

Two Recent Anthologies on Color

Jonathan Cohen*

Although philosophers have puzzled about color for millennia, the recent explosion in philosophical interest in the topic can largely be traced to C. L. Hardin's widely-read and deservedly-praised *Color for Philosophers: Unweaving the Rainbow* [Hardin, 1988]. While Hardin has had no more than the usual, limited success in convincing other philosophers to adopt the substance of his views, he has been quite influential about a point of philosophical methodology: he has convinced many that responsible philosophical work on color simply must make contact with the vast body of empirical color science, and thereby has effected an enormous (and to my mind, extremely salutary) change in the terms of recent philosophical discussion of color.¹ Indeed, writers have been so eager to take Hardin's lesson on board that one is hard-pressed to find a recent philosophical book on color that does not acknowledge it, crediting Hardin by name.

In this vein, a number of recent anthologies on color have attempted to integrate philosophical and scientific work on color. Among these are *Readings on Color* (itself two volumes: [Byrne and Hilbert, 1997b], and [Byrne and Hilbert, 1997c]), and *Color Vision: Perspectives from Different Disciplines* [Backhaus et al., 1998].

Readings on Color is comprised of two separate volumes: *Volume 1: The Philosophy of Color*, and *Volume 2: The Science of Color*.

Volume 1: The Philosophy of Color anthologizes many of the most important articles from the philosophical literature on color and color experience of the past twenty-five years. These include papers by Smart and Armstrong concerning the viability of physicalist theories of color (roughly, views according to which colors are objective, mind-independent, physical properties of objects), and contributions by Johnston and Peacocke defending dispositional analyses (on which colors are construed as dispositions to affect certain sorts of perceivers in certain circumstances).² There are also two papers by Boghossian and Velleman criticizing both physicalist and dispositionalist theories, and one

*Department of Philosophy, University of British Columbia, joncohen@ruccs.rutgers.edu

¹It is a tribute to the synopsis of findings of color science Hardin presented in this work not only that it is still regarded by many as the canonical philosopher's introduction to color science, but that it continues to stand up today, some twelve years after its initial publication.

²These views have sometimes been discussed under other names. What Smart and Armstrong call 'physicalist theories' have sometimes received the labels 'color objectivism' and 'primary quality theory of color', while dispositional theories have been dubbed 'color subjectivism' and 'secondary quality theory of color' by some authors.

from Shoemaker on the nature of color experience. In addition to these reprinted papers, there are two new articles.³ In one, Hardin argues against the relevance of traditional philosophical intuitions about spectrum inversions. In the other, Byrne and Hilbert defend their own version of color physicalism and an intentionalist/representationist conception of color experience. Moreover, Byrne and Hilbert have added a useful introduction that lays out the main issues of contention between the essays in the volume and outlines the most important positions taken with respect to these issues. On the whole, although there are a few papers I would have liked to see included that are not, I cannot think of a better single introduction to recent philosophical work on color than this volume.

Volume 2: The Science of Color represents a broad array of approaches (psychophysics, physiology, physics, computational models of reflectance recovery, evolutionary psychology, etc.), and collectively they give one the basics (rather than the very latest results) of a number of fields of research on color vision that will be useful to philosophically-minded newcomers. In addition to an introduction to the volume that summarizes the contributions and explains the relations between the disparate subfields represented, Byrne and Hilbert have provided an annotated bibliography of suggestions for further reading and a helpful glossary of technical terms.

The essays in this volume are especially well-suited to the needs of philosophers (this is not surprising, since the editors are both philosophers). For example, Nassau's paper on the diversity and heterogeneity of physical mechanisms that result in color appearances is directly relevant to philosophical questions about multiple realization and reduction. Similarly, the selection from Hurvich outlines modern opponent-process theory, the framework in terms of which contemporary vision science explains the relations among the colors (e.g., the exclusion relation between green and red, the similarity relation between red and orange) that have puzzled philosophers for eons.⁴ This last topic has also figured centrally in contemporary philosophical work on color: several writers (e.g., [Hardin, 1988], [Maund, 1995], [Thompson, 1995]) have appealed to these relations to argue against physicalist theories of color. Similarly, there are a number of selections concerning color constancy — the visual system's capacity to represent the color of objects as stable despite changes in illumination and other aspects of the viewing conditions, which some philosophers have taken to vindicate the distinction between apparent and real colors, and thereby to show that colors are, in some interesting sense, objective. Because the individual essays in Byrne's and Hilbert's scientific volume are so closely bound up with such philosophical topics, the volume is a superb starting place for the philosopher who wishes to become acquainted with the empirical issues.

³Also, Johnston has supplied a new postscript to "How to Speak of the Colors" that considers how the dispositionalist view of color defended in that paper is related to visual experience.

⁴Hurvich's contribution is especially nice to have in the volume, since the book from which it is drawn, [Hurvich, 1981], is out of print (and difficult to locate).

[Backhaus et al., 1998] originated in an interdisciplinary conference on color held at the Einstein Forum in Potsdam in February 1996. According to their preface, the editors conceive of the book

... in the first place as a text book for introductory courses at the graduate level. It provides an introduction to the exciting field of color vision for students and readers who are new to the field. The second intention of this book is to give established scientists an overview and an update on research activities in related fields. We hope that the material gathered from the diversity of fields will motivate students and experts alike to take a broader perspective with regard to color vision from the different disciplines (v).

Given these aims, it seems that some of the disciplines are better represented in the book than others; in particular, a disproportionate number of the papers are physiological.⁵ There are approximately eight papers (depending on how you count) on physiological topics including the physiology of retinae and retinal receptors, processing of color information in the brain, the molecular genetics of color vision, comparative color physiology, and the evolution of trichromatic and tetrachromatic color vision; also included are roughly six papers on topics in color psychophysics (including color contrast gain control, binocular brightness combination, and color vision in blindsight), one paper on basic color terms and basic color categories, two on physical, physiological, and psychological color spaces, and one on the use of PostScript to produce color computer graphics.

The book is printed on thick, glossy stock that nicely shows up the many beautiful illustrations (among the most impressive are the photographs of age-related changes in the lenses of human eyes on page 7, the brain images in chapter 6, reproductions of psychophysical stimuli in several chapters, and even some reproductions of Impressionist paintings in chapter 1). Unfortunately, one result is that the book costs \$50 in paperback (\$90 in cloth), which may put it out of reach for use in many classrooms (especially in philosophy classrooms, where it would presumably be used as a supplement to other materials).⁶

This volume, of course, is not written primarily for or by philosophers. However, philosophers will be puzzled by the role assigned to their field in its pages: the only philosopher included is Hardin, and his contribution, “Basic Color Terms and Basic Color Categories” — an overview of the psychological literature on categories into which colors are sorted and the lexicalizations of such categories in various natural languages — shies away from the discussion of

⁵On the other hand, this fact may make the volume especially useful to philosophers, insofar as physiology has been rather neglected in philosophical discussions of color.

⁶As the editors point out, the book would have been far more dear in the past: “Until very recently, books containing as many color illustrations as this one were reserved for those wealthy popes and dukes who could afford illuminated manuscripts” (xiv). True enough; but I doubt this will bring much comfort to graduate students whose seminars require the purchase of [Backhaus et al., 1998].

The Byrne and Hilbert volumes are individually more affordable (although the pair of volumes comes to more than [Backhaus et al., 1998]): they cost \$31.50 each in paperback, and \$75 (volume 1) and \$64 (volume 2) in cloth.

philosophical questions in favor of psychological ones.⁷ This choice leaves aside what is, in my view, the most interesting and active area of current philosophical work on color, which centers on the ontological disputes between color physicalists ([Armstrong, 1968], [Hilbert, 1987], [Byrne and Hilbert, 1997a]), dispositionalists ([McGinn, 1983], [Peacocke, 1984], [Johnston, 1992]), functionalists ([Jackson, 1998], [McLaughlin, 2001], [Cohen, 2000]), color eliminativists ([Hardin, 1988], [Maund, 1995]), and others. The editors don't even seem to acknowledge that there is room for dispute on these matters when, for example, they make the highly controversial claim (without any apparent hesitation) that "color, as we experience it, is not an inherent property of objects but is associated with the spectral distribution of light reflected from them in the context of preceding and surrounding illumination" (xiii; philosophically controversial claims about color occur sporadically elsewhere in the book, e.g., 189, 219). Philosophers have had a lot to say about these questions, so it is curious that perspectives from their discipline are wholly absent from *Color Vision: Perspectives from Different Disciplines*.⁸

All that said, the book succeeds admirably in providing an overview of the current state of play in a number of disparate areas of research on color vision. And while some of this material may be rather more than most philosophers will need for their immediate philosophical purposes, awareness of such issues cannot but add to the sophistication of their work on color in the long run.

References

[Armstrong, 1968] Armstrong, D. (1968). *A Materialist Theory of the Mind*. Routledge, London.

⁷On this subject, see also [Hardin and Maffi, 1997], a recent anthology co-edited by Hardin on the topic of color categories.

⁸Strangely, the editors seem to think that the main job for philosophers in this area is that of helping scientists to find better criteria for individuating qualitative color sensation types:

Ultimately, we can never be sure that two humans have the same color experience, even if they identify the same stimulus using the same words. Inferences about sensations are even more difficult in the case of different animal species with which we can only communicate via behavioral experiments. For this reason, philosophers remain useful in guiding our thinking about further criteria that, if satisfied, might allow a reasonable person to infer whether two people or two different species experience the world in the same way (xiv).

It is perhaps not entirely coincidental that this project is intimately tied to the research program of one of the editors: Backhaus's chapter 2 — an astonishingly synoptic discussion of integrated models of different stages of color vision, ranging from the physics of photons and the electrophysiology of photoreceptor cells, through the electrophysiology of postreceptoral neural processing of color information, to the psychophysics of color vision — concludes with five criteria whose satisfaction in an organism, he tells us, licenses the attribution of color sensations to that organism. Unfortunately, Backhaus advances literally no argument to show that his (controversial) criteria are sufficient for color sensation (perhaps he should have consulted a better philosopher).

- [Backhaus et al., 1998] Backhaus, W. G. K., Giegl, R., and Werner, J. S., editors (1998). *Color Vision: Perspectives From Different Disciplines*. Walter de Gruyter.
- [Byrne and Hilbert, 1997a] Byrne, A. and Hilbert, D. R. (1997a). Colors and reflectances. In [Byrne and Hilbert, 1997b], pages 263–288.
- [Byrne and Hilbert, 1997b] Byrne, A. and Hilbert, D. R., editors (1997b). *Readings on Color, Volume 1: The Philosophy of Color*. MIT Press, Cambridge, Massachusetts.
- [Byrne and Hilbert, 1997c] Byrne, A. and Hilbert, D. R. (1997c). *Readings on Color, Volume 2: The Science of Color*. MIT Press, Cambridge, Massachusetts.
- [Cohen, 2000] Cohen, J. (2000). Color: A functionalist proposal. Under review ([http://rucss.rutgers.edu/~joncohen/functionism.pdf](http://rucss.rutgers.edu/~joncohen/functionalism.pdf)).
- [Hardin, 1988] Hardin, C. L. (1988). *Color for Philosophers: Unweaving the Rainbow*. Hackett, Indianapolis.
- [Hardin and Maffi, 1997] Hardin, C. L. and Maffi, L., editors (1997). *Color Categories in Thought and Language*. Cambridge University Press, New York.
- [Hilbert, 1987] Hilbert, D. R. (1987). *Color and Color Perception: A Study in Anthropocentric Realism*. CSLI, Stanford.
- [Hurvich, 1981] Hurvich, L. M. (1981). *Color Vision*. Sinauer Associates, Sunderland, Massachusetts.
- [Jackson, 1998] Jackson, F. (1998). *From Metaphysics to Ethics: A Defence of Conceptual Analysis*. Oxford, New York. Originally given as the 1998 Locke Lectures.
- [Johnston, 1992] Johnston, M. (1992). How to speak of the colors. *Philosophical Studies*, 68:221–263. Reprinted in [Byrne and Hilbert, 1997b], 137–176.
- [Maund, 1995] Maund, B. (1995). *Colours: Their Nature and Representation*. Cambridge University Press, New York.
- [McGinn, 1983] McGinn, C. (1983). *The Subjective View: Secondary Qualities and Indexical Thoughts*. Oxford University Press, Oxford.
- [McLaughlin, 2001] McLaughlin, B. (2001). The place of color in nature. In Mausfeld, R. and Heyer, D., editors, *Colour Perception: From Light to Object*. Oxford University Press, New York. Forthcoming.
- [Peacocke, 1984] Peacocke, C. (1984). Colour concepts and colour experiences. *Synthese*, 58(3):365–81. Reprinted in [Rosenthal, 1991], 408–16.

- [Rosenthal, 1991] Rosenthal, D. (1991). *The Nature of Mind*. Oxford University Press, New York.
- [Thompson, 1995] Thompson, E. (1995). *Colour Vision: A Study in Cognitive Science and the Philosophy of Perception*. Routledge, New York.