence of the requisite physiological processes. They are only to be expected as necessary for the operation of the powers which are taken as basic. But this is not to treat the powers as basic in the sense that their operation has no explanation in terms of physiological processes. At most, it implies that the physiological processes tell us how, rather than why, the basic powers can operate. And even this perspective is, as I say, not consistently maintained in the biological works. On my interpretation, it is not maintained here in the *De Anima* either, because he cites the physiological process to explain why (*dia ti*) plants do not perceive.<sup>176</sup>

end p.223

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<sup>170</sup> *Sens.* 446<sup>b</sup>28-447<sup>a</sup>6.

<sup>171</sup> The original article was my (1974). The reasons for qualification are explained in my (1980), 166-74.

<sup>172</sup> *GA* 789<sup>b</sup>3-22.

<sup>173</sup> *PA* 677<sup>a</sup>18, *GA* 778<sup>a</sup>35-<sup>b</sup>1, <sup>b</sup>14, <sup>b</sup>18, 782<sup>a</sup>20-783<sup>b</sup>8, 789<sup>b</sup>20.

<sup>174</sup> *PA* 658<sup>b</sup>2-5; 663<sup>b</sup>14; 677<sup>b</sup>25-30; 679<sup>a</sup>28; 694<sup>b</sup>6; *GA* 738<sup>a</sup>33-4; 743<sup>b</sup>7-18; 755<sup>a</sup>21-4; 766<sup>a</sup>16-30; 767<sup>b</sup>10-23; 776<sup>a</sup>25-<sup>b</sup>3; 788<sup>b</sup>33-789<sup>a</sup>4; 789<sup>a</sup>12-14.

<sup>175</sup> *DA* 415<sup>b</sup>8-12; <sup>b</sup>21-8; 416<sup>a</sup>8-9; <sup>b</sup>21-2; *GA* 740<sup>b</sup>25-741<sup>a</sup>2; cf. 726<sup>b</sup>18-21; 729<sup>b</sup>27; 739<sup>a</sup>17; *PA* 640<sup>a</sup>23.

<sup>176</sup> *DA* 424<sup>a</sup>32-3.



## III

With the idea of a literal coloration process defended, I can now bring out its historical significance. It was seen in Section I that Aristotle had plenty to say about what *we* should call the intentional objects of perception. But Franz Brentano thought that Aristotle had actually himself framed the concept of an intentional object. This seminal notion was introduced by Brentano into modern philosophy in 1874. His idea was that if I inherit a fortune, the fortune must exist, in order to be the object I inherit. But if I hope for a fortune, the fortune need not exist outside my mind, in order to be the object of my hopes. This feature—not having to exist outside the mind in order to serve as an object—is called by Brentano intentional inexistence.

Furthermore, he proposes it as the distinguishing feature of mental, as opposed to physical, phenomena, that they are one and all directed to objects of this kind. Even in sense-perception, the square shapes I may represent some scene as containing need not really exist in the external scene, in order to be the objects my sense-perception represents as being there. Descartes's earlier distinction between the mental and the physical, according to which we have infallible awareness of our own mental states, is hard to accept in the age of Freud, and so the completely different criterion proposed by Brentano has merited attention.

But where did he find the idea of an intentional object expressed in Aristotle?

Curiously enough, in the doctrine, which I have interpreted as physiological, of form received without matter. In *Die Psychologie des Aristoteles* (1867), Brentano interpreted that doctrine as meaning that the object of sense-perception (colour or temperature, for example) is not, or not only, physically present in the observer, but present as an object (*objectiv*), that is, as an object of perception.<sup>177</sup>

In *Psychologie vom empirischen Standpunkt* (1874), he went further: in his doctrine that the senses receive form without matter, Aristotle was already referring to intentional inexistence. The forms received without matter were intentionally in-existent objects.<sup>178</sup>

Throughout, Brentano claimed to be following the medieval scholastics, and his earlier interpretation at least would have been readily suggested by Thomas Aquinas' insistence on the intentional status of what is received.

In fact, however, Brentano's interpretation was only made possible by a long history of distortions, a history which I shall be telling elsewhere<sup>179</sup>, and which here I will only sketch. First, the Greek commentators, Alexander, Themistius, and Philoponus, dephysiologized Aristotle's theory of the reception of form without matter. Their motive was not to give the most straightforward reading of the text, but to rescue Aristotle from certain particular problems in physics and logic. If literal coloration was transmitted to the eye, we might get different colours colliding in the same place. Again, if Socrates' fragrance was transmitted to the observer's nostrils, we

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<sup>177</sup> Brentano (1867), 79-81, 86, 120 n. 23, translated (1977), 54, 58, 229 n. 23.

<sup>178</sup> Brentano (1874/1959), 125, translated (1973), 88.

<sup>179</sup> Sorabji (1991).

might violate the logical requirement in Aristotle's *Categories*, which was taken to mean that Socrates' particular fragrance cannot exist separately from him. The commentators' interpretations were designed to give Aristotle the most defensible view.

The result was a theory in which, except for the case of the tactile qualities, hot, cold, fluid, and dry, the reception of form was no longer to be understood as a physiological process. By Philoponus it is called a cognitive (*gnōstikos*) reception. The Islamic philosopher Avicenna added in the idea of an intention or meaning (*ma'nā*, in the Arabic), giving as examples shape, colour, quantity, quality, where (*pou*) and posture. Sense-perception does not abstract from these. In the medieval Latin translations of Avicenna and Averroës available to Albert and his pupil Thomas Aquinas, the Arabic word was translated *intentio*, and *intentio* in perception now appears to be a kind of message which is physically housed. It is the information housed, not the physical housing. It can still in these authors exist in mid-air between perceiver and perceived, and so it is not a message of which anyone is inevitably aware, but Brentano was to change this. For him an intentional object is the object of a mental attitude.

The irony in all at this will now be apparent. Brentano's idea of intentionality was lent the authority of Aristotle, but only through the distortions of successive commentators. We can also see the value of getting clear on the physiological interpretation which I have argued Aristotle originally intended. Only so can the distortions be detected. The purpose of the best commentators is not simply to reflect Aristotle, but to reconstruct him, and that invites originality. The reinterpretation of Aristotle was not perfectly uniform—Philoponus, Aquinas, and Brentano had different versions—much less was it specifically Christian. It was the work of commentators, whether Christian, pagan, or Muslim. It was the commentators who made possible Brentano's interpretation and who lent authority to his important new proposal for the philosophy of mind. Brentano's interpretation should not be taken at face value, but seen for what it is, the culmination of a series of distortions. The moral is that in the history of philosophy the distortions of commentators can be more fruitful than fidelity.<sup>180</sup>

## 13 Aristotle on the Sense of Touch

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<sup>180</sup> I am extremely grateful to Myles Burnyeat for ammunition both for and against my suggestions in Section I, as well as for pressing the issue in Section II. Further acknowledgements for my discussion of the Stoics in Section I are given in my (1990) and in n. 60, and for Section II will be given in my (1991), but I should like here to acknowledge John Ellis's work on the inseparability of Socrates' fragrance (1990 and London Ph.D. Diss. 1991).