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II

The Spirit and The Letter: Aristotle on Perception

VICTOR CASTON

It is hard to imagine that a footnote could cause so much controversy. In his 1974 article, 'Body and Soul in Aristotle', Richard Sorabji claimed that perceiving, on Aristotle's view, involves a *physiological* process in which the sense organ 'literally takes on' the perceptible quality of the object (49 n. 22).¹ It was intended, no doubt, as a straightforward reading of Aristotle's claim that perception is a form of assimilation, where the sense organ becomes like its object.

But that is not to say it was uncontroversial. In 1983, Myles Burnyeat began to deliver a paper aimed at refuting this sort of literalism, along with the functionalist interpretation he took it to support. On Burnyeat's reading, *no* physiological or material change takes place during perception—instead, perception is purely a 'spiritual' change (to use Aquinas' term). The dispute has grown beyond all bounds. A draft of Burnyeat's paper was finally published in 1992 as 'Is an Aristotelian Philosophy of Mind Still Credible?' in a collection devoted in good part to this debate;²

It is a special pleasure to dedicate this essay to Richard Sorabji, who has over many years been both a teacher and a friend. I can think of few colleagues as stimulating or as resourceful, not to mention as decent and as generous, as him. He is someone who not only loves wisdom, but takes joy in it, and talking philosophy with him is always fresh and exciting. My years in London are some of my most treasured.

In writing this essay, I have profited greatly from the comments and criticisms of others, especially Richard and of course the editor, Ricardo Salles, who worked tirelessly to see this all through. I have also received invaluable comments from Alan Code, John Malcolm, and Bob Sharples, and audiences in Mexico City and USC. As one would expect, none of them agrees with me entirely—hence the benefit.

¹ R. Sorabji, 'Body and Soul in Aristotle' ['Body and Soul'], *Philosophy* 49 (1974), 63–89; reprinted in Jonathan Barnes, Malcolm Schofield, Richard Sorabji (eds.), *Articles on Aristotle*, vol. 4: *Psychology and Aesthetics*, (London, 1979), 42–64.

² M. F. Burnyeat, 'Is an Aristotelian Philosophy of Mind Still Credible? (A Draft)' ['Still Credible?'], in M. C. Nussbaum and A. O. Rorty (eds.), *Essays on Aristotle's De anima [Essays]* (Oxford, 1995; originally published, 1992), 15–26.

and many other articles have been written on the topic since then,³ including a handful by each of the main protagonists,⁴ not to mention two full length book treatments, one supporting each side.⁵ It has developed into a set battle, on which virtually everyone in the discipline has their own entrenched views.

The stakes are high. At issue is nothing less than how psychological phenomena fit into the natural world for Aristotle, and consequently whether his approach is a viable one for our own investigations. On a literalist reading, Aristotle believes that psychological changes are always grounded in underlying physiological changes, including perception. On a spiritualist reading, in contrast, perceiving is not grounded in anything further, but instead constitutes a basic form of interaction with the world. Such a view, as Burnyeat emphasizes, is something we can no longer accept. Indeed, we can 'scarcely even imagine what it would be like to take [it] seriously' ('Still Credible?', 16).

³ e.g., H. Granger, 'Aristotle and the Functionalist Debate', *Apeiron* 23 (1990), 27–49; S. Broadie, 'Aristotle's Perceptual Realism' ['Perceptual Realism'], in J. Ellis (ed.), *Ancient Minds = The Southern Journal of Philosophy*, suppl. vol. 31 (1992), 137–59; H. Granger, 'Aristotle's Perceptual Realism', in J. Ellis (ed.), *Ancient Minds = The Southern Journal of Philosophy*, suppl. vol. 31 (1992), 161–71; A. W. Price, 'Aristotelian Perceptions' ['Perceptions'], *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 12 (1996), 285–309; J. E. Sisko, 'Material Alteration and Cognitive Activity in Aristotle's *De anima*' ['Material Alteration'], *Phronesis* 41 (1996), 138–57; D. Bradshaw, 'Aristotle on Perception: The Dual-Logos Theory' ['Dual-Logos Theory'], *Apeiron* 30 (1997), 143–61; J. E. Sisko, 'Alteration and Quasi-Alteration: A Critical Notice of Stephen Everson, *Aristotle on Perception*' ['Quasi-Alteration'], *Oxford Studies in Ancient Philosophy* 16 (1998), 331–52; J. Broackes, 'Aristotle, Objectivity and Perception' ['Objectivity'], *Oxford Studies in Ancient Philosophy* 17 (1999), 57–113; F. D. Miller, Jr., 'Aristotle's Philosophy of Perception', *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 15 (1999), 177–213; R. Woolf, 'The Coloration of Aristotelian Eye-Jelly: A Note on On Dreams 459b–460a' ['Eye-Jelly'], *Journal of the History of Philosophy* 37 (1999), 385–91; J. M. Magee, 'Sense Organs and the Activity of Sensation in Aristotle' ['Activity of Sensation'], *Phronesis* 45 (2000), 306–30; and there are likely others I have overlooked. For a parallel debate on Aquinas, see the references in R. Pasnau, *Theories of Cognition in the Later Middle Ages [Theories of Cognition]* (Cambridge, 1997), 42 n. 20 and his own ch. 1 §2.

⁴ R. Sorabji, 'Intentionality and Physiological Processes: Aristotle's Theory of Sense-Perception' ['Intentionality and Physiological Processes'], in Nussbaum and Rorty (eds.), *Essays*, 195–225; M. F. Burnyeat, 'How Much Happens when Aristotle Sees Red and Hears Middle C? Remarks on *De anima* 2.7–8' ['How Much Happens'], in Nussbaum and Rorty (eds.), *Essays*, 421–34; R. Sorabji, 'Aristotle on Sensory Processes and Intentionality: A Reply to Myles Burnyeat' ['Sensory Processes and Intentionality'], in D. Perler (ed.), *Ancient and Medieval Theories of Intentionality [Intentionality]* (Leiden, 2001), 49–61; M. F. Burnyeat, 'Aquinas on "Spiritual Change" in Perception' ['Aquinas'], in D. Perler (ed.), *Intentionality*, 129–53; M. F. Burnyeat, 'De anima II 5' ['DA II 5'], *Phronesis* 47 (2002), 28–90. (Sorabji, 'Sensory Processes and Intentionality' is a reply to an earlier version of Burnyeat, 'DA II 5' presented to the same conference.)

⁵ S. Everson, *Aristotle on Perception [Perception]* (Oxford, 1997) defends a literalist reading, while T. K. Johansen, *Aristotle on the Sense-Organs [Sense-Organs]* (Cambridge, 1998) supports a spiritualist one.

Sorabji's footnote is almost thirty years old now, and one might have hoped that some of the heat (and smoke) of battle had dissipated. But the gauntlet has been thrown down once again. In a paper that circulated in the mid-1990s, Burnyeat in effect offered the following disjunctive syllogism: either his own view is right or Sorabji's is, *tertium non datur*; but Sorabji's isn't; *ergo, etc.*⁶ I shall argue against both the disjunction and Burnyeat's conclusion. Not only is there logical space between these two alternatives, but there is excellent reason to reject each. Against spiritualism, Aristotle believes that there is always an accompanying physiological change in perception. Yet it needn't be the specific sort of change that literalism requires: it is not necessary for the organ to instantiate the exact same perceptible quality that is being perceived. In perception, the matter of our sense organs comes to share *the same proportions* that the perceptible quality exhibits. But the organ can realize this proportion in different contraries, and so without necessarily replicating the perceptible quality within ourselves.⁷

1. A Budget of Interpretations

It is impossible to assess whether a disjunction is exhaustive, much less whether either alternative is true, without a precise formulation of the positions involved. One will search the literature in vain, however, for anything like a definition.⁸ This unclarity has helped give the debate the appearance of being intractable, and even theological, in character.⁹

⁶ Burnyeat, 'DA II 5', 81–3; cf. also 46, 48, 76–7.

⁷ This line of interpretation enjoyed some currency in the late 1980s, and occasional support since then: D. Modrak, *Aristotle: The Power of Perception* (Chicago, 1987), 56–62, cf. 28; T. W. Bynum, 'A New Look at Aristotle's Theory of Perception', *History of Philosophy Quarterly* 4 (1987), 163–78; J. K. Ward, 'Perception and *Λόγος* in *De anima* ii 12' ['Perception and *Λόγος*'], *Ancient Philosophy* 8 (1988), 217–33; J. Lear, *Aristotle: The Desire to Understand [Aristotle]* (Cambridge, 1988), 109–16; A. Silverman, 'Color and Color-Perception in Aristotle's *De anima*' ['Color-Perception'], *Ancient Philosophy* 9 (1989), 271–92; M. Tweedale, 'Origins of the Medieval Theory that Sensation is an Immaterial Reception of a Form' ['Immaterial Reception'], *Philosophical Topics* 20 (1992), 215–31 at 226–30; Price, 'Perceptions'; Bradshaw, 'Dual-Logos Theory'. Cf. also J. L. Ackrill, *Aristotle the Philosopher* (Oxford, 1981), 66–7; C. Shields, 'Intentionality and Isomorphism in Aristotle', *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 11 (1997), 307–30 at 327–30. But recently it has come under withering fire: see esp. Burnyeat, 'DA II 5', 81–2, but also Sorabji, 'Intentionality and Physiological Processes', 214–15; Everson, *Perception*, 96–9. The present essay is an attempt to show that this third option deserves more serious consideration.

⁸ The closest one finds is the sort of gloss that occurs, e.g., at Everson, *Perception*, 10 and 58.

⁹ The theological motif, which I exploit below, is not entirely facetious. Burnyeat is reported to have originally characterized his position as the 'Christian view', because of the

The exact contours of spiritualism are known to be tricky, and not just for its detractors,¹⁰ especially as regards the way in which perception is still supposed to be bodily and physical. But it is wrong to think that literalism is a straightforward matter, for there are subtleties here too. By hammering out precise formulations, we shall be in a better position to appreciate what is essential to each position and what variations each allows, as well as to assess the logical relation between them. At the very least, we will have definite proposals on the table, which others can use to refine or clarify their positions.

1.1 Literalisms

Let us begin, then, with Literalism. Sorabji's original statement of the position occurs as part of his discussion of *De anima* 3.2, concerning how we perceive that we see. We are aware of our seeing, Sorabji claims, because we are aware of our visual *organ*:

[Aristotle] goes on to remind us that the organ is coloured during the perceptual process (425b22–5), and presumably we will be aware of its coloration. This coloration is a physiological process, which could in principle, even if not in practice, be seen by other observers, using ordinary sense perception. ('Body and Soul', 49–50; cf. 64)

In a lengthy note, he elaborates this as a 'literal taking on of colour' (49 n. 22).¹¹ In perception, the organ 'becomes like the object'¹² in the strong sense that it takes on *the exact same quality* that is being perceived. Its being observable is merely a consequence of this. If something genuinely takes on a perceptible quality, such as violet, then it should be possible to observe this, at least in principle. The intuition behind this reading is both crude and captivating: in cognition, we *replicate* the object within ourselves, thus mirroring the world we perceive. The sense organ 'is potentially what its object actually is',¹³ then, in a perfectly literal sense.

adherence of interpreters such as John Philoponus, Thomas Aquinas, and Franz Brentano, all of whom were 'committed Christians' (*apud* M. Nussbaum and H. Putnam, 'Changing Aristotle's Mind' ['Changing Aristotle's Mind'], in Nussbaum and Rorty (eds.), *Essays*, 27–56 at 51; cf. Sorabji, 'Aristotle to Brentano', 248 and 'Intentionality and Physiological Processes', 210–11).

¹⁰ Burnyeat now acknowledges that some of the formulations in his earlier 'Draft' were not sufficiently careful ('Aquinas', 146–7, 152).

¹¹ Of the many supporting references, he picks out four as especially suggesting literal coloration: *De an.* 2.11, 424a7–10; 3.2, 425b22–4, 427a8–9; 3.13, 435a22–4.

¹² *De an.* 2.5, 417a20 (ὁμοιον ἔστω), 418a5–6 (ὁμοιωταὶ καὶ ἔστω ὅσον ἐκεῖνο).

¹³ *De an.* 2.5, 418a3–4; 2.9, 422a7; 2.10, 422a34–b3; 2.11, 423b30–424a2.

It will be useful to formulate this original position more precisely. Like all the views we shall be considering, it only concerns the perception of 'proper' perceptibles (*ἰδία αἰσθητά*), qualities such as white or sweet, which are exclusive to one sense. (For simplicity, I will refer to these in what follows simply as 'perceptible qualities', unless otherwise noted.) According to the present view, then, all instances of the following schema will be true:

PRIMITIVE LITERALISM: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* literally takes on the quality *F* in the relevant organ at *t*.

It is worth remarking several features of this formulation, as it will provide a framework for much that follows.¹⁴ First, it is intentionally weak. It only states a *necessary condition* of perceiving, or more precisely, of *coming* to perceive. It does not, in itself, tell us what would constitute sufficient conditions for perception, much less its essence. It does not, therefore, amount to a theory of perception. Rather, it is a *thesis*, which different theories might accept in common. For Primitive Literalism leaves open the exact nature of the relation between perception and the organ's taking on the perceptible quality. Here are several possibilities. A Primitive Literalist might be *reductionist* and hold that perceiving is *type-identical* with taking on a perceptible quality. Others might reject this, insisting that they are *distinct types*, though closely related. If so, one might differ again over the type of relation involved: the two types of event might be *coextensive*, or *covary* in some weaker way, or exhibit even looser relations. And one might differ yet again over the tokens of these types. The tokens of each event type might always be distinct from one another; or they might be *token identical*, so that any token event of perceiving is *also* a taking on a perceptible quality. One might even hold that each perceiving is *constituted* by the taking on a perceptible quality, in the way that a concrete substance is constituted by matter. All of these views have in fact been attributed to Aristotle in recent years by different interpreters. But they all share Primitive Literalism in common. It thus provides a useful way of treating these diverse interpretations: by overthrowing this one thesis, all of them will be overthrown. The logical weakness of this formulation constitutes an obvious dialectical strength.

What is it for the organ to 'literally take on' a perceptible quality? Many will not even see room for a question here, taking the answer to be completely straightforward: it is just for *the organ's matter* to take on that quality. This contrasts with Empedocles' theory of effluences, where the sense organ actually receives an influx of matter from the perceptible

¹⁴ Since the remaining formulations will all be variations on this basic schema, I will omit the initial generalization about all the instances being true for the sake of convenience. But they should all be understood as including it, along these same lines.

object. Against this, Aristotle insists that the sense organ is *transformed* by the action of the perceptible quality, so as to become like it. This suggests the following elaboration of Primitive Literalism:

FUNDAMENTALISM: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* literally takes on *F* in the relevant organ at *t*, such that the organ will be *F* in the same way that the perceived object is *F*, in virtue of having the same material disposition.

Aristotle holds, for example, that the color of objects is determined by the proportion of black to white at their surface; and this depends, in turn, on the amount of transparent material at the surface, which is itself a function of the proportion of earth and fire there.¹⁵ According to Fundamentalism, then, when I look at a wisteria plant, the amount and distribution of transparent material in my eye jelly, and hence the amounts and distribution of earth and fire, will change so as to exhibit the corresponding proportions of the wisteria. The jelly behaves, in effect, like Polaroid film. It takes on the perceptible quality of the object by undergoing changes in its own material qualities, such that it comes to possess the perceptible quality *in the same way* that the perceptible object does.¹⁶

It may come as a surprise, then, to learn that this is *not* how Sorabji understands Literalism. In fact, Literalism's first apostle has never been a Fundamentalist.¹⁷ According to Sorabji ('Sensory Processes and Intentionality', 52–3), the eye's material disposition does *not* become like the material disposition underlying the color in the visible object. Instead, the eye jelly will be colored in a similar way to other transparent bodies, such as the sea (although not exactly similar). Transparent material is not visible intrinsically (*καθ' αὐτό*), according to Aristotle, but rather 'through an *extraneous* color' (*δι' ἀλλότριον χρώμα*, *De an.* 2.7, 418b4–6), that is, the color of a visible object outside it.¹⁸ Thus although the sea appears to

¹⁵ *De sensu* 3, 439a18–b18 (esp. b8–12), 440b14–23. Cf. *De anima* 2.7, 418b9–20; *De sensu* 3, 439b25–440a6; *De gen. anim.* 5.1, 779b27–33, 780a27–36, 5.6, 786a5–13. See R. Sorabji, 'Aristotle, Mathematics, and Colour' ['Mathematics and Colour'], *Classical Quarterly*, NS, 22 (1972), 293–308, esp. 292; Sorabji, 'Sensory Processes and Intentionality', 52; Brookes, 'Objectivity', 59, 62–4. This is not what occurs in the eye jelly according to Sorabji himself, however, as we shall shortly see.

¹⁶ For a clear endorsement of Fundamentalism, see Everson, *Perception*, 84.

¹⁷ Although Burnyeat refers to this as Sorabji's 'new approach' (Burnyeat, 'DA II 5', 75 n. 123), Sorabji himself indicates that this view goes back to an unpublished commentary on *De sensu* 3–7 that he wrote in 1968/69 (Sorabji, 'Sensory Processes and Intentionality', 52 n. 4). This is confirmed by allusions in his published writings ('Mathematics and Colour', 293 n. 2; 'Intentionality and Physiological Processes', 212) to the very same doctrines he develops in Sorabji, 'Sensory Processes and Intentionality', 52–4. Cf. Woolf, 'Eye-Jelly', 386 n. 8.

¹⁸ Sorabji speaks of the color that the eye jelly takes on in perception as 'borrowed' ('Intentionality and Physiological Processes', 212) and as 'alien' ('Sensory Processes and

have a color of its own (*ἴδιον*), it in fact has one only *extrinsically* (*κατὰ συμβεβηκός*, *De sensu* 3, 439a18–b16). These extrinsic colors have the *same formal cause* as the intrinsic colors of solid objects, 'because they can excite the actually transparent medium in the relevant way' and so look the same. But they do *not* have the *same material basis*. Intrinsically, the eye jelly is colorless. But it can still take on colors extrinsically, through the extraneous colors of the objects seen. It is in this sense that the eye, during perception, can be said to be 'colored *in a way*' (*ὡς κεχρωμάτισται*, *De anima* 3.2, 425b22–3): it takes on the color merely extrinsically, not intrinsically and in its own right.

On Sorabji's view, then, there needn't be any change in the organ's material disposition, at least not of the sort the Fundamentalist demands. The organ can literally take on a perceptible quality *without* its material disposition changing to become like the one underlying the perceptible quality in the object:

LATITUDINARIANISM: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* literally takes on the quality *F* in the relevant organ at *t*, even if it does not come to have the same underlying material disposition and so does *not* come to be *F* in the same way that the object perceived is *F*.¹⁹

Sorabji still considers this to be a *physiological* change. But it is a change in its *formal characteristics alone*: when I look at the wisteria, my eye jelly becomes like it in form, and *not* in matter.²⁰ Ironically, this is just how Burnyeat characterized *spiritualism*, as distinct from Sorabji's view: 'Receiving the form of something just means becoming like it in form. So, receiving the form of something without its matter means becoming like it in form but not becoming like it in matter' ('Still Credible?', 24). On Burnyeat's view, like Sorabji's, there is no change in the underlying

Intentionality', 53). But both terms are clearly renderings of *ἀλλότριον*, where the contrast seems to be between what is extraneous and what is inherent. On this point, see F. A. Lewis, 'Aristotle on the Relation between a Thing and its Matter', in T. Scaltsas, D. Charles, and M. L. Gill (eds.), *Unity, Identity, and Explanation in Aristotle's Metaphysics* (Oxford, 1994), 247–77 at 262–4.

¹⁹ The 'even if' clause here makes two claims about having the same material disposition: (i) it is *not precluded* from ever occurring, but (ii) it is *not required* either. Thus, while this view allows some of the changes the Fundamentalist posits, it denies that they always occur and so rejects the Fundamentalist claim that they are a necessary condition of perceiving.

²⁰ In what follows, I will use 'physiological' in this weaker way, where it does *not* entail a material change, so as to ensure that the discussion applies equally to Sorabji's position. This will not make a difference in general, since any material changes in an animal's body will also count as physiological changes in this weaker sense. The difference concerns only the converse: most people assume that any physiological change is also a material change; but this is what Sorabji seems to reject. If I am right in what follows, this distinction does not in fact make a great difference to the arguments, which strictly concern the claim of literalism itself.

material qualities.²¹ And he cites with approval the same passages Sorabji does to explain the way in which the eye can be said to be 'colored':²² like the medium, it is colored *in a different way* from solid objects like 'flags and fruit' ('Aquinas', 133 n. 14). Is there anything more than a verbal disagreement between Sorabji and Burnyeat? Or is Latitudinarianism just a form of spiritualism?

There *is* in fact an iota of difference. On Burnyeat's view, the eye jelly is only 'visible in a way and coloured in a way—without *really* being coloured and, in consequence, without undergoing a *real* alteration' ('How Much Happens', 425; emphasis mine). Or, to put it a little more precisely, if the color predicate in question comes to apply to the organ or to the medium at all, it will do so *in a different sense* that contrasts with the way that predicate applies to solid objects ('Aquinas', 133). Such coloration, he claims, is *not* observable: the eye, like the other organs, 'must remain *perceptibly* neutral throughout' ('DA II 5', 75).²³

On Sorabji's view, in contrast, the color predicates apply to the eye jelly *in the same sense* that they do to solid objects. Although the sea's color is apparent, it is not *merely* apparent or illusory. It is genuinely colored: it can truly be said to have a given hue in just the same sense that surrounding objects can, and so can be seen. Sorabji can allow that the eye jelly, like the sea, is colored *in a different way* than objects are colored, even in a 'derivative way', to use Burnyeat's phrase: it takes on extraneous colors from the objects, while they have them intrinsically. But they will not be colored *in a different sense*. The same predicate applies *univocally* to both.²⁴

²¹ Burnyeat, 'Still Credible?', 22; 'How Much Happens', 429; 'Aquinas', 135.

²² And not only Burnyeat. These texts are not proprietary to any interpretation: Tweedale also appeals to these texts ('Immaterial Reception', 227), but while rejecting *both* Literalism and Spiritualism. He favors a third kind of view, of the sort I shall defend below, that only requires that the organ embody the ratio that defines the perceptible quality in question (226–8). See §4.4 below.

²³ Burnyeat goes on to contrast this perceptible neutrality with the 'borrowed colors' Sorabji attributes to the eye, on the grounds that if the eye had a borrowed color, it would lack the transparency required for vision: 'borrowed colours are no easier to see through than inherent colours' ('DA II 5', 75). But this conflicts, *prima facie*, with Burnyeat's approval of the notion of borrowed color in an earlier article, as explicating the sense in which the eye and medium can be said to be colored ('Aquinas', 133). I am not sure how Burnyeat would reconcile these two claims. He has two options, it seems. (A) He can abandon the parallel between the eye jelly and the sea, and deny that the eye takes on borrowed colors. But he thereby forfeits the Aristotelian basis he used to explain the sense in which the eye *does* become colored and so like the object. (B) He can retain the parallel with the sea and grant that the eye, like the sea, takes on borrowed colors, while insisting that both remain *intrinsically* transparent; the borrowed colors, after all, are merely extrinsic. But this would undermine his criticism of Sorabji, since the sea is not 'perceptibly neutral': the sea's borrowed color is manifest and hence difficult to see through.

²⁴ The key move here is unproblematic: 'infertile' can be applied univocally to both men and women—it means they are unable to sexually reproduce—but it is made true in different ways in the two cases.

Burnyeat thus denies what Sorabji affirms, namely, that the perceptible predicate applies to the organ *in the same sense* that it does to the object. The difference, that is, is just literalism itself, the claim that a certain literal, univocal *predication* is true:

CANONICAL LITERALISM: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* literally takes on the quality *F* in the relevant organ at *t*, such that it becomes true to say that the organ is *F* at *t* in just the same sense that the perceptible object is *F* (whether or not it is *F* in the same way).

This thesis also captures what is common to Fundamentalism and Latitudinarianism. Both maintain that it is literally true to say that the organ takes on the perceptible quality, and that it can be said to have that quality in just the same sense that the object does. Because of this, both also accept what is entailed by this claim, above all that the change could be observed by ordinary means, at least in principle. The two positions differ over what *makes* this predication true. In one case, it involves acquiring the same kind of material disposition found in solid objects. In the other, it does not require this, but only a shared formal characteristic, of a sort that can also be found in indefinite bodies of matter. On this point, literalists may differ. But to be a literalist at all, one must accept Canonical Literalism.

1.2 'As Matter to Form'

Burnyeat rejects Canonical Literalism. But his position is richer, and stronger, than a mere denial. The best way to appreciate the difference is to consider a further tenet of Sorabji's, to which Burnyeat also objects and which helps to explain the precise contours of his spiritualism.

In our formulations of literalism above, we left open the exact nature of the relation between perceiving and the literal taking on of a perceptible quality. But Sorabji is not neutral. He explicitly rejects the reductive claim made by Thomas Slakey²⁵ that these events are type identical. On Sorabji's view, perception *is* a physiological process. But it is more than that. That, he believes, is just the point Aristotle is making at the end of *De anima* 2.12, when he claims that 'smelling is something else besides (*para*) the process of being affected by odour' (Sorabji, 'Body and Soul', 54):

Aristotle would not agree that perception is simply a physiological process. For this 'simply' (Slakey's word) would ignore the formal cause... Aristotle would reject the view of some materialists that talk of sensations or houses could be

²⁵ T. J. Slakey, 'Aristotle on Sense Perception', *The Philosophical Review* 70 (1961), 470–84.

replaced by talk of physiological processes or bricks, without impairing our ability to describe and explain. Formal descriptions cannot be replaced by material descriptions in this way... [Perception and images] are indeed physiological processes in a way, but only in a sense of 'are' which does not mean 'are identical with', and with the proviso that they are not 'simply' physiological processes. (Sorabji, 'Body and Soul', 55–6)

Taking on the perceptible quality is only the *material cause* of perception. But perceiving, for Aristotle, must also have a formal cause. Although Sorabji does not specify a formal cause for perceiving ('Body and Soul', 64; cf. 56), both causes would have to be specified in its definition, if it is to meet Aristotle's general requirements for definitions of states of the soul (*τὰ πάθη τῆς ψυχῆς*, *De an.* 1.1, 403a3–b19), a set that appears to include perception explicitly among its number (403a7).

The claim that perceiving is a single event, which is at once a physiological process and yet also something other than that, naturally suggests a so-called 'token identity' view that rejects type identity: a single token event simultaneously instantiates two distinct types. More important, though, is the relation between these two types, of matter to form. The material and formal aspects of psychological states will be distinct and yet inseparable, each forming a necessary part of its essence. Perceiving, we might say, following the Definition of Chalcedon, is 'made known in two natures, without confusion, without variation, without division, and without separation' (*ἐν δύο φύσεσιν, ἀσυγχύτως, ἀτρέπτως, ἀδιαιρέτως, ἀχωρίστως γνωριζόμενον*). Or more mundanely:

CHALCEDONIAN ORTHODOXY: Perception has two natures, which are inseparable and irreducible, related to each other as matter to form: it is neither a purely material change nor a purely formal one, but rather 'a *logos* in matter'.

The distinction between form and matter allows Sorabji to go further than 'dual aspect' theories, and specify the relation between these two types. Perceiving *is* a physiological process, in so far as this physiological process is its material cause. For just that reason, though, the 'is' in question is not the 'is' of identity, but rather the 'is' of *composition* or *constitution* (Sorabji, 'Body and Soul', 55).

Chalcedonian Orthodoxy is a distinct and independent claim. It is not entailed by Canonical Literalism, nor does it entail Canonical Literalism. If, however, Aristotle's strictures on the definition of psychological states apply to perception (as they seem to), then Chalcedonian Orthodoxy cannot be avoided.

Burnyeat rejects the antecedent of this conditional. On his view, perception is *not* to be included in the list of the soul's *pathē* and so is not constituted by a physiological process (see below, pp. 282–3). This, he thinks, is the upshot of Aristotle's characterization of each

sense as capable of 'taking on form without the matter' (*De an.* 2.12, 424a17–19):

... whatever the meaning of the phrase 'taking on form without matter', it picks out the most basic level of interaction between a perceiver and the object perceived. Accordingly, if taking on form without matter is not the physiological process that Sorabji describes, then in Aristotle's view there is *no physiological process* which stands to a perceiver's awareness of colour or smell *as matter to form*. The most basic effect on the perceiver is identical with an awareness of colour or smell... Without Sorabji, the functionalist can point to *no material process* that serves for Aristotle *as the realization of perception*. (Burnyeat, 'Still Credible?', 15, emphasis mine; cf. 'How Much Happens', 421)

Burnyeat thus rejects Chalcedonian Orthodoxy. But he does this by arguing for an even stronger position, namely, that *no* material or physiological process takes place in perception *at all*;²⁶ for if no physiological process takes place, then *a fortiori* there is no physiological process that serves as the matter of perception either.²⁷ This is why Burnyeat concentrates on whether 'the *most basic* level of interaction between a perceiver and the object perceived' is material or not. Just what counts as *basic* for Aristotle is, in my view, the crux of the entire debate.

Rejecting Chalcedonian Orthodoxy, even in this strong way, need not cut all ties to matter and the body. In fact, Burnyeat insists that perception, for Aristotle, must take place in an embodied living thing with the appropriate organs: it is a change *in, and of, the body* (cf. 'Aquinas', 146–9) and presupposes various *standing material conditions* concerning the organ, the medium, and the perceptible object ('How Much Happens', 422–3). It is for just this reason that Aristotle regards perception as a *natural* or *physical* change. But, on Burnyeat's view, it is not a *material* change. He denies that these terms are synonymous ('Aquinas', 146). Physics is the study of natural bodies, which are capable of undergoing change, and hence compounds of matter and form. But not all changes in natural bodies, Burnyeat maintains, need be changes in both matter and form. In the case of perception, Aristotle employs a 'physics of form

²⁶ Burnyeat, 'How Much Happens', 429, 430; 'Aquinas', 130; 'DA II 5', 28.

²⁷ Logically, it is possible to reject Chalcedonian Orthodoxy, while allowing that there *are* physiological changes in perception: one would simply deny that they serve *as the matter for* perception. Burnyeat now takes this to have been Aquinas' line—the physiological processes that do occur in perception are *concomitant* or *accidental* to the perceiving ('Aquinas', 136–9)—and he even shows some willingness to apply this strategy to Aristotle himself as well (cf. 134–5, 139, 142–3). But this would be a significant retreat from his earlier position. For without an explicit statement from Aristotle that such changes are merely accidental to perception, it is hard to resist the pressure of the Chalcedonian reading of *De an.* 1.1. This is why Burnyeat's original, more extreme claim, that there are *no* physiological changes in perception *at all*, is rhetorically his most effective. It pre-emptively blocks the opening for a Chalcedonian reading.

alone' ('How Much Happens', 430, 431; 'Aquinas', 149), where there is no material change whatsoever—and hence a physics that *we* cannot accept or even ultimately understand ('Still Credible?', 16, 19, 25–6).

The position Burnyeat attributes to Aristotle is not unlike a strain of the Monophysite heresy, specifically the one championed by Eutyches. Perceiving is unquestionably a change that arises *from* two natures (*ἐκ δύο φύσεων*). But what results is virtually a single nature, where the contribution of the material is 'like a drop of wine absorbed by the sea'. Perceiving does *not*, that is, consist *in* two natures (*ἐν δύο φύσεσιν*):

MONOPHYSITISM: Although perception is a physical and bodily change, which requires certain standing material conditions, there is *no underlying physiological change* in perception and hence none that is related to it as its matter.

This position does not yet tell us what *does* occur in perception, and so doesn't properly constitute a form of spiritualism—once again, the positions seem to be logically independent. But it does bring into sharp relief one of the more distinctive features of Burnyeat's position and one of his key disagreements with Sorabji. This will be valuable as we try to formulate spiritualism more precisely.

1.3 Spiritualisms

Spiritualism is not a new position. The term itself is taken from Aquinas' characterization of perception as a 'spiritual change' (*immutatio spiritalis*).²⁸ But the idea occurs both earlier and later, Burnyeat suggests, invoking John Philoponus and Franz Brentano as allies ('Still Credible?', 18). It would be a mistake to think, however, that Burnyeat's position is just warmed over scholasticism. There are striking differences, and the contrast once again will help us to appreciate what is distinctive and novel in Burnyeat's position.

One key difference lies in their motivations. The scholastic tradition is not primarily concerned with the nature and viability of physicalism and

²⁸ Burnyeat, 'Still Credible?', 21; cf. Everson, *Perception*, 10 and Burnyeat, 'Aquinas', esp. 129. For Aquinas' view, see esp. *In DA* 2.24, 18–75 (§§551–4); *ST* 1a q. 78 a. 3; 1a2ae q. 22 a. 2 ad 3. Cf. *In DA* 1.10, ll. 189–200 (§159); 2.5, ll. 70–83 (§284); 2.14, ll. 262–82 (§418); 2.20, 44–88 (§§493–5); *ST* 1a q. 67 a. 3; q. 75 a. 3. There has been considerable debate about the nature of this change: see Sheldon M. Cohen, 'St. Thomas Aquinas on the Immaterial Reception of Sensible Forms', *The Philosophical Review* 91 (1982), 193–209; J. Haldane, 'Aquinas on Sense Perception', *The Philosophical Review* 92 (1983), 233–9; P. Hoffman, 'St. Thomas Aquinas on the Halfway State of Sensible Being', *The Philosophical Review* 99 (1990), 73–92; Tweedale, 'Immaterial Reception'; A. Simmons, 'Explaining Sense-Perception: A Scholastic Challenge', *Philosophical Studies* 73 (1994), 257–75; and Pasnau, *Theories of Cognition*, ch. 1.

with whether there are underlying physiological changes, as Burnyeat is. What leads them to posit 'spiritual' changes in cognition is a growing suspicion that certain puzzles are not easily solved by Aristotle's ordinary conception of alteration. Chief among them is the 'contraries' problem: nothing can receive contrary forms at the same time in the same respect, as this would result in contradiction; and yet in certain cases connected with cognition, it seems as if contrary forms must be simultaneously received.²⁹

Aristotle raises this *aporia* himself in connection with our ability to distinguish sweet from bitter or white from black. To discriminate them, we must be aware of both at the same time by means of a single faculty (*De anima* 3.2, 426b12–29). But

it is impossible for the same thing to undergo contrary changes in so far as it is undivided during an undivided period of time. For if it is sweet, then perception undergoes change in this way, as does understanding, while if it is bitter [it undergoes change] in the contrary way, and if white in a different way . . . and it is impossible for it to be white and black at the same time, so that it cannot bear their forms either, if perception and understanding are this sort of thing. (426b29–427a14)

This puzzle brings the question of literalism into sharp relief. If perception and understanding involve literally taking on the form of the object—if, that is, it becomes true to say that the sense becomes *F* in just the same sense that its object is—then it will be impossible for the same thing to perceive white and black at once, as seems to be required at this stage of the *aporia* for discriminating white from black. If Aristotle does in the end require this,³⁰ the only way to avoid contradiction seems to be the one Alexander of Aphrodisias suggests: *abandon literalism*. Our sense, he reasons, must be affected by the perceptible *in some other way* (*εἰ δ' ἄλλος ὁ τρόπος τῆς ὑπὸ τῶν αἰσθητῶν κινήσεως τῇ αἰσθήσει*), so that the organ does not receive the perceptible qualities 'as matter does'

²⁹ This story is told in great detail, with translations of many of the relevant texts, in Richard Sorabji's 'From Aristotle to Brentano: The Development of the Concept of Intentionality' ['Aristotle to Brentano'], in H. Blumenthal and H. Robinson (eds.), *Aristotle and the Later Tradition = Oxford Studies in Ancient Philosophy* 1991, suppl. vol., 227–59; for the contraries problem in particular, see 229–30. Although Sorabji regards this development as innovative and important in the history of philosophy, he also considers it a deviation from Aristotle's views. A similar narrative is told by Joseph Owens, though with a characteristically more sympathetic assessment: J. Owens, 'Aristotelian Soul as Cognitive of Sensibles, Intelligibles, and Self' ['Soul as Cognitive'], in J. R. Catan (ed.), *Aristotle: The Collected Papers of Joseph Owens* (Albany, NY, 1981), 81–98, at 86–95; cf. his 'Form and Cognition in Aristotle' ['Form and Cognition'], *Ancient Philosophy* 1 (1980), 17–27 at 22–5.

³⁰ An assumption that seems to be called into question by the remainder of Aristotle's discussion (427a10–14).

(οὐχ ὡς ὕλη τῶν αἰσθητῶν τὰ πάθη δέχεται τὰ αἰσθητήρια, *De an.* 61.30–62.4 Bruns). And in fact the eye does not literally turn white or black when one looks at these colors, as we readily observe (ὁρῶμεν, 62.4–5). Nor does the medium. If I am looking at a white object and you at a black one, our lines of vision may cross; but their intersection is not literally colored in either way. A similar point holds for reflections in mirrors and water (62.5–15). This distinction between two ways of being affected—(i) ‘as matter is’ and (ii) ‘in a different way’—finds natural resonances in *De anima* 2.5 when Aristotle suggests that alteration takes place ‘in two ways’ (δύο τρόπους ἀλλοιώσεως, 417b13–15) and that perception is ‘a different kind of alteration’ (ἕτερον γένος ἀλλοιώσεως, 417b6–7; cf. 3.7, 431a5–6), as well as in *De anima* 2.12 when he distinguishes between receiving form ‘without the matter’ (ἄνευ τῆς ὕλης, 424a18–19) and being affected ‘along with matter’ (πάσχειν μετὰ τῆς ὕλης, 424b3).

But what exactly does it mean to say that it changes in ‘some other way’? The negative expressions seem to leave the door wide open. The scholastic tradition takes this worry seriously by adhering as closely as possible to the ordinary model of ‘reception’ and ‘assimilation’. On their view, the sense still becomes like the object by *taking on the same form*: it is literally the same form and it is literally received. In fact, it is just on account of this, they would add, that the resulting perception is *about* the object and invariably *true*.³¹ But the form is not received in such a way that *the same predicate* will be literally true of the subject, that is, *in just the same sense* that it is true of the object. That is what happens if the sense received the form ‘as matter does’. It was just this point that led to the contraries problem in the first place and posed difficulties for Canonical Literalism.

On the proposed view, a single form can be received in two ways, with and without matter. Since both changes involve genuine reception of the very same form, the distinction must be based instead on *how* the form *inheres* in the sense. This is the view we find in Avicenna and enshrined in the subsequent tradition as a distinction between two types of inherence or ‘being’: *esse naturale* or *physicale*, on the one hand, and *esse spirituale* or *intentionale*, on the other. When a form has the first sort of being, then (depending on the type of form involved) it results in an eponymous *substance* or *accident*, which will, in general, be material.³² When it has

³¹ A point Burnyeat himself stresses in his treatment of Aquinas (‘Aquinas’, 149). But he may not be entitled to this claim himself, without the metaphysical doctrines it presupposes.

³² But not always. The distinction at issue is slightly broader than the distinction between ‘material’ and ‘immaterial being’, as Thomas shows (*ST* 1a q. 56 a. 2 ad 3). When one angel thinks of another angel, and the first angel receives the form of the second, *both* forms have immaterial being in the first angel, since angels are purely immaterial beings. Yet the form of the second angel has *intentional* being in the first, who is thinking of

the second sort of being, in contrast, it results in a *cognition* of that substance or accident or, in the case of the medium and mirrors, *transmission of information* about the object to a subject. But none of the results will be eponymous (except homonymously). Perception requires the second of these kinds of inherence:

HIGH CHURCH SPIRITUALISM: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* takes on *F* spiritually in the relevant organ at *t*—the quality *F* comes to have intentional being in the organ, even if does not come to have natural being—so that it need not be true to say that the organ is *F* at *t* in just the same sense that the perceptible object is *F*.

On this view, a spiritual change is *necessary* for cognition, whether or not it is also a sufficient condition. In fact, many scholastics would deny that it is a sufficient condition, since they believe that the perceptible form also has intentional being in the medium and mirrors, which do not perceive. Natural changes are also *not excluded* on this view: nothing prevents the sense from undergoing both sorts of changes at once. High Church Spiritualism simply denies that natural changes are a *necessary condition* for perception. All that is required is a spiritual change.

To some, this will seem little more than spells and bells. Metaphysical distinctions often arouse suspicion, especially ones as tailored to a solution as this. How, moreover, are we to understand the claim that the form is genuinely exemplified if the corresponding predicate doesn’t apply? Some might find it attractive, then, that the recent Spiritualist revival eschews all such talk. Like High Church Spiritualism, it distinguishes two types of change. But it does not distinguish two modes of *being*, much less explain the reception of form in perception as a distinctive kind of exemplification.³³

This is not just a matter of emphasis. For according to recent Spiritualism, perception is to be contrasted with ‘real change’: ‘That is what makes this [sc. a kettle or a plant’s being warmed] a case of *real change*; the matter of the thing is assimilated to—becomes like—the matter of the agent . . . It follows that receiving the warmth of a warm thing without its matter means becoming warm *without really becoming warm*’ (Burnyeat, ‘Still Credible?’, 24; emphasis mine). Now, Burnyeat’s point cannot be

him, while the first angel’s own form has *natural* being. Thus, if a form has material being, it also has natural being. But the converse is not true: a form may thus have natural being *and* immaterial being.

³³ Recently, Burnyeat has allowed that the predicate does apply in *some* sense, though not in the same sense that it applies to the object (‘Aquinas’, 133; ‘DA II 5’, 73–4). But he does not explain this by appealing to the kind of *being* a form has or its manner of *exemplification*, except in explicating Aquinas’ view (‘Aquinas’, 141, 149).

that *nothing happens* during perception.³⁴ Obviously, there *is* a transition in going from not perceiving anything to perceiving something, and from perceiving one thing to perceiving another. The claim is rather that it is not really *alteration* or *assimilation*, that is, that it is not really *a certain kind of change*, but another. In vision, for example, what happens in the perceiver is 'not a real coloration or a real assimilation, but only a quasi-alteration/assimilation/coloration' (Burnyeat, 'How Much Happens', 428). He similarly regards the medium of perception as being affected in the same way as the perceiver ('How Much Happens', 427) and undergoing only 'non-real alteration' or 'quasi-alteration' (425, 427, 429–30). The characterization of quasi-alteration here is purely negative, as *not* being a literal exemplification of the perceptible quality. It is not explicated positively in metaphysical terms, as in High Church Spiritualism, as involving a different kind of exemplification.³⁵

What happens is described instead in exclusively *phenomenal* terms. Nothing else transpires in perception except a perceptible quality's *appearing* to a perceiver and the perceiver's 'registering, noticing, or perceiving' it.³⁶ It is 'a matter of appearances alone' ('How Much Happens', 428), about which *nothing more can be said*:

All that happens when Aristotle sees red is that (to use a more recent jargon) he is 'appeared to redly' by an actually red object, and is so appeared to because the object is red. This gives the sense in which he is reddened by the red object, and comes (instantaneously) to be like it. The object's redness appears to him. He is aware of red. ('DA II 5', 75–6; emphasis mine)

Similarly, in the case of the medium, all that is supposed to happen is that sensible forms *appear through* the medium to a perceiver, 'no more, no less' ('How Much Happens', 425–7). End of story.

³⁴ Burnyeat actually considers this possibility in his most recent piece, but explicitly rejects it ('DA II 5', 56). He does maintain that 'nothing happens' in the medium, however, when a color is visible: it is 'a static condition, a state of affairs, not an event or process' ('How Much Happens', 426). The illumination of the air is likewise a mere 'Cambridge change', on his view, a change in its relational properties, without any underlying change in its nature or condition ('How Much Happens', 424–5). Johansen, in contrast, argues against it being a mere Cambridge change (*Sense-Organs*, 136–46), because Aristotle regards such changes as having the least reality (*Phys.* 5.2, 225b11–13; 7.3, 246b11–12; cf. *De sensu* 6, 446b10–13).

³⁵ Recently, Burnyeat has used more positive-sounding formulations: he speaks of coming to perceive as an 'extraordinary alteration', in contrast with ordinary (and 'unordinary') alterations ('DA II 5', 65, 74–5). But there is still no attempt to cash out this distinction in terms of exemplification or being.

³⁶ Burnyeat, 'Still Credible?', 24. Similarly: 'the reception of sensible forms is to 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' ('Still Credible?', 21–2); 'when he sees a colour or hears a sound, *nothing happens save* that he sees the colour or hears the sound' ('How Much Happens', 421; emphasis mine).

Someone might object that this emphasis on the phenomenal is not so distinctive. All Spiritualists regard the changes involved as peculiar to the interaction between perceptibles and perceivers and as irreducible to topic-neutral terms. In fact, a High Church Spiritualist's appeal 'to intentional being' might well be cashed out only by referring to perception or awareness more generally. But the new Spiritualist goes further than this when he insists that the change must be described in *exclusively* phenomenal terms. This is much stronger than claiming that the effect of the perceptible on a perceiver is *identical* with perception.³⁷ Such identity, after all, is something a materialist can accept, along with irreducibility.³⁸ It is rather that there is *no other more fundamental way* of characterizing this change, according to the new spiritualism. Awareness is 'the *most basic effect*' of the perceptible quality (Burnyeat, 'Still Credible?', 15; emphasis mine): receiving form without the matter 'picks out the *most basic level* of interaction between a perceiver and the object perceived' ('Still Credible?', 15).³⁹ And this is to be understood in purely phenomenal terms: 'the effect on the organ is the awareness, no more and no less' ('Still Credible?', 22). This is Burnyeat's point when he claims the only values Aristotle could substitute into a Ramsey–Lewis sentence are the very psychological terms that such sentences are meant to eliminate.⁴⁰ When Aristotle 'sees a colour or hears a sound, *nothing happens save* that he sees the colour or hears the sound' (Burnyeat, 'How Much Happens', 421).

³⁷ As Burnyeat does. The 'key doctrinal passage' at *De anima* 3.2, 425b26–426a26 'states that the effect of the colour on the eye is identical with the seeing' ('How Much Happens', 428).

³⁸ A token identity theory, such as Davidson's Anomalous Monism, can equally insist that the effect of the perceptible is identical with the perceiving, when taken *as a token event*, while also maintaining that perceiving, *as a type*, is irreducible to any type of change described in physical terms. The point is not idle. Burnyeat takes it to be an indication of 'how badly our categories, which emanate from Descartes, fit [Aristotle's] philosophy' that Aristotle regards 'vibration' and 'hearing' as 'two descriptions of one and the same event' ('How Much Happens', 431), whereas we take one to designate something physical and the other something mental. But Aristotle's position is not out of line with our categories at all. Though Aristotle thinks a single token event is involved, he also regards the two *types* as distinct: what it is to vibrate is different from what it is to hear (*De an.* 3.2, 425b27, 426a16–17). But this is precisely the kind of claim a token identity theorist makes: the same token event can be *both* mental and physical, even though these are distinct types of event. Indeed, much philosophy of mind in the past thirty years or more presupposes that one and the same thing can be both mental and physical. *Our use of these terms is not Descartes*.

³⁹ According to Burnyeat, Aristotle uses 'the qualitative language of alteration as the *lowest level* descriptor of what happens in perception' ('DA II 5', 83). But this language, he claims, has to be reconstrued in purely phenomenal terms.

⁴⁰ Burnyeat, 'Still Credible?', 22. See also 'DA II 5', 81, n. 141.

This goes beyond what we find in the scholastic interpreters. *It rules out all non-phenomenal effects, including any physiological effects.*⁴¹ The scholastic position, in contrast, leaves room for them. In making a spiritual change a necessary condition, High Church Spiritualism does *not* exclude natural changes, which often appear in their accounts. Sometimes vision is claimed to involve no natural changes. But this is the exception rather than the rule.⁴²

In excluding all physiological change, recent Spiritualists take a more extreme position. Perception is still considered a bodily, and hence a physical, change (Burnyeat, 'Aquinas', 146–9). But it is *not* a *material* or *physiological* change. It belongs to a 'physics of form alone'.⁴³ Perceptible qualities produce perception directly, without the accompaniment, much less mediation, of any other processes. It is not simply an *irreducible* type of causal interaction. It is *basic*, that is, without any underlying physiological change. Perception, like warming and moistening, would be an interaction at the lowest level of Aristotle's natural world (cf. Burnyeat, 'DA II 5', 82–3).

It is precisely this feature of Aristotle's physics, Burnyeat argues, that we must find unacceptable. It is something we cannot understand, much less believe. It involves 'assumptions... of such a kind that we can scarcely even imagine what it would be like to take them seriously.

⁴¹ 'There is no material or physiological process in the Aristotelian theory of vision' ('How Much Happens', 429); 'with each of the five senses we have to do with a physics of form alone, without material processes' (431); 'Aristotelian perception involves no material processes, only standing material conditions' ('DA II 5', 28). Something similar also holds for the effect of perceptibles on the medium (426). Johansen likewise argues in this case that physiological changes are *excluded* (*Sense-Organs*, 11–12, 126, 136, 270, 282).

⁴² See Sorabji, 'Aristotle to Brentano' and also Tweedale, 'Immaterial Reception'. Burnyeat has recently argued that Thomas Aquinas holds one of the more extreme positions, like his own. Although Aquinas considers vision to be 'more spiritual' than the other senses because unlike them there are no natural changes (*In De an.* 2.14, ll. 241–86 (§§417–18); *ST* 1a q. 78 a. 3), according to Burnyeat *none* of the other natural changes which occur in other types of perception are *underlying* physiological changes for Aquinas, changes that serve as matter for the act of perceiving ('Aquinas', 131–7). Aquinas would thus reject Chalcedonian Orthodoxy across the board. This has been disputed recently by Pasnau ('What is Cognition? A Reply to Some Critics', *American Catholic Philosophical Quarterly* 76 (2002), 483–90 at 488–90; cf. his *Thomas Aquinas on Human Nature: A Philosophical Study of Summa Theologiae 1a 75–89 [On Human Nature]* (Cambridge, 2002), 57–65), who argues that perception is a 'wholly bodily process' (*On Human Nature*, 59). But Burnyeat can accept this last claim, as stated. What he denies is that perception is a *material* process. (That, in his view, is precisely the problem with Aristotle's philosophy of mind: perception is a bodily, but not a material, process.) It is unclear whether Pasnau can claim that perception is a wholly *material* process, though, since for Aquinas vision is solely a spiritual change and spiritual being implies immaterial being. However that may be, the key point for me is that Aquinas *does* accept natural changes *in the organ*, at least in the case of touch and taste, whether or not these changes underlie perception.

⁴³ Burnyeat, 'How Much Happens', 430–31; cf. 'Aquinas', 149.

Aristotle's philosophy of mind is no longer credible because Aristotelian physics is no longer credible' ('Still Credible?', 16). If Burnyeat is right, we cannot accept Aristotle's philosophy of mind for the same reason we cannot accept New Age claims about crystals—that quartz, for example, has the power to bring clarity or amethyst creativity. It is not simply that these rocks don't *in fact* have those powers. It's that nothing *could* have the power to produce those effects, without underlying physiological changes relevant to the change in question. We don't think of such powers as *basic*. But one would have to, to believe in crystals. Or in Aristotle's theory of perception, if Burnyeat is right. Call this position, then, 'New Age Spiritualism':

NEW AGE SPIRITUALISM: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* does *not* undergo any physiological change in the relevant organ at *t*, or indeed any real alteration, but only 'quasi-alteration': it does not become true to say that the organ is *F* at *t* in the sense that the perceptible object is *F*, but only that *F* appears to *S* at *t*.

If Aristotle accepts New Age Spiritualism, Burnyeat is right to say that 'all we can do with the Aristotelian philosophy of mind and its theory of perception... is what the seventeenth century did: junk it' ('Still Credible?', 26). The critical question is whether Aristotle does accept it.

Burnyeat's interpretation is thus a *consciously* uncharitable one. He thinks that in this case, the Principle of Charity simply breaks down. Aristotle's texts leave us no space to attribute a more plausible or defensible view (Burnyeat, 'DA II 5', 82–3). The only interpretation left, he maintains, is one that acknowledges the gulf between us: Aristotle's physics recognizes as basic powers that none of us could accept or even comprehend as such. It is as beyond the pale as believing in the power of crystals.

1.4 Another Way Out?

From even this brief sketch, it should be clear that there are not two opposing positions here, but at best two broad families of positions. And it is also clear that the differences between different versions make a significant difference. They greatly affect which texts and arguments are relevant or probative, as the case may be.

A little more reflection shows that these two broad families do not jointly exhaust the field either. One can reject *both* literalism and spiritualism.⁴⁴ Canonical Literalism is committed to a very specific change—not

⁴⁴ As Burnyeat now acknowledges ('DA II 5', 82–3). But while Burnyeat concedes that there is 'logical space' for intermediate options, he denies that there is 'textual space', so

any physiological alteration will do. It must be such that the *exact same predicate* that applies to the perceptible quality comes to apply to the organ as well, and *in exactly the same sense*. New Age Spiritualism⁴⁵ rejects this, but it rejects much more. No physiological alteration of *any sort* is supposed to take place at all. It thus rejects a broader position, of which Canonical Literalism is only one species:

A BROAD CHURCH READING: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* undergoes *some* physiological change in the relevant organ at *t* such that it becomes like *F*.

This thesis is the true foil to New Age Spiritualism and the target of its criticisms, not Canonical Literalism. If a Broad Church position succeeds, New Age Spiritualism must fail, and vice versa. But the success of a Broad Church position does *not* entail the success of Canonical Literalism—there is some intervening space. It may well be that Aristotle requires material or physiological changes in perception, without requiring that the same predicate that applies to the object also applies to the organ and in just the same sense.⁴⁶

This is precisely what I shall argue in what follows. Aristotle rejects New Age Spiritualism, in favor of a Broad Church position. But he also rejects Canonical Literalism. The view he endorses commits him to physiological changes in perception, of a fairly specific sort. But they do not require the same predicate to be true in just the same sense, as Canonical Literalism does.

that effectively the choice is between Sorabji's interpretation and his own. But the logical space of interpretations is determined simply *by the text*: it is just the range of options that the text does *not explicitly rule out*. 'Textual space', therefore, cannot be narrower than logical space, unless it is a matter of *implicit* constraints on acceptable readings. But those would have to be established by ordinary means, through exegetical arguments and competing probabilities.

⁴⁵ I omit mention of High Church Spiritualism here, since it concerns a logically independent condition, namely, whether a form must be received with intentional being. But it is easy to imagine rejecting this *as well as* rejecting Canonical Literalism and New Age Spiritualism. All one needs to do is deny that Aristotle recognizes two types of exemplification; and this denial is compatible with any of the remaining positions on the presence of physiological changes. There is in fact no good textual evidence for positing two types of exemplification; and any argument for it by elimination is undercut by the options we are exploring here.

⁴⁶ A Broad Church reading, it should be noted, could even accommodate a cousin of High Church Spiritualism. As formulated above, High Church Spiritualism holds that a spiritual change is required, but natural changes are not—natural changes are permissible, but they are not required. But it would be possible to hold that *both* types of change are required, and this would count as a Broad Church reading. This sort of hybrid position should not accept the *specific sort* of natural change Canonical Literalism is committed to, however, since it is precisely this that leads to the introduction of 'spiritual changes' as a solution to the contraries problem.

2. Against New Age Spiritualism

The arguments for New Age Spiritualism are essentially negative arguments, designed to show that Aristotle is *not* committed to underlying physiological changes. Since such a position rules out any Broad Church position, including the intermediate position I shall eventually argue for, it will be crucial to meet this challenge first.

New Age Spiritualist arguments come in two strengths. One type tries to show that Aristotle's views *preclude* underlying physiological change. We shall consider two arguments of this sort: (1) the Argument from Extraordinary Alteration and (2) the Argument from the Efficacy of Sensibilia. If successful, these arguments would provide decisive evidence for New Age Spiritualism. But there is also a second, weaker type of argument for New Age Spiritualism, which attempts to show that, whether or not a commitment to underlying physiological changes is compatible with Aristotle's explicit pronouncements, it is nevertheless *at odds* with his theory. We shall consider two arguments of this sort as well: (3) the Argument from Anachronism and (4) the Argument from Silence.

None of these arguments is successful. But we do not have to rest content with a narrow judgement of *non liquet*. Because the arguments for New Age Spiritualism are all arguments *against* a Broad Church position, exposing their errors helps in building the positive case for a Broad Church position.

2.1 The Argument from Extraordinary Alterations

In *De anima* 2.5, Aristotle introduces perceiving as a change or modification in the perceiving subject (416b33–4). What can perceive is acted on and affected by the perceptible quality, and through this change it 'becomes like' the perceptible (417a20, 418a5–6). In so doing, the subject comes to perceive, exercising its capacity for perception. Aristotle then goes on to distinguish two kinds of transition from potentiality to actuality (417a21–b2), using knowledge as an example. To go from

i. not having knowledge

to

ii. possessing knowledge

the first state must be 'destroyed' or replaced by the second. But in going from (ii), the state of possessing knowledge, to

iii. actually contemplating or using knowledge

the first state is not destroyed, but rather preserved, since contemplating knowledge already possessed is 'a progression towards itself and its own realization' (εἰς αὐτὸ γὰρ ἡ ἐπίδοσις καὶ εἰς ἐντελέχειαν, 417b6–7). This second type of transition, from (ii) to (iii), is 'either not a case of altering', Aristotle remarks, 'or a different kind of alteration' (ἢ οὐκ ἔστιν ἀλλοιούσθαι... ἢ ἕτερον ἀλλοιώσεως, 417b6–7), a comment he repeats a few lines later, applying it explicitly to perception.⁴⁷

Some have thought that by classifying perception as the second type of transition *in contrast with* the first, Aristotle meant to *exclude* physiological change. Commenting on the above passage, Burnyeat remarks, 'If the change involved in perception is not an ordinary alteration but comparable rather to the transition from (ii) to (iii), it *cannot be a matter of* literally and physiologically becoming red or smelly' ('Still Credible?', 19; emphasis mine). Nor is literal assimilation all that is ruled out. The same passage 'also implies that the physical material of which Aristotelian sense-organs are made does not need to undergo *any ordinary physical change* to become aware of a colour or a smell' ('Still Credible?', 19; emphasis mine). And in fact no such change is involved, on Burnyeat's reading.⁴⁸ An ordinary physical change would be a transition of the *first* sort, and according to Aristotle perceiving is *not* that sort of transition. That is, from the claim that

A. Perceiving is not an ordinary alteration

it is supposed to follow that

B. Perceiving does not involve any ordinary alteration

or even

C. Perceiving does not involve any ordinary physical change.

Johansen even offers (C) as a paraphrase of what Aristotle says: 'Now perception is said to be an affection in this second sense, *involving no change of attributes* in the perceiver' (*Sense-Organs*, 12, emphasis mine; cf.

⁴⁷ 'Either one must say it is not a case of being affected, as was stated before, or there are two forms of alteration' (ἤτοι οὐδὲ πάσχειν φατέον, ὥσπερ εἴρηται, ἢ δύο τρόπους εἶναι ἀλλοιώσεως, 417b13–15).

⁴⁸ In spite of his occasional use of weaker formulations to the effect that such changes are *not necessary* to perception ('Still Credible?', 19, 22, 23), Burnyeat more commonly endorses the more emphatic claim that there are *no such changes* in perception, according to Aristotle: 'Still Credible?', 15, 21–2; 'How Much Happens', 421, 423, 429, 430, 431; 'Aquinas', 130; 'DA II 5', 28. Johansen likewise shifts from claiming that such changes are not essential to Aristotle's account (*Sense-Organs*, 41, 93, 106–7, 115, 253) to claiming that they *do not occur at all* on Aristotle's view (11–12, 126, 136, 270, 282).

269–71). If this were right, we could make short work of the Broad Church position, and with it any form of Literalism.⁴⁹

Aristotle never states (B), much less (C), and neither of them is entailed by (A).⁵⁰ This is seen most easily by considering versions of Literalism which maintain that there are always *two* token changes in perception, one formal and the other material.⁵¹ The fact that *one* of these changes is not an ordinary alteration obviously does not preclude *the other* from being one. On the contrary, events of two different types might stand in various relations to one another, including the matter–form relation. But even if perception consists in a *single* token change, with both formal and material aspects, there is still no difficulty. An analogy will help. In general, we distinguish between colors and shapes, and we classify squares as shapes *rather than* colors—square is *not* a color. Have we thereby excluded the possibility of *colored squares*? Obviously not. To have a shape is not to have a color. But this does not prevent something from having both a shape *and* a color. In fact, squares are *always* colored, of necessity (cf. *De an.* 3.1, 425b8–9). So, too, in the case of perception. To perceive is to realize one's nature; and to realize one's nature is *not* to lose an attribute. But this does not prevent my perceiving on a given occasion *also* being the loss of an attribute; in fact, it might necessarily involve the loss of an attribute.

In classifying perception, Aristotle is concerned with the essence of perception as a *type* of event. But this does not exhaust what is involved in *token* perceivings. They may have other features, including material features. More generally, in trying to isolate the essences of things, Aristotle can happily claim that to be an *X* is to be *F* and *not* to be *G*, even if all *X*s are *G*s—indeed, even if all *X*s must be *G*s in order to be *F*. Hypothetical necessity typically constrains material characteristics not included in the definition in just this way.

These aren't idle observations either. In the passage at issue, Aristotle uses the example of *a builder when he is building* (τὸν οἰκοδόμον ὅταν

⁴⁹ Magee ('Activity of Sensation', 317–18) also takes this to be a fairly straightforward inference, and adduces *De an.* 3.7, 431a4–8 as additional support. But the latter passage again does not take us beyond (A). The real issue is still the inference from (A) to (C).

⁵⁰ A point made by Cohen (S. Marc Cohen, 'Hylomorphism and Functionalism' ['Hylomorphism'], in Nussbaum and Rorty (eds.), *Essays*, 57–73 at 63–4), and one which Burnyeat now concedes: 'II 5 on its own does not rule out the involvement of some (as yet unspecified) ordinary alteration, or some non-qualitative change' ('DA II 5', 82; emphasis mine). But Burnyeat still insists that Aristotle accepts (C): although there is logical space for Aristotle to reject (C), he claims, there is 'no textual space' (82–3). It is important to examine, then, whether this text and others do make room for it.

⁵¹ D. Charles, *Aristotle's Philosophy of Action* (Ithaca, 1984), 213–27; R. Heinaman, 'Aristotle and the Mind–Body Problem', *Phronesis* 35 (1990), 83–102 at 92–8; Everson, *Perception*, 255 (cf. 95).

οἰκοδομῇ, 417b9) to help explain the sense in which the transition from (ii) to (iii) is different from other alterations. Johansen infers from this that when the builder builds '[h]e cannot really be said to change by doing so, for he is not acquiring *any* new attributes' (*Sense-Organs*, 269; emphasis mine). This is, on the face of it, an extraordinary claim about building. One could try to soften this impression in various ways, by arguing, for example, that the builder changes *other* things, rather than undergoing change *himself* (*De an.* 2.4, 416b1–2; cf. Johansen, *Sense-Organs*, 270–1); or perhaps that he is involved in *locomotion*, by moving his limbs, but *not* alteration in the strict Aristotelian sense of a change in quality (putting aside any overheating or dampening). But neither of these construals is relevant to the point in context. Aristotle is not drawing a contrast between activity and passivity, or alteration and locomotion, but between preserving and losing one's nature. Thinking and perceiving, like building, are not properly characterized as cases of being altered *because* (διό, 417b8) they are the activation of a capacity already acquired (cf. *De an.* 2.4, 416b2–3). All of these transitions are on a par.⁵² The critical question, therefore, is whether activation *as such* precludes ordinary changes. The answer is clear from the case of the builder. It simply cannot be that *all that happens* when the builder builds is his building, *without any material changes* taking place, as is alleged to occur in the case of perception—the builder cannot exercise his building capacity seated, with arms folded. Therefore, if these cases are to be treated on a par, as Aristotle plainly intends, this sort of activation cannot preclude material changes.

We can go further. Exercising one's building capacity isn't just *compatible* with ordinary changes like hammering and sawing. The capacity is exercised *precisely by* effecting such changes. To build is not the same as to saw or to hammer, but one cannot do the former except by effecting changes of the latter sort. Building is *realized* in such changes: they serve as matter to the activity of building.⁵³ The activation of a capacity, therefore, may not only *involve* ordinary changes. They may be *necessary* to its exercise,⁵⁴ and in some cases even *realize* or *constitute* it.

⁵² This is a point well made by Sisko, 'Material Alteration', 142–3; cf. Sorabji, 'Intentionality and Physiological Processes', 221. Everson (*Perception*, 93) rightly notes that Aristotle's distinction is not peculiar to *cognitive* capacities at all.

⁵³ In fact, we can say even more strongly that building *supervenes* on such activities: whenever he builds, he must perform at least one of these activities (although it need not be any one of them in particular), and each of these is such that, if he genuinely performs it, he is *eo ipso* building.

⁵⁴ This is supported by *Physics* 7.3 (version A), where Aristotle argues that a number of changes are not alterations, while allowing that they may necessarily involve alterations, including the completion or perfection of a house (246a17–18). Completion is an excellence, and as such depends upon how things stand relative to one another (*ἐν τῷ πρὸς τι πὼς ἔχειν*, 246b3–4), and relatives do not themselves undergo any sort of

In the end, Aristotle's point in contrasting the transition from (i) to (ii) with the transition from (ii) to (iii) is much more commonplace. In exercising a particular capacity *C*, I do not alter *with respect to C* in a way that destroys *that capacity*. On the contrary, exercising *C* generally preserves or even reinforces it. But from the fact that I do not alter *with respect to C*, it hardly follows that I do not alter *in any other way*. Indeed, it may be the case that in order to exercise *C*, I *must* alter with respect to other qualities. This is clearly the case with the builder, and so it cannot be ruled out in the case of the perceiver. None of the differences between these cases seem relevant to *that* difference.

2.2 The Argument from the Efficacy of Sensibilia

A second, more sophisticated objection has been put forward by Sarah Broadie, who argues that physiological changes are precluded from serving as the 'material bases of acts of perception' by Aristotle's account of *perceptible qualities* (Broadie, 'Perceptual Realism', 143). Aristotle believes in the 'efficacy of sensibilia', the view that perceptible qualities such as red or sweet are efficacious *as such*, and not in virtue of any other characteristic concomitant with them (138). What causes me to see red is just the quality red: it is a real feature of external objects and a genuine causal power in its own right. Consequently, Aristotle is not compelled 'to postulate physiological processes in order to explain sensory input from the environment' ('Perceptual Realism', 144). This much is explicitly endorsed by Burnyeat:

What is more, the warm or red object acts as cause in virtue of being warm or red. Not for Aristotle the modern idea that the object acts on the perceiver in virtue of some non-phenomenal feature (molecular motion, light reflectancy) on which its appearing warm or red depends. Aristotle's is a world in which, as I have emphasised before, colours, sounds, smells, and other sensible qualities are as real as the primary qualities (so called by us). They are real in the precise sense that they are causal agents in their own right. (Burnyeat, 'DA II 5', 45)

Perception occurs *in virtue of* the action of perceptible qualities as such, and not in virtue of any underlying 'non-phenomenal feature'.

change (b10–14). Even so, 'it may be necessary that [states, and their losses and acquisition] come about or cease *when other things alter*, just as form and shape do, for example, when hot and cold or moist and dry things alter or whatever these states primarily occur in' (ἀλλὰ γίνεσθαι μὲν ἴσως αὐτὰς καὶ φθείρεσθαι ἀλλοιούμενων τινῶν ἀνάγκη, καθάπερ καὶ τὸ εἶδος καὶ τὴν μορφήν, οἷον θερμῶν καὶ ψυχρῶν ἢ ξηρῶν καὶ ὑγρῶν, ἣ ἐν οἷς τυγχάνουσιν οὐσαι πρώτοις, 246b14–17). This point is correctly explained by Alexander of Aphrodisias, *Quaest.* 3.2, 81.27–82.7.

But Broadie thinks we can go further. Because of this realism about perceptible qualities, Aristotle ought to avoid 'any theory that seeks to bridge some presumed gap between awareness and the external stimulus by means of a series of micro-changes in respect of primary qualities' ('Perceptual Realism', 144). Such changes, she argues, would 'threaten to make the color *causally redundant*' ('Perceptual Realism', 144; emphasis mine). If these primary quality changes directly cause perception, color's role is not only indirect, but inessential—*any* way of bringing about these primary quality changes would equally produce a visual experience of color. This, Broadie believes, puts its causal relevance in jeopardy: if these changes are brought about by the 'primary quality configuration of the object's surface', or more generally the material qualities underlying color, she concludes, then 'the color itself *does no work at all*' (144–5, emphasis mine). Color, in short, would be *epiphenomenal*. And that is something that Aristotle cannot accept. It would imply that colors, despite being genuine qualities of physical objects, are 'incapable of making themselves known to percipients', something which, she claims, is even 'more repugnant to the intellect than a color (considered as an external quality) that gets itself seen without mediation by special physiological events' (145), as New Age Spiritualism alleges. If perceptible qualities are to be the proper causes of perception, as Aristotle clearly takes them to be (cf. *De an.* 2.6, 418a23–5), they must produce perception directly, *without the mediation of physiological events* (Broadie, 'Perceptual Realism', 150–1).

This argument is a variation of a causal-explanatory exclusion argument, such as is found in contemporary debates about mental causation. It rests on one of our deeply held intuitions about explanation, which forms a key part of our scientific view of the world:⁵⁵

CAUSAL-EXPLANATORY EXCLUSION PRINCIPLE: For any given event, there cannot be two or more complete and independent causal explanations, apart from isolated cases of overdetermination.⁵⁶

Generally, we assume that when there are competing causal explanations of this sort, at most one can prevail, to the exclusion of the rest; and in those cases where we accept more than one account, we seek to show that

⁵⁵ This assumption is examined in illuminating detail in J. Kim, 'Mechanism, Purpose and Explanatory Exclusion', in J. E. Tomberlin (ed.), *Philosophy of Mind and Action Theory = Philosophical Perspectives* 3 (1989), 77–108; reprinted in his *Supervenience and Mind: Selected Philosophical Essays [Supervenience and Mind]* (Cambridge, 1993), 237–64, and specifically with regard to its role in debates over mental causation in Part II of his *Supervenience and Mind*.

⁵⁶ A causal explanation is *complete* if, and only if, it identifies conditions that are nomically sufficient to produce the effect. Causal explanations are *independent* if, and only if, each describes a state of affairs that could have held in the absence of the other.

they are not really in competition, either because they are not independent or because they are not both complete. If there genuinely were two complete and independent causal explanations, we would have a case of overdetermination. And even when we allow for such cases, we are still averse to thinking that they occur systematically in causal regularities. But Aristotle would be committed to systematic overdetermination, according to Broadie, if in addition to perceptible qualities he posited primary quality changes in perception. He would be introducing causal competition in *every* perceptual encounter. And such a position is inherently untenable and unstable. So, given Aristotle's realism about perceptible qualities, she argues, primary quality changes are the ones that have to go.

Now, some might quarrel whether Aristotle could accept a causal-explanatory exclusion argument, given his doctrine of the four causes; or whether such arguments are valid in general, given the possibility of token-identity views.⁵⁷ But neither complaint is quite to the point. Broadie is concerned about competition for *only one* of Aristotle's four causes, namely, the efficient cause. His explanatory pluralism, therefore, is neither here nor there. So long as Aristotle does not allow two complete and independent *efficient* causes of a single event (except in isolated cases of overdetermination), he accepts the relevant version of her assumption. As for token identity views, Aristotle does allow that Polyclitus is the efficient cause of a statue as well as the sculptor, since that is who the sculptor happens to be. But he draws a distinction. Polyclitus is an efficient cause only *per accidens*, whereas the sculptor is the cause 'properly described' (*τὰ οἰκείως λεγόμενα*, *Physics* 2.3, 195a27–b6); and Aristotle demands that we always seek the 'most exact' cause of each thing (*δεῖ τὸ αἴτιον ἐκάστου τὸ ἀκρότατον ζητεῖν*, 195b21–5). Thus, so long as he holds that there can be at most one *proper* efficient cause of each thing, he would again accept the relevant version of the exclusion principle, as Broadie requires: color alone, and not its underlying material qualities, would be the proper efficient cause of seeing.

The more pertinent question is why this sort of argument would rule out 'special physiological changes' *in the subject*. Causal-explanatory exclusion arguments focus, as the name suggests, on competition between *causes*. Its primary relevance, then, is to the perceptible *object* that brings perception about, and not what occurs in the subject. Yet it is clear that we would never draw the same kind of conclusions about the object. From a causal-explanatory exclusion argument, we could not conclude that color has *no material basis* in the object, for example, or that the effect of color on the medium involves *no underlying material change*. The

⁵⁷ Both objections are raised by Broackes ('Objectivity', 105–7).

most we would be entitled to infer is that such underlying material features are not, as such, the *proper cause* of seeing, not that there *aren't* any such features. Now, grant this more limited conclusion and extend it to the perceiving subject. One could infer that just as color alone is the proper efficient cause of seeing, so seeing alone is the proper effect of color. *Still nothing follows about the presence of underlying material structures or changes.*⁵⁸ This is clear, once again, from the case of building. In *Physics* 2.3, in fact, Aristotle uses it to make clear the canonical form of explanation, where efficient cause and effect are both described in proper terms. Building, he says, is due to a builder in virtue of his building expertise (195b21–3). Yet in this case there can be no doubt that there are material changes underlying this causal interaction, in both agent and patient (see above, pp. 267–8). They are, moreover, systematically related: each underlies, respectively, the proper cause and the proper effect of the interaction. This is, after all, the intended benefit of Aristotle's distinction between the formal and material aspects of things. We can cite one aspect as having primacy in a given explanatory context, without having to deny or exclude the presence of the other. Aristotle is thus free to insist that perceptible qualities are responsible for bringing about perception, while *also* allowing that there are underlying physiological changes. The New Age Spiritualist needs a much stronger argument, if he is to preclude such changes.

Someone might try to up the ante as follows, then. Given Aristotle's causal realism about perceptible qualities, he ought not to posit underlying physiological changes. For if there were any such changes, it would be *these*, and not color, that would have explanatory primacy. A lower level would not just be a causal competitor, it would *edge out* any higher competition. Causal responsibility, it might be claimed, always resides *on the lowest level*. Therefore, if color is to be a proper efficient cause of vision, it must not only be *irreducible* to underlying material qualities, it must be *basic*—Aristotle must recognize it as one of the *fundamental* powers in the cosmos. Higher orders of phenomena, in contrast, can be called 'causes' only by courtesy: to use Jaegwon Kim's apt oxymoron, they are capable of 'epiphenomenal causation' at best.⁵⁹ For it is the

⁵⁸ As Nussbaum and Putnam ('Changing Aristotle's Mind', 36) rightly point out, 'it is one thing to hold that perception cannot be explained "from the bottom up," quite another to hold that it is not accompanied by or realized in any material transition.' They accept the former, but deny the latter.

⁵⁹ See J. Kim, 'Epiphenomenal and Supervenient Causation', in P. A. French, T. E. Uehling, Jr., and H. K. Wettstein (eds.), *Causation and Causal Theories = Midwest Studies in Philosophy* 9 (1984), 257–70; reprinted in his *Supervenience and Mind*, 92–108. Unlike nineteenth-century epiphenomenalists, who regarded mental events and bodily events as distinct, but parallel tokens, Kim is concerned primarily with cases of token identity, where the mental supervenes on the physical. He later comes to view 'epiphenomenal causation'

lower orders that are actually doing all the work. But the inefficacy of higher-order phenomena inevitably undercuts their claim to reality.⁶⁰ If Aristotle wants to preserve the efficacy of color and other perceptible qualities, then he must either (a) *reduce* them, by taking them to be *identical* with underlying physiological changes or (b) *eliminate* underlying changes entirely, taking perceptible qualities instead to be *basic*. Causation, on this view, is always on the lowest level. Hence, colors must have nothing underneath them if they are to be real.

Such a view comports well with certain late twentieth-century views on the Unity of Science. But nowhere do we find Aristotle inclined towards such a view. To the contrary. Like nineteenth- and twentieth-century emergentists,⁶¹ Aristotle insists that in objects of increasing complexity, there are genuinely new, irreducible causal powers. But he does *not* regard them as basic. They depend crucially on the elemental powers that underlie them, while remaining distinct and efficacious in their own right. Nor is this a stance he invokes just to solve 'special' problems concerning life and consciousness. It is evident already in his treatment of *chemical* qualities, just as it is for nineteenth-century emergentists like Mill and Lewes. For Aristotle, the class of basic qualities is extremely small. There are only four: hot, cold, moist, and dry (*De gen. et corr.* 2.2). They do not suffice to explain all the behavior of even simple chemical compounds, which differ from each other precisely with regard to their causal powers. In *Meteorology* 4.8–9, Aristotle discusses *eighteen* pairs of such powers (see esp. 385a12–18), all of which go beyond the efficacy of elemental qualities.⁶²

with increasing suspicion, as a threat not only to mental causation, but mental realism, and advocates a return to a form of reductionism: see esp. J. Kim, 'The Myth of Nonreductive Materialism', *Proceedings and Addresses of the American Philosophical Association* 63 (1989), 31–47, reprinted in his *Supervenience and Mind*, 265–84, and J. Kim, 'The Nonreductivist's Troubles with Mental Causation' ['Nonreductivist's Troubles'], in J. Heil and A. Mele (eds.), *Mental Causation* (Oxford, 1993), 189–210, reprinted in his *Supervenience and Mind*, 336–57.

⁶⁰ As Samuel Alexander wryly observed (*Space, Time, and Deity*, 2 vols. (London, 1934; originally published, 1920), 2.8), to hold that there are inefficacious higher-order phenomena 'supposes something to exist in nature which has nothing to do, no purpose to serve, a species of *noblesse* which depends on the work of its inferiors, but is kept for show and might as well, and undoubtedly would in time, be abolished'. For an excellent discussion of the connection between mental realism and mental causation, see Kim, 'Nonreductivist's Troubles', 348–51.

⁶¹ For an invaluable and illuminating discussion of emergentism, see B. P. McLaughlin, 'The Rise and Fall of British Emergentism' ['British Emergentism'], in A. Beckermann, H. Flohr, and J. Kim (eds.), *Emergence or Reduction? Essays on the Prospects of Nonreductive Physicalism* (Berlin, 1992), 49–93.

⁶² The ability and inability, respectively, to (i) solidify, (ii) melt, (iii) soften in heat, (iv) soften in water, (v) bend, (vi) break, (vii) shatter, (viii) be crushed, (ix) be molded, (x) be compressed, (xi) be drawn out into threads, (xii) be beaten out, (xiii) be divided; (xiv) be cut; (xv) stick together; (xvi) be compacted, (xvii) burn, and (xviii) smoke.

But these powers are not independent of the elemental qualities either. Which capacities an object has *follows from* (ἀκολουθεῖ, *Met.* 1.3, 340b16–17) its particular makeup of elemental qualities. In this sense, these higher powers can be said to *come from* the elemental qualities present (ἐκ τούτων, *De gen. et corr.* 2.2, 329b32–34; cf. 329b34–330a29), and so an object's possessing this or that ability can thus be *traced back* (ἀναγόνται) to its elemental qualities, though not *reduced* to them, as some translations misleadingly suggest (*De gen. et corr.* 2.2, 330b24–26).⁶³ The lower-level qualities *determine* which higher-level powers an object has, and to that limited extent have a certain role within explanatory accounts. But they do so *without usurping the explanatory primacy* of the higher-level powers.

Perception need not be any different. Broadie is right to insist on the fact that Aristotle's explanations are in terms of higher-level powers, like perceptible qualities, and higher-level effects, like perceiving. But this does not rule out the *presence* of lower-level qualities and changes involving them. On the contrary, they may be systematically related, as the underlying material cause.

Neither of these arguments for New Age Spiritualism—the Argument from Extraordinary Alteration and the Argument from the Efficacy of Sensibilia—succeeds, then. Both are formulated in exceptionally strong terms. They aim to show that Aristotle's own doctrines *rule out the possibility* of underlying physiological changes in perception and so establish New Age Spiritualism. Given the strength of this claim, it is not surprising that both fail. The doctrines in question are fully compatible with such changes.

In comparison, the next two objections are more moderate. Neither attempts to show that Aristotle's texts are *incompatible* with a Broad Church reading. At most they undermine its plausibility, by raising doubts about our motivations and about the textual evidence. But even that would represent a significant gain for New Age Spiritualism. If a Broad Church reading is anachronistic or something Aristotle never articulates, it remains a notional possibility at best. Such an option might be available to Latter Day Aristotelians, who only have to avoid contradicting the Master's *ipsissima verba*. But it would strain the Principle of Charity unduly. A Broad Church reading requires more than logical space, if it is to be an attractive interpretation of Aristotle.

⁶³ A point rightly noted by Johansen (*Sense-Organs*, 181, esp. n. 8) concerning the relation of hot, cold, moist, and dry to other tangible qualities.

2.3 The Argument from Anachronism

The first objection intimates that any Broad Church reading—any reading that requires an underlying physiological change—is guilty of a form of anachronism. In my opinion, it is this objection which is primarily responsible for the allure New Age Spiritualism has had among interpreters of Aristotle. And it deserves to be stared down, in full candor.

The objection runs like this. Our own perspective has been inalterably shaped by the rejection of Aristotelian science in the early modern period. Yet we cannot appreciate what is distinctive about his philosophy of mind, and why it is forever closed to us, until we consider what it would have been like to be an Aristotelian *before Descartes*. Here is the finale of Burnyeat's first paper:

But what the details of the theory of perception teach us is how closely the failure of the functionalist interpretation of Aristotle is bound up with the fact that Aristotle has what is for us a deeply alien conception of the physical. If we want to get away from Cartesian dualism, we cannot do it by travelling backwards to Aristotle, because although Aristotle has a non-Cartesian conception of the soul, we are stuck with a more or less Cartesian conception of the physical. To be truly Aristotelian, we would have to stop believing that the emergence of life or mind requires explanation. We owe it above all to Descartes that that option is no longer open to us...new functionalist minds do not fit into old Aristotelian bodies. (Burnyeat, 'Still Credible?', 26; cf. 16)⁶⁴

This criticism is not only aimed at functionalist interpretations, which might easily be suspected of anachronism. For the assumption that is alleged to be anachronistic is just the claim that there is some change that *constitutes* or *realizes* perception, which can be identified in *topic-neutral* terms (Burnyeat, 'Still Credible?', esp. 22–3). Such an assumption is not limited to Canonical Literalism, but equally belongs to any Broad Church reading. It does not turn on the specific physiological changes that Canonical Literalism demands.

The 'emergence of life or mind' is central to Broadie's diagnosis too. We find New Age Spiritualism perplexing, she suggests, because we are deeply committed to the 'Paradigmatic Priority of Inanimates', the view that interactions between inanimate objects are paradigmatic for the physical in general and that perception in particular 'results from a process whose initial stages at least can be explained by principles governing the behavior of inanimate things' ('Perceptual Realism', 150). Our faith in the Paradigmatic Priority of Inanimates is made all the more

⁶⁴ See also Burnyeat, 'How Much Happens', 431; 'Aquinas', 131, 146–9, 151; 'DA II 5', 78, 81.

natural by our belief in their Chronological Priority: we take it for granted that both life and consciousness appeared relatively late in the history of the world (148–9). But, Broadie notes, Aristotle doesn't accept the Chronological Priority of Inanimates. The species of living things are permanent features of his world—at no time were there only inanimate objects in the sublunary world. Consequently, Aristotle did not have the temptation to view inanimates as paradigmatic either. He is committed to the substantial natures of living things, which form a basic and irreducible part of the physical world. What we take to cry out for further explanation is for him a feature that simply must be acknowledged and accepted.

It can hardly be denied that our outlook is imbued with the prevailing notions of our time, which are profoundly influenced by the views of Descartes and Darwin. But that should not be allowed to poison the well. The key issue is not whether interpreters' motivations are impure, but whether the concerns they ascribe to Aristotle are peculiarly modern. And in this case, they simply aren't.

Aristotle is well acquainted with the Chronological Priority of Inanimates. He alludes to Empedocles' view that biological species originated from haphazard combinations of parts and ultimately the four elements.⁶⁵ In fact, living things make a fairly late appearance on the world stage in many Presocratic cosmogonies. Anaximander, for example, thinks the first living things were formed in the sea, well after the heavens and the earth were formed (DK 12 A 11 and 30). Anaxagoras and Democritus also accept a marine origin of life.⁶⁶ Others, such as Empedocles and Archelaus, adopt a slightly different view, according to which life first originates within the warm, moist earth.⁶⁷ The belief in an origin of life is also widespread in ancient Greek culture generally, as reflected in myth and literature, enough to provide the basis for W. K. C. Guthrie's Messenger Lectures, *In the Beginning: Some Greek Views on the Origins of Life and the Early State of Man* (Ithaca, NY, 1957).

The Paradigmatic Priority of Inanimates, even in its most extreme form, also forms part of the furniture of Aristotle's intellectual world. The suggestion that matter is nothing but extended substance, which possesses nothing more than shape, orientation, and motion, does not need to wait for Descartes. It is what ancient atomists like Democritus

⁶⁵ *Physics* 2.8, 198b29–32. Cf. DK 31 A 72, B 35.9–17, B 57, B 59, B 61, B 62, and B 73.

⁶⁶ Anaxagoras: DK 59 A 42.12 (although A 1.9 has it occurring in moist earth). The Atomists: DK 68 A 139; cf. 67 A 22.

⁶⁷ Empedocles: DK 31 B 62. Archelaus: DK 60 A 1.17, 4.5. In philosophical authors, this account can also be found in Plato *Menexenus* 237d–238a; Epicurus fr. 333 Usener; Lucretius 5.805–15; and Diodorus Siculus 1.7.4–6 (Diels regards the latter as deriving from Democritus' *Mikros Diakosmos*; see DK vol. 2, p. 136).

famously maintained, 'a single account that applies to all bodies' (*περί πάντων ἐνὶ λόγῳ*, *De gen. et corr.* 1.8, 324b34–325a2).⁶⁸ These physical principles are completely fundamental to his theory, even if he admits a special type of 'soul' atom.⁶⁹ For Democritus' account of life and consciousness, from breathing to the various phenomenal qualities we experience in perception, consistently refers to the basic, geometrical properties of atoms and their resulting motions, including spherical soul atoms.⁷⁰ Aristotle can thus complain that 'most of the natural philosophers' (cf. *De sensu* 4, 442a29–30) 'trace proper perceptibles back to these [sc. the common perceptibles], as Democritus does to white and black. For he says the one is rough and the other smooth, and traces back flavors to shapes' (442b10–12). Democritus need not *identify* individual colors with textures or flavors with shapes—in fact, it's not clear to what extent he even acknowledges their reality (DK 68 B 9). But he does explain our experience of these qualities by referring to the shapes, motions, and arrangements of atoms. This is clear from Theophrastus' summary: 'None of the other perceptibles has a nature, but rather each is a state of the sense when it undergoes alteration, and things appear to us as a result. Not even cold or hot have a nature. Instead, *the arrangement [of atoms], by shifting, produces our alteration*' (*De sens.* 63, 517.8–12 *Doxogr. Gr.*). Nor is this strategy peculiar to the atomists. Plato's *Timaeus* also explains the phenomenal features of experience by appealing to the geometrical properties of matter, as Aristotle is quick to point out.⁷¹ Here, as with Democritus, we find the Paradigmatic Priority of Inanimates with a vengeance, where the lowest level is characterized solely in quantitative terms (so-called 'primary qualities').

There are also less extreme forms of Paradigmatic Priority, which do not insist on a purely quantitative approach. Empedocles, for example, offers a qualitative chemistry based on four elements, and he explains the characteristics of compounds such as blood, bone, flesh, sinews, and claws, by appealing to the proportion of elements contained in them.⁷²

⁶⁸ See esp. Aristotle *Metaph.* A.4, 985b4–22 (= DK 67 A 6); *De gen. et corr.* 1.2, 315b33–316a1; 1.8, 325b17–19, 326a1–3, a15. Also DK 68 B 9, A 37–8, 124–5.

⁶⁹ *De an.* 1.2, 403b31–404a9, 405a8–13; 1.3, 406b15–25 (= DK 67 A 28; 68 A 101, 104). Also *Aet. Plac.* 4.3.5 and 7 (= DK 67 A 28; 68 A 102).

⁷⁰ On life and respiration, *De an.* 1.2, 404a9–16; *De resp.* 4, 471b30–472a18 (= DK 67 A 28; 68 A 106). On perceptible qualities and the experiences they produce, see DK 68 B 9; *De gen. et corr.* 1.2, 315b33–316a1; Theophr. *De sens.* 61–8, 516.25–519.12; 73–8, 520.24–522.25 *Doxogr. Gr.* (= DK 68 A 135); Theophr. *De plant.* 6.1.6–2.4 (= DK 68 A 129–31); and also DK 68 A 124–5. On other mental states, see DK 68 B 7, 9, and 33; also Theophr. *De sens.* 58, 515.22–5 *Doxogr. Gr.* (= DK 68 A 135) and DK 67 A 30.

⁷¹ e.g. *De gen. et corr.* 1.8, 325b24–8. For the analysis of perceptible properties, see *Tim.* 61d–67e; cf. Theophr. *De sens.* 83–6, 524.20–525.27 *Doxogr. Gr.*

⁷² DK 31 A 78, B 96, 98; cf. B 23.

Plants, for example, are said to grow upwards because of the fire they contain while their roots grow downwards because of the earth (*De an.* 2.4, 415b28–416a2). In Aristotle's view, this is indicative of Empedocles' general approach to all substances, animate or inanimate.⁷³ Any chance cause, he believes, might have brought about these compounds, including living compounds, so long as the elements are in the right proportions.⁷⁴ The idea that the same kinds of material explanation are to be offered for both animate and inanimate phenomena alike is a familiar and recurrent view.

The difficulty is not, therefore, to understand what it would be like to be an Aristotelian before Descartes, but to comprehend how someone could be a New Age Spiritualist *after Empedocles and Democritus*. Aristotle is not in a position to 'stop the question "What makes this a living thing?" before it can arise' (Burnyeat, 'Still Credible?', 26), because by his time these sorts of questions had *already* been raised. He cannot pretend to be innocent of these concerns. If Aristotle were a New Age Spiritualist, he would have been taking a self-conscious and deliberate stand, in reaction to his predecessors, a stand that would have required reasons and argument.

These texts are not news, and in his most recent articles Burnyeat has explicitly acknowledged the relevance of Aristotle's predecessors, at least in passing. The late appearance of life is one of the 'key tenets' of ancient atomism, he notes, which has since become 'an important part of the modern scientific outlook' ('Aquinas', 151). He also acknowledges that several of Aristotle's predecessors explain perception by appealing to 'microscopic effluences and particles' ('DA II 5', 35; cf. 37 n. 28). But Burnyeat doesn't see this as compromising the main thrust of his position, because he takes Aristotle to be 'vehemently opposed' to the emergence of life ('Aquinas', 151) and to offer 'objections of principle against those who account for perception, or for other cases of being affected, by appeal to what happens at the microscopic level' in *De generatione et corruptione* 1.8 ('DA II 5', 36).⁷⁵

But these are not minor concessions. The terms of the argument have shifted significantly. If positing underlying physiological changes were peculiarly modern, it would have been understandable why, in the

⁷³ *De gen. et corr.* 2.6, 333b9–11; *Metaph.* A.10, 993a17–22; *De an.* 1.5, 409b32–410a6 (includes DK 31 B 96; cf. also Simplicius' introduction to the fragment). His appeal to microscopic 'pores' and what fits into them may have been more limited—Aristotle, at any rate, criticizes him for only using it in connection with perception and mixture (though the latter surely plays a large role in Empedocles' system).

⁷⁴ *De caelo* 3.2, 300b25–31 (= DK 31 B 57); *De gen. et corr.* 2.6, 333b4–16; *De part. an.* 1.1, 640a19–23 (= DK 31 B 97).

⁷⁵ Magee also takes the objections in *De gen. et corr.* 1.8 to be quite general ('Activity of Sensation', 325).

arguments we considered earlier, Aristotle had not explicitly ruled out such changes. Being premodern, he would not have been aware of our concerns and so could easily be excused for not addressing them. But now it is admitted that they *are* a prominent feature of his intellectual landscape, of which he is well aware. So if Aristotle is a New Age Spiritualist, he must consciously reject these views. The question is therefore our earlier one: in his criticisms of his predecessors, does Aristotle *rule out* underlying material changes? If he has 'objections of principle' against any such underlying changes, we can eliminate a Broad Church reading straight away.

If one examines Aristotle's criticisms of Democritus, Empedocles, and others, one will find objections to specific microphysical processes and to certain general patterns of explanation. But none of them has any direct bearing on the question at issue. *De generatione et corruptione* 1.8 does offer a battery of arguments, but they concern details peculiar to Democritus' and Empedocles' theories. Aristotle finds Democritus' theory inconsistent on the question of whether atoms are free of qualities and incapable of producing or undergoing alterations, as well on questions about their size and intrinsic differences (326a1–b6). The mechanism of passageways or 'pores' that Empedocles appeals to in his account of perception runs into a different sort of trouble, having to do with Empedocles' denial of the void (325b1–10, 326b6–28).⁷⁶ In neither case do we have a general criticism of underlying material changes, or any that could be easily generalized. More to the point, there is nothing here that affects the question of whether there can be underlying material changes given Aristotle's theory of elements, which, as one might expect, is designed to avoid both sets of objections against his predecessors.⁷⁷

The one general objection which Aristotle repeatedly makes against his predecessors is that they regard the material nature of things as providing the *primary*, or even *sole*, explanation, and so leave the final cause entirely out of account.⁷⁸ But Aristotle does not go to the other extreme, advocating that one *only* give a teleological explanation and allowing no role to the material. On the contrary, he accepts both, insisting only on the *primacy* of teleological explanation. In *De generatione animalium* 5.8, he argues against Democritus that the front teeth fall out *both* because it is

⁷⁶ Theophrastus criticizes Empedocles' appeal to pores in perception, arguing that as inanimate things have pores too, they should also perceive, thus erasing the distinction between the two: *De sens.* 12, 502.25–503.4 *Doxogr. Gr.*

⁷⁷ Elsewhere Aristotle offers other criticisms of Democritus and Empedocles—e.g., *De gen. et corr.* 1.2 and 2.6; *De caelo* 3.7–8; *De sens.* 4, 442a29–b24—but they likewise depend upon specific details of their systems.

⁷⁸ See *Phys.* 2.8 and *De gen. an.* 5.8 for criticisms along these lines of Empedocles and Democritus, respectively.

better and as a necessary consequence of the materials: it happens on account of the end, while *also* being necessary due to the material and efficient causes (789a8–14, b2–8, b12–15). If we take this as indicative of Aristotle's general explanatory stance, and apply it to the case of perception, what we would expect is that he would *not* rule out underlying material qualities and the changes they undergo. He would insist merely that they do not bear the *primary* responsibility for perception. The explanation of why perception occurs will instead be primarily (though not exclusively) in terms of the perceptible quality, our perceptual ability, and the end of perception. Precisely, we might add, what one would expect from an emergentist.

The rhetoric of anachronism should therefore be abandoned. To persist in it, when the real issue concerns the extent of Aristotle's disagreement with his predecessors, would be little more than a bait-and-switch. What Aristotle objects to in the 'bottom-up' approach of his predecessors is not that there is a bottom, but that they do not leave room for 'top-down' explanation, much less give it the pride of place he thinks it deserves. His insistence on the primacy of 'top-down' explanation, then, is not incompatible with a commitment to underlying physiological changes. What he rejects is a view that regards *all* causal explanation as stemming *from the lowest level*. But a Broad Church position is not committed to such a causal claim, only the ontological one that there *are* underlying physiological changes. Emergentists combine just this sort of ontological commitment with a 'top-down' explanatory approach.

2.4 The Argument from Silence

This brings us to the last argument, which concerns textual evidence (or lack of it). If Aristotle held a Broad Church position, we would expect him to say something about underlying physiological changes, either in general or by way of example. But, it is suggested, Aristotle is *silent* about such changes, and what he does say about perception leaves little room for them. The sense organs are simple in structure, without moving parts, and their sensitive portions are composed entirely out of homoeomerous material (Burnyeat, 'How Much Happens', 422–3). Of the four basic types of change Aristotle recognizes—generation, growth, locomotion, and alteration—the only change that seems appropriate to such organs is the last, and in this case he regards it as a distinct 'kind of alteration', or perhaps in an even more qualified vein as 'an alteration *of a kind*' (ἀλλοίωσις τινος).⁷⁹ But this, Burnyeat argues, leaves no 'textual

⁷⁹ Burnyeat, 'Still Credible?', 19; 'DA II 5', 34–7, 74, 76–7, 81–3.

space' for any underlying changes, even if there is 'logical space' ('DA II 5', 82–3).

This, I believe, is the strongest argument New Age Spiritualist interpretations have. And, as an argument *ex silentio*, it only goes so far. It establishes at most a *lack* of evidence for a thesis, which is not the same as *possessing* evidence against it, much less possessing evidence for the opposing thesis. Still, the embarrassment to a Broad Church position would be costly enough. In the absence of alternative explanations, that would count somewhat in favor of a New Age Spiritualist reading.

It is doubtful, though, that Aristotle is silent. He says several things that on the face of it commit him directly to underlying physiological changes in perception. This shifts the burden of proof considerably. To establish *silence*, it would have to be shown that these passages *cannot* coherently be read in this way, which would be a very high bar to clear indeed. What has been offered in the literature falls well short of that. We are given *alternative* readings to show that certain passages *need not* be read in a Broad Church way. But in that case the issue concerns the competing probabilities of rival readings, not silence. The *mere possibility* of an alternative reading does not constitute an argument against a Broad Church interpretation, much less an argument for a New Age Spiritualist one. What would have to be shown is that this alternative reading is *more probable*.

In three key cases, though, the comparison does not even seem close. The alternative readings strain, even at a grammatical level. Aristotle is not silent. The most that could be argued is that he does not voice a Broad Church position loudly or emphatically or often enough. But poor elocution—if indeed it is—is an even frailer reed than silence.

2.4.1 The body always Undergoes Something (De an. I.1)

The first text appears explicitly to endorse a general commitment to underlying physiological changes. In the first chapter of the *On the Soul*, Aristotle sets out the following puzzle:

The states of the soul (τὰ πάθη τῆς ψυχῆς) also pose a difficulty. Do they all belong in common to that which has [a soul] too, or is any exclusive to the soul itself? For we have to come to grips with this, even though it isn't easy. In most cases, it seems, [the soul] does not undergo or produce anything without the body, such as getting angry, growing bold, wanting, and *perceiving in general*. Understanding is most likely to belong exclusively. (I.1, 403a3–8)

But in the discussion that immediately follows, Aristotle shows reservations as to whether even understanding is an exception, conceding that it may have some connection with the body after all (a8–15). He then

restates his earlier generalization with approval: 'It is in fact likely that *all* the states of the soul (τὰ πάθη τῆς ψυχῆς) occur together with a body—aspersion, gentleness, fear, pity, boldness, as well as joy, loving and hating—since the body undergoes something in conjunction with these' (a16–19). A similar claim is reiterated twice more. After three examples involving anger and fear (a19–24), Aristotle infers that 'the states are clearly accounts in matter' (λόγοι ἐν ὕλῃ, a24–5). This, in turn, has direct consequences for how such states should be defined (a25–b16). After a comparison of the different types of definition employed by natural science, mathematics, and first philosophy, Aristotle sums up the results of the discussion: 'The states of the soul (τὰ πάθη τῆς ψυχῆς), we were saying, cannot be isolated from the natural matter of animals, in so far as they are just this sort of thing, as anger and fear are, and not like a line or a surface' (b17–19). The passage as a whole is plainly programmatic. Aristotle is trying to make as general a claim as he can about the soul's relation to the body and about the consequences this has for the proper form of definition for psychological states, as involving both matter and form. He countenances only one possible exception, the understanding; and even here he thinks there may be a connection with the body. If this is right, then Aristotle seems to be committed to underlying physiological changes in perception and quite possibly for every type of mental state in general. The passage appears to voice support, directly and explicitly, for both a Broad Church position and Chalcedonian Orthodoxy.

Burnyeat dismisses this as a 'widespread illusion' ('DA II 5', 82 n. 143). But how are we to be cured of this impression? Johansen suggests that the passage's central claims are in fact much vaguer and weaker than have been thought. Aristotle is only claiming that 'there is no mental process, with the possible exception of thought, which is not a process of the body' (*Sense-Organs*, 11; emphasis mine). For a New Age Spiritualist, these will all be *bodily* processes. But they need not be, or involve, *material* ones (cf. Burnyeat, 'Aquinas', 146–9; cf. p. 14 above).

Some of Aristotle's formulations could be read in this weaker way, as merely requiring embodiment: his first claim, for example, that none of these states occurs 'without a body' (οὐθὲν ἄνευ σώματος, 403a6) and later claims that they will always occur 'together with a body' (μετὰ σώματος, a17; cf. a15).⁸⁰ But his subsequent elaboration of the thesis cannot. He says that in all these cases the body undergoes something *in conjunction with* these states (ἅμα γὰρ τούτοις πάσχει τι τὸ σῶμα, a18–19). What the

⁸⁰ Sisko ('Quasi-Alteration', 351, esp. n. 26) thinks that the second of these claims may be stronger than the first; but even so, he still thinks it may only apply to emotions, as Burnyeat claims. My point is that it would not matter even if *both* were to be read in the weaker sense Johansen advocates. The clear and unambiguous reference to bodily change is in the succeeding lines, 403a18–19.

body undergoes, therefore, must be something that can be distinguished from *the state as a whole*—otherwise, there is nothing for its change to be in conjunction with (ἅμα τούτοις). The type of bodily change at issue *cannot be identical*, therefore, with the type of mental change, even if it should turn out on Aristotle's view that a single token event instantiates both types. If perception falls within the scope of 'all the states of the soul' at 403a16, as it does earlier at a3–7, then there will be a change which the body undergoes that is *not simply* the perceiving, but rather some underlying aspect of it.

The only way to avoid this conclusion is to deny the antecedent. Which is precisely what Burnyeat does.⁸¹ He argues that perception is *not* included within the scope of 403a16 and a24–5. Instead, Aristotle has in mind πάθη only in the narrow sense of *affections*, or even *passions* (in the sense of emotions), and not the broader sense used at 403a3, where it stands for *states* or *conditions* of the soul, including perception.⁸² The turning point is said to occur at 403a10–11, where Burnyeat claims these πάθη have been 'divided' into the soul's acts or affects (τῶν τῆς ψυχῆς ἔργων ἢ παθημάτων). After that, πάθη refers only to the *second* of these subdivisions; in particular, at 403a25 'no explicit stand is taken on the *erga* [i.e., acts] of the soul' ('How Much Happens', 433 n. 38).

This is a hard reading. Suppose that the phrase 'acts or affects' at a10–11 does introduce a sharp distinction and that the remarks about πάθη in the subsequent lines (403a16–25) are restricted to affects. Nothing yet follows. Burnyeat's reading requires a further tacit assumption, namely, that perception belongs among the soul's *acts* (ἔργα) and so is not covered by his remarks about πάθη and bodily processes. But this would be a very strange assumption for Aristotle to make, either for dialectical purposes or in the context of his own views. The most natural way to understand the contrast between 'acts and affects' is as parallel to the contrast found earlier in the passage between acting on something and being affected (cf. πάσχειν . . . ποιεῖν, 403a6–7). But perception falls on the wrong side of this divide. According to the *endoxa* or received views Aristotle considers, perception is a type of *being affected* or *acted upon* (πάσχειν).⁸³ It is a view he also endorses himself consistently throughout the corpus.⁸⁴ Aristotle

⁸¹ Burnyeat, 'How Much Happens', 433, esp. n. 38; 'Aquinas', 129–30; 'DA II 5', 82 n. 143.

⁸² On this broader use of πάθος, see H. Bonitz, *Index Aristotelicus*, 2. Aufl. (Graz, 1955; originally published, 1870), 556a60–b43.

⁸³ *De an.* 1.5, 410a25–6; 2.4, 415b24; 2.5, 416b33–5. This is something Burnyeat emphasizes himself at points (e.g., 'DA II 5', 71).

⁸⁴ *De an.* 1.5, 410a25–6; 2.4, 415b24; 431a4–6; *De insomn.* 2, 459b4–5; *De motu anim.* 7, 701b16; *Physics* 7.2, 244b7–12. Other passages confirm this indirectly. The argument of *De an.* 3.2, 425b25–426a25, for example, relies crucially on the assumption that the functioning of the perceptual capacity is the functioning of a *patient* (426a4–5, a9–11). The

does place careful qualifications on just how this passivity should be understood.⁸⁵ But none of them implies that perception is a case of *acting* or *producing* (ποιεῖν) instead. This is confirmed by his treatment of the understanding. Aristotle does recognize a type of understanding as active or productive in *De anima* 3.5. But he contrasts it explicitly with another type of understanding (430a11–17) that is passive and acted upon, *just like perception in general* (3.4, 429a13–18).

It might be argued, more tendentiously, that Aristotle uses the phrase ‘acts or affects’ to mark a different contrast, between the kind of ἐνέργεια that perception is said to be in *De an.* 2.5 and ‘ordinary’ affections. But it is dubious that such a technical distinction, which requires so much effort on Aristotle’s part to tease out, could be presupposed so early on here, in a dialectical discussion; and that it would be introduced, without any further indication, by such non-technical language as ‘acts or affections’. This is what, in American football, is referred to as a Hail Mary pass. But not even such extreme measures will make sense of the remainder of passage.

The problem is that the New Age Spiritualist must read πάθη as shifting its sense several times in course of the passage. It is not just that its meaning would have to narrow suddenly at a16–25, without warning or explanation. It is that πάθη occurs *four more times* later in the passage, where it plainly has the broader meaning of *state* (403b10, 12, 15, 17). We also find the same kind of disjunction, ἔργα καὶ πάθη, followed again by πάθη by itself (b12–15), where it would be absurd to think πάθη shifts to a narrower sense. The natural scientist and the mathematician are both concerned with *states* of matter that are not isolable (τὰ πάθη τῆς ὕλης τὰ μὴ χωριστά, a10, a14). But the natural scientist is concerned with all ‘acts and states’ of a specific kind of body and matter (τοῦ τοιοῦδὲ σώματος καὶ τῆς τοιαύτης ὕλης ἔργα καὶ πάθη, a12), while the mathematician is concerned with them in abstraction, in so far as they are not the *states* of a specific kind of body (ἢ δὲ μὴ τοιοῦτου σώματος πάθη, a15). Aristotle’s claim about the scope of mathematics is not intelligible if πάθη is construed narrowly, either as affections or as passions. Mathematics obviously does not study how bodies are acted upon or our emotions, but the quantitative characteristics of bodies in general. But these closing remarks, concerning the scope of crafts, natural science, mathematics, and first philosophy (403b9–16), flow directly from the earlier discussion about the proper form of definition for the πάθη of the soul (403a25–b9). To make sense

argument in *Metaph.* Γ.5, 1010b30–1011a2 likewise assumes that external objects are agents that *produce* perception (ποιεῖ τὴν αἴσθησιν) in the subject.

⁸⁵ *De anima* 2.5, 417b2–7, b12–16. Cf. 3.4, 429a29–b5.

of the programmatic aims of the passage as a whole, we must construe πάθη consistently throughout, in its broad sense, as a *state*.

Perception, then, should be counted as one of the πάθη of the soul at 403a16–19 and a24–5. If so, Aristotle is committed to underlying physiological changes for every state of the soul, *including perception*. The only possible exception he leaves room for is understanding; and even this loophole may be closed.⁸⁶

2.4.2 The Organ’s Qualities Affect Sensitivity (*De an.* 2.11)

In a passage at the end of *De anima* 2.11, Aristotle discusses how the constitution of the organ of touch affects its sensitivity, in a way that has implications for the kind of changes involved. The organ of touch is unique among the senses. In the other senses, the material is *neutral* with respect to the range in question: the eye jelly, for example, is colorless, the air in the ear silent. Touch, in contrast, inevitably possesses some of the qualities along its own range. For ‘the differentiae of bodies as such’ (αἱ διαφοραὶ τοῦ σώματος ἢ σώμα)—the elemental qualities hot, cold, moist, and dry—are themselves tangible (423b27–9). Consequently, all bodies have them, including the organ of touch. But then touch will have ‘blind spots’:

For to perceive is to be affected in a certain way, so that the agent makes it the sort of thing it is itself in actuality, since it is [that sort of thing] in potentiality. For this reason we do not perceive what is similarly hot and cold or hard and soft, but only excesses, due to the sense being like a kind of mid-point in the opposition among perceptibles. Because of this, it discriminates between perceptibles, since what is midway is able to discriminate: for it is related to each of them as the other extreme is. And just as that which is going to perceive light and dark must be neither of these in actuality, but both in potentiality (and similarly in the other cases), so in the case of touch, [that which is going to perceive] must be neither hot nor cold. (424a1–10)

The passage does not say anything explicitly about underlying physiological changes in perception, only about standing material conditions in the organ. But Aristotle’s argument turns on the kinds of change the organ of touch *can* undergo given its constitution, and the kinds of change it *must* undergo if we are to perceive certain tangible qualities. To perceive an object, the organ must in some sense become the sort of thing the perceptible acting on it is (424a1–2). But if the organ has a particular perceptible quality as part of its constitution, it cannot *become*

⁸⁶ For related criticisms of Burnyeat’s reading, with which I am sympathetic, see Sorabji, ‘Sensory Processes and Intentionality’, 56–9 and M. Nussbaum and H. Putnam, ‘Changing Aristotle’s Mind’, 42–5.

the right sort of thing, for the simple Eleatic reason that it *already* is that sort of thing and so there would be no change or transition.⁸⁷ Hence (δύο, a2), we cannot perceive any tangible object which is *similarly* (ὁμοίως) hot, cold, moist, or dry, that is, similar to the constitution of our own organ (a2–3). This is the Literalist's strongest evidence.⁸⁸ Aristotle seems to be assuming that in the case of touch, if a subject is to perceive a tangible quality *F*, the organ must come to be *F*, in just the same sense that the object is. That would be why a given constitution blocks a particular content.

This cannot be Aristotle's argument, though, if he is a New Age Spiritualist. On that view, our organ does not undergo any physiological change when we perceive, and so it should be irrelevant whether the organ of touch, for example, can *become* warm or not. Why are there blind spots, then, on a New Age Spiritualist's view? Johansen suggests that the point does not concern physiological changes, but changes in perception

⁸⁷ Melissus *apud* Simpl. *In Phys.* 103.17–20; cf. DK 30 B 1. Gorgias: *apud* Sext. *Emp. Adv. math.* 7.71 (= DK 82 B 3); cf. *MXG* 979b26–33. It might also be in Parmenides (DK 28 B 8.12–13), if Karsten's emendation of ἐκ τοῦ ἐόντος (followed by Reinhardt and Tarán) is to be accepted.

⁸⁸ Even so, it is not decisive: the point cannot be extended to the senses generally, much less the understanding. (On the senses, see §3.1 below; on the understanding, see my 'Aristotle's Argument for Why the Understanding is not Compounded with the Body', *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 16 (2000), 135–75.) All Broad Church readings are committed to a weaker blind spot principle, though, because all hold that the organ must become like the perceptible quality through some physiological change. We might put this schematically as follows. When I perceive a quality *F* at *t*, my organ becomes like *F* by taking on *G* (allowing different Broad Church readings to specify *G* differently). If so, then I cannot come to perceive *F* at *t* if my organ is already *G* in the period leading up to *t*, because it could not then take on *G* at *t*. Literalism is just a special case of this more general position, where *G* is always identical with *F*. Nonliteralists do not require this: *G* need not be identical with *F* in every case. Thus, a nonliteralist might accept that *G* = *F* in the case of the tangible qualities—or at any rate, in the case of *hot, cold, moist, and dry* (cf. Philop. *In De an.* 432.33–433.1)—without inconsistency. But even if a nonliteralist insists that *G* is *never* identical with *F*, he could make still sense of Aristotle's observation by supposing that being hot or cold or moist or dry *necessitate* having the relevant *G*. An organ with a certain temperature could not then come to perceive that temperature, since being *F* it would already be *G* and so could not come to be *G*, as is required. Both responses concede that in the case of touch there is a tight linkage between *F* and *G*. But both deny that this must be extended to perception in general.

A brief comment should be added here about Aristotle's requirement that all the organs be *neutral* (424a7–10), since Sorabji has enlisted this as support for Literalism ('Intentionality and Physiological Processes', 215). Aristotle's point is *not* that the organs must be *qualityless*, since we know that the organ of touch will have *some* temperature (a2–4, cf. 423b27–9), and hence a blend of hot and cold. It is rather that the sense must be 'like a kind of mid-point', and not either of the extremes, if it is to discriminate qualities along the range, including both endpoints (424a4–7). It is 'both in potentiality' (δυνάμει δ' ἀμφοῖ, a9) in the ways the senses generally are by being receptive of form 'without the matter'. On the relevant sense of being potentially *F*, see §4.1 below.

(*Sense-Organs*, 215–17). If we are already *perceiving* a given quality, such as the warmth of the organ of touch, then we cannot *come to perceive* that quality in anything else.⁸⁹ 'There is nothing in this explanation of the blind spot phenomenon', Johansen concludes, 'that lends support to a literalist interpretation' (217).

Two features of this reading are worth noting. First, on this reading there are *no blind spots*, strictly speaking: the organ of touch will not be insensitive to any tangible qualities. On the contrary, it is actually perceiving the very quality to which it is allegedly blind. It just does not perceive it in an *external* object. Second, what blocks the perception of an external quality is *another perception*, namely, the perception of our own constitution, and not our constitution *per se*. Our constitution affects what we can perceive *only indirectly*, in so far as we are *perceiving* it. This would become evident if the perception of the organ were not continuous, but intermittent: the fact that the organ has a quality *F* as part of its constitution would not prevent it from perceiving *F* in other things, namely, at times when it was not perceiving *F* in the organ. The constitution of the organ thus plays no *direct* role in blocking perceptions. Neutral material conditions are thus *not essential* for perceiving the full range of qualities. They are required for perceiving other things only when there is a concurrent perception of the organ itself.

It is also a hard reading. The passage does not mention a *perception* of the organ at all. And for good reason. Aristotle takes it for granted that we do *not* perceive our own organs. In fact, our inability to do so is something that an adequate theory should be able to explain: 'There is a difficulty as to why there is not also perception of the senses themselves and why, without something external, they do not produce perception, although there is within them fire, earth, and the other elements, of which there is perception in their own right or of what is concomitant to them.' (2.5, 417a2–6)⁹⁰ Aristotle answers this by saying that the perceptual capacity must not have a perceptible quality 'in actuality, but only in potentiality', and so requires something that actually has the quality to affect it (2.5, 417a6–9), which in the case of perception will be external (417b19–20). But if this is right, then blind spots cannot arise via the indirect route Johansen suggests.

Aristotle's explanation of the blindspot phenomenon is more direct. The tangible qualities of the organ of touch prevent our perceiving the

⁸⁹ By framing the question in terms of *coming* to perceive, the New Age Spiritualist can still take advantage of the Eleatic argument, and so evade Cohen's criticism ('Hylo-morphism', 66).

⁹⁰ A passage of which Burnyeat is well aware ('DA II 5', 39–40). As he rightly points out, the claim is just an instance of a more general principle that nothing naturally unified can affect itself: *Metaph.* 9.1, 1046a28; *Phys.* 8.4, 255a12–15.

same qualities *because* (διό, 424a2) the organ must itself take on certain qualities if we are to perceive them, and it can't if it already has them. The organ's material constitution has direct bearing on the sorts of physiological changes it can undergo and, as a result, what it can perceive.

2.4.3 *The Eye's Moisture is Affected by Visible Objects* (De gen. an. 5.1)

In *De generatione animalium* 5.1–2, Aristotle speaks even more directly about the material constitution of sense organs and how they affect perception. In the first chapter, he discusses the constitution of the eyes. Differences in eye color correlate with differences in our capacity for day and night vision. Both characteristics are due to the same cause, namely, the amount of *moisture* (τὸ ὑγρόν) contained by the eye:

For some eyes have more moisture, others less, than is commensurate with the change, while others have a commensurate amount. Those eyes that have more moisture are brown-eyed, those that have less blue-eyed ... (b34) We should take the same thing to be responsible for the fact that blue eyes are not sharp-sighted during the day, while brown eyes are not during the night. For due to having less moisture, blue eyes are changed more by light and visible objects *in so far as they are moist* and *in so far as they are transparent*. But vision is the change of this part in so far as it is transparent and not in so far as it is moist. Brown eyes are changed less due to having more moisture, since night light is weak, while at the same time the moisture is in general hard to affect at night too. (779b26–780a7)

The eye is both moist and transparent. But the two aspects are different: to see is for the eye to change in so far as it is transparent, and not in so far as it is moist. Still, the eyes are affected by visible objects in *both* respects, 'in so far as they are moist *and* in so far as they are transparent' (ὑπὸ ... τῶν ὁρατῶν ἢ ὑγρὸν καὶ ἢ διαφανές, 780a3). It is simply incorrect to claim that what we find mentioned in these chapters are 'all static material conditions' that 'facilitate or impede accuracy of perception without adding to the processes that take place at the moment of perceiving' (Burnyeat, 'How Much Happens', 423).

One could not in fact ask for clearer evidence of a token identity view. When a visible object affects the eyes, they undergo a single change with two aspects—that is precisely why Aristotle has to speak of the change the eyes undergo 'in so far as' (ἢ) they have one characteristic or the other. This description also supports Chalcedonian Orthodoxy (see p. 254 above), since transparency seems to be a formal or 'higher-level' characteristic, while *being moist* is indisputably a material characteristic, indeed

an *elemental* one and thus at the lowest level in Aristotle's system.⁹¹ The fact, moreover, that he explains vision by reference to one of these aspects, namely, the higher-level one, is typical of his overall explanatory strategy. And it is evident here that it does *not preclude* the presence of an underlying material change or such changes having explanatory relevance. It is '*because* the moisture is moved and affected a great deal' (διὰ τὸ πάσχειν τι μᾶλλον καὶ κινεῖσθαι τὸ ὑγρόν) by extremely bright things that we temporarily cannot see, whether our vision is strong or weak (780a12–14). Too much moisture results in night blindness, as occurs in brown eyes, because at night the eyes' moisture is hard to affect or move (δυσκίνητον, a6), while too much dryness results in cataracts (a14–25). None of these explanations appeal to transparency, or the purity or clarity of the moisture, but rather the overall amount and balance of elemental qualities like moist and dry. Nor is moisture invoked to explain only failures or incapacities. Differences in vision are explained in part by whether the amount of moisture is *commensurate* (σύμμετρον) with the *commensurate change* (τῆς σύμμετρον κινήσεως), or excessive or deficient (779b26–8). These elemental conditions and the changes they permit are relevant to what type of vision is produced by visible objects, even if vision is a change in the eyes *qua* transparent.⁹²

Much to his credit, Johansen recognizes the difficulty this passage poses for the Spiritualist interpretation. His solution is to treat the καὶ in the key phrase ἢ ὑγρὸν καὶ ἢ διαφανές at 780a3 as 'corrective': instead of translating the phrase 'in so far as they are moist *and* in so far as they are transparent', he argues it should be construed 'qua moist, *or rather* qua transparent' (*Sense-Organs*, 106). This is an exceptionally hard reading. From a phrase that straightforwardly says '*A and B*', we are supposed to understand 'not *A*, but rather *B*'.⁹³ The context, in any case, rules it

⁹¹ One might be tempted to think of the effect on the eye jelly qua transparent as the material change underlying vision, as Broackes does ('Objectivity', 66–7; cf. 62–4), since the transparent is a characteristic of the organ's matter, and the effect that visible objects have on it is an effect common to certain inanimate objects, like the visual medium. But I suspect a New Age Spiritualist would view transparency as a *formal* characteristic, specified only by *reference to perception*: it is that feature of matter in virtue of which something *appears through* it and is seen. The effect of the visible object on the organ in so far as it is moist, in contrast, cannot be sidelined in this way.

⁹² On the continuum between normal and dysfunctional cases, see Sisko, 'Material Alteration', 146.

⁹³ Johansen (*Sense-Organs*, 106, n. 125) cites H. W. Smyth, *Greek Grammar* (Cambridge, Mass., 1980; originally published, 1920), §2870 and J. D. Denniston, *The Greek Particles*, 2nd edn. (Oxford, 1950; originally published, 1934), 292 I(8). But the exempla they cite all involve numerical estimates or obvious rhetorical heightening effects, and so bear little resemblance to the present context. Aristotle's phrase would have to be rendered something like: 'in so far as they are moist, nay, *transparent!*' But this would make irrelevant the subsequent line (780a3–4), as we shall see.

out. The sentence that immediately follows this phrase—namely, that vision is the change in the eyes ‘in so far as they are transparent and not in so far as they are moist’ (ἡ διαφανές, ἀλλὰ οὐχ ἡ ὑγρόν, 780a3–4)—is contextually relevant only if visible objects affect the eyes in *both* respects. This second line is not only *compatible* with an underlying physiological change, as Johansen concedes (*Sense-Organs*, 106–7). It *presupposes* such a change.

Johansen ultimately takes this second line to show that *even if* there are such changes, they are not part of the *explanation* of what vision is (*Sense-Organs*, 107). But this addresses a different question. *All* parties to the debate accept Aristotle’s ‘top-down’ approach to explanation, which does not restrict itself to basic, elemental qualites, but appeals primarily to higher-level qualities, such as transparency.⁹⁴ The critical question is whether such a strategy *excludes* underlying physiological changes. And plainly here it does not. In fact, such changes can have explanatory *relevance*, even if this falls short of full causal responsibility. Aristotle often appeals to underlying qualities when discussing variations in performance and behavior. They help to explain how well formal qualities and changes are implemented. It is thus an integral part of the overall story of even the ‘purest’ sense, vision.

It is worth noting that John Philoponus, who is often touted as a star witness for spiritualism, accepts such changes as well. To be sure, he does say that the *sense* is acted on by the form alone, which is received ‘cognitively’ (γνωστικῶς, *In De an.* 438.6–10 Hayduck). But Philoponus also insists that the *sense organ* is affected by perceptibles, in two ways in fact, both as a body and as a sense organ (439.15–17). This is not only the case with touch, where flesh and the internal organ grow hotter or colder (432.33–5, 438.13–15). As a sense organ, the eye is also affected by colors, which cause its contents to coalesce or disperse; and as a body, it is affected by the fire present in them, which heats it (439.18–20). The fact that the *sense* receives a form only ‘cognitively’ does not preclude underlying material changes taking place in the *organ*. *Philoponus thus rejects New Age Spiritualism*. At the same time, he also rejects Canonical Literalism. He asserts that in every sense except touch, the matter of the organ does *not* come to be *F* in the same sense that the perceptible object is *F*. Even in the case of touch, this only happens with the hot, cold, moist, and dry, and *not* the heavy, light, viscous, crumbly, rough, and smooth (432.33–433.1). He heads for the middle ground between these two positions, as shall we.

⁹⁴ See, e.g., Nussbaum and Putnam, ‘Changing Aristotle’s Mind’, 36; Sorabji, ‘Intentionality and Physiological Processes’, 223.

2.4.4 Activities ‘Common to Body and Soul’ (*De an.* 3.10)

The most that can be said against a Broad Church reading is that for Aristotle underlying physiological changes do not seem to have the *thematic centrality* that they do for us. Even if one grants the programmatic and general claims made in *De anima* 1.1, it is striking that he does not speak about physiological changes in perception *more frequently* in that treatise. Contrast discussions of passions or action, where reference to the body is unavoidable. According to Burnyeat, this shows that cognition is special.⁹⁵ If sensible forms cause themselves to be known, he urges, ‘they had better do it with the least possible involvement of matter’ (‘How Much Happens’, 433).

A great deal depends here on context, though. Aristotle distinguishes among his own psychological works according to how much or how little they are concerned with the material side of things. He contrasts those writings that are ‘about the soul’ (περὶ ψυχῆς) with those that are about ‘states common to body and soul’ (κοινὰ τῆς ψυχῆς καὶ τοῦ σώματος), where perception is explicitly included in the second group, as common to body and soul.⁹⁶ Given that he speaks about perception in both works, we should therefore understand the difference as one of *emphasis* or *focus*. The *De anima* concerns the soul itself, without much focus on the body at all, whereas the *Parva Naturalia* and *De motu animalium* have more to say about its role.⁹⁷

In any event, Aristotle does discuss the body in purely cognitive cases, such as memory and recollection. Differences in the ability to retain memories depend on the material quality of the central organ, in particular the extent to which it is hard, soft, moist and dry (*De mem. et remin.* 1, 450a32–b11). These qualities are invoked to explain how well the central organ ‘takes the impression’ of a memory and how long it retains it in the soul (ἐν τῇ ψυχῇ, 450b10–11), by referring to the way in which these elemental qualities promote or hinder the material changes involved. A more striking example, perhaps, is recollection, which is not a passive process like memory, but a kind of reasoning (συλλογισμός τις) and so found only in humans (2, 453a8–14). Aristotle is explicit about the

⁹⁵ Burnyeat, ‘Still Credible?’, 23; ‘How Much Happens’, 433; ‘Aquinas’, 129–30; ‘DA II 5’, 80 n. 138.

⁹⁶ *De sens.* 1, 436a7–8, b2–7; *De somno* 1, 454a9–11; *De an.* 3.10, 433b20. See Nussbaum and Putnam, ‘Changing Aristotle’s Mind’, 41–2.

⁹⁷ Nussbaum and Putnam, ‘Changing Aristotle’s Mind’, 37. C. H. Kahn (‘Sensation and Consciousness in Aristotle’s Psychology’, *Archiv für Geschichte der Philosophie* 48 (1966), 43–81, reprinted in Jonathan Barnes, Malcolm Schofield, and Richard Sorabji (eds.), *Articles on Aristotle*, vol. 4: *Psychology and Aesthetics* (London, 1979), 1–31) examines at length the differences between these treatises, concluding that they are due to methodological considerations and questions of emphasis.

involvement of material changes: 'The person engaged in recollection and performing a search *moves something bodily* (σωματικόν τι κινεῖ) in which the state resides' (2, 453a22–3, cf. a14–15). This process can be disrupted, he goes on, in people who have 'moisture around the perceptive region' (ὕγρότης . . . περὶ τὸν αἰσθητικὸν τόπον), since the moisture, once moved, is not easily stopped (453a23–6). Similar causes are used to explain our inability to put an immediate stop to passions like anger or fear, or to get a phrase or tune out of our heads (453a26–31). The movements of moisture in our body also affect the *content* of mental states. Dream material is derived from waking experiences, but subsequently distorted by the turbulence of the bloodstream, caused by the rising heat from digestion (*De insomn.* 3, 461a8–24, b18–20). In all of these cases, our cognitive activity is affected by underlying material changes, especially as regards the elemental qualities hot, cold, moist and dry, and not only when things go wrong (cf. Johansen, *Sense-Organs*, 92), as the examples of memory, recollection, and night vision show. They help to explain the range of differences in performance, whether successful or unsuccessful.

Our survey of New Age Spiritualist arguments leads us to the following conclusions, then. A Broad Church reading is neither precluded by Aristotle's doctrines nor anachronistic. It is also something about which he is not silent. On the contrary, there are texts that commit him to underlying physiological changes in perception and hence to a Broad Church position. He cannot be a New Age Spiritualist.

3. Against Canonical Literalism

Aristotle is committed to a Broad Church position. But is he further committed to *Canonical Literalism*? Canonical Literalism requires quite specific changes: whenever a subject comes to perceive a perceptible quality *F*, the relevant organ takes on the *exact same* quality, so that it becomes true to say the organ is *F* in just the same sense that the object is. Aristotle never says as much explicitly, of course—if he had, there could hardly have been such controversy. But it is naturally suggested by the model of assimilation, which forms the centerpiece of Aristotle's theory of perception and understanding. Cognitive capacities, on his view, are capacities to *become similar* to the objects we have cognition of. They must be different from their objects to begin with, but potentially such as their objects actually are; and through the action of these objects they come to be actually like them. Talk of assimilation does not *entail* total similarity. But this is the simplest interpretation, and that weighs

somewhat in Canonical Literalism's favor. Why introduce qualifications if Aristotle himself does not?

3.1 Aristotle vs. Empedocles

The answer is that Aristotle *does* introduce qualifications, qualifications that on examination *preclude Canonical Literalism*. At two points, Aristotle severely criticizes Empedocles' theory of cognition, according to which 'like is known by like'. The move is significant, since superficially the theory has much in common with his own view. But this seems only to motivate Aristotle to more vigorous opposition, so as to distinguish his own view more, much as it had with Empedocles' *harmonia* theory of the soul (*De an.* 1.3). In the present case, Aristotle is equally emphatic: 'his theory necessarily leads to many impossibilities' (ἀναγκαῖον δὲ συμβαίνειν πολλὰ καὶ ἀδύνατα τῷ λόγῳ, *De an.* 1.5, 409b23–8).

Aristotle begins by pointing out that we not only have a cognition of the elements, but complexes of them, for example 'god or man or flesh or bone' (409b28–410a1). And it does no good to know each of the elements that make them up, without also knowing how these complexes are composed from them. Aristotle cites Empedocles himself, who emphasizes the importance of the proportions of elements in a compound like bone (DK 31 B 96). But then, Aristotle argues, Empedocles' theory requires more than just elements inside of us:

For each [element] will know what is like it, but none will know bone or man unless these are also present within. That this is impossible hardly needs to be said, though. For who would worry whether there is a *stone* or a *human* in the soul? Similarly, what is *good* and what is *not good*? The same holds for the other cases as well. (410a8–13)

Aristotle doesn't take the trouble to explain what is absurd about having a stone in one's soul. He thinks it's obvious. We can quickly rule out two narrow readings of the absurdity. First, it is not that we would have the object of cognition *itself* in our soul—that when I feast my eyes on an object, such as a stone, I literally consume *it*. It would be equally absurd if I were to have *any* stone in my soul or, more generally, an inner *replica* of every object I perceive or understand. Nor would Empedocles be open to this charge: he doesn't think we swallow objects whole.⁹⁸ But he is open to the charge that we *reproduce* every object within ourselves, and that's the point Aristotle is pressing here. Second, the absurdity cannot be that we would have a replica of the object *in the soul*, as opposed to the body.

⁹⁸ At most he thinks we imbibe *parts* of them, viz. the effluences constantly streaming off bodies that find their way into our sense organs: DK 31 A 86, 92.

That would rest on a tendentious distinction between soul and body that might easily be sidestepped. Aristotle's opponent could simply reply that the replica is in the body or the entire person, not 'in the soul'. Construed in either of these ways, Aristotle's objection would be of limited effectiveness against views of this sort. But in context he clearly intends a broad criticism of the view that 'like is known by like'.

One thing that is plainly absurd is the idea that inside of us we might have a foreign material like stone or a large physical object such as a human. Along these lines, Themistius exuberantly adds: 'And who would wonder whether a plane tree is present inside? Or a fig tree?' (*In De an.* 33.19–20 Heinze). But as Aristotle's subsequent example shows, the absurdity extends well beyond compound substances (410a11–13). Sinners cannot become good simply by entertaining pious thoughts, nor can judges become bad just by thinking about criminal acts. But that *is* what would happen, if the objects we cognize were always replicated within us. Aristotle adds a related criticism to this, concerning each of the categories. How, if like is known by like, are we to know the different kinds of being—what a substance is, or a quantity or a quality, and so on (410a13–22)? The more we reflect on specific cases, the more implausible it seems to require total similarity in every cognition. In general, no part of us becomes the kinds of things we have cognition of.

Later in the *De anima*, after he has provided his own detailed accounts of perception and understanding, Aristotle returns to this theme. He clarifies the sense in which perception and understanding 'are' their objects:

Now, in summarizing what has been said about the soul, we should say once more that the soul is, in a way, all the things there are. For the things there are can either be perceived or understood; and knowledge is in a way the things that can be known, perception the things that can be perceived. But we must examine in what way this is so. Knowledge and perception are subdivided by their objects: [knowledge and perception] in potentiality by [their respective objects] in potentiality, and in actuality by [their respective objects] in actuality. The part of the soul that can perceive and the part that can know are in potentiality these things, namely, that which can be known and that which can be perceived. But they are necessarily either the things themselves or their forms. Yet surely they are *not the things themselves*. For the stone is not in the soul, but rather its form. (431b20–432a1)

In claiming that the soul is 'all the things there are', Aristotle is quick to guard against two misunderstandings. The first would be that the soul at a given moment was actually all the things there are. In fact, it is all things *only* in potentiality, in so far as it can cognize each in turn. And even then, it will be these things only 'in a way' (*πως*, 431b21, 23). It would be a mistake to think that in perceiving or understanding a given object, the

soul becomes that thing itself, since that would produce the absurdity of having a stone within us. The faculty 'becomes' its object *only* in so far as it has *the form* of its object 'in the soul'.

Thus, whatever it means to have the form of an object in the soul, it cannot result in a *replica* of the object within us—Aristotle explicitly rejects that here. But Canonical Literalism is committed to just that.⁹⁹ We can put this more precisely. For any general term '*F*',

(R) An *F* produces a *replica* if, and only if, it produces another instance of *F*.

But Canonical Literalism holds that whenever a perceptible quality *F* acts on the appropriate sense organ and someone perceives it, it becomes true to say that the organ is *F* in just the same sense that the object is—it contains another instance of *F*. According to Canonical Literalism, then, perception *always* results in a replica of the perceptible quality. But Aristotle *denies* that there is always a replica in perception. Therefore, he must reject Canonical Literalism as well.

It is worth stressing this point. Aristotle plainly thinks that one *can* have the form of *F* 'in one's soul' while avoiding the absurdity of replicas—to his mind, that is just the advantage of his theory over Empedocles'. But if a replica doesn't result, it must be because the organ has received the form of *F* in such a way that the ordinary consequences of being *F* do not follow. But then the predicate '*F*' does *not* apply *in just the same sense* that it does to the object, as Canonical Literalism requires. For if the predicate did apply univocally, everything entailed by '*F*' would hold in both cases equally and we would have a replica. To avoid replicas, then, one must deny that the predicate is applied univocally; and in doing so, one thereby rejects Canonical Literalism.

3.2 A Disanalogy between Perception and Understanding?

Literalists have not in general discussed Aristotle's criticisms of Empedocles, so it is difficult to know how they might respond.¹⁰⁰ Sorabji is an exception, although even his remarks are brief and offered only in passing. He takes the example of the stone not to be about perception, but under-

⁹⁹ As Thorp picturesquely puts it, when I see, smell and hear a donkey, there will be 'une petite poupée' of the donkey, which brays and stinks, in a place close to my heart ('Le mécanisme de la perception chez Aristote—étude de quelques problèmes' ['Mécanisme de la perception'], *Dialogue* 19 (1980), 575–89 at 575). But while Thorp regards such a theory as obviously false (576), he also thinks it is Aristotle's: 'il faut donc qu'il y ait, pour Aristote, une poupée du monde extérieur près du cœur' (583).

¹⁰⁰ For example, Everson fails to mention either *De anima* 1.5 or 3.8 in his book-length study (*Perception*).

standing, and thinks that it shows how the two are *disanalogous*. On his view, Aristotle draws a 'first tentative comparison' between perception and understanding in *De anima* 3.4, insofar as both involve the reception of form. But he thinks Aristotle begins to move away from such talk almost immediately, so that by the time he reaches the example of the stone in *De anima* 3.8, he 'realizes that the desired analogy is only partial' ('Intentionality and Physiological Processes', 213). This, Sorabji contends, leads Aristotle to modify his account of understanding. His solution to the problem of the stone depends on a 'non-physiological' application of the word "form", confined to the case of thought' (214; emphasis mine).

The exact import of this last phrase is unclear. It obviously implies that there isn't any *physiological* exemplification of the form of a stone and so no part of the body of which it becomes true to say that it is a stone in the sense that the stone itself is. But physiology isn't quite to the point. Exemplifying the form of the stone *nonphysiologically* doesn't help, if it remains true that some part of me is a stone in the same sense that the stone itself is. Sorabji's point must be more general: when we think of a stone, there isn't any change, physiological or otherwise, such that part of us literally becomes a stone—we don't come to have a replica of the object inside of us. That this is absurd 'hardly needs saying', Aristotle rightly observes (410a10). But then Sorabji rejects any extension of Canonical Literalism to the understanding.

This is a significant concession. In making it, Sorabji accepts that (i) a literalist approach commits one to replicas; (ii) in some cases this leads to absurdities Aristotle is keen to avoid; and finally (iii) the way he avoids such consequences is by abandoning a strict literalist approach. How, then, can Aristotle still accept Canonical Literalism? Literalism may always lead to replicas, on Sorabji's view, but it doesn't always lead to absurdities. In the case of understanding, replicas would be absurd, and so Aristotle rejects literalism. But in the case of perception, Sorabji thinks, they are not. If so, then Aristotle can remain a Canonical Literalist, within its original prescribed limits. Replicas, according to Sorabji, are a problem *only* for the understanding. This is one of the key disanalogies between the two faculties.

There are of course differences in Aristotle's treatment of perception and understanding. But in his criticisms of Empedocles, Aristotle does not oppose or contrast them in any way. To the contrary. His argument in the passage from *De anima* 3.8 rests on an extended, systematic parallel between perception and knowledge (431b22–8); and in *De anima* 1.5, he consistently pairs verbs of perceiving and knowing throughout.¹⁰¹

¹⁰¹ αἰσθάνηταί τε... καὶ ἕκαστον γνωρίζῃ, 409b24–5; γινώσκειν τὴν ψυχὴν καὶ αἰσθάνεσθαι, b30–1; γνωριεῖ ἢ αἰσθήσεται, b31; cf. αἰσθάνεσθαι δὲ τὸ ὁμοιον τοῦ ὁμοίου καὶ γινώσκειν τῷ ὁμοίῳ τὸ ὁμοιον, 410a24–6.

without marking any general difference between them. Far from 'tentatively' advancing the analogy in *De anima* 3.4 and then quietly sidelining it, Aristotle appeals to the analogy both earlier and later, and on precisely the point at issue. He is not marking a contrast here between perception and understanding. Replicas are raised as a difficulty for cognition in general, not just the understanding.

The best Sorabji can do, it seems, is to make an argument from silence. None of Aristotle's *examples* of replicas involve proper perceptibles. The only cases he explicitly mentions are of compound substances, nonperceptible qualities, and the categories. The elastic clause at the end of the passage, moreover—'the same holds for the other cases as well' (τὸν αὐτὸν δὲ τρόπον καὶ περὶ τῶν ἄλλων, 1.5, 410a11–13)—is nonspecific. It needn't be completely general, Sorabji might argue; it is only a vague gesture at more of the same kind of examples. This leaves some logical space. Aristotle doesn't state explicitly that replicas of proper perceptibles are absurd, and so he might have been able to accept Canonical Literalism after all, within its original limits, as a doctrine about perception.

Silence is a very slender reed on which to support Canonical Literalism. Aristotle's choice of examples is easily explained, given the rhetorical context. For purposes of *reductio*, one needs to pick manifest absurdities, and a compound like a stone is exactly the right prescription, as are qualities like good and not good. He can then comfortably generalize to quite different cases: 'the same goes for the other cases as well'. Such rhetorical exigencies do not signal any disanalogy between perception and understanding.

If Aristotle *had* permitted replicas in perception, moreover, it would have undermined his critique of Empedocles dialectically. Aristotle attacks the principle that 'like is known by like', by extending it beyond the elemental cases Empedocles explicitly mentions to cases he doesn't discuss, such as compounds and qualities, and then Aristotle argues that replicas in these cases are unacceptable. His strategy gives us a reason to reject Empedocles' principle only if what is sought is a *fully general* account of cognition that applies to all cases equally; and Aristotle has a credible alternative, if the likeness principle he proposes in *De anima* 3.8 is meant to be fully general and so avoids replicas across the board. But if Aristotle splits the question and offers two different principles—one for perception, which entails replicas, and another for understanding, which avoids them—then Empedocles is off the hook. For Empedocles could help himself to the same strategy. He could claim that his likeness principle, and hence any commitment to replicas, applies only to the perception of elements, and then offer some other story for composites and qualities. After all, the only explicit evidence Aristotle can find in Empedocles concerns replicas of the elements; Empedocles is silent about

the rest. But then neither theorist would have a fully general likeness principle—the two theories would be on all fours in this regard. For Aristotle's critique to be fair, he must offer as general a theory as he demands from Empedocles. Given that he faults Empedocles for the generality of his account, Aristotle cannot himself have a gerrymandered solution, which requires replicas in perception and rejects them in understanding. His own account must be equally uniform and general.

A little reflection suffices to show that Aristotle would have found replicas in perception absurd too. Replicas of common and accidental perceptibles are problematic in just the way that replicas of stones or humans are. It would be just as absurd, and for just the same reasons, to require that a six-meter length or Diaries' son be present inside of me when I perceive such things. Replicas of proper perceptibles, in contrast, are more like replicas of the qualities good and not good. It is not so much that an animal couldn't replicate such qualities. It is rather that the central sense organ, the heart, would have to be able to instantiate all of them, perhaps in quick succession, just by having a perception of them. Aristotle would have to believe that 'the fleshy tables of the heart' not only become as hard as the hard surface I am touching¹⁰² or as rare and yielding as the air I wave my hand through, but likewise exhibit a play of colors as I look out on the world, emit an odor when I smell my morning coffee, and echo at full volume the lecture I am listening to.¹⁰³ The difficulty of observing the central organ¹⁰⁴ does not lessen this imagined absurdity, any more than it does in the case of the stone.

Nor is the problem simply a mechanical one. The burlesque that would have to play out in the chambers of the Aristotelian heart would not differ, in relevant respects, from the inner theater that Gilbert Ryle so relentlessly ridiculed in Descartes. It raises a quite general worry about the type of account being offered. As Theophrastus rightly objects against Empedocles, it invites a *homuncular regress*:

¹⁰² In any case, Aristotle actually *denies* that something hard is produced by something hard: *De gen. et corr.* 1.5, 320b21. (I would like to thank Istvan Bodnar for pointing this out.)

¹⁰³ Cf. Philop. *In De an.* 432.33–433.1 C. Freeland, 'Aristotle on the Sense of Touch', in Nussbaum and Rorty (eds.), *Essays*, 227–48 at 232; J. Barnes, 'Aristotle's Concept of Mind', *Proceedings of the Aristotelian Society* 72 (1971–2), 101–10, reprinted in Jonathan Barnes, Malcolm Schofield, Richard Sorabji (eds.), *Articles on Aristotle*, vol. 4: *Psychology and Aesthetics* (London, 1979), 32–41 at 38. Thorp ('Mécanisme de la perception', 583, n. 13) suggests that *De motu an.* 8, 702a7–10 shows the central organ is capable of such changes. Some changes, no doubt. But not enough to permit 'à la poupée [du monde extérieur] de se dissoudre et de se reconstruire au rythme du mouvement des yeux', as well as the full range of flavors, odors, and sounds.

¹⁰⁴ Sorabji, 'Body and Soul', 49, n. 22; 'Intentionality and Physiological Processes', 209–10; but cf. 'Intentionality and Physiological Processes', 222.

As regards hearing, it is absurd [for him] to think, when he appeals to internal sounds, positing an inner sound like that of a bell, that it is clear how [animals] hear. For on account of [the inner sound], we hear outer sounds. But on account of what will we hear *it* when *it* sounds? For the very same point still has to be answered.¹⁰⁵

Theophrastus in effect presents Empedocles with a dilemma. If one *hears* inner sounds in the same way as outer sounds, that is, by means of a still more interior sound, a vicious regress threatens. If, on the other hand, an inner sound does *not* have to be heard in this way—and according to Aristotle's theory we do *not* hear the movement of air in our ear, when we are hearing properly (420a15–18)—why was an inner *sound* posited, a *replica*, in the first place? Perception requires a change through which the subject becomes in *some* way similar to the object. But why must the result *look* like, *sound* like, *smell* like, *taste* like, and *feel* like the object? Why would an exact replica be *required* if we do not have to perceive or be aware of it at all?

4. An Analogical Reading

Aristotle, as we have seen, rejects New Age Spiritualism: he is committed to physiological changes in perception, and hence to a Broad Church position. But he also rejects the specific physiological change that Canonical Literalism requires. If having a cognition of *F* required that some part of us become *F*, in just the same sense that the object is, there would always be a replica inside us, which Aristotle finds completely absurd. That leaves us with the remainder of a Broad Church reading, the complement to Canonical Literalism, which only requires a certain *likeness* to the object:

AN ANALOGICAL READING: If a subject *S* comes to perceive a perceptible quality *F* at time *t*, then *S* undergoes some physiological change in the relevant organ at *t* such that it becomes like *F*, even if it does not become true to say that the organ is *F* in just the same sense that the perceptible object is *F*.

This is no different from a Broad Church reading, except that it explicitly states that replicas are *not required*, thus ruling out Canonical Literalism. On an Analogical reading, then, there may be *some* cases where a change results in a replica of a perceptible quality—the best textual evidence would be in the case of the hot, cold, moist, and dry. But in general there will not be a replica in perception (if ever). What is essential in all

¹⁰⁵ *De sens.* 21, 505.12–15 *Doxogr. gr.*, reading τὸ γὰρ αὐτὸ in l. 15 with the MSS, rather than Wimmer's correction, τοῦτο γὰρ αὐτὸ, printed in both Diels and Stratton.

cases is that there will be a relevant set of characteristics that is shared with the object, in virtue of which the resulting state will be about that object, whether or not there is a replica. The organ need be the same as the object merely in an *analogical* sense (cf. *Metaph. Δ.9*, 1018a13).¹⁰⁶

Aristotle distinguishes perception and understanding from other sorts of changes, where a replica *is* required, as cases where the form is received 'without the matter'. These changes essentially involve the *transmission of information* or *content*. The resulting state is *about* the object, by means of a more limited kind of likeness, through a kind of transduction or transposition of characteristics found in the object. Such appeals to likeness naturally arouse suspicion. If the sense organ does not become exactly like the object, but only in a certain respect, a great deal hangs on how the *relevant* respect is determined; and, as the present controversy demonstrates, Aristotle does not spell this out for perception. But he *does* spell it out in connection with what he calls *phantasia*, a form of representation closely related to perception; and in this case the representation exemplifies the *proportions* of the perceptible object. Given the link between representation and perception, then, it is reasonable to look for proportions in perception as well. It turns out proportions in fact play a key role in Aristotle's account of perceptible qualities.

4.1 Receiving Form without the Matter

It is important to keep in mind that Aristotle usually *does* require replicas in changes. Not only does 'man beget man', but hot things make other things hot, cold things cold, and so on (*De gen. et corr.* 1.7, 324a9–14).¹⁰⁷ This can be the case even when living things are altered by perceptible qualities, as when a plant is warmed or cooled (*De an.* 2.12, 424a32–b1).¹⁰⁸ The plant takes on warmth in such a way that it can be said to be warm in the same sense that the sun is (even if not to the same degree).

¹⁰⁶ Irwin (*Aristotle's First Principles* (Oxford, 1988), 307–11) argues along similar lines that while the sense organ must *express* the form of the object, in the sense that we could infer from it what such an object would have to be like, it need not *realize* this form. In particular, the similarity with the object does not consist in my matter's coming to have the causal powers of the object (308), such as, presumably, the ability to look like the object.

¹⁰⁷ Cf. *Metaph. Z.7*, 1032a24–5, b11–12; *Z.9*, 1034a21–30 (though cf. 1034b1–4); *A.3*, 1070a4–6. For an excellent survey of this principle more generally, and the restrictions and extensions Aristotle adds, see §3 ('The principle of causal synonymy') of I. Bodnar, 'Aristotle, Physics', *The Stanford Encyclopedia of Philosophy* (forthcoming), <<http://plato.stanford.edu/>>.

¹⁰⁸ Against Everson, who claims that plants are 'not affected by temperature *even in the standard way*': being mostly earthy, he argues, they could not be heated without losing their nature as plants; instead they only receive an influx of warm matter and are 'not affected by the form at all' (*Perception*, 87–9). Taking the warming of plants to be such an exceptional

Yet while plants get warm, they don't *feel* it. Aristotle contrasts changes like these, where something is 'affected with the matter' (*πάσχειν μετὰ τῆς ὕλης*, 424b1–3), with perceiving, where the perceptible forms are received 'without the matter' (*ἄνευ τῆς ὕλης*, 424a18–19).¹⁰⁹ This sort of change, he explains, involves a more limited likeness, which expressly *falls short* of replication:

Concerning every sense in general, we need to appreciate that the sense is that which can receive perceptible forms without the matter, just as wax receives the ring's signet without the iron or gold: it takes on the golden or brazen signet, but not in so far as [the ring] is gold or bronze. Similarly in this case, the sense of each [perceptible] is affected by what has color, or flavor, or sound, though not in so far as it is said to be each of these, but in so far as it is this sort of thing and in accordance with its *logos*. (424a17–24)

It is easy to mistake what is distinctive about this sort of change. At first glance, Aristotle's point might seem to be that the wax becomes like the ring *only in a certain respect*: in receiving the impression, the wax does not become another *metal ring*; rather, it only takes on the same surface contours.¹¹⁰ But that feature, of changing only in a certain respect, is not at all distinctive. *All* accidental change is like that. If I heat water on an electric stove, the water becomes like the heating element only in so far as both are hot, and not in other respects: it does not become red, or metallic, or hard, much less a kettle or a heating element (except in the extended sense that it is something that can heat other things). Plants, too, become like the sun, but only in so far as they become hot. In both cases, there is a replica, but it is only a replica of the heat, not the heating element or the sun. In general, an agent can make a patient like itself in one respect, while differing in all sorts of other ways. The limited likeness involved can be characterized schematically as follows:

(LL) If *x* is affected by *y* in so far as *y* is *F*, then *x* becomes *F*.

Such a principle only guarantees likeness in the relevant respect. But that is all that is involved in the replicas produced by ordinary accidental changes like warming. If the signet ring example is just an illustration of

change shows what difficulties the literalist interpretation is in; and it completely unhinges the contrast Aristotle is drawing in this chapter. But for my purposes, the crucial point remains intact. Plants *are* heated and cooled (*καὶ γὰρ ψύχεται καὶ θερμαίνεται*) and so *replicate* the agent; and yet they fail to perceive this, despite being animate and affected by perceptibles (*τὰ φυτὰ οὐκ αἰσθάνεται ἔχοντά τι μόριον ψυχικὸν καὶ πάσχοντά τι ὑπο τῶν ἀπτῶν*, 424a32–b1).

¹⁰⁹ See also *De an.* 3.2, 425b23; 3.12, 434a30; *De part. an.* 2.1, 647a7, 28.

¹¹⁰ I ignore the fact that the depressions and projections will be reversed in the case of the wax, which is clearly not intended to be part of the *tertium comparationis*.

(LL), we lose the contrast Aristotle is trying to draw between receiving forms *with* the matter and *without* the matter.

Now, taking on an impression *is* an ordinary alteration for Aristotle. It is the kind of thing he can unproblematically explain using his standard account of alteration,¹¹¹ and it is perfectly in line with (LL). If taking on an impression was all Aristotle was after, he could have made his point as effectively with a stick and clay: when the round end of the stick is pressed into the clay, it takes on a cylindrical impression, but it does not become wooden. But it is obvious that such an example wouldn't have worked. Something essential has been lost. The wax does not merely take on an impression of the surface contours. What it takes on, Aristotle says twice, is the ring's seal or *signet* (τὸ σημείον, 424a20, a21).¹¹² This goes beyond the kind of likening that occurs with the stick, and not just because the signets on rings are pictorial (as ancient Greek signets overwhelmingly are). A signet produces a *sealing*, an impression that establishes the identity of its owner and consequently his authority, rights, and prerogatives. When a sealing is placed on a document, especially for legal or official use, it authorizes the claims, obligations, promises, or orders made therein.¹¹³ A sealing thus differs from other impressions in that it *purports to originate from a particular signet*. The wax thus receives the 'golden or brazen signet' (λαμβάνει τὸ χρυσοῦν ἢ τὸ χαλκοῦν σημείον, a20–1) which is representative of the office or person to whom the signet belongs. But

¹¹¹ In the *Categories*, Aristotle characterizes alteration as a change in quality (14, 15b12), and *shapes* as a kind of quality (8, 10a11–26). It is true that in *Physics* 7.3, he argues that certain changes of shape are not alterations, namely, those which result in *substances* (245b9–246a9; cf. 1.7, 190b5–6). But this scruple about substantial change does not affect the cases at issue here, which involve accidental change.

¹¹² Cf. Plato *Tht.* 191d. On the meaning of σημείον, see J. Spier, 'Emblems in Archaic Greece', *Bulletin of the Institute of Classical Studies* 37 (1990), 107–29 at 107; cf. L. Lacroix, 'Les "blasons" des villes grecques', *Études d'archéologie classique* 1 (1955–6), 91–115 at 92–3; J. Boardman, *Greek Gems and Finger Rings: Early Bronze Age to Late Classical [Greek Gems]* (London, 1970), 428–9. On classical finger rings, see Boardman, *Greek Gems*, 212–34.

¹¹³ In addition to sealing private correspondence, legal documents, and official public documents, sealings were used to indicate possession, identity (in voting) and also in sacrifice. For a good, brief summary of the uses of signets, with literary references, see D. Plantzos, *Hellenistic Engraved Gems* (Oxford, 1999), 18–22; also G. M. A. Richter, *The Engraved Gems of the Greeks, Etruscans, and Romans*, 2 vols., vol. i: *Engraved Gems of the Greeks and the Etruscans: A History of Greek Art in Miniature* (London, 1968), 1–4 and esp. Boardman, *Greek Gems*, 13–14, 235–8, 428–30. Possession is not limited to letters or objects either. A fourth-century B.C. Athenian clay impression of a signet, depicting a man and a woman embracing, has the legend: ΕΧΩ ΤΕ ΚΑΙ ΦΙΛΩ ΑΡΙΣΤΟΤΕΛΗ[Ν]. A. Christodouloupoulou-Proukake ('Πήλινο σφράγισμα δακτυλολήθου από την Αθήνα' *Αρχαιολογική Έφημερίς* (1977), 164–70) examines the possibility that this might have belonged to Aristotle's mistress, Herpyllis, and concludes that while there is no conclusive evidence in favor of such an identification, it cannot be ruled out either. (I would like to thank Seth Schein for translating this article for me.)

although the signet is received, it is *not replicated*, for it is 'not received in so far as [the ring] is gold or bronze' (ἀλλ' οὐχ ἢ χρυσοῦς ἢ χαλκός, a21). What results is a *sealing*, not another golden or brazen signet. The latter is part of the power of one's position or office and can be used repeatedly. The former is just a one-off effect.

High Church Spiritualism is right to this extent, then. When a form *F* is received without the matter, *F* is received and exemplified *in a different way*; consequently, the patient will be actually *F* in a different way as well. When *F* is received without the matter, no part of the patient need become a *replica* of *F*: it need not become true that the patient is *F* in the same sense that the agent is, as occurs in ordinary alteration, where the patient is affected 'with the matter'. High Church Spiritualism is also right to regard receiving form without the matter as essentially involving the *transmission of information* or intentional content, where this need not involve cognition or consciousness, as the example of the wax makes clear. But Spiritualism is wrong to think that a different kind of being is required, or that material changes are somehow unnecessary. Although receiving form without the matter differs from ordinary changes, it is not unrelated to them. It is not merely *compatible* with such changes; it *requires* them. This is clear again from the example of sealing wax. The wax receives the signet *by* undergoing an ordinary change, by receiving the surface contours of the signet and replicating *them*.

In receiving form without the matter, strict replicas are no longer a necessary condition. Such reception typically involves a kind of *transduction*, where information is transmitted in a different form.¹¹⁴ When something receives the form of *F* 'without the matter', it does so by receiving some distinct, but relevantly related form, *G*:

TRANSDUCTION: If some *x* receives *F* without the matter from some *y*, then for some relevantly related *G* (where *G* ≠ *F*),

- i. *x* receives *G* with the matter from *y* and so becomes a replica of *G*
- ii. *x* receives *F* by receiving *G* with the matter.

To say that *F* is received by receiving 'the relevant *G*' is of course only a promissory note, which must be cashed out if the theory is to make any genuinely substantive claims. But for Aristotle, the relevant characteristic will still be something *shared* by the agent, related to its being *F*, so that the patient will genuinely become like *F*. But it needn't become a replica

¹¹⁴ For an illuminating examination of transduction, see Z. W. Pylyshyn, *Computation and Cognition: Toward a Foundation for Cognitive Science* (Cambridge, Mass., 1984), ch. 6. Although many of the details are specific to his computationalism, the general contours of the discussion are still of relevance.

of *F*. What is required, rather, is that it becomes a replica of *G*, so that it becomes *G* in just the same sense that the agent is *G*.¹¹⁵

Apply this to the case of the wax and signet ring.¹¹⁶ The wax impressed by a signet ring does *not merely* take on surface contours, as it would from a stick. It transmits information about the owner of the ring, by receiving his signet. But the wax does not do this by becoming another signet—it receives the signet ‘without the matter’. Instead, it becomes a sealing; and it does this by receiving the surface contours of the signet ‘with the matter’ and replicating them. The form of the signet is thus genuinely received, but in a transduced form: the wax receives *F* by becoming *G*, not by becoming *F*. The only literal similarity required between the wax and the signet is due to the underlying change that occurs with the matter, of taking on the surface contours of the ring.

One might be tempted to regard the reception of *F* in such cases as *nothing more* than the reception of *G*—receiving *F* is either reducible to receiving *G* or altogether eliminable, and our talk of receiving *F* ‘without the matter’ is a mere *façon de parler*, because all that is *really* going on is the reception of *G*. But that is just to assume that a form is genuinely received *only if* it is *replicated*; and that is precisely what Aristotle is calling into question here. Receiving form without the matter is a genuine type of reception. It just isn’t a replication of that form. It is true that in receiving *F* by receiving *G*, there is only a single event involved: receiving *F* and receiving *G* are, in Aristotle’s phrase, ‘one and the same in number’. But they are still two distinct types of reception. They differ, to use another phrase of Aristotle’s, ‘in being’—what it is to *be* each differs. Receiving *G* is a perfectly ordinary reception with the matter, while *F* is received without the matter, *by* receiving the relevant *G*. Receiving *F* without the matter is therefore *not reducible* to receiving *G*. It is merely *how F* is received, the mechanism *by which F* is received.

Again, we can apply this to the case of the signet ring. There is genuinely such a thing as sealing a document, and it is *not simply* impressing

¹¹⁵ Transduction may be a special instance of a more general pattern of how forms are transmitted. Alan Code has suggested to me (in conversation) that there may be a similar pattern in sexual reproduction, going in the *opposite* direction. Although ‘man begets man’, on Aristotle’s view, he does it by means of seed; and while the seed is a part of a living human being, Aristotle emphatically denies that it is a human being itself. Rather, it is something that can produce a human being, in virtue of the actual motions present within it. Here the agent has some relevant characteristic $G \neq F$, such that it can produce an *F* by acting on the patient. As in the case of perception, a form *F* is transmitted by means of actual characteristics distinct from it.

¹¹⁶ As should be evident, I take the wax and signet ring to be a *genuine* example (οἶον, 424a19) of receiving form without the matter, as it was for scholastic commentators, such as Philoponus (*In De an.* 444.17–26, cf. 437.19–25). Even Aquinas describes it as a ‘fitting example’ (conveniens exemplum, *In De an.* 2.24, §554).

shapes into wax, any more than signing a document is *simply* making a scrawl.¹¹⁷ There are not two separate acts here: there is not a distinct and separable act of signing in addition to making a scrawl, or a sealing in addition to the impressing. Rather, one does one *by* doing the other: one cannot seal a document without making an impression, or sign it without making a scrawl. The two are distinct types of act, even if a single event instantiates them both.

The fact that some relevant characteristic *G* is shared by agent and patient gives a literal sense to the claim that ‘the perceptible part is in potentiality the sort of thing the perceptible is *already* in actuality’ (τὸ δ αἰσθητικὸν δυνάμει ἐστὶν οἷον τὸ αἰσθητὸν ἤδη ἐντελεχεία, *De an.* 2.5, 418a3–4), *without* conceding Literalism. The way in which something is potentially *F* depends on the way in which it would be actually *F*; and there is a sense in which the organ genuinely becomes like the object through perception (418a5–6). If so, then there should be a way (πως, *Phys.* 7.2, 244b11) in which the eye can be said to ‘whiten’ (λευκαίνόμενον, 244b8), even if it does not become literally white. It becomes the same ‘by analogy’ (*Metaph.* Δ.9, 1018a13), *analogically* white, if you will.¹¹⁸ It is like white in a relevant respect, even if it does not become true that it is white *in the same sense* that the perceptible object is. It is only in an analogical sense that ‘whitened’, ‘heated’, ‘sweetened’, and other predicates can in general be ‘said equally both of what is inanimate and animate, and again in what is animate, both of the non-perceptual parts and the senses themselves’ (ὁμοίως τὸ τε ἄψυχον καὶ τὸ ἐμψυχον λέγοντες, καὶ πάλιν τῶν ἐμψύχων τὰ τε μὴ αἰσθητικὰ τῶν μερῶν καὶ αὐτὰς αἰσθήσεις, 244b8–10).¹¹⁹

When Aristotle moves from sealing wax to perception in the opening of *De anima* 2.12, he makes a similar qualification. Though the sense is affected by an object with ‘a color, or flavor, or sound’, it does not do so ‘in so far as it is said to be *each of these*’ (ἀλλ’ οὐχ ἡ ἕκαστον ἐκείνων

¹¹⁷ Although with some signatures (such as my own), it is admittedly more difficult to see the difference.

¹¹⁸ Ward appeals to similar terminology, when she suggests that ‘the sense-organ resembles the sensible object analogically, but not qualitatively. In this respect, the senses may be said to represent the same information as the sensible object, without becoming qualitatively “such as” the object . . .’ (‘Perception and Λόγος’, 230 n. 10). I would take issue with the opposition she draws between the analogical and the qualitative, since on my view the patient becomes qualitatively like the object in certain respects. But there may be only a verbal disagreement here, since she does not treat these as dichotomous in the rest of her article.

¹¹⁹ Everson rightly draws attention to this passage (*Perception*, 134–7), but fails to take any note of the qualifying hedge ‘in a way’ (πως) in the claim that the senses alter (244b10–11), a criticism rightly made by Sisko, ‘Quasi-Alteration’, 345–6. Compare similar hedges at *De an.* 3.8, 431b21, 23. New Age Spiritualist defenses depend crucially on this sort of qualification: see, e.g., Burnyeat, ‘DA II 5’, 36–7, 74, 78–9.

λέγεται, 424a23)—that is, not in so far as the object is said to be crimson, or spicy, or shrill¹²⁰—‘but rather in so far as it is *this sort of thing* and in accordance with its *logos*’ (ἀλλ’ ἢ τοιονδί, καὶ κατὰ τὸν λόγον, a24). The sense organ receives a particular perceptible quality, such as crimson, by being acted on by a crimson object. But it is affected not in so far as the object is crimson, but in so far as it has a more general feature by which it is crimson—the *proportion*, as I shall argue below (§§4.3–4), that characterizes crimson and so is part of its *form* and *account*. The phrase ‘in accordance with its *logos*’ expresses all three of these senses, but especially the first, which is crucial in the immediate sequel to our passage. Aristotle characterizes the sense as a kind of proportion (424a26–8), which, like the tuning of an instrument, can be damaged by extreme changes that destroy the balance of the sense organ (a28–32; cf. 3.2, 426a27–b7). To receive the form of crimson ‘in the soul’, then, does not entail that any part of our eye comes to be crimson—at least not in the same sense that the object is—any more than some part of us comes to be a stone when we perceive it. But this sort of reception does entail that there will be *some* relevantly related predicate that is literally true of both the crimson object and some part of our eyes, and in just

¹²⁰ Since these phrases have been construed in very different ways, it will help to be more explicit about how I construe the various phrases in the passage (translated above, p. 301). I take the object that has (τοῦ ἔχοντος) a given color, flavor, or sound in a22 to be the implicit subject of ‘is said to be’ (λέγεται) in a23, and ‘each of these’ (ἐκαστον ἐκείνων) to be the predicate, parallel to ‘this sort of thing’ (τοιονδί) in the next clause. The plural ‘these’ (ἐκείνων) refers back to the set of perceptible qualities just listed in a22. If so, then the distinction is between being affected by objects in so far as they are a given color, flavor, etc., and in so far as they are ‘this sort of thing’ (τοιονδί), that is, in so far as they have a related characteristic that is not identical with the color, flavor, etc. To read it as a contrast more favorable to the literalist, between being affected by objects *as such* and being affected by them *as colored*, ‘these’ (ἐκείνων) would have to refer back not to color, flavor, and sound, but to a singular expression, ‘what has’ (τοῦ ἔχοντος) them; also ‘each’ (ἐκαστον) would have to serve as the subject of ‘is said to be’ (λέγεται), as R. D. Hicks argues (*Aristotle, De anima* (Cambridge, 1907), 416 *ad loc.*). But Hicks admits that in addition to having to supply the plural ‘objects’, one would have to take ‘each’ not only as a subject, but implicitly again as a predicate, in order to give the proper antithesis with ‘this sort of thing’ (τοιονδί) in a24. One is not likely to find such clumsiness preferable unless one is already committed to literalism. Those who are not, such as Ward and Silverman, are apt to read ‘these’ (ἐκείνων) in the way I have suggested, as referring back to the perceptible qualities just mentioned (Ward, ‘Perception and *Λόγος*’, 220–1; Silverman, ‘Color-Perception’, 289, n. 9). But after that, we diverge. They think that ‘each of these’ (ἐκαστον ἐκείνων) is the subject of ‘is said to be’ (λέγεται) and that the subsequent contrast is between being affected by the object in so far as it has a *determinate* characteristic, like color, and in so far as it has a *determinate* characteristic, like crimson. I fail to see how this contrast would be relevant to the wax example or the argument in context. In contrast, I take Aristotle to be speaking generally about determinate perceptible qualities, like crimson, spicy, and shrill.

the same sense. Such a change is *necessary*, though *not* sufficient, for perception and understanding.¹²¹

The image of the signet ring has wider ramifications. Other images in the tradition, such as inscribing words on the tablets of the heart,¹²² also convey the themes of signification and intentional content. But the appeal to signet rings adds an epistemological dimension, due to the *legitimizing* function of seals. They are used to verify that a document and its contents have the authority of the person from which it originates, and so that its claims and commitments have his backing and sanction. In the case of perception, this amounts to the suggestion that our perceptions have *the backing of the world* and so provide us with a warranted basis from which to operate. Through perception, objects in the world give their *stamp* and *authority* to the messages the senses report about the differences among objects (πολλὰς εἰσαγγέλλουσι διαφοράς, *De sens.* 1, 437a2).¹²³

4.2 Phantasia and Understanding

Aristotle also uses sigillary language to explain memory traces. Memory on his view requires quasi-perceptual representations (φαντάσματα), which are produced from perceptual stimulations (αἰσθήματα) in such a way as to be like them. In fact, they are even said to be ‘like perceptual stimulations but *without the matter*’ (ὥσπερ αἰσθημάτά ἐστι πλὴν ἄνευ

¹²¹ I take the opening of *De anima* 2.12 to offer a *necessary* condition of perception, something that holds of all perception, but *not* a *sufficient* condition, something that belongs only to perception or even only to cognition. As the wax example shows (and possibly also the medium), it is possible to receive form without the matter in the absence not only of cognition and consciousness, but even life. Cf. Philoponus *In De an.* 444.17–20; Sorabji, ‘Intentionality and Physiological Processes’, 218–19. Those who take it as a sufficient condition are forced to claim that the comparison with wax sealings is nothing more than an analogy, and a bad one at that, which ‘limps’: J. Owens, ‘Aristotle: Cognition a Way of Being’, *Canadian Journal of Philosophy* 6 (1976), 1–11, reprinted in John R. Catan (ed.), *Aristotle: The Collected Papers of Joseph Owens* (Albany, 1981), 74–80 at 77–8; Owens, ‘Soul as Cognitive’, 91; cf. F. Brentano, *Die Psychologie des Aristoteles, insbesondere seine Lehre vom ΝΟΥΣ ΠΟΙΗΤΙΚΟΣ* (Mainz, 1867), 81.

¹²² e.g., Aesch. *Supp.* 179, P. V. 789, Ag. 80, Choe. 4501, Eum. 275. (For close discussion, see D. Sansone, *Aeschylean Metaphors for Intellectual Activity = Hermes Einzelschriften*, Heft 35 (1975), ch. 4.) Cf. also Pind. O. 10.2–3; Soph. *Phil.* 1325, *Trach.* 683; and of course Plato *Phil.* 38e–39c.

¹²³ The problem with the metaphor, of course, is the existence of counterfeit seals, as Solon well appreciated (cf. D. L. 1.57; Diod. Sic. 1.78). Alan Code has suggested to me (in conversation) that Aristotle might not have regarded this as an insuperable objection. The fact that there are counterfeits does not undermine the authority perception has ‘all or for the most part’. In any case, it is clear that Aristotle did not give these implications the consideration that the Stoics later would.

ὑλης, *De an.* 3.8, 432a9–10; cf. 3.7, 431a15). In this case, it is the perceptual stimulation which acts as a signet:

For it is clear one must take the state, the possession of which we call memory, to be like a kind of picture (οὐδὲν ζωγράφημα τι), which occurs due to perception in both the soul and the part of the body that has it. For the change that occurs is imprinted (ἐνσημαίνεται), like a kind of impression (οὐδὲν τύπον τινὰ) of the perceptual stimulation, just as signatories produce with their rings (οἱ σφραγίζονται τοῖς δακτυλίοις). (*De mem. et remin.* 1, 450a27–32; cf. b2–3, 5, 10–11)

This passage contains obvious echoes of Plato's *Theaetetus*, where the imagery is used to explain memory and ultimately false belief (esp. 191CE, 194C–195A). But the systematic connections with Aristotle's own use of the imagery in perception are more significant. In general, representations will be similar to perceptual stimulations *in content*: they are 'of' what perception is of' (ὅν αἰσθησίς ἐστιν, *De an.* 3.3, 428b12–13). And this is because representations are similar *as changes* to the perceptions they come from (ὁμοίας ταῖς αἰσθήσεσι), and so can affect the animal in similar ways (429a1–6; 428b10–17). But the memory traces 'stamped' from perceptual stimulations are *not replicas*: while they are of perceptions, of what we have previously seen or heard or experienced before, they are not perceptions themselves.¹²⁴ They are essentially of what is no longer present, and so involve a backwards reference to another experience, while perception concerns only what is present.¹²⁵ Unlike the most basic perceptions, which are always true, representations are capable of falsehood.¹²⁶ They are weaker than perceptions and cannot compete with fresh perceptual stimulations.¹²⁷ Representations thus differ quite generally from perceptions.

Aristotle intends understanding to be explained along the same lines as perception. It, too, involves becoming like its object without necessarily producing a replica:

[The understanding] must, therefore, be unaffected and yet able to receive the form and potentially be this sort of thing, though not it. Its situation is similar [to that of perception]: just as that which can perceive is related to the things that can be perceived, so the understanding is related to the things that can be understood. (*De anima* 3.4, 429a15–18)

¹²⁴ *De mem. et remin.* 1, 449b22–3, 450a19–21.

¹²⁵ *De mem. et remin.* 1, 449b13–15, 450a25–7, b11–20.

¹²⁶ *De an.* 3.3, 427b11–12, 428b17–30.

¹²⁷ *De insomn.* 3, 460b32–461a7; *De div. per somnum* 1, 463a8; 2, 464a16–17. Cf. *Rhet.* 1.11, 1370a28. For a full discussion of the nature and content of *phantasia*, and its relation to perception, see my 'Aristotle and the Problem of Intentionality' ['Problem of Intentionality'], *Philosophy and Phenomenological Research* 58 (1998), 249–98.

The understanding is capable of becoming, *not* the object of understanding itself, but only this *sort* of thing (τοιούτον ἀλλὰ μὴ τοῦτο, 429a16). If the object of understanding were a concrete individual, such as a zebra, then Aristotle would only be denying that my understanding is able to become *that* individual zebra; at most, it would become the *same type* of thing the object is. But it is just as absurd to think that my understanding, or any part of me, ever becomes a zebra, whether or not it is the same zebra as I am thinking about. More likely, the expressions 'this sort of thing' (τοιούτον) and 'it' (τοῦτο) refer back to the *form* mentioned in the previous clause (τοῦ εἶδους, a15–16), and so to objects of understanding in a narrower sense: not to any individual zebra, that is, but to the essence or form of zebras, what it is to be a zebra. But then Aristotle denies that our understanding literally becomes such *forms* and so replicates them. It can only become 'the sort of thing' these forms are. Aristotle's point here is parallel to the one in *De an.* 2.12, when he claimed the sense was affected not by a color as such, but only by this sort of thing (τοιοῦδί, 424a24). This is as it should be. For if any part of me could exemplify what it is to be a zebra, it would become a zebra. Just as in perception, my understanding's ability to become the 'sort of thing' the form of zebra is is more limited. It is a matter of me exemplifying *certain* characteristics the form of zebra has, without necessarily exemplifying *all* of them. Becoming like it in a certain way allows me to *understand* what zebras are, rather than having to *become* one—that predicate need never apply to any part of me. Nothing like Canonical Literalism can hold for the understanding.¹²⁸

If we apply the model of transduction to the understanding, we arrive at the following. When we understand *F*, our understanding receives the

¹²⁸ One might object that replicas *do* occur in one important set of cases. In the case of objects 'without matter' (τῶν ἀνευ ὕλης, *De an.* 3.4, 430a3), Aristotle claims that 'what understands and what is understood are the same' (τὸ αὐτὸ ἐστὶ τὸ νοοῦν καὶ τὸ νοούμενον, a3–6; cf. *De an.* 3.5, 430a19–20; 3.7, 431a1; *Metaph.* A.9, 1075a2–5). Which objects he has in mind is never made clear; for all we know, they may be separate substances or intelligences. But I take the point here to be roughly this. As with perception, the activity of the understanding and the activity of its object are 'one and the same' (cf. *De an.* 3.2, 425b26–426a26). But unlike perceptible objects, or even objects of understanding that *have* matter, there is *nothing more* to the objects in question *than this activity*. Hence, in such cases, the activity of understanding will be one and the same as the object itself, and not merely its activity. This 'sameness' needn't yield replicas, however, even in this restricted set of cases, since Aristotle states (and never retracts) that what it is to understand and what it is to be understood—their being—are *not* the same (*Metaph.* A. 9, 1074b38), just as the activity of perception and of the perceptible also 'differ in being' (*De an.* 3.2, 425b27, 426a16–17). If that's right, then only accidental sameness is at issue, in which case we cannot validly infer that the understanding is *F* just because its object is—such an inference is what Aristotle rejects as the 'fallacy of accident' (*De soph. el.* 24; *Phys.* 3.3). But even if replicas were allowed in this limited range of cases, it still would not give us the equivalent of Canonical Literalism for the understanding, since replicas would not result in *every* case of understanding.

form of *F* without the matter, that is, without necessarily replicating *F*—the understanding need not be *F* in the same sense in which the object is. The understanding receives *F*, moreover, by our undergoing ordinary changes: for some relevant *G* (where this in general will be distinct from *F*), we receive *G* with the matter and so have replicas of *G* within us. If our earlier surmise about proportions is correct, this may well involve taking on some of the proportions of the object, and at least in the most rudimentary cases, of basic perceptual concepts (cf. *De an.* 3.8, 432a11–14).¹²⁹ That this is in fact Aristotle's view is clear from a digression in *De memoria*, where he argues that precisely this sort of proportional model underlies thoughts.

4.3 *Phantasia and Proportions*

In remembering an earlier event, we are often able to judge when it happened, at least roughly. Aristotle explains this by appealing to our general ability to judge or estimate magnitudes:

For a person does not think of things that are large and far away by thought extending to that place, as some say vision does (since a person will think in a similar way even if they do not exist), but rather by a proportional change. For in it there are similar shapes and changes. How will it differ when a person thinks of larger things from when he thinks that they are smaller things? For everything inside is smaller, just as things outside are likewise proportional. Perhaps just as something else in the person can be taken to be proportional to the forms, so too [there is something proportional] to the distances. (*De mem. et remin.* 2, 452b11–16)

Aristotle holds that since we can think about things whether they exist or not, we must do so by means of something inside each of us (*ἄλλο ἐν αὐτῷ*, 452b16). In fact, we do it by means of a proportional

¹²⁹ Aristotle distinguishes the *most basic* form of understanding, which he regards as always true (or, at any rate, never false), from complex thoughts that involve additional operations he calls 'combination and division' (*De an.* 3.6, 3.8; *Metaph.* Θ.10; cf. *De interp.* 1). These operations seem to refer to predication and negation in propositional thoughts; but they are presumably involved in the construction of complex concepts as well. Yet even if the appeal to proportions is restricted to the most basic concepts, it may place substantive constraints on what can be understood. Aristotle not only seems to accept such a restriction (*De mem. et remin.* 1, 449b30–450a14), but even worries whether we can ever understand anything that is 'separate from magnitude' (*De an.* 3.7, 431b18–19). It is obviously possible to form a complex concept about items separate from magnitude (as I did in formulating this sentence). But it might not be possible to have the *most basic kind* of understanding of them, if all the basic or primitive concepts are drawn directly from perceptions and quasi-perceptual representations, and the latter always involve magnitudes.

change (τῇ ἀνάλογον κινήσει, b11–12) that *models* the complex relations among objects over time: in particular, their shapes (σχήματα, b12), forms (εἶδεσιν, b15), distances (ἀποστήμασιν, b16), and changes (κινήσεις, b13). Just as these different magnitudes stand in various proportions to one another, so do various features of the change inside of us. We can even judge a given set of objects to have a larger *absolute* size, if the representation includes a part proportional to our distance from the objects (b13–16). The 'proportional change' to which these magnitudes belong is presumably a quasi-perceptual representation (φάντασμα), since such representations always underlie thoughts on Aristotle's account, especially thoughts about continuity, time, and magnitude.¹³⁰

Two points are immediately salient here. The first is that given the size of the large, distant objects in question, *strict replicas* are a nonstarter. They would involve the same absurdity Aristotle urges against Empedocles. Hence, the appeal to proportions. Second, Aristotle need not even be committed to *scale models*, where the proportions exhibited by the model are along the same *dimensions* as the proportions they represent—length by length, height by height, duration by duration—differing only in their absolute value. Any change inside a human will inevitably be smaller than objects that are 'large and far away'. But in fact the same proportions may be preserved by magnitudes along different dimensions. A phonograph record, to take Wittgenstein's example (*Tractatus*, 4.014; cf. 4.01), preserves the proportions of the music's auditory and temporal magnitudes in *spatial* magnitudes in the record's grooves. What is essential for Aristotle is simply this: the magnitudes of an object are represented by the magnitudes of a representation, that is, by the magnitudes of an internal bodily state, where all that need be shared in common are the *proportions* between their respective magnitudes.

Representations will thus be 'like' their objects in very definite respects. The resulting similarity is fairly abstract. A representation will possess the same *relation structure* as its object, including the relations between its magnitudes—it is a *homomorph*, if you will, of the object represented. If scale models are *not* required, moreover, then the models may not even bear a superficial resemblance to the objects, as quite diverse things might exemplify the same set of proportions. This is important, since the representations in question are not tiny objects, but changes that travel in the bloodstream and can be stored in the area around the heart.¹³¹ The fact

¹³⁰ *De mem. et remin.* 1, 449b30–450a14; *De an.* 3.7, 431a14–17, 431b2; 3.8, 432a4–10. For a discussion of the textual issues in the passage, see J. E. Sisko, 'Space, Time and Phantasms in Aristotle, *De memoria* 2, 452b7–25', *Classical Quarterly* 47 (1997), 167–75.

¹³¹ *De mem. et remin.* 1, 450a27–b11 (cf. a10–12); 2, 451b16–452a10 (cf. 452a12–b7), 453a4–26; *De insomn.* 3, 461b11–24; cf. 2, 459a23–b7; 3, 460b28–461b1.

that such changes embody these proportions, Aristotle believes, enables us to have the corresponding thoughts about large and far away objects.

Aristotle need not intend this as a full account of the content of such representations. Proportions alone would seriously underdetermine their content, since too many things share the same proportions. But he clearly is saying something about the way such representations are *realized*, at least in humans, about the *mechanism* that enables us to have such thoughts.¹³² And that is all we need for present purposes, since we are not trying to give a full account of the content of perceptions here (or of representations). All we are trying to determine is the character of the *underlying material changes* involved. This passage establishes that they share a set of proportions in common.¹³³

4.4 Perceptible Qualities and Proportions

Representation, as we have seen, is not only generated from perception, but is a similar sort of change and so has similar content (see above, p. 308). Hence, it is reasonable to look for proportions in perception too. But, it may be objected, this is where the analogy fails us. There is a straightforward sense in which proportional models can be used for common sensibles, like extension, time, and change, all of which have a quantitative aspect. Proper perceptibles, in contrast, are essentially qualitative for Aristotle, and he would resist any attempt to reduce quality to quantity. How, he asks rhetorically at one point, can states like white, sweet, and hot be *numbers* (*Metaph.* N.5, 1092b15–16)? That's the sort of thing that Academics and Atomists believe, not sensible Aristotelians. And Aristotle explicitly rejects Democritus' attempt, as we have seen, to reduce the proper perceptibles to common perceptibles, like shapes (*De sens.* 4, 442b10–14).

Qualities are *not reducible* to quantities, to be sure. But Aristotle thinks that some qualities have quantitative aspects, in so far as they are defined by a *proportion* of constituent qualities along the same range.¹³⁴ This

¹³² The material realization is nonetheless quite important, since a given realization will possess causal powers that, in the relevant context, help to account for its particular content. Again, the example of the phonograph record is illuminating: the proportions of its grooves are not, in and of themselves, sufficient to pick out the musical content of the record—there are conceivably many other things, besides the musical performance, that share the same proportions. But in the context of the playback system (e.g., turntable, amplifier, and speakers), they bear a very direct relation to the music, which they are capable of reproducing.

¹³³ For a more extensive analysis of this passage, see my 'Problem of Intentionality', 260–3.

¹³⁴ For an excellent, close discussion of Aristotle's use of mathematics in perception, see Sorabji, 'Mathematics and Colour'.

point is most obvious where there are differences in degree (*μᾶλλον καὶ ἧττον*). Aristotle takes intermediate *temperatures* straightforwardly to exhibit proportions of the two extremes.¹³⁵ Presumably other tangibles, at least moist and dry, are no different. *Sounds* can also be treated successfully in this way, as Aristotle well knows and accepts.¹³⁶ Pitch is defined relatively, in terms of an interval, which can be expressed as a ratio. Originally, this was understood as a ratio of the lengths of two sections of a string, such that each section produced one of the pitches, or of features of other means of sound production.¹³⁷ But attempts were made, as early as Archytas (DK 47 B 1) and Plato (*Tim.* 67aC, 79E–80B), to see this as a function of a physical quantity belonging to the transmitted sound itself, such as speed.¹³⁸ In fact, because of this approach's success in music (*De sensu* 3, 439b30–440a6), Aristotle seems happy to apply proportions in the much more striking cases of *colors* and *flavors*.¹³⁹ And while he does not expressly say so, he might not have been averse to treating *odors* in this way as well, given his view that the differences between odors are close to that between flavors and that they are therefore ordered analogously between their contraries.¹⁴⁰

Now, qualities in the different modalities—crimson and spicy, for example—might turn out to share the same numeric ratio. Aristotle believes that, just as in music, there are only a determinate number of whole number ratios among colors (3, 439b30–440a2) and flavors (4, 442a12–16). He acknowledges, moreover, that qualities in the different modalities are similar to one other 'by analogy' (*κατ' ἀναλογίαν*, *De gen. et corr.* 2.6, 333a28–30).¹⁴¹ But they will not be the same *qualities*, because proportions are always proportions of something: the numbers that stand

¹³⁵ *De gen. et corr.* 2.7, 334b8–16, esp. b14–16.

¹³⁶ See, e.g., *An. post.* 2.2, 90a18–23; *De an.* 3.2, 426b3–7; *De gen. anim.* 5.7, 786b25–787b20; *Metaph.* A.2, 997b21; A.5, 985b32; I.1, 1053a15–17.

¹³⁷ For a clear and accessible introduction to the use of ratios in Greek harmonics, see the introduction to A. Barker (ed.), *Greek Musical Writings*, 2 vols., vol. i: *Harmonic and Acoustic Theory* (Cambridge, 1989), esp. 5–8. The monochord, whose two sections were used to measure the ratios, appears to have been the invention of a fifth-century theorist, Simos (see M. L. West, *Ancient Greek Music [Greek Music]* (Oxford, 1992), 240–1). But ancient testimonia link the discovery of the ratios to other methods of sound production: a smith's differently weighted hammers, strings held taut by different weights, cymbals of different thickness, and vessels filled with different amounts of liquid. For an exacting and critical discussion, see West, *Greek Music*, 234.

¹³⁸ Aristotle disagrees with the specific reductivist analysis Archytas and Plato offer, but not the relevant physical quantity, much less the general project: *De an.* 2.8, 420a26–b4.

¹³⁹ Colors: *De sens.* 3, 440b14–26. Flavors: *De sens.* 4, 442a12–31. *Metaph.* I 2, 1053b28–1054a13.

¹⁴⁰ *De sens.* 4, 440b28–30; 5, 443b3–20.

¹⁴¹ He also calls them *συστοιχα* (*De sens.* 6, 448a16–17), presumably because they will occupy the same position in their respective orders or lists.

in proportion to one another are the amounts of *constituents* in the mixture.¹⁴² Perceptible qualities are thus defined as proportions of a specific pair of contrary qualities along the same range. So while crimson and spicy might share the same numeric proportion, they will still be proportions of different contraries: one is a proportion of white and black, the other a proportion of sweet and bitter.

There are two ways, then, in which something might take on the proportions of a given perceptible quality, such as crimson. It might exemplify them (i) in the same contrary qualities as the perceptible quality—so, in the case of crimson, in the amounts of white and black. Or it might exemplify them (ii) in some other set of contrary qualities. The first case results in a *replica* of the perceptible quality, since we have the *same* proportion of the *same* contraries.¹⁴³ But not in the second case. The same proportion is received, but in *different* contraries, and so it need not produce a replica of the perceptible quality. What results instead will depend on the specific contraries that exemplify the proportion. These may be (a) proper perceptibles in a different modality, such as hot and cold, or (b) a pair of contraries that are not proper perceptibles at all, such as being viscous and being runny. In either case, (a) or (b), the proportion of the perceptible quality can be received without producing a replica, and hence without the matter.

If perception involves exemplifying the proportions of the perceptible quality in this second way, (ii), then there is a clear and precise sense in which the organ becomes like the object and has its form within it, without receiving the matter and hence without producing a replica. And it derives from Aristotle's own approach to qualities and the structure of their respective quality-spaces. The organ takes on the defining ratio of the perceptible quality, without exemplifying it in the same contraries. For each kind of sense organ, there will be a specific set of contraries that exemplify the proportions in the relevant modality—not any set will do.¹⁴⁴ It might be the case that in vision, for example, the proportion of white to black will be embodied in the proportions of proper perceptibles like hot and cold, or qualities that are not proper perceptibles, like runny or viscous. In either case, we do not end up with a

¹⁴² See esp., *Metaph.* I 2, 1053b28–1054a13, which specifically mentions proportions of colors and sounds. The same assumption also underlies Aristotle's critique of Pythagorean and Platonic appeals to numbers as the being of things: *Metaph.* N. 5, 1092b16–22; cf. A.9, 991b13–20.

¹⁴³ A point well made by Bradshaw, 'Dual-Logos Theory', 156.

¹⁴⁴ This is comparable to the representation of *absolute* distances in the proportional models of 'large and far away' objects (*De mem. et remin.* 2, 452b13–16), or of *absolute* elapsed time of remembered events (b17–22). In each case, there will be some specific correlation between magnitudes in the subject and those represented, which itself is not a function of proportions, but some primitive feature of this particular mechanism.

replica of the object perceived.¹⁴⁵ Which contraries Aristotle might have chosen is not as pertinent as the general story: the proportions of perceptible contraries are mapped on to the proportions of specific contraries in the respective organs, thus allowing transduction. The resulting states of the organ are thus *not* 'abstract ratios', such as could be represented purely in numbers or with barcodes.¹⁴⁶ They *concretely embody* the proportions of the qualities of the object in their own contraries. This is essential to their role as *underlying* material changes, when the perceptible form is received without the matter.¹⁴⁷

When lavender is left in a room, the air, like my nose, is affected by it precisely in so far as it is fragrant. Both the air and my nose take on the same proportions as define the fragrance. 'What, then,' Aristotle asks, 'is smelling besides being affected in a certain way?' (*De an.* 2.12, 424b16–17). Unlike the air, which exemplifies this proportion in the same contraries, in my nose the proportion is exemplified in some other pair of contraries. Hence, I smell lavender, while the air becomes fragrant (b18). By taking on its proportion in this way, in a functioning organ of smell, I receive its fragrance without the matter.

5. Conclusions

It should be plain from the opening survey that, contrary to what Mrs Thatcher once claimed, there *is* an alternative. We are not confined

¹⁴⁵ Even if the proportion is embodied in proper perceptible qualities, and so would be in principle observable, it still will not mirror or replicate the particular object in question. The fact that there will be some changes in the organ in response to a perceptible object, that exhibit some correspondences to its perceptible features, isn't absurd in the way that replicating the object is. On the contrary, Aristotle's commitment to underlying material changes and to some kind of similarity require him to accept some story such as this.

¹⁴⁶ As Silverman, for example, claims ('Color-Perception', 279; cf. 290, n. 16); some things Price says are also suggestive of this ('Perceptions', 295). Ward, 'Perception and *Λόγος*', in contrast, seems to draw all the right distinctions at 222, but then go awry on 227, when she claims that if we are to speak precisely what affects the sense is not a sensible quality, such as a color, but a ratio (e.g., 3:2). On the reading I have defended, the organ is instead affected by *the sensible quality* and receives *it*; but it does so by embodying the same ratio in a pair of contraries, even if they are not the same contraries as are present in the sensible object.

¹⁴⁷ If the *De insomniis* passage about menstruating women staining mirrors red (2, 459b23–460a26) is in fact genuine—something that might reasonably be questioned, since the passage is not only poorly connected to the context, but makes claims about vision and menstruation at odds with Aristotle's views elsewhere (L. Dean-Jones, *Women's Bodies in Classical Greek Science* (Oxford, 1994), 229–30)—then the reciprocal *action* posited between subject and object (ὥσπερ καὶ ἡ ὀφθαλμοῦ πάσχει, οὕτω καὶ ποιεῖ τι, 459b27; ἀντιποιεῖ, 460a25) would be the transmission of this ratio. Since, however, these proportions will be exemplified in different sets of contraries, it need not result in literal coloration in both cases, against Woolf, 'Eye-Jelly'.

to the two dominant parties. And there is reason to think that both are mistaken. Aristotle seems committed to there being *some* physiological change in perception, without its necessarily resulting in a *replica* of the perceptible quality. That is just what it is for a form to be received without the matter: information about the object is transmitted by preserving only certain aspects of its form, thus effecting a transduction. For Aristotle, proportions provide the relevant, information-bearing feature in a range of cases. In explaining how we can think of certain things, he appeals to the proportions of the underlying representations; and in accounting for the quality-space of proper perceptibles, he likewise appeals to proportions, the proportions of the perceptible contraries that define each sensory range. By exemplifying the same proportions as the perceptible quality perceived, but in a different set of contrary qualities, the sense organ can come to be relevantly like the perceptible quality, without replicating it.

Sorabji's Latitudinarianism comes *extremely* close to this view. He, too, insists on an underlying physiological change in all perception, and takes this to consist in exemplifying the defining ratio of the perceptible quality in question. He denies, moreover, that the proportions of material elements in the organ change in such a way that the quality *F* is exemplified in the same way that it is in the object. The main difference is that, for Sorabji, this results in another instance of the same perceptible quality, such that it will true to say that the organ is *F* in just the same sense as the object, along with any of its consequences, such as observability. But if Aristotle is opposed to replicas in cognition as a general rule, as I have argued, this is precisely what should be jettisoned. All Sorabji has to lose is Canonical Literalism itself.

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The Discriminating Capacity of the Soul in Aristotle's Theory of Learning

FRANS A. J. DE HAAS

Introduction

Richard Sorabji, who has inspired and fostered my philosophical work and career for many years, has remarked that among ancient philosophers, Aristotle most expanded perceptual content to compensate for the denial of reason and belief to animals.¹ He has also claimed that Aristotle introduced the idea that perception is a kind of discriminating as part of his attempt to distinguish belief from perception.² I offer this essay to Richard as a set of further considerations concerning the significance of discrimination in Aristotle, both perceptual and intellectual.

The Problem of Learning

After Plato any discussion of learning has to solve the problem Plato framed in the *Meno*:

And how, Socrates, will you look for that of which you do not at all know what it is? What will you put forth as the subject of inquiry without knowing it? And if you happen to find what you want, how will you know that this is the thing which you did not know?—I know, Meno, what you mean; but just see what a controversial argument you are introducing. You argue that a human being cannot look for what he knows nor for that which he does not know; for he will not go looking for what he knows: he already knows it, and in that case he has no need to

¹ R. R. K. Sorabji, 'Intentionality and Physiological Processes: Aristotle's Theory of Sense-Perception', in M. C. Nussbaum and A. O. Rorty (eds.), *Essays on Aristotle's De Anima* (Oxford: Clarendon Press, 1992), 196; R. R. K., Sorabji, *Animal Minds and Human Morals. The Origins of the Western Debate* (London: Duckworth, 1996), 17–20.

² Sorabji, *Animal Minds*, 35–6; see 58 for the expansion of the term to incorporate judgement instead of mere discrimination.

Metaphysics, Soul, and Ethics in Ancient Thought

Themes from the work of
Richard Sorabji

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RICARDO SALLES

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