

Vision: Variations on Some Berkeleian Themes, Robert Schwartz, Oxford, Basil Blackwell, 1994, Pp. 162.

This relatively short book, in four chapters, addresses some key issues in the theory of vision: the manner in which we perceive distance and size, and the nature and relevance of inference in the perceptual process. These issues are presented in the context of Berkeley's seminal work on vision and throughout the book the author is at pains to present an impartial account of Berkeley's work in the light of subsequent research. Appropriately, the book concludes with a comparison of Berkeley's position with that of J. J. Gibson.

Perhaps one of the most engaging qualities of the book is the fairness with which Schwartz treats not only Berkeley but all of the other "vision theorists", psychologists, and philosophers who populate the pages. Indeed, it is the willingness to attempt to see "what was really meant" in Berkeley's writings, rather than being content with the (often incorrect) interpretations of others, which continually provides one with the motivation to carry on reading even when one disagrees with Schwartz's perspective. Given that Berkeley's writings are very often misunderstood, this is a very welcome characteristic. Indeed, as a companion to Berkeley's own text, this book would play a very useful role in keeping a reader's prejudices at bay whilst coming to an understanding of Berkeley's intended message. Nonetheless Schwartz is no apologist for Berkeley; rather he provides an impartial assessment of Berkeley's position on vision, an altogether more comfortable endeavour.

Jesseph is on different ground in dealing with *The Analyst*. He is prepared to make stronger philosophical claims for it. It is presented as an essential part of our understanding of Berkeley's account of science and mathematics and Jesseph claims that it is independent of immaterialism (however still no discussion of this). He forays into the heady world of Berkeley scholarship in discussing the possible identity of the 'infidel mathematician' attacked in the text. His presentation of the mathematical background is detailed in comparison to his discussion of the mechanical background to *De Motu* and his discussion of the elements of the infinitesimal calculus and Newton's calculus of fluxions is clear, as is his account of Berkeley's arguments against these. The 'outline analysis' of *The Analyst* is useful for those unfamiliar with that work. Once again the discussion of responses to Berkeley's position is scanty, as is the note on the text.

As an introduction to the two texts it serves well - but no Berkeley novice would buy so expensive a work (£51.00). Specialists in Berkeley gain no great insights from the introductory material and no detailed interpretative strategy is presented. Issues which could be addressed are sidestepped, such as the immaterialism issue, the relation of theory of meaning to ontology, etc.. It (rightly) claims no superior status for its translation of *De Motu* or the text of *The Analyst* over pre-existing versions. What is puzzling about this book is who might constitute its intended readership.

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From a Berkeleian perspective, Chapter 1 of Schwartz's book is undoubtedly the most interesting and compelling. It takes Berkeley's position on distance and views it from the different perspectives of subsequent vision theorists. If I can pick out one single detail for mention, it is the problem of calibrating one's perceived distance (or "egocentric distance") with absolute distance (or "ecocentric distance"). For Berkeley, this is accomplished by learning, through association of the perceived distance and the actions of the perceiver in his environment. That is, it is achieved through the association of proprioceptive information with exteroceptive information. This is an issue of great contemporary interest in psychology, epistemology, and computational perception, and Schwartz does no small service in reminding us that it is not a new problem. He also provides a very well presented discussion on the nature of binocular stereopsis and, in particular, on the relevance of stereopsis to Berkeley's position. Contrary to common belief, stereopsis does not damage in the least Berkeley's case for the indirectness of the perception of distance and it is instructive to read Schwartz's account of this.

Chapter 2 treats the perception of size and, *inter alia*, how it is we perceive given objects to have a constant size irrespective of their distance from us and in spite of the consequent variation in the size of the image which is projected onto the retina. Berkeley's position on this issue is that the perception of size is achieved through the association of the tangible size of objects with (a) the visible size of an object - the tangible size being proportional to the visible size; (b) the relative blur of the visual

appearance - tangible size being inversely related to the degree of blur; and (c) the intensity of the visual appearance - the tangible size being inversely related to the intensity. Unfortunately, most of the chapter is given over to a discussion of a position that Berkeley himself rejects: the so-called 'taking account of distance' thesis. This thesis posits that the magnitude of an object is perceived by the prior estimation of its distance from the observer and by exploiting this information with a knowledge of the visual angle subtended by that object at the retina of the eye.

Chapter 3 on perceptual inference introduces many interesting issues, not the least of which is Schwartz's observation that Berkeley's theory of vision can be construed as a thesis that the perceptual process is like linguistic understanding. That said, very little of chapter 3 addresses overtly Berkeleian issues. This is not surprising given that Berkeley argued strongly that visual perception does not involve any sort of deliberate inferential (or reasoning) process. This is no criticism of the book for, as Schwartz points out, a great deal of modern vision theory presumes the validity of the inferential position. Again, the service which Schwartz does is to assess this purported validity in a balanced manner. In doing this, Schwartz notes a distinction (as he does elsewhere in the book) between organic or physiological processes of visual sensing, on the one hand, and psychic or psychological processes, on the other. Schwartz's point is that it is very difficult to say with any confidence where one should draw this distinction in the first place. Arguments for the validity of perceptual inference are often based, for example, on some inadequacy in informational content which results from purely physiological

processes and the consequent necessity to invoke some compensatory psychological processes. Schwartz's solution is to side-step the issue completely. He argues that it is the drawing of the distinction in the first place which causes the difficulty by giving vision theorists irrelevant (and non-existent) problems to solve - 'bogus controversies' as he calls them. His arguments are appealing. I have, however, to say that I believe he draws an unsupported conclusion when he asserts: 'much of the air should be knocked out of the debates over whether ... a realist or anti-realist account of vision is correct'. This assertion seems unsupported because Schwartz has almost systematically avoided becoming engaged in any deep consideration of the ontological foundations of vision, a matter I will return to in a moment.

Chapter 4 is primarily concerned with the work of Gibson, a vision theorist almost as controversial as Berkeley. In this instance, Berkeley acts as a backdrop for Gibson and the purpose of the chapter seems to be to present an impartial and fair assessment of the merit of Gibson's position. That said, Schwartz does draw some very interesting parallels between the work of the two men, perhaps the most important being the observation that 'Berkeley and Gibson each make much of the fact that it is our experience of the visual world that is significant for behaviour. This leads them both to emphasize the inseparability of seeing and doing'. This is a very instructive, for it is something that so-called modern practitioners of computational vision, for example, are now re-discovering.

Chapter 4, and the book, concludes with an all-too-brief look at the ontological foundations of vision theories. Given Berkeley's own priorities, arguably the book finishes perhaps as it should have begun. Schwartz makes some very valuable and even-handed observations on these ontological issues. For example, he states that 'the realist thesis of a world ready-made, independent of our contribution, is no more tenable than the idea that the world is whatever we fancy it to be'. And he notes, in passing, that 'a radical subjectivist thesis is no part of Berkeley's idealism.' Indeed as so often in the book, this is a pertinent and thoughtful observation which can go some way to correcting common misconceptions.

Although this is a valuable and enjoyable book, it is not without shortcomings. Perhaps the most obvious deficiency is that it does not contain a complete and succinct summary of Berkeley's position as presented in the *Essay Towards a New Theory of Vision*. The book also misses the opportunity to rehearse the essence of Berkeley's arguments, for these have an elegance and beauty all of their own, irrespective of their subject matter. To get the most out of this book, it would be essential to have first made a careful reading of Berkeley's original text.

There is another lesser shortcoming. Although Schwartz acknowledges the importance of David Marr as a contemporary theoretician of vision, he does not address his work in any substantive manner. This is a pity since Marr's work has been so influential on modern thought on vision and it would have been

instructive to have Berkeley's approach contrasted with Marr's position, if only to highlight the strength of the Berkeleyian tradition.

As we noted above, Schwartz does not develop in any depth the ontological and epistemological foundations of vision. Furthermore, Schwartz's final sentence of the book leaves one feeling disappointed. He states that 'it would seem that serious work in the theory of vision can best proceed by letting these grander metaphysical ideas float free on their own'. This is indeed regrettable if one remembers the epistemological problem with which we are inevitably faced when we attempt to provide any exposition of the nature of perception, visual and otherwise. For any attempt at such an exposition must depend on the very thing we are investigating, namely vision! It is clear that irrespective of how hard it is to deal with these issues, the ontological and the epistemological concerns inevitably raise their heads and demand to be addressed. Schwartz's desire to make progress without addressing them is understandable, and he is certainly not alone in this. So one must beware of singling him out for criticism. However it is unfortunate, given that perhaps Berkeley's most valuable legacy was an understanding of the deep interdependence between our perceptual processes and our conceptions of reality.

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