

Seeing, Doing, and Knowing: A Philosophical Theory of Sense Perception, by Mohan Matthen. Oxford: Oxford University Press, 2005. Pp. xxii + 362. H/b £67.50, \$120.00; P/b £25.00, \$45.00.

In the Prelude to Matthen's marvellous *Seeing, Doing, and Knowing*—'The New Philosophy of Vision'—he welcomes a comparatively recent development in theorizing about perception. Vision (for example) is not now treated as merely presenting the subject with a 'sensuously given mosaic of color spots' (David Lewis's phrase, quoted at p. 2), the relevance of which to the scene before the eyes is obscure, but rather as 'delivering an interpreted message' (p. 5) about our familiar three-dimensional environment. 'Sensory experiences are not insulated inner events that must be decoded or diagnosed by us before they can be put to use, but rather inherently *meaningful* states with representational significance beyond themselves' (p. 19). And that emphasis on how sensory awareness purports to be of objects located in three-dimensional space fits naturally with the idea that our sensory systems are 'problem solvers' (p. 5). In the case of vision, the fundamental task is what is often called 'inverse optics': starting from the activity of receptors in the retina, the visual system attempts to extract the best hypothesis about the environment.

Of course, the problem the visual system tries to solve has no unique solution, in the sense that innumerable environmental configurations could be responsible for any given pattern of retinal stimulation. One of Matthen's examples is illumination and surface reflectance, which—simplifying matters somewhat—are jointly responsible for the light reaching the eye from an object. Following Matthen, let us add to the inverse optics picture the claim that colour is reflectance. Since the light reaching the eye is the product of the illumination and reflectance, in essence the visual system has to solve a single equation with two unknowns. Yet the visual system somehow manages to disentangle the relative contributions of the illumination and reflectance, with the result that we see the colours of surfaces reasonably accurately. Exactly how the visual system solves this problem is disputed, but as far as research programmes in cognitive science go, this one is far from degenerating.

Although Matthen praises the inverse optics programme for its rejection of the 'traditional subjectivist paradigm' (p. 6), his ultimate ambition is to bury it. He sees 'five interrelated difficulties' (p. 6), of which I shall mention a representative three. (All five use colour as an illustrative example.) The first concerns constancy: we are good, but not perfect, at tracking the reflectance of a thing through diverse lighting conditions. Since 'colour appearance does not track reflectance precisely ... what exactly is the value of fingering this precise physical quantity as its target?' (p. 7).

The second problem stems from the diversity of kinds of colour vision across species. 'This is a puzzle if we think that colour is reflectance, and that

colour vision decodes reflectance and illumination — for in many organisms, colour vision seems to be decoding something that is of only idiosyncratic significance' (p. 7).

The third problem is, in effect, about modes of presentation. Colour vision does not deliver a message about reflectance as such — if it did, then the identification of colour with reflectance would hardly be controversial. Aristotle saw colours, despite knowing 'nought about reflectance', so '[s]houldn't a theory of colour vision be able to offer us a better account of its significance *to the perceiver?*' (p. 7).

(Later in the book, Matthen makes an apparent concession to those who identify colour with reflectance by saying that 'physicalist theories [of colour] capture the *secondary content*' of surface colour perceptions (p. 234). But this is not really a concession, since it basically amounts to the claim that reflectances are correlated with surface colour perceptions, which no one need deny.)

'The upshot', according to Matthen, 'is that we need a different and more accommodating way to think about objective sense-features and their locations' (p. 7), and it is this that *Seeing, Doing, and Knowing* aims to provide.

Is that really the upshot? Take the first problem. True, 'colour appearance does not track reflectance precisely'. But how can this suggest that the identification of colour with reflectance is mistaken? After all, colour appearance does not track *colour* precisely — that, is we do not have perfect *colour* constancy. Far from raising a worry, the failure of colour appearance to track reflectance precisely is exactly what Matthen's opponent requires.

Turning to the second problem, Matthen's chief example is the pigeon, which has colour vision extending into the ultraviolet. As the concentration of ultraviolet increases with the angle from the sun, the pigeon's colour vision could potentially be used for navigation in an otherwise featureless sky. Supposing that it is, then 'for the bird, colour is a property of directions as well as surfaces ... [which] makes pigeon-colour a different property than the one we see' (p. 173). Of course, colour is not just a property of surfaces, but also of light sources and volumes, and that fact alone raises trouble for the view that identifies colour with reflectance. As Matthen mentions (p. 176, n. 8), proponents of the reflectance view have generally taken it to be in need of amendment for precisely this reason. But the account can be extended — volumes, surfaces, and light sources all change the incident light in various ways (in the case of light sources, by adding to the light rather than reflecting it), and colour can perhaps be identified with more general light-transforming properties, of which reflectances are determinates.

Supposing that the reflectance account can be extended to cover light sources, do Matthen's pigeons raise an extra difficulty? Yes, if the example shows that pigeon colours are properties of *directions* (as Matthen supposes) because directions themselves do not change light in any way. But the

example forces no such description, any more than the fact that humans can use their colour vision to identify the east–west axis in the morning or evening shows that human colours are properties of directions. Matthen's pigeons may be navigating by seeing coloured regions of the sky rather than coloured directions.

The third problem about modes of presentation, needless to say, is not so easily dismissed. Does Matthen's 'different and more accommodating way to think about objective sense-features' solve it?

Matthen summarizes his more accommodating alternative as follows: 'sensory systems are automatic sorting machines that come into direct contact with environmental objects and sort them into classes according to how they should be treated for the purposes of physical manipulation and investigation' (p. 8) — hence the 'Doing' in the book's title.

As far as the third problem goes, the relevant part of the above quotation is the bit about 'sorting machines'. This is 'The Sensory Classification Thesis', the main thrust of which is that 'sensory systems classify *distal* stimuli — objects or happenings in the external world' (p. 19). That might not seem worthy of lengthy defence, since it sounds like (in Matthen's terminology) 'Distal Attributivism', the view that 'every sensory state attributes some quality to an external object' (p. 19) which (as Matthen notes) has been well enough defended already. However, SCT goes beyond DA in at least one crucial respect: 'it is a theory about the construction of sense-features' (p. 20), and in particular it 'insist[s] that categories like *red* are the products of sensory activity' (p. 19), they are 'not simply patterns in the ambient energy record' (p. 20).

There is a further important respect in which SCT (at least as Matthen goes on to elaborate it) differs from DA. It is commonly assumed that sensory classification involves representations for the categories being classified, but usually these representations are not taken to be within the perceiver's ken — theory and experiment are needed to reveal them. In contrast, SCT takes the representations to be out in the open, because they are '[s]ensations: events in sensory consciousness with a particular subjective feel. These events are like labels that the system attaches to stimuli *in order that we may know that they have been assigned to a particular class*' (p. 24, my emphasis).

If 'sensations' are thought of as 'labels' for features of external objects, dispositionalism about such features is often the next step: redness is the disposition to produce a certain kind of sensation, for instance. Matthen, however, is at pains to disavow this view: 'something looks red because the visual system has assigned it to the class of red things; the experience of red is simply the visual system's *label* for that class, the way we know how the thing has been classified. As we have been saying, it is an inversion to say that something is red because it produces in us the experience of red' (p. 32).

Often dispositionalism is associated with an epistemic thesis: a perceiver discovers that a tomato before her eyes is red partly because she notices the occurrence of a certain sensation. Despite resisting the dispositionalist identification of redness with a disposition to produce sensations, the quotations in the two paragraphs above suggest that Matthen agrees with the epistemic thesis. His analogy with language reinforces this interpretation:

[T]he English call a feline creature 'cat', the French call it 'chat': this does not mean that they are employing different classifications; all it means is that they have different words for the same classification. Analogously in sensation. Different sensations can betoken the same sense-feature. (p. 33, see also p. 147)

Someone who says 'Le chat est sur le paillason' is speaking of cats and mats, not about French. But understanding that sentence requires awareness of the French label for a cat. Since the analogous epistemic thesis is true in the linguistic case, this suggests that Matthen thinks the epistemic thesis is true in the perceptual case.

Now Matthen does stress that '*sensations* are not normally objects of our awareness' (p. 27, see also p. 193), which seems in tension with the epistemic thesis. But perhaps all he means by this is that we do not normally *attend* to our sensations, as we do to external objects; nonetheless, we are aware of them, lurking in the background.

Matthen uses the linguistic analogy to suggest a solution to the third problem, of explaining colour's '*significance to the perceiver*'. The 'mode of awareness', or 'manner of presentation' (p. 28) of the colour green is the sensation or 'label' that the visual system uses to classify things as green.

This proposed solution to the third problem raises a host of difficult questions, but for the sake of the argument let us suppose it is correct. Why can the proponent of the picture Matthen criticizes — inverse optics coupled with the identification of visible qualities with 'real-world physical variables' (p. 6) — not just take it on board? How could Aristotle see colours, despite his ignorance of reflectances? Very roughly: for the same reason that that he could understand the word 'hydor' despite his ignorance of hydrogen and oxygen. That may not be a good answer, but it does not seem to be in conflict with the basic picture that Matthen urges us to reject.

To summarize: Matthen persuasively argues against the traditional 'subjectivist paradigm' in the philosophy of perception, but what is not as persuasive is his case against recent views that emphasize — as Matthen does himself — 'the outward-orientated phenomenology of sensing' (p. 3).

These issues form only a small fragment of *Seeing, Doing, and Knowing*. It is an intricate and dense book, packed with empirically informed and philosophically sophisticated treatments of non-conceptual content, sensory concepts, sensory similarity, animal colour vision, visual objects, visual reference, and much more. This review has spent time splashing around in the

shallow end; anyone interested in perception should buy the book and wade deeper. (Thanks to Mohan Matthen and David Hilbert for comments.)

Department of Linguistics and Philosophy
Massachusetts Institute of Technology
Cambridge MA 02139, USA

ALEX BYRNE

doi:10.1093/mind/fzq091

Advance Access publication 10 February 2011

Real Essentialism, by David S. Oderberg. New York, NY: Routledge, 2007. Pp. ix + 314. H/b £80.00, P/b £26.99.

David Oderberg's *Real Essentialism* is an extended defence of the traditional Aristotelian idea that everything has an essence. Chapter one is a critique of what Oderberg calls 'contemporary essentialism', accounts of essentialism that attempt to analyse essence in terms of notions such as possibility and necessity. In Chapter two, Oderberg addresses criticisms of essentialism that originate with Quine, Popper, and Wittgenstein. Chapter three focuses on the epistemology of essence, arguing that we can come to know the real essences of things even though they may not be directly observable.

Chapter four marks the section of the book wherein Oderberg presents his account of the structure of essence. This account is situated within a metaphysical framework of *hylomorphism*, the view (roughly) that all material objects consist of *form* (or *actuality*) and *matter* (or *potentiality*). Chapters five and six explore the connections between essence, existence, and identity. In Chapter seven, Oderberg discusses some features of his account of essence, including how the real essentialist treats accidents, properties, artifacts, and matters of constitution.

In Chapters eight to ten, Oderberg applies his hylomorphic account of essence to life, species, and persons. In Chapter eight, Oderberg argues that the distinction between living and non-living things is that living things have a 'life principle or soul,' whereas non-living things do not (p. 194). Chapter nine is a defence of essence in the biological domain. Chapter ten is a defence of the claim that what distinguishes human beings from all other living creatures is that our essence is constituted by the form of rationality.

Oderberg covers a tremendous amount of ground in *Real Essentialism*. Unfortunately, the ambitious scope of the book makes it hard for the author to cover the material in as much detail as it deserves. Early on in the book, for example, Oderberg claims that the structure of reality must be such that there are metaphysically substantive facts about resemblance. While I am sympathetic to this idea, I found it difficult to understand some of Oderberg's arguments. For instance, Oderberg gives the following *reductio ad*