S. Marc Cohen

The Credibility of Aristotle's Philosophy of Mind

Aristotle's philosophy of mind is at once tantalizingly up-to-date and frustratingly archaic. Some contemporary theorists find it extremely congenial: they see Aristotle as the originator of the functionalist theory of the nature of mental states. Others take a dimmer view of Aristotle's contemporary relevance: they find Aristotle's theory of mind too riddled with outmoded assumptions to be taken seriously any more. Nowhere has this diversity of opinion been more extreme than in the dispute between Myles Burnyeat and the functionalists.

In a provocative paper[1] entitled 'Is an Aristotelian Philosophy of Mind Still Credible?' Burnyeat has brought a powerful line of criticism against those two leaders of the functionalist bandwagon, Hilary Putnam[2] and Martha Nussbaum.[3] Burnyeat is out to discredit not just the Putnam-Nussbaum interpretation but any attempt to read Aristotle's teaching about the soul as an early version of the functionalist theory of mind. If Burnyeat is right, not only Putnam-Nussbaum but also Edwin Hartman,[4] Kathleen Wilkes,[5] and Richard Sorabji[6] are all misguided in their more or less explicitly functionalist interpretations of Aristotle.

---

1 To appear in a forthcoming collection of essays on Aristotle's *de Anima*, edited by Martha Nussbaum and Amelie Rorty.

2 Cf. his 'Philosophy and our Mental Life,' in *Philosophical Papers, II* (Cambridge: Cambridge University Press 1975).

3 Cf. Essay 1 ('Aristotle and Teleological Explanation') in her *Aristotle's De Motu Animalium* (Princeton, NJ: Princeton University Press 1978).

4 Edwin Hartman, *Substance, Body,* and *Soul: Aristotelian Investigations* (Princeton, NJ: Princeton University Press 1977)

5 Kathleen V. Wilkes, *Physicalism* (Atlantic Highlands, NJ: Humanities Press 1978), ch. 7

6 Richard Sorabji, 'Body and Soul in Aristotle,' *Philosophy* **49** (1974) 63-89; reprinted in J. Barnes, M. Schofield, and R. Sorabji, eds., *Articles on Aristotle, Vol. 4: Psychology and Aesthetics* (London: Duckworth 1979) 42-64

But Burnyeat does more than dispute the functionalist interpretation of Aristotle. He also argues that when we correctly understand Aristotle's philosophy of mind, we will realize that the only thing to do with it is to junk it. So anyone who finds any contemporary relevance, functionalist or otherwise, in Aristotle's theory will have to come to terms with Burnyeat's argument. That is what I propose to do in this paper. I will try to show that Burnyeat has not succeeded in refuting either Aristotle or his functionalist interpreters. I will not, however, attempt to provide additional positive reasons for embracing the functionalist interpretation.

I will take it that the prima facie basis for the functionalist interpretation is straightforward and familiar. Aristotle's conception of the soul is biological: soul is that in virtue of which something is alive. A soul, moreover, is not a Cartesian substance (not a thing in its own right) but a substance in one Aristotelian sense – the principle of organization of a living body. The soul of a living thing is a set of capacities in virtue of which that thing lives. In a human, the soul is a complex set of capacities to nourish oneself, to take in sensory information about one's environment, to move voluntarily, and to think. It is in terms of the soul and its actions or movements that we explain these characteristic human activities and account for the bodily parts and systems on which they depend.

These explanations and accounts are *teleological*. We explain movements in terms of the goals they are aimed at rather than in terms of the mechanical workings of the body which carries them out. We account for the eye or the heart not in terms of what it is made of but in terms of its function – what it *does*, what it is *for*.

Aristotle says that the relation of the soul to the body is that of form to matter. Hence the complex of soul and body – the individual living thing – is subject to the same hylomorphic analysis Aristotle gives to any physical complex. And a proper understanding of that hylomorphic analysis makes clear how close Aristotle's theory of the soul comes to contemporary functionalism.

The form/matter distinction is typically explicated by appeal to the paradigm case of an artifact.[7] A statue is some bronze with a certain

7 Relying on the artifact model in explicating the form-matter distinction, as both Aristotle and most of his commentators do, makes for trouble in understanding his hylomorphic theory of mind. Critics such as Burnyeat and Ackrill (see below, pp. 118-19) see this as a flaw in the theory; but it might equally will be taken to be a shortcoming in the model.The problem with the artifact

shape; this house consists of these bricks and boards arranged and assembled in such-and-such a way; an axe is some iron that has the capacity to chop. In the simplest case, form is nothing more than shape; in the more complex cases, form is more like the functional organization of a complex system. But in each case, the substance in question – the statue, house, or axe – is reckoned a compound of matter and form. Bronze, bricks, and iron are matter; shape, arrangement, and capacity are form. In all these cases, matter and form are *contingently* related. In each case, the matter might have had a different form, and the form might have been found in different matter.

Presumably, Aristotle thinks that psychological processes are related to their physiological bases in the same way. *Seeing*, for example, is not just a certain physiological process in the eye; rather, that physiological process is only the *matter* of the psychological process. But if matter and form are contingently related, then there is no *essential* connection between, e.g., *seeing* and any particular type of physiological process. Rather, *seeing* is functionally defined in terms of its object. The object of seeing is the visible, and the visible is color (418a27-9), so seeing is the perception of color. The eye, of course, is noncontingently involved in seeing, and the eye is a physical organ, but that will not be sufficient for us to identify seeing with any particular type of physiological process. For to describe an organ as an *eye* is to describe it *functionally*, as the organ of sight, and does not impose any physiological constraints upon it. The eye of one type of creature may thus be physiologically very different from that of another. Hence it would be *chauvinistic* of us to assume that any creature which sees does so via the same physiological process which serves as the material realization of seeing in us. It is at least possible for vision to have a different material realization in some other kind of creature. This contingent connection between matter and form is what enables Aristotle to adopt functionalism's characteristic anti-chauvinistic stance.

So the key elements of functionalism are clearly present in Aristotle's account. Definitions of psychical states are always to be given in

model is that it oversimplifies hylomorphism and ultimately misrepresents it in the cases that are most important to Aristotle. The crucial point of misrepresentation is the contingent connection between matter and form. In all but the simplest cases, matter already contains a great deal of form, and form carries with it many material requirements. (I am grateful to Montgomery Furth for his illuminating presentation of this point during the discussion at Edmonton.)

terms of form and function, never in terms of material composition. Psychical states require some material embodiment, but not any particular kind of embodiment. But there is no unbridgeable gulf between the psychical and the physiological. Soul and body are not opposed kinds of substance with incompatible properties, but formal and material aspects of one and the same thing. Aristotle thus resists hard-nosed materialism but shows no inclination toward dualism. His view seems to be what Bernard Williams has dubbed 'a polite form of materialism.'[8]

Of course it has become a commonplace to point out that Aristotle did not really have a philosophy of mind – did not, that is to say, attempt to solve the mind-body problem as drawn up by Descartes. And since functionalism is a response to the Cartesian problem, there is a clear, but I think superficial, sense in which Aristotle could not have had a functionalist theory of mind.

Burnyeat's criticism of the functionalist interpretation does, indeed, make a great deal of the pre-Cartesian character of Aristotle's thought, but in a striking and sophisticated way. He claims that in recent years it is the mental half of Cartesian dualism that has come under fire, while the matter half has remained intact in all of us. We have inherited our contemporary view of the physical from Descartes. But Aristotle's physics is so different from Descartes' (and, hence, from ours) that no modern philosopher could share it. For in Aristotle's view of nature, the emergence of mind and life from inanimate matter is not something that requires explanation. It is thus Aristotle's physics that is responsible for the fact that his philosophy of mind is no longer credible. New functionalist minds, Burnyeat concludes, do not fit into old Aristotelian bodies.

Now for the details of Burnyeat's argument. He is willing to grant that Aristotle's theory of mind has a superficially functionalist appearance. Aristotle's hylomorphic definitions make it appear that whereas ψυχή and psychical functions must be embodied, there is no special requirement on how they are embodied, or in what kind of matter they are embodied. But this is just the functionalist's point: the mental does not depend on any *particular* material set-up.

Burnyeat focuses on Aristotle's theory of perception, and in particular on the mysterious Aristotelian doctrine that perception involves the sense-organ's taking on the sensible form of the perceived object without its matter. A standard interpretation of this doctrine has been advanced by Richard Sorabji:[9] in perceiving a tomato, for example, a portion of the sense-organ, the eye-jelly, goes red. In general, when one perceives a sensible object to be *F*, some part of one's sensory apparatus literally becomes *F*.

The attraction of the functionalist interpretation is that it permits one to reject this piece of antiquated physiology without abandoning an Aristotelian theory of perception. For Aristotle does not *identify* seeing red with the reddening of the eye-jelly. Rather, according to the Sorabji interpretation, the reddening of the eye-jelly is only the material side of perception, the *matter* of which the perception of red is constituted. As such, it stands to the perceptual process of seeing red as does clay to the vase which it constitutes. On this line, Aristotle's account of perception, taken as a philosophical theory, does not depend in a crucial way on his story about the physiological basis of perception. We can thus discard the quaint theory of the reddening eye-jelly, replace it with a more up-to-date physiology, and still claim to be advancing an Aristotelian theory of perception.

Against the Sorabji interpretation of Aristotle's notion of the sense-organ's taking on form, Burnyeat offers a rival account deriving from Philoponus, Aquinas, and Brentano. According to the rival account, the sense-organ's taking on a sensible form is nothing more nor less than an awareness of that form: the eye's taking on a color is just one's becoming aware of a color. Taking *on* a form is to be thought of as taking *in* that form; the sense-organ's becoming *F* is to be thought of as the sense-faculty's becoming *aware* of *F*-ness.

Burnyeat defends the rival account in detail and with great ingenuity. He concludes not only that Aristotle is not telling the particular physiological tale about the material basis of perception that the Sorabji interpretation supposes, but that on Aristotle's account of perceptual awareness, no physiological change is needed for the sense-organ to become aware of a perceptual object. It is this last point that clinches his case against the functionalist interpretation, Burnyeat thinks. For Aristotle would have to be seen as conceding that an animal's perceptual capacities are fundamental, not supervenient. They simply *are* the way they are, and do not require explanation in physiological terms. Aristotle does not regard the emergence of life as a mysterious fact standing in need of explanation. Rather, according to Burnyeat,

8 Bernard Williams, 'Hylomorphism,' *Oxford Studies in Ancient Philosophy* **4** (1986), 195

9 'Body and Soul in Aristotle,' 49: see esp. n.22.

Aristotle has the explanations going the other way around: we explain the physical properties of animals in terms of their contribution to the existence of animal life.

No doubt the proponent of the Putnam-Nussbaum interpretation will be inclined to object that Burnyeat has wrongly saddled the functionalist with precisely the kind of reductionism that he opposes. Far from trying (vainly) to reduce psychological phenomena to physiological (and ultimately chemical and physical) ones, the functionalist agrees with Aristotle that seeing cannot be reduced to any physiological process. But I think that Burnyeat's point can be put in a way that avoids any appearance of confusion of functionalism with reductionism.

What the reductionist maintains, and what both Aristotle and contemporary functionalists deny, is that for any psychological process, ψ, there are conditions, specifiable in purely physical terms, that are necessary and sufficient for the occurrence of ψ. What the contemporary functionalist is especially keen to deny is that there could be physiologically *necessary* conditions. This is what allows different kinds of creatures with radically different physiologial make-ups still to be in the same mental state, a possibility no chauvinistic physicalist with a type-type identity theory can countenance.

However, although the functionalist may not believe that there is any particular kind of physical state that is necessary for a given mental state, he may still hold that the mental state must be 'realized' in some physical state or other. Now not all functionalists would agree with this, but some surely would. After all, some functionalists claim to be advocating a version of physicalism, while others take their view to be incompatible with physicalism.[10] And the physicalistically-inclined functionalist would surely want to say that each token of a functionally-defined psychological state is still a physical state, even if no purely physical description of it will reveal its psychological nature.

Moreover, the functionalist is free, consistent with his anti-chauvinism, to allow that there could be, for any psychological state, *sufficient* conditions, specifiable in purely physical terms, for its occurrence. There might thus be a brain state in humans that is sufficient for their being in pain, and another kind of physical state altogether in Martians that is sufficient for their being in pain. But if Aristotle removes physical constraints from psychological processes to the extent Burnyeat says he does, he would be unlikely to follow the functionalist down this path. For the intuition behind the view is that organisms with radically different physiologies may still be in the same (functionally defined) mental state. And the non-dualistic ontology that best fits this intuition is one which denies type-identity but accepts token-identity between the mental and the physical. But Burnyeat's Aristotle cannot accept even token-identity: I may see red even though there is *no* corresponding physiological change in my sensory apparatus.

Burnyeat offers several considerations in favor of his anti-functionalist interpretation of Aristotle's account of perception. At the beginning of *de An* II 12, in characterizing perception in general as the power to receive the sensible form of things without the matter, Aristotle illustrates his point with the analogy of a piece of wax taking on the impression of a signet-ring. But this is the very model Plato introduces in the *Theaetetus* to mark off judgment from perception, and Burnyeat sees Aristotle's use of it as deliberate. In applying Plato's wax block model directly to perception, Aristotle is insisting, against Plato, that perception is something that already includes articulate awareness from the start.

Since perception is awareness from the start, we do not have the problem of explaining how the awareness in perception supervenes on an underlying physiological process. The supervenience of the mental on the physical – the idea that in any two worlds where the physical facts are the same, the mental facts are the same – is a modern invention, and is alien to Aristotle. The underlying physiological processes are merely necessary, and never sufficient conditions for the psychological states they underlie. The boiling of the blood around the heart is a necessary condition for anger, but can occur without one's really being angry, Aristotle notes (403a21-2). Burnyeat's Aristotle, like Plato's Socrates in the *Phaedo*, sees physiological processes as necessary conditions only. Indeed, Burnyeat even thinks that the only physiological conditions relevant to perception, on Aristotle's account, are states of receptivity to sensible form, such as having transparent eye-jelly.

This brings Burnyeat into direct conflict with Sorabji, on whose view it is an entirely physiological process, such as the coloration of the eye-jelly, that Aristotle describes as a sense-organ's receiving sensible form without matter. In so describing it, Sorabji suggests, Aristotle means to be contrasting his own view with that of Empedocles or Democritus,

10 Cf. Ned Block, 'What is Functionalism?' in N. Block and J.A. Fodor, eds., *Readings in Philosophy of Psychology, Vol. 1* (Cambridge, MA: MIT Press 1980) 171-84.

who thought that in vision material particles emanated from the object seen and into the eye of the beholder. Sorabji's Aristotle is thus contrasting two different physical processes, not a physical and a non-physical one. He describes the reception of form as being *without matter*, but he does not mean that the process is *immaterial*.

Against this account, Burnyeat argues that receiving form with matter is not correctly construed as absorbing some matter carrying a certain form. If it were, then receiving form without matter would be absorbing the form without its being carried by a material vehicle. But this is an absurd way to view the relation between form and matter. Form is not something that can leave one material vehicle (or exist without a material vehicle at all) and be absorbed by another material vehicle. Rather, to receive the form of something is just to become like it in form. Therefore, to receive the form of something without its matter is to become like it in form without becoming like it in matter; and to receive the form of something with its matter is to become like it in both form and matter.

From this understanding of the notions of 'taking on form' and 'taking on matter,' Burnyeat concludes that to receive the warmth of a warm thing, for example, is to become warm without really becoming warm, i.e., to register, notice, or perceive the warmth without actually becoming warm. His idea is this: when you are heated by proximity to a warm object, say, a stove, you become *like* it in both form and matter. Your matter takes on the same form (viz., heat) that the iron of the stove already has. But when you merely perceive the warm stove without being heated by it, you do not become like it in matter, for your flesh does not become like the iron, i.e., does not take on form, heat. Rather, you become like the warm object in form only. You take in its warmth without becoming warm. Or, as Burnyeat is equally happy to put the point, you become warm without *really* becoming warm.

This is a striking interpretation, but Burnyeat does not attempt to offer evidence in its support. Rather, he shows us how he can finesse the single text that would seem to be an insuperable stumbling block. The passage occurs at the end of the crucial chapter *de An* II 12. Aristotle has been discussing the question whether sensible objects, such as colors or smells, can have effects other than being perceived. He seems to be asking what the difference is between, e.g., smelling and the physiological process in which the sensible object, odor, affects the nose. If this is Aristotle's question, then we have him explicitly drawing the distinction between physiological and psychological processes that is crucial to the functionalist interpretation. Burnyeat, on the other hand, takes Aristotle to be asking a different question, viz., what the

effect of sensible qualities is on non-sentient things. Aristotle's question, Burnyeat says, is not what more there is to smelling than having an odor affect the nose, but what more there is to odor's effect on the nose than there is to its effect on the air.

The only thing Aristotle says that would seem to rule this reading out occurs at 424b17. Aristotle asks what more smelling is than being affected by something, and suggests in response that perhaps, in addition to being affected physiologically, smelling is *also* perceiving, i.e., being aware. At any rate, that is how his suggestion is to be understood if we read in the 'also' (καί) that one editor (Torstrik) added in a textual emendation. Burnyeat, following Kosman,[11] argues convincingly that the corrupt αι in the defective manuscript reading ὀσμᾶσθαι αι αἰσθάνεσθαι is not the remnant of an original καί but simple dittography. The scribe wrote αι αι αι, which is one αι too many. So Aristotle is not saying that perceiving is something over and above a sense-organ's being affected. Rather, he is saying that the effect on the sense-organ consists in nothing more nor less than an awareness of sensible form. Far from confirming the functionalist reading, Burnyeat concludes, this passage provides evidence against it.

The idea that the effect of sensible form on a sense-organ is nothing *less* than a state of awareness has the consequence, Burnyeat notes, that the matter of which sense-organs are composed is *essentially* capable of awareness. For there is, according to Burnyeat's Aristotle, no physiological state of a sense-organ on which a state of awareness can supervene. Sensible form produces awareness in the sense organ directly; there is no intervention or supervention involved.

But what kind of matter is this that is *essentially* capable of awareness? It is certainly nothing like the matter composing a Cartesian body, whose essence is simply to be extended in space, and whose connection to mind and the mental is as tenuous and contingent as a connection can be. It is in terms of this lifeless, insensible Cartesian matter that the mind-body problem is framed. But how can there be a mind-body problem if there is a kind of matter which has awareness built in at the ground level? And how can a theory be considered a version of functionalism if it denies the contingency of the connection between a psychological state and its physical realization?

---

11 L.A. Kosman, 'Perceiving that we Perceive: *On the Soul III, 2*,' *Philosophical Review* **84** (1975) 499-519

Burnyeat's case against the functionalist interpretation rests upon these two crucial claims about Aristotle's theory of perception:

(A) a sense-organ's taking on a sensible form is an act of awareness rather than a physiological change, and

(B) it is possible for perception to occur without any associated physiological change.

It is not crystal clear what Burnyeat takes to be the relation between (A) and (B). He offers several considerations in favor of both theses, but it is not always clear which of the two in particular he takes his evidence to support. And while he nowhere argues that (B) follows from (A), his easy transition from (A) to (B), and some of his remarks about them, suggest that he may have the following sort of argument in mind: perception is *nothing more nor less* than a sense-organ's reception of sensible form, and the reception of form is not a physiological process. So since there is nothing *more* to perception than the reception of form, it is possible for perception to occur without any corresponding physiological change.

But this is not a convincing line of argument. Perception may be (i.e., be identical to) nothing more than the reception of sensible form, but there may still be more to (i.e., required for) perception than that. If the eye's taking on the sensible form of the object seen is not a physiological process, that only shows that there is an essential part of vision that is not a physiological process, not that there is *no* physiological process that is essential to vision.

So (B) does not follow from (A). And while (B) is certainly incompatible with a token-physicalistic version of functionalism, the situation with (A) is less clear.

One might also complain, as Nussbaum and Putnam have done,[12] about Burnyeat's argument for (A) as well. For he devotes the bulk of his effort to refuting Sorabji's interpretation of the sense-organ's taking on sensible form. Nussbaum and Putnam reply that even if Burnyeat is right in his criticism of Sorabji (which they seem happy to grant), he will only have established that the reception of form is not the *particular* physiological process Sorabji claimed it to be, but not that the reception of form is not a physiological process tout court.

12 Martha Nussbaum and Hilary Putnam, 'Changing Aristotle's Mind' (forthcoming in Nussbaum and Rorty).

However, there is no evidence that in talking about the sense-organ's reception of sensible form Aristotle actually did have some *other* physiological process in mind. Functionalists such as Nussbaum and Putnam should not, therefore, be so quick to distance themselves from the Sorabji interpretation.

A better move for the functionalist, it seems to me, is to concede nothing to Burnyeat without first examining the details of his refutation of Sorabji. This, at any rate, will be my strategy in what follows. I will show that Burnyeat's refutation is flawed and that his argument for the rival interpretation is not compelling. I will also try to establish that the passages in which Aristotle uses the enigmatic notion of a sense-organ's taking on sensible form favor the traditional interpretation.

Burnyeat's case against Sorabji depends on the rejection of Sorabji's account of the notion of taking on form without matter. But Burnyeat's argument against this account is defective. He claims that on Sorabji's account receiving form *with* matter is absorbing matter which carries a certain form, and infers from this that receiving form *without* matter must, on Sorabji's account, be absorbing a form which is not carried by any material vehicle. But this gets Sorabji wrong. On his account, receiving form with matter is not merely absorbing the material vehicle that carries some form; it must also involve, in an appropriate sense, absorbing the form, as well. If you eat a tomato you absorb some matter carrying a certain form, but you do not receive the form along with the matter. Rather, this is a case of absorbing matter *without* form, which Sorabji need not construe as absorbing formless matter, whatever that would mean, but as absorbing matter without absorbing its form. Conversely, the Sorabjian account of absorbing form without matter is absorbing form *without absorbing matter*. Burnyeat's observation that form is not the sort of thing that can move about without a material vehicle is correct but irrelevant – the Sorabji interpretation need not deny it. What is at issue is not whether the form initially has a material vehicle, but whether the form is ultimately received by – i.e., comes to characterize – the matter of a recipient.

In arguing against Sorabji's account, Burnyeat makes a point of understanding the notions of taking on form and taking on matter in parallel fashion. But on his own account there is a curious lack of parallel. On the surface, it all seems quite symmetrical: taking on the form of x is construed as becoming *like* x in form; taking on the matter of x as becoming *like* x in matter. But *being like* x *in form* is taken to mean being aware of x, while *being like* x *in matter* is taken to mean having matter that is, in the relevent respect, like x's matter. But my matter

is, in the relevant respect, like your matter when my matter has taken on the form that your matter already has. Thus, Burnyeat is able to construe the taking on of the matter of a sensible object – a notion that Aristotle does not discuss – as meaning precisely what, on the traditional view, is supposed to be meant by the taking on of the form of a sensible object.

The dialectical advantage of this manoeuver is that it forces a reinterpretation of the notion of taking on form. If taking on the matter of something means becoming like it in form – becoming *really F* – then what can taking on the form of something amount to? It cannot mean becoming like it in form – becoming *really F* – for that is what taking on its matter is supposed to mean. It can only mean, Burnyeat and company say, becoming *F* without *really* being *F*. And what does *that* amount to? Not, as one might suppose, being an illusory, fake, or counterfeit *F*, but being aware of or noticing *F*-ness.

But what reason is there to suppose that Aristotle *would* mean by 'taking on matter' what Burnyeat says he would? No evidence is offered to oppose the eminently plausible view that the 'taking on of matter' that Aristotle says is *not* involved in perception is the actual ingress into a subject's body of external material, as in fact happens in nutrition and as is alleged by Empedocles and Democritus to happen in perception.

When we turn to the passages in which Aristotle discusses a sense-organ's taking on the sensible form of the object of perception, we find further difficulties for Burnyeat's interpretation. At 424al, Aristotle makes the point that in perception the sense-organ is potentially such as the object of perception is actually. On the Sorabji interpretation, his point is quite straightforward, for in perception the sense-organ takes on the sensible form of the object: in perceiving the *F*-ness of something, the sense-organ itself becomes *F*. And of course the sense-organ cannot become *F* unless it is (a) already potentially *F* and (b) not yet actually *F*. We cannot feel warmth unless our organ of touch is capable of becoming warm; and we cannot feel the warmth of something our organ of touch is already as warm as. At 424a7 Aristotle goes on to say that the organ which will perceive white and black must itself actually be neither white nor black, but potentially both. Again, his point seems quite straightforward: something which is already actually white cannot *become* white. Perception is a process of taking on sensible form, and the sense-organ cannot *take on* a form it has already assumed.

But what is Aristotle's point on the rival interpretation? Why can't the eye-jelly which is going to perceive white be already actually white?

On the rival interpretation, for the eye-jelly to *be* white is just for the patient to be *noticing* whiteness. But why would Aristotle want to say that one who is already noticing whiteness cannot be about to notice whiteness? Whereas Sorabji takes perception to be, at least in part, a genuine process in which the sense-organ undergoes an alteration, Burnyeat understands it to be not a genuine alteration at all. In perception, according to Burnyeat's Aristotle, the sense-organ is merely brought into activity; perception is nothing more than the exercise of a capacity. This means that the simple logical point about genuine changes, viz., that a thing which is already *F* cannot become *F*, is unavailable to Burnyeat. A thing which is already red cannot be about to *turn* red; but one who is already playing tennis may be about to play more tennis.

A crucial passage for the traditional interpretation is 425b22-6, where Aristotle argues that 'what sees' (τὸ ὁρῶν) is itself 'in a way colored.' This remark makes perfectly good sense on the traditional interpretation. Aristotle is discussing the question of how, or whether, we perceive that we perceive. How can we *see* that we see, when all that we can, properly speaking, *see* is the proper object of sight, viz., *color*? Aristotle's answer is that what sees is in a way colored, 'for the sense-organ receives the sensible object without its matter.'

This as-it-were coloration of τὸ ὁρῶν can be interpreted either, à la Sorabji, as the literal coloration of the eye-jelly, or, following Burnyeat and company, as the visual awareness of color. But it is the coloration of what sees that *explains*, Aristotle says, why perception and images (φαντασία) linger on after the object of perception has been removed. The explanation is simple on the traditional line: we look at a tomato, and the eye-jelly goes red. Remove the tomato and the impression of red persists. This is because something really *is* still red, viz., the eye-jelly.

On the rival interpretation, however, Aristotle's explanation is feeble: the reason the impression of red persists is that we have been *aware of something red*. But this is less an explanation than a restatement of the explanandum. The question is why, when one has been perceptually aware of a red tomato, the *impression* of redness persists after the tomato has been removed. Aristotle thinks he has an explanation of this phenomenon, and on the Sorabji interpretation he does, but on the rival interpretation Aristotle's explanation is a non-starter.

A large part of the motivation for the rival interpretation seems to come from a desire to help Aristotle out, for the account of the physiology of perception Aristotle offers, on the traditional view, is, as Jonathan Barnes puts it, 'open to devastatingly obvious empirical

refutation.'[13] Be that as it may (and I think that Sorabji has adequately met this objection), proponents of the rival view do not seem correspondingly concerned about the philosophical shortcomings of what Aristotle has to say on their account of the matter. To think that in the perception of a tomato the eye-jelly literally becomes red may be physiologically naive, but it provides Aristotle with a non-vacuous account of phenomena such as after-images. This is an account that Aristotle cannot give on the rival interpretation. If philosophical vacuity is the cost of avoiding empirical refutation, the rival interpretation's gesture cannot be considered an altogether friendly one.

The only truly recalcitrant passage for the Sorabji interpretation now appears to be the *de An* II 12 discussion of the fact that plants do not perceive. Clearly Aristotle is interested in the case of plants because they are apparent counter-examples to his theory of perception. A plant has a soul and it can take on the form of a sensible object – for example, it can get warm. So why, according to Aristotle's theory, does it not perceive warmth? In his answer, Aristotle must make clear that his theory can distinguish between the effect a sensible object has on a sense-organ and its effect on a non-sensitive subject, such as air, or a plant. And this is just the distinction that Burnyeat's account has Aristotle making.

Of course, Sorabji also sees Aristotle as making this distinction, and agrees with Burnyeat that Aristotle's reason for denying that plants perceive is that their taking on of sensible form is *not without matter*. Where they disagree is over the interpretation of this crucial phrase. Sorabji takes Aristotle to be asserting that plants can get warm only by taking on warm matter; Burnyeat takes him to mean that the only way they can take on warmth is in a *material* way, by having their *matter* become warm.

One may be inclined to agree with Burnyeat here, if only because Sorabji attributes to Aristotle such an implausible theory of plant-warming. Surely Aristotle would have noticed that a plant can get warm by just sitting in the sun, without ingesting any material at all? But Sorabji and Burnyeat may both be wrong on this point. Aristotle says that the reason plants do not perceive warmth is that they do not have a mean (424b2); that is, they do not have the right initial temperature, poised between warm and cold, to perceive these two qualities.

13 'Aristotle's Concept of Mind,' *Proceedings of the Aristotelian Society* **72** (1971-72) 101-10; reprinted in Barnes, Schofield, and Sorabji, 32-41

Their matter can get warm, but that material change does not constitute the perception of warmth. The reason it does not constitute perception is not that it is only a material change, nor that it is only achieved by taking on external matter, but that it is the wrong *kind* of material change.

Burnyeat concedes that the requirement that the organ of touch be in a mean or intermediate state appears to support Sorabji's interpretation. His counter-proposal is that the intermediate state of the sense-organ is merely an initial condition required for perception to take place, but that Aristotle does not suppose there to be an actual physical change away from the mean—a warming or cooling, for example – in the sense-organ. Rather, the departure from the mean is what Aquinas called a 'spiritual' change, i.e., a becoming aware of warmth or cold. However, this proposal faces the same problem we encountered earlier at 425b21-6. For Aristotle's explanation of our failure to perceive when our sense-organ is not in the right initial state becomes vacuous on Burnyeat's reading: an already warm sense-organ cannot perceive warmth because it cannot become warm, i.e., because it cannot perceive warmth.

Burnyeat is surely right that a plant's inability to perceive warmth is due to the fact that its matter is not *sensitive* to warmth. But Sorabji is right on the larger issue. For it is still a physical difference between a plant's matter and ours that explains its insensitivity. Perceiving warmth is not getting warm in an immaterial way, but having the right kind of matter – the kind that composes a sense-organ – get warm in a straightforwardly material way.

But this talk of the right *kind* of matter, Burnyeat would surely say, smuggles in a notion that is antithetical to functionalism. For the right matter is matter that is *essentially* alive, *essentially* capable of awareness. And matter that is essentially alive cannot be only contingently related to the form – i.e., to the soul – in virtue of which it is alive.

Burnyeat derives the conclusion that animal matter is essentially alive from two sources. One, which we have already examined, lies in the details of the theory of perception; the other is Aristotle's frequently enunciated *homonymy principle*, according to which a body that is not actually alive is a body in name only, i.e., is not really a body at all, just as an eye which cannot see is not really an eye. It is tempting to treat this principle as a mere linguistic ruling – that, for example, it is inappropriate or misleading to use the term 'body' for what is no longer alive – but Burnyeat understands it as a physical thesis that is incompatible with Aristotle's hylomorphic theory of mind. This

tension in Aristotle's thought has been brilliantly articulated by John Ackrill,[14] whom Burnyeat cites with approval.

Aristotle's problem, as Ackrill presents it, emerges when he tries to specify the *matter* component of a living body, i.e., of a hylomorphic compound whose form is its soul. On the one hand, the matter of any compound must *potentially* have that form; on the other hand, it must not have it *necessarily*. It might seem that there is no problem: the matter of an animal is its *body*. But this solution is blocked by the homonymy principle; if we try to pick out the matter without the form, the body without the soul that animates it, we must fail, for if what we pick out is not alive, then what we pick out is not a body. The homonymy principle prevents the fulfillment of the contingent specification requirement. As Ackrill puts it:[15]

> The body we are told to pick out as the material "constituent" of the animal depends for its very identity on its being alive, in-formed by ψυχή.

Nor can we retreat to such candidates as *flesh and bones*, or other such bodily parts and organs, for the homonymy principle applies to them, as well. Here is the way Aristotle puts it (*GA* 734b24):

> there is no such thing as face or flesh without soul in it; it is only homonymously that they will be called face or flesh if the life has gone out of them, just as if they had been made of stone or wood.

But if we descend to the level of the inanimate elements of which living things are ultimately composed – earth, air, fire, and water – we have gone too far. Although they satisfy the contingent specification requirement, since they are what they are independent of composing a living body, they fail in a different way. For the elements are too remote to be the matter of a living hylomorphic compound; they are not even *potentially* alive (cf. *Metaph* Θ 7). Ackrill concludes:[16]

> Until there is a living thing ... there is no "body potentially alive"; and once there is, its body is necessarily actually alive.

14 'Aristotle's Definitions of *Psuche*,' *Proceedings of the Aristotelian Society* 73 (1972-73) 119-33; reprinted in Barnes, Schofield, and Sorabji, 65-75

15 'Aristotle's Definitions,' 126

16 'Aristotle's Definitions,' 132

But this temporal language – 'until,' 'once' – distorts the homonymy principle. Ackrill makes it seem as if the point is diachronic and developmental, viz., that new animals do not come into being by having life installed in previously inanimate bodies. But it is not the point of the homonymy principle to rule out such a Frankensteinian account of the generation of life; rather, it is to remind us of the crucial importance of function in the definition of a living creature or an organic system. The question is not whether there is a time before life begins at which what we have on our hands is a non-living body that is potentially alive; it is, rather, whether we can, in the case of a presently living animal, pick out something that now functions in certain characteristic ways although it will eventually cease to do so, which will continue to exist (at least for a while) after this happens, and whose functioning in those ways is definitive of the life and existence of that animal. What the homonymy principle tells us is that what we pick out for this role cannot be the body.

Still, there is something that looks, acts, and functions very much like the body, although it cannot, strictly speaking, *be* the body, since it will continue to exist after death, when the body no longer exists. Nor is this something the corpse, which only *begins* to exist at death. It is to this continuing something (which non-Aristotelians are inclined to call the 'body') that Aristotle needs to refer. Well, then, let him refer to it in some other way – say, as the BODY. The BODY has accidentally those properties the body has essentially, and in virtue of which the animal is alive. When the BODY functions, the body is alive; when the BODY ceases to function, the body, but not the BODY, ceases to exist.

The hylomorphist's appeal to the BODY does not just pay lip-service to the homonymy principle or treat it as a mere linguistic ruling. But it does, as Bernard Williams[17] has pointed out, leave the hylomorphist with a pair of entities on his hands – the body and the BODY – which are the subjects of psychologial and physiological investigation respectively. And so it seems that the hylomorphist has neatly sidestepped the mind-body problem only to be confronted with the perhaps equally

17 In 'Hylomorphism.' I am indebted on several points to Williams' insightful discussion of Aristotle's hylomorphic theory; in particular, I have borrowed from him the distinction between the body and the BODY. I should point out, however, that Williams himself is less sanguine than I about the tenability of a hylomorphic theory.

intractable body-BODY problem. So the hylomorphist is by no means out of the woods.

But at least he is safe from Burnyeat's argument. For certainly the BODY is composed of ordinary matter, and there is no reason to think that the matter composing the body is any different. The difference between the body and the BODY, that is to say, need not be a difference in their matter. In short, we have been given no reason to think that the homonymy principle is a physical thesis to the effect that there is a kind of matter whose life and sensitivity are independent of and not explicable in terms of its physical properties. Granted that a sightless eye is not just not *called* an eye any more, it ceases to *be* an eye. But that is not to say that the *only* difference between it and a living, functioning eye is that one can see and the other cannot. There is still room for a physical difference between the two to account for their functional difference.

Burnyeat has the idea that this is ruled out by the homonymy principle, which he sees as entailing an unbridgeable gap between the physiological and the psychological – between the non-living and the living. If this is how Aristotle intended the principle, we should expect to find him restricting its application to living things. Such a restriction would confirm Burnyeat's interpretation of homonymy and strengthen his conclusion that there is a kind of Aristotelian matter whose life and awareness are built in and irreducible to anything physical.

But Aristotle does not restrict the homonymy principle in this way. For one thing, he seems willing to apply it even to artifacts. Thus, at 412b14-15 he says that an axe no longer capable of performing its function 'would not be an axe, except homonymously.'[18] *Meteor* IV 12 reiterates this point (the example is changed to a saw) and extends it even further into the inanimate realm. What we find is a systematic downward applicability of the homonymy principle, and, along with it, a systematically pervasive appeal to functional definitions. For the homonymy principle is now extended to natural bodies well below the threshold of life and consciousness – viz., all the way down to the elements themselves (390a7-19):

> [E]ach of the elements has an end and is not water or fire in any and every condition of itself, just as flesh is not flesh ... What a thing is is always determined by its function: a thing really is itself when it can perform its function; an eye, for instance, when it can see. When a thing cannot do so it is that thing only in name, like a dead eye or one made of stone ... So, too, with fire; but its function is perhaps even harder to specify by physical inquiry than that of flesh. The parts of plants, and inanimate bodies like copper and silver, are in the same case. They all are what they are in virtue of a certain power of action or passion – just like flesh and sinew.

Aristotle thus insists on functional definitions even of copper and silver, water and fire. His doctrine concerning inorganic compounds and their component elements, then, is not in principle different from that concerning animals and their parts; he draws no sharp distinction between physicalistic and functionalistic descriptions and explanations. It is sometimes thought that this tends to discredit the functionalist interpretation, on the grounds that functionalism requires just such a contrast between functional and (merely) physical explanation that Aristotle seems unwilling to provide. But this line of thought has no force unless the version of functionalism envisaged is one that is incompatible with physicalism; and there is no reason to suppose that Aristotle's theory would be of that variety.

The lesson we learn from *Meteor* IV 12 is instructive on this point. Aristotle indicates that he regards the matter of which living bodies are composed as inherently no different from that composing the rest of nature. His conception of the physical is not so deeply alien as Burnyeat has supposed; in particular, it does not prevent his hylomorphism from being plausibly construed as a direct ancestor of contemporary functionalist therories.

---

18 The passage, unfortunately, is vexed. Aristotle suggests this analogy: as a living body is to its soul, so is an axe to its capacity to chop. If an axe were a living body, this capacity would be its soul, whose removal would render it no longer an axe, except homonymously. 'But in fact,' Aristotle goes on, 'it is an axe' (νῦν δ'ἔστι πέλεκυς). The commonest reading of the quoted sentence takes it to withdraw the counterfactual assumption: an axe is *not* a living body, so it doesn't have a soul – it's just an axe. But on another reading, it refers back to the consequence derived from that assumption: since an axe is not a living body, it remains an axe even when it can't chop. On the second reading (but not the first), Aristotle refuses to apply the homonymy principle to the axe. But the first reading is preferable, as becomes clear from Aristotle's justification: 'for it is not of this kind of body that the essence or formula is the soul, but of a certain kind of natural body having within itself a source of movement and rest' (οὐ γὰρ τοιούτου σώματος τὸ τί ἦν εἶναι καὶ ὁ λόγος ἡ ψυχή, ἀλλὰ φυσικοῦ τοιουδί, ἔχοντος ἀρχὴν κινήσεως καὶ στάσεως ἐν ἑαυτῷ). Cf. R.D. Hicks, *Aristotle: De Anima, with translation, introduction and notes* (Cambridge: 1907), 316-17. (I wish to thank David Keyt for a helpful discussion of this passage and for convincing me that the favorable reading is in fact the right one.)

Summary of Discussion following Cohen's paper

MOHAN MATTHEN: I am inclined to think that Aristotle was a functonalist about *some* things, but I have difficulties seeing how functionalism is to be applied to perception, especially at the level of a state like seeing red – that is, at the level of perceiving what Aristotle called a proper object of sense. In order for functionalism to be plausible at this level, one has to maintain that, e.g., sensing redness is significant enough teleologically that if some organism should fail to possess the red-sensitive mechanism we happen to possess, then it would be likely to possess some other red-sensitive mechanism. But this is not very plausible: more likely a creature without our red-sensitive mechanisms would be sensitive to something else, to some other significant property of the environment. So the fact that we sense *redness* is due to the wholly contingent fact that our evolutionary predecessors happened to possess the precursors of cone-cells. The choice of the direct objects of sense are thus much more sensitive to mechanisms than a functionalist can comfortably allow. To bring this down to Aristotle: what evidence is there for thinking that he takes the eye-jelly to be just a sufficient but not a necessary condition for being receptive of colors? Quite likely this is a question that tells against Burnyeat as well: for Aristotle might have made our sensitivity to red more dependent on our physiology than he allows possible.

MARC COHEN: I think this is a very good objection to any non-physicalist account of Aristotle's theory of color perception. Aristotle may think of some mental states as having physiological bases that are sufficient, but not necessary, for those states to obtain, but color perception probably isn't one of them. It's more likely that he thought that the relevant sufficient condition (the coloration of the eye-jelly) was also necessary. But, as you note, this objection also presents a problem for Burnyeat; if the physiological mechanisms of perception are essentially involved in an account of what *redness* itself is, then they will also be involved in the *awareness* of redness, contrary to what Burnyeat supposes.

ROGER SHINER: Your use of the body-BODY distinction suggests that Aristotle thought of humans coming-to-be in much the way that Frankenstein's creature came-to-be: that is, by an inanimate body becoming suddenly animate. I think we should avoid ways of talking that implicate him in this way of thinking.

COHEN: I certainly did not intend the body-BODY distinction to suggest that Aristotle subscribed to a Frankensteinian theory. Bodies are not BODIES, and what was once a body can cease to be one and become (or, perhaps, be replaced by) a BODY. But this is a one-way street: a BODY can never turn into a body. So here I am able to use the body-BODY terminology to express Aristotle's anti-Frankensteinianism, if I may call it that.

I did say that it was not the point of the homonymy principle to rule out the Frankensteinian account. Of course, I did not mean to suggest that Aristotle wants to safeguard such an account. My point was only that this is not what he meant to be ruling out when he deployed the homonymy principle to show that the body would not be a body without the soul.

JIM HANKINSON: What is the relation between functional explanation and the matter that embodies the function? Aren't the functional properties, even those of artifacts, necessarily tied to some sort of matter? And if so, how does the functionalist pull off multirealizability?

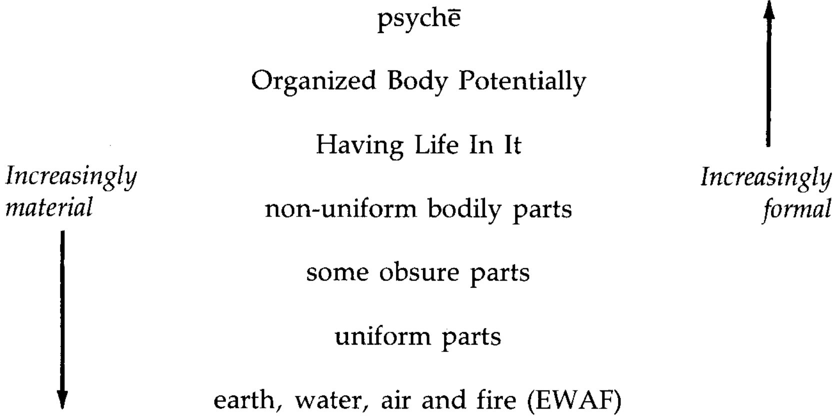
COHEN: That's a good question, because, in a slightly different form, it's one which Aristotle actually worries about. For him, the puzzle is whether there should be reference to matter in a definition, and he seems to vacillate on this issue. In *de Anima* (A 1) and *Metaphysics* (Z 7), for example, he is willing to include reference to matter in a definition; in *Metaphysics* (H 4) he observes that some substances have definite material requirements ('a saw could not be made of wool ... or of wood' – 1044a28). But in *Metaphysics* (Z 10-11) he claims that 'only parts of the form are parts of the definition' (1035b33). The most straightforward way to reconcile these apparently conflicting tendencies is to say that matter terms may sometimes occur in definitions, but when they do so they refer to form rather than to matter. The idea here is that what makes a certain kind of matter requisite for a certain kind of substance has to do with the *form* of that matter, which would include its functional characteristics.

I think this tells us how a functionalist can pull off multi-realizability. He must claim that when a functional property (e.g., of an artifact) is necessarily tied to some sort of matter, it is tied to it by virtue of some functional (i.e., formal) characterization of that matter.

Thus, axes are tied to iron not qua iron, but qua hard material capable of holding a sharp edge. Iron was once presumably the only

suitable material to make axes out of, so it was then not obviously inappropriate to include *iron* in the definition of *axe*. But *iron* was merely going proxy for a functional charaterization of the required *kind* of matter. (I doubt that Aristotle would reject an axe made of stainless steel as definitionally defective.)

MONTGOMERY FURTH: Here is Aristotle's view of the structure of an animal:



Ackrill's point is misguided because the soul, i.e., the form, reaches way down into the matter – and most matter disappears when soul does. Talk about a special mysterious life-possessing matter is unnecessary if you think of a form that integrates matter to this extent.

COHEN: I take it that you agree with me that Aristotle has no peculiar kind of matter that separates his physics radically from ours.

FURTH: Burnyeat is trying to avoid the Frankenstein picture when he introduces that matter.

COHEN: But that's just to replace one implausible and mysterious theory with another. Even if any organism capable of perception and cognition must be made of a special 'organic' matter, that matter is itself composed of ordinary inorganic matter, and ultimately of the four elements.

Your diagram does a good job of making that clear. It also helps us to understand why the Frankensteinian theory and the 'special matter' theory do not exhaust the alternatives. My only objection to the diagram is that it suggests that after death all we are left with is the elements. In fact, it seems that what we are left (at least for a while), viz., a corpse, lies at some higher level of organization than that of the elements, even if it is not alive.

FURTH: What we have left is rubble, which we are tempted to call homonymously a man.

ALAN CODE: If functionalism says that the relation between the psychical function and the material physiology is contingent, then Aristotle's view cannot be functionalism. But can't we say that the whole depth of soul or form (in Furth's diagram) is a functional state of the material elements, granting Aristotle does not think that there are even possible alternative material compounds for this functional state. This view would be functionalist in the sense that the soul is a functional state of matter.

COHEN: this is a tempting move to make if we want to break, once and for all, the awkward non-contingent connection between the soul and its material basis. We will then have just one level of material components, viz., that the elements, and something very complex as the formal component. Now, since we have gone all the way down to the bottom (in Furth's diagram) we don't have to worry about a conflict with the homonymy principle. Flesh may be necessarily actually alive, but earth, air, fire, and water are not. However, I doubt that Aristotle would be happy with this conclusion, since in his view the elements are not even potentially alive.

CODE: The elements are not potentially alive only in the sense that they are not the *proximate* matter for living body. In a broader sense we can say they are potentially a living organism. Aristotle is basically looking at the relation of a substantial form to inanimate matter. The ergon comes from the form. So we have a functional organization of an inanimate substratum. Aristotle looks at it this way because his physics is so crude.

FURTH: Θ 7 says that nothing is potentially x unless it is the immediately preceding matter. It is a very valuable passage because it is the one place where Aristotle clearly discusses the vertical dimension of ἐξ οὗ.