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### Book Review

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# Book Review

*Technical Functions. On the Use and Design of Artefacts. (Philosophy of Engineering and Technology, Volume 1.)* Wybo Houkes & Pieter E. Vermaas. Springer, Dordrecht (2010), viii + 175 pp., ISBN 978-90-481-3899-9, £90.00

The authors of this new book will be known to readers of *Design Studies* for their penetrating philosophical analyses of design-related concepts, notably the concept of *functions* of artefacts (Houkes *et al.*, 2002; Vermaas & Dorst, 2007). Functions of artefacts have also been addressed in recent *DS*-papers by Gero & Kannengiesser (2004), by myself (2009), and more thoroughly by Crilly (2010).

But the book is by far the most comprehensive treatment of the subject so far, at least when it comes to the depth of coverage. As for the breadth, however, Houkes and Vermaas explicitly limit the scope of their analysis and theory to *technical* artefacts; i.e. ‘material objects made to serve practical purposes; objects ranging from tablets of Aspirin to Concorde, from wooden clogs to nuclear submarines’, as they say in their preface (p vii). As furthermore they explain on the first page of the introduction chapter, the scope excludes *social* artefacts (e.g., ‘laws and organisations’); *aesthetic* artefacts, or works of art (such as ‘statues and symphonies’); and *scientific* artefacts (‘theories and models’). Yet in the very next sentence, Houkes and Vermaas reassure the reader that they do *not* limit their analysis to engineering, and again they offer some suggestively diverse examples of what is *within* their scope: ‘objects ranging from everyday items such as tea bags and television sets, to technologically complex objects such as bridges and microchips’. (Though to me this pretty much carries a flavour of engineering, too.) Apparently for good measure Houkes and Vermaas add that the account they develop of such objects ‘may even be expanded to include *natural* objects such as stones and batches of water that serve practical purposes’. The full implications of this deceptively light remark did not dawn to me until the last chapter of the book, where an interesting and slightly disconcerting instability of

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the concept of *artefact* surfaces as a side effect of the theory developed in the book! Anyway, still on page one, Houkes and Vermaas sum up their choice of scope saying that, ‘In short, our analysis is about useful material’, and that the focus of the book is on ‘the central feature of technical artefacts: their intimate connection to teleology’.

After reading the first few pages of the book, I thus found myself thrilled by what they promise: a philosophical theory about the teleology (purpose-directedness) of ‘material objects made to serve practical purposes’ (and as a bonus, so to speak, even natural objects as well, used for such purposes). Indeed, that is quite something. Why was it, then, that at the same time I couldn’t help feeling a twinge of disappointment?

Perhaps as a result of my exposure lately to the invigorating company of hundreds of young design school students with artistic mindsets and all kinds of appetites for life, the opening statements of this book make the project of its authors stand out to me as not only wonderfully ambitious, but also curiously *ascetic* in its no-nonsense practical-useful-technical approach to design. Furthermore, the audience that Houkes and Vermaas address seems rather exclusive. At first sight at least, the book presents itself as a book written *by* professional philosophers of technology, *for* professional philosophers of technology. Not being a member of that club left me vaguely uneasy, as if I were a gatecrasher at someone else’s party. Whether in that capacity or not, however, it seems appropriate for me to concentrate in this review on the question probably most relevant to readers of *Design Studies*: what, if anything, does this book have to offer designers or design theorists?

Obviously, the above idiosyncratic remarks don’t do the *contents* or the philosophical *contributions* of the book any justice. They merely convey (and slightly exaggerate) my immediate impressions as a reader with a profound and professional interest in design, presented with this book for the first time. And no doubt to many of us, living in an academic environment swamped by words, such immediate impressions are what make the difference between reading on and not reading on. But let me be absolutely clear about this: it would be a pity if potential readers in the design community put this book aside unread, just because the authors do so little to persuade us that it is worth reading for what it has to say about designing.

*Function*, to be sure, is a concept central to designing. By means of the concept of a *use plan* (roughly: a sequence of considered actions whose execution is a physical process involving objects – artefacts and their components – so as to obtain a goal state), this book offers us a sophisticated understanding of function. It shows how function is (or can be) intimately connected to other central concepts such as *using*, and indeed *designing* itself. According to the theory developed, for example, *designing* is (in complex ways) about the construction of use plans; and *function* is construed as the ‘physicochemical capacities’ of objects, by virtue of which their manipulation according to a use plan makes the execution of the plan successful, in terms of realising the desired goal state. (*I am the one to blame, not the authors, for the considerable loss of elegance and clarity that this attempt at an impossibly condensed summary involves.*)

Perhaps the most valuable insight that the general design-oriented reader may gain from Houkes & Vermaas’s book is that the key concepts of our discipline (or any other discipline for that matter) should not be defined and grasped in isolation. Concepts are not like solitary trees that can be contemplated one at a time and walked around at ease. They are rather like trees in a thicket that compete for light (our attention), shape each other, and combine their shapes and sizes to form the thicket.

This being as it may, the book itself is academic philosophy cover to cover, and even though it is not thick, it is *tough*. The analyses are lengthy, densely argued, copiously referenced of course, and uncompromisingly rigorous. Yet the authors do a wonderful job to help the reader keep on the track; by providing crisp outlines, not only of the entire book in the introductory chapter, but also in the form of abstracts at the beginning of each chapter. (I have to admit that I took advantage of this and spent my reading time selectively, primarily on the chapters that seemed most interesting to designers: Chapters one, two, four and seven.) Furthermore, important passages such as major concept definitions are highlighted as tables for easy reference; and there are frequent recaps whenever needed to resume a line of reasoning that was left earlier. Last, but not least, formal definitions and arguments are illustrated by persuasive examples throughout.

There are bits and pieces of information in every academic book that is crucial for the reader to understand what the book is all about, and decide whether or not he should bother to read it. Such information belongs in the very first pages. In this book some of it appears

much too late. For example on page 26, long after the analytical machinery has been revved up to full speed, we are told that ‘design methodologists aim at providing rules and methods in order to improve actual practices of designing, whereas we [Houkes and Vermaas] aim at reconstructing designing, in order to develop our philosophy of artefacts and, eventually our theory of technical functions.’ And not until page 37, the design methodologist who has nevertheless kept on reading, is rewarded for his perseverance by the passage, ‘Our characterisations [of designing] do not translate directly into a design methodology. Still our reconstruction [of designing] may be useful for design methodologists.’[...] ‘It may, furthermore, be of value to evaluate proposals for design methods’. – It would seem from these last remarks that after all, and contrary to my initial impression, the book aims at other readers than professional philosophers of technology. So why not tell us so from the outset, and invite us to the party by giving us good reasons to read on?

As already noted, one of the important things that Houkes and Vermaas *do* tell us from the outset, is that the book is about *technical* artefacts. They reiterate this restriction of scope on page 12, at the end of the introductory chapter, adding that future research ‘may find a place’ for non-technical artefacts, or non-technical aspects of technical artefacts, in the picture they paint. Yet as I made my way through the book, I kept wondering why this completion of the picture is left for ‘future research’ without a more firm intention to make it happen, and why Houkes and Vermaas merely *stipulate* the limitation of their analysis to technical artefacts, without offering any justification or explanation?

It is far from obvious to me that the distinction between ‘technical’, ‘social’, ‘aesthetic’ and ‘scientific’ artefacts is so sharp, and the differences between these breeds of artefacts so deep, that a theory of functions covering all of them would be infeasible. (Isn’t it true of virtually *all* artefacts, for example, that they have an ‘intimate connection to teleology’?) If indeed the authors have good reasons for nevertheless restricting themselves to the realm of technical artefacts the way they do, I should have liked to have those reasons stated up front, too.

What *is* obvious to me, however, is that from a ‘designerly’ point of view, a function theory applicable to artefacts in general would have been considerably more attractive than a theory (arbitrarily?) limited to ‘technical’ artefacts. Conceiving of functions as

‘physicochemical capacities’ of objects as Houkes and Vermaas do (pp 29 and 84) is what most conspicuously limits the scope of their theory. But would the theory become prohibitively complex, or would it be rendered incoherent, if the word ‘objects’ were used in a broader sense; if goal states were allowed to include mental ones such as pleasure, or understanding; if the physicochemical capacities were exchanged with (say) causal powers or dispositional properties, so as to make the theory applicable to other kinds of artefacts that we design – such as social, aesthetic and scientific artefacts?

By my lights, at least, any prospect of expanding the theory in that direction would have been far more worthy of the authors’ attention than the prospect of expanding it into *biology*, which is discussed at great length in chapter 6 (apparently because function in biology is attracting much attention in current philosophical debates). But let me not be driven into unfair criticism of what the book is *not* about, by my designerly parochialism. I have good reasons to recommend this book to members of the design community – at least to the more courageous readers among them. And I have no reason to doubt that as a philosophical achievement this book has considerable merit.

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*Per Galle*