Wybo Houkes, Pieter E. Vermaas, *Technical Functions. On the Use and Design of Artefacts*, Springer, 2010, pp. 175, $ 159, ISBN 9789048138999

Irene Olivero, Università degli Studi di Padova (Centro di Ricerca CIGA)

As the authors themselves point out, this book is about "many of the most mundane objects surrounding us" (p.1), which they refer to as "technical artefacts". By technical artefacts Wybo Houkes and Pieter Vermaas mean to focus on objects that, first of all have been created by someone, and that serve to our practical purposes. In more detail, the theory which the authors want to offer is about technical artefacts broadly conceived: "objects ranging from everyday items such as tea bags and television sets, to technologically complex objects such as bridges and microchips" (p.1). This spectrum of objects may even be expanded to include natural objects such as stones and batches of water, if they serve to practical purposes: so, in general, to every useful material. Thus, as a consequence, what this account excludes from the analysis are the so called "social artefacts", i.e. objects such as laws and organizations, the so called "aesthetic artefacts" or "works of art", i.e. objects as statues and symphonies, and the so called "scientific artefacts", i.e. objects such as theories and models. Excluding these objects it is just a matter of choice, hence, to some extent, arbitrary.

The book, which is developed in seven chapters, presents a new action-theoretical account of using and designing artefacts, called the ICE-functional theory. This theory connects the material side of technical artefacts with the aims of everyday users and the tasks of engineers when designing for those everyday users.

The focal point of the book is the intimate connection between artefacts and teleology, a connection which seems to be, and in fact is – according to Houkes and Vermaas – the main feature of technical artefacts. The authors note the need of a detailed analysis of this notion, pointing out that, despite artefacts have been described in teleological terms for ages, artefact teleology is more problematic than it may seem at first. And that this is so is illustrated by the notion of function. The most shared insight in this respect indeed is that functions are *essential* to artefacts, since it seems very natural to describe and categorize artefacts in

terms of their technical function or functions. But – as Houkes and Vermaas underline – there is no consensus about who and what determines technical function. Furthermore, most of the existing accounts (namely, the intentional function theories, the causal-role function theory, and the evolutionist function theories), trying to resolve this issue, raise more problems than they dispel.

The authors reply to this problem by outlining that "functionality is not as important for describing artefacts as it is often taken to be. This calls for a change of focus: for properly understanding technical artefacts, philosophers, but also engineers, should consider the intentional actions that involve these artefacts instead of merely regarding them as functional objects" (p.4). What Houkes and Vermaas indeed intend to do by this book is a revolution of the main theory about the metaphysics of artefacts, claiming that much more important to define their essence, if they have one, are the intentional actions involved in creation, use and design of artefacts.

As a second main issue, by analyzing and clarifying the connection between functionality and teleology, the authors examine the intuitive distinction between artefacts and natural objects (especially biological organisms), in order to prove that functions cannot be considered exhaustive in defining both the kinds. On this purpose, they initially explore the similarities between the natural and the artificial realm insofar as functions are concerned, and they note that they are insufficient to definitely overthrow the tradition, but more than sufficient to refine the importance of the intentional actions.

Finally, concerning the methodology, the terminology and themes beyond the whole work, Houkes and Vermaas precise that are borrowed from analytic philosophy, since it perfectly fits the purpose: they indeed analyze actions in terms of rationality and plans, which provide a background for a theory of functions. Moreover, they draw on resources mined in disciplines such as action theory and epistemology, which means that their approach to both actions and artefacts is more normative rather than descriptive.

It must be said also that Houkes and Vermaas do want to meet our intuitions and to use them as data, even though intuitions about this theme are likely to be unschooled, weak and divergent. According to this purpose, the authors try to make this appeal to intuitions as explicit and circumscribed as

possible: they translates their listed intuitive, phenomenological data into clear specification, or – as they define them – *desiderata*, that a successfully theory of technical artefacts has to satisfy.
The four desiderata (the proper-accidental *desideratum*, the malfunctioning *desideratum*, the support *desideratum*, and the innovation *desideratum*) reflect the following four phenomena, which characterize artefact using and designing: use versatility, possible lack of success, physical restriction and innovation. To briefly get a sense of what all these phenomena are about, one can think – as the authors cleverly bring readers to do – of multiple examples from our everyday experience. Use versatility can be understood by thinking about how we can use, for instance, a chair: it may be used for sitting on, but it can even be a tool on which one can stand to change a light bulb. In regard to the second aspect – the fact that success is never guaranteed – one might think, for instance, of a television which shows unsharp images or does not respond to the remote control. Then, in order to grasp the third phenomenon – the physical restriction (the fact that objects cannot perform any function exactly because of their physical structure), one might think of the impossibility for a tea bag to be used effectively for ramming a storefront. The positive side of this restriction is that we can, in most of the cases, reasonably expect some measure of success when using an artefact. These two aspects of the same feature of artefacts lead to the related desideratum: there has to be a measure of support for ascribing a function to an artefact, even if it is malfunctioning or has gained a function only transiently. Finally, the fourth characteristic of artefacts use consists in regularly displaying innovative uses: consider cellular phones with cameras, or more paradigmatically, the first airplane.
The first chapter is dedicated to sketching a detailed introduction about the methodology, the aim, the goals intended by the authors, namely a brief outline and an overview of what comes to light beyond the themes implied in general in the book.
The action-theoretical background is presented in chapter 2, by analyzing "artefact" using and designing in terms of one central, versatile concept: the "use-plan", that is to say a series of actions, including manipulation of objects in order to realize a practical goal. This concept has been called for "because [the authors] are convinced that artefacts only have function by virtue of the fact that human beings are capable of (goal-

directed) use and design of artefacts" (p.16). According to this concept, using is cast as the execution of a use plan, while designing as the construction and communication of a use plan. Closing the chapter, the authors show how focusing on use plans can provide a framework for evaluating artefact using and designing.

None of the existing accounts cited above has so far been able to account for all of the mentioned features of artefacts together. This is the main topic of chapter 3, in which Houkes and Vermaas present a critical review of existing and possible theories of technical functions, i.e. of the intentional, causal-role and evolutionist function theories. The aim of this review is establishing that the theories mentioned cannot meet the desiderata, preparing the development of the authors' alternative, outlined forward in the following chapter.

Finally, in chapter 4, Houkes and Vermaas sketch their ICE-function theory, constructed by employing the useful material borrowed from the three basic functional theories criticized in the previous chapter. The 'I' comes before emphasizing the relevance of intentionality. They construct their theory on the basis of their reconstruction of designing in terms of use plans, a theory which consists of two definitions of what it means to justifiably ascribe function to artefacts, relative to use plan of those artefacts, so that it can successfully meet their four desiderata.

However a complication arises, addressed in chapter 5: the ICE-functional theory meets the malfunctioning desideratum only to some extent, and that is due to the necessity of meeting the support desideratum. This might bring one to think that the desiderata are mutually incompatible. Nevertheless, this is not the case, and that it is shown by a twofold route, in order to broaden the viability of the theory. First, distinguishing between the belief that an artefact exercises a capacity and the belief that the artefact has that capacity; second, reflecting on the normative concept of malfunctioning claims, and revealing two types of normative content: one related to practical reason and one related to the privileging of use plans and the role of professional designers, which in particular leads to beyond social and action-theoretical background of a theory of technical functions.

Then, in chapter 6, the authors explore the merits of their theory in other domains beyond technology. On closer inspection,

engineering, physics and chemistry contain functional descriptions, which can be easily accommodated by the ICE-functional theory. However, this mentioned theory cannot adequately capture a functional description in biology, for which the ICE-theory leads to a dilemma: either give up on a uniform analysis of functions and seek for a separate theory for biological functions, or to hold on to such a uniform analysis on pain of accepting the teleological background.

Lastly, the final chapter is dedicated to presenting some general entailments of this analysis for the metaphysics of artefacts. The main goal of this study is to definitely challenge and undermine the metaphysical position that takes the nature of artefacts as being essentially functional. Houkes and Vermaas hold instead that if artefacts have an essence that would be embedded in use plans: thus, they focus primarily on the intentions. They indeed conclude that artefacts are objects with a twofold nature: they have intentional as well as physical characteristics, and they are used and man-made objects.

The book *Tecnhical Functions* ultimately presents a very good analysis which brings the reader to a detailed understanding of technical artefacts and their functions. The merit of this volume is that it can represent a good guide through the main existing theories of functions, showing contemporarily both their strengths and their weak points, giving an overview of the main issues on this topic. The value of the book – despite what the authors themselves consider as a weak point – is also that is focused on a specific kind, not trying to attempt an account for every kind of artefacts, including the non material or the non intentional ones. This feature leads the reader into a more restricted field, preventing useless confusions. Furthermore, it shows how our technology-saturated everyday life needs a rigorous philosophical analysis, bringing to light the importance of the impact technical artefacts have on the society and the one the society have in defining them.