

PHENOMENOLOGY AND THE PHILOSOPHY OF TECHNOLOGY

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Bas de Boer and Jochem Zwier (eds), *Phenomenology and the Philosophy of Technology*. Cambridge, UK: Open Book Publishers, 2024, <https://doi.org/10.11647/OBP.0421>

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Digital material and resources associated with this volume are available at <https://doi.org/10.11647/OBP.0421#resources>

ISBN Paperback: 978-1-80511-379-9

ISBN Hardback: 978-1-80511-380-5

ISBN Digital (PDF): 978-1-80511-381-2

ISBN Digital eBook (EPUB): 978-1-80511-382-9

ISBN HTML: 978-1-80511-383-6

DOI: 10.11647/OBP.0421

Cover image: photo by Engin Akyurt, leather fabric texture, November 12, 2022; <https://unsplash.com/photos/background-pattern--50ez9-BEMg>

Cover design: Jeevanjot Kaur Nagpal

Introduction: Articulating the Phenomenological Legacy of the Philosophy of Technology

Jochem Zwier and Bas de Boer

Open any textbook about the philosophy of technology and you are likely to encounter opening sentences like ‘our world is saturated with technological artifacts’, ‘it is impossible to imagine any aspect of human life that is not affected by technological developments’, or, more grandiose, ‘we live in a technological age’. Such observations stage technology as a theme that is worthy of philosophical analysis, or even as *the* theme deserving philosophical reflection today. After all, if, as purported, ‘technology fundamentally shapes the human condition’, and if this condition always entreats philosophy, it appears not only legitimate but necessary to philosophically question technology.

Echoing the time-honoured pair of *existentia* and *essentia*, of the *that* and the *what*, the fact that technology is relevant then quite naturally leads to the question of what it is, which is to say what it is essentially. Yet mainly after developments in the twentieth century, the quest for finding a historically unchanging, universally valid, and therefore essentialist answer to the question of what technology is has been largely abandoned. This is not to say that essential characterizations of technology such as ‘means to an end’ or ‘human made’ have become impossible or mistaken, but that their limits have become apparent. A social media platform is human made and serves communicative ends, but this tells us little about how it shapes our experience of the world, how it affects information, misinformation, or disinformation, how it shapes the meaning of friendship, how it constitutes one’s identity,

etc. Accordingly, the *what*-question gradually made way for such *how*-questions.

Be that as it may, how-questions obviously allow for various types of answers. For example, when asked how a social media platform shapes the identity of users, one could offer a technical answer: it does so by using such and such algorithms, which operate on the basis of such-and-such hardware and software. Alternatively, one could offer (social) scientific answers: it does so by mobilizing such and such psychological mechanisms on the part of users, by tying in with such and such economic or political powers, etc. While these are all answers to a how-question, they already interpret this question to be framed in technical or (social) scientific terms. And while this may lead to fruitful results, it also raises another how-question, namely: how is it that the question appears *as* a technical question or *as* a question to be answered by referring to psychological or economic mechanisms? As the difference between a technical and psychological framework in the above example makes clear, the question itself does not immediately make evident how the theme in question appears, nor how it is to be approached.

1. Phenomenology

It was the ambition of phenomenology to develop the original or primordial how-question. In cultivating this ambition, phenomenology became an influential school in (continental) philosophy. Its roots can be traced back to the work of Franz Brentano in the second half of the nineteenth century, and the work of Edmund Husserl and Martin Heidegger is often singled out as giving phenomenology a prominent place in the philosophical landscape. It has influenced many different fields, ranging from ethics and anthropology to science studies and the philosophy of technology. As noted, it addressed the primordial question of how it is that things appear or 'show themselves' (*phainesthai*). Phenomenology critically responded to what it saw as a bias in the prevalent understandings of its day, according to which how-questions were presupposed to be questions for positive science (be it physics, psychology, social science, or other), without acknowledging this presupposition *as* presupposition. Positive science was quietly accepted as the golden road leading to a universal objectivity: rather than being

treated as one particular way of understanding how reality appears and works, it was taken to be reality's final description, or at least as the principal method able to offer such a description. Phenomenology criticized the idea that the theoretical frameworks and formidable abstractions of the technical and scientific disciplines self-evidently open to the final description of things.

This critique revolved around the meaning of the empirical. While the sciences are clearly empirical in the sense that they formulate their theories and hypotheses with reference to sense-data, phenomenology precisely questioned the sense of such data. The sciences tend to dissect such data into parts which are then taken to behave according to mechanistic laws. Accordingly, we might think we see a cow, but when we 'really' look at it (e.g., with a scientific gaze, perhaps aided by scientific instruments), we see that it 'is' an interoperative collection of organs, cells, organelles, or molecules. Or, more radically, we see a thing, but what is 'really' happening is photons hitting our eyes triggering neural responses. While arguably somewhat of a caricature, such examples showcase the scientific tendency to dissect, abstract, and sort empirical sense-data to fit mechanical explanations, and then privileging these explanations as conclusive.

Phenomenology questioned neither the sophistication nor the fruitfulness of such analyses, but objected to the idea that they are to be regarded as the sole or ultimate way to make sense of the world. Instead, as it developed, phenomenology came to the idea that the positive sciences precisely lost sense of the world by mistaking their abstract representations for original experience. Hence the famous phenomenological motto to go back 'to the things themselves', to describe things not from the pre-formatted perspective of the sciences, but as Husserl said, to accept a thing 'simply as what it is presented as being' (Husserl, 1983, p. 44), which is to say the way it is presented to and constituted by thought. A central notion in Husserl's phenomenology is that thought is 'intentional', which is to say that it is necessarily directed toward objects in a specific way, meaning that the object appears in a specific way. When I see or 'intend' a tree as a species of oak, my experience of it is already structured in a particular way that differs from remembering the tree, avoiding the tree on a bike ride, etc. Intentionality thus expresses the 'how' of things appear

in relation to thought or consciousness, which became an important point of departure for both Heidegger's and Maurice Merleau-Ponty's reinterpretations of phenomenology.

Particularly after its crossings with existentialism and the philosophy of life (*Lebensphilosophie*) in the work of Heidegger, Jean-Paul Sartre, and their followers, the Husserlian emphasis on how experienced things are constituted by and for consciousness was gradually replaced by a focus on experience as lived experience: on how things are encountered by existing in a life-world. According to the analyses that followed, how things are encountered in lived experience differs significantly from how they appear from scientific or other theoretical perspectives. In everyday existence and lived experience, one does not first encounter external and naked objects to then furnish them with qualities and meanings through theoretical and rational operations. Instead, things always already appear as fitting in a meaningfully structured whole in which we ourselves are included.

To the question 'what is a table?', phenomenology accordingly avoids answering by alluding to objective properties (length, weight, colour), but first asks: how does the table appear? In everyday existence, the table is not first encountered as a quality-bearing object standing over against subjective consciousness, but primarily appears as something for me to sit at. When I grab a pencil to make a quick note, I do not so much grasp an external object but immediately grasp something that meaningfully shows itself as being for-writing. When I enter the classroom, I do not observe fifty similar objects and one reversed object, but I immediately grasp the difference between the lecturer's table and the student's tables, and I immediately know where I am supposed to sit.

The meaningfully structured whole in which things already appear as having their place is what Heidegger called *world*. Rather than something external that consciousness must somehow bridge, the world is something in which human existence is already included, famously expressed in the notion of being-in-the-world. We accordingly do not first experience photons on our eyes, synthesize these into the object 'tree', and then deduce that it could be used to make timber for our subjective needs. Rather, described phenomenologically, 'the wood is a forest of timber, the mountain a quarry of rock; the river is water-power, the wind is wind "in the sails"' (Heidegger, 1996, p. 66). Things

are not bestowed with meaning by means of theoretical reflection, but instead always already appear in a meaningful way to human existence as it practically engages with the world. Again, this is not to say that phenomenology discounts the fecundity of theoretical and scientific explanations, but it challenges their primacy and instead views them as a particular and derivative mode of being-in-the-world.

1.1 Heidegger

With respect to technology specifically, this phenomenological idea is developed in Heidegger's distinction between the ready-to-hand (*Zuhandenheit*) and the present-at-hand (*Vorhandenheit*). In his analysis of tool use in *Being and Time*, Heidegger shows that our primary interaction with tools is not one in which tools appear as objects in front of us but instead recede from view (Heidegger, 1996, §§15–16). A screwdriver, for instance, does not appear as an object with certain properties (as present-at-hand) but immediately appears as something 'in-order-to' do something else, such as driving a screw into the wall (as ready-to-hand). I am already familiar with the screwdriver as well as with the instrumental totality in which I am immersed and can simply start using the screwdriver immediately without explicitly thematizing it.

Rather than just an anthropological or sociological observation regarding tool use, this rather drastically repositions the subject. Modern philosophy had considered the subject as an isolated thinking substance that then somehow accesses the world to engage with things, leading to numerous difficulties related to how such isolation and subsequent accessing should be considered. Heidegger's phenomenological analyses serve to show how the subject, or rather *Dasein* (Heidegger precisely uses this term to avoid connotations that the modern concept of subject has) is always already in-volved with the world, or simply is in-the-world.

With respect to the aforementioned question of 'how' things appear, the result is that phenomenology becomes particularly sensitive to how we are already involved or included in a particular way of appearance. Philosophy need not first establish how our experience of things like rocks or trees could be possible by coming up with metaphysical materialist or idealist principles, but instead asks and describes

how we have already understood them. Such understanding or pre-understanding is not so much produced or construed by a subject as it is quietly accepted. The technical or practical engagement articulated in readiness-to-hand demonstrates this involvement particularly well.

Moreover, limiting our scope to questions concerning technology, this idea of already-being-involved and already-having-understood remains central in Heidegger's later questioning of technology. In asking what technology is, he argues that while technology is obviously a means to an end and something made and used by human beings, it primarily designates 'how' the world appears to us: how, in Heidegger's terms, it reveals the world. He argues that the mode of revealing particular to modern technology has the character of an enframing (*Gestell*) that challenges reality forth to appear as standing-reserve (*Bestand*). This amounts to saying that modern technology constitutes a relationship between humans and the world in which the latter principally appears as a resource that is constantly available for humans to be instrumentalized and used.

Although we cannot here delve into the intricacies of Heidegger's analysis (several of the contributions to this volume will do so) it is important to underline its relevance to our topic of phenomenology and technology. On the one hand, technology here takes on decidedly philosophical significance, not so much because of what it implies morally, but because of what it implies ontologically for the very being of the world and of human existence. On the other hand, Heidegger's diagnosis has come to function as a springboard for further discussions in philosophy of technology, at times further articulating the notion of technology as enframing, at other times criticizing and outright rejecting this articulation of technology. As will become clear from both the later part of this introduction as well as the contributions to this volume, such discussions are ongoing.

1.2 Merleau-Ponty

Another important encounter between phenomenology and technology can be found in the work of the French philosopher Merleau-Ponty. Like Heidegger, he took as a point of departure that to exist as a human being implies being-in-the-world that cannot be sidestepped. In doing

so, he moved away from Husserl's focus on how experienced things are constituted for thought or consciousness, and understood the human being as always already involved in the world in which everything has a meaningful place and is interpreted against a horizon of familiarity. And precisely because human beings are always immersed in this world already, they naturally pass over the question of how their being-in-the-world is constituted. For Merleau-Ponty, the task of the phenomenologist is to find a way that enables description of that what humans are always already immersed in.

While Heidegger develops his phenomenology from an analysis of the existential structure of *Dasein*, Merleau-Ponty takes *embodiment* as a founding category.¹ Our body is, on Merleau-Ponty's account, not an object amongst other objects as the modern (Cartesian) worldview would have it, but is what Husserl called a 'zero-point of orientation' and the 'medium of all perception' (Husserl, 1989, p. 61). Being-in-the-world presupposes the existence of a body from which intentional relations originate: our body 'is the vehicle of being in the world [...] [through which we are] united with a definite milieu, merg[e] with certain projects, and [are] perpetually engaged therein' (Merleau-Ponty, 2012, p. 84). The central question then becomes how to describe the ways in which embodiment is constitutive of world.

The notion of embodiment does not refer to our body as an object with definite boundaries but instead, precisely because the body is a zero-point of orientation, our body is primarily to be understood in terms of what Merleau-Ponty calls the 'I can' (Merleau-Ponty, 2012, p. 139). The notions of motor intentionality and habit are crucial for understanding the constitution of the I can. Motricity is the primary mode of intentionality because inhabiting a world implies a familiarity with the objects around us and the capacity to interact with them. Concretely, when reaching for an object such as a glass, we are not imagining beforehand what is the exact distance between my body and

1 In this introduction, we limit ourselves to Merleau-Ponty's *Phenomenology of Perception*. In his later works, most notably in *The Visible and the Invisible*, Merleau-Ponty attempts to ground the ontology of world proper in his embodied phenomenology. Discussing this development is beyond the scope of this introduction. For a discussion of this aspect of his work, see for example de Boer and Verbeek (2022) or Landes (2013, pp. 161–180).

the object, but rather respond immediately to the object's solicitation without any mediating representations. Motricity, then, is to be understood as a positioning in the environment through a body schema: a pre-reflective unconscious manner of experiencing the environment and one's capabilities to act in it (e.g., Merleau-Ponty, 2012, p. 101; see also Gallagher, 1986).

Our body schema forms the horizon for how other objects appear to us, and shapes the possibilities for perception and action (i.e., the 'I can'). The body schema is not something static, not something that remains the same over a lifetime, but is instead dynamic in that is modified in light of past experiences and actions. It allows for tools to be incorporated, and it becomes modified when the objective properties of the body change. For instance, when being sufficiently familiar with using a cane, this cane becomes part of the body schema of the blind person, or the body schema might change when someone loses a leg. This possibility of incorporation has formed an important inspiration for the philosophy of technology.

Merleau-Ponty captures this dynamism with the notion of habit: 'my own body is the primordial *habit*, the one that conditions all others and by which they can be understood' (Merleau-Ponty, 2012, p. 93, my emphasis). When going down the stairs I do not need to remember the distance between the respective steps consciously, nor do I need to explicitly establish the distance that I am about to travel when leaving the door of house. The world that I inhabit as an embodied subject already presupposes the presence of a relationship between a manifold of virtual coordinates that I do not need to be made explicit (Merleau-Ponty, 2012, p. 131). These virtual coordinates are not properties of an external world waiting to be found by the embodied individual, but are the result of a process of *sedimentation* through which world is constituted in the first place. The possibility of walking down the stairs unproblematically 'only remains around me as my familiar domain if I still hold "in my hands" or "in my legs" its principal distances and directions, and only if a multitude of intentional threads run out toward it from my body' (Merleau-Ponty, 2012, pp. 131–32). Put differently, sedimentation is grounded in motor intentionality, but in turn shapes how motor intentionality concretely manifests and how the environment appears as a place of familiarity for me.

Merleau-Ponty's work paved the way for an understanding of intentionality as constituted by the embodied interactions between individuals and their surroundings, resulting in the world that one is at home in and in which objects attain familiarity. In the context of the philosophy of technology, as we will see, he is one of the key inspirations—besides Heidegger—for analyzing how technologies co-shape embodiment and help to constitute novel body schemas, as a result of which new forms of being-in-the-world can emerge.

2. Phenomenology and the Philosophy of Technology

We noted that the phenomenological starting point from lived experience and practical engagement with things in-the-world opened up new avenues for philosophy of technology. On the one hand, the phenomenological critique of the primacy of theory made it possible to consider technology beyond the platitude stating that 'technology is applied science'. For, if practical engagement comes before scientific reflection, and if practical engagement involves technology, then technology cannot be limited to an application of science. Moreover, inspiration from phenomenology meant that the questions about technology no longer solely revolved around what technology is (something already discussed by Aristotle), how it should be considered a human category (as discussed in the works of Ernst Kapp and Arnold Gehlen), or its role in the process of political-economy (as analyzed by Karl Marx). With reference to the above-mentioned how-questions, the phenomenological question became how technology shapes our experience of the world, how it plays a role in the way things appear, or how we ourselves appear as its users.

Fast forwarding to how phenomenology has inspired philosophical explorations of technology in recent decades, at least two groups with an explicit phenomenological slant can be discerned, namely postphenomenology's questioning of the role of technology *in* experience; and what we might call the terrestrials who question the technological world on earth. A brief survey of these schools of thought should not only clarify whether, why, and how they study technology phenomenologically, but should also indicate their limits, unfinished businesses, and uncharted territories, which is where the present volume is situated.

2.1 Postphenomenology

Don Ihde describes postphenomenology with the following equation: ‘pragmatism + phenomenology = postphenomenology’ (Ihde, 2012, p. 117, p. 128). Limiting our focus to the second aspect of the equation, three ways in which phenomenology inspires postphenomenology can be discerned: (1) the understanding of technologies as mediators of human-world relations, (2) the characterization of technologies as revealing the world in a particular way, and (3) the focus on how technologies shape lived experiences by constituting specific ways of embodied being-in-the-world.

With respect to the first point on mediation, postphenomenology takes Heidegger’s work as a central-point of reference.² More specifically, it departs from Heidegger’s observation in *The Question Concerning Technology* that the essence of modern technology is in itself nothing technological; it is not to be found in the workings of technological artefacts or a particular way of thinking. Rather, ‘technologies must be understood *phenomenologically*, i.e., as belonging in different ways to our experience and use of technologies, as a human-technology relation, rather than abstractly conceiving of them as mere objects’ (Ihde, 1993, p. 34). Heidegger’s analysis of tool use in *Being and Time* is a key source of inspiration for this idea. His analysis, which can be viewed as a more praxis-oriented reinterpretation of Husserl’s intentionality, shows that tools (or technologies) are not experientially present when put to use, but rather enable specific relationships with reality (e.g., the hammer establishes a relationship with a nail that appears as ‘hammer-able’). As mentioned, he calls this primary mode in which tools appear the ready-to-hand (*Zuhandenheit*), which he contrast with a mode of appearance as present-at-hand (*Vorhandenheit*), in which they appear as objects with describable qualities that are ultimately foreign to us (Heidegger, 1996, §§15–16). This understanding of technologies in terms of the ready-to-hand is central to the postphenomenological notion of technological mediation, which indicates that our encounter with the world is always

2 In this chapter, we focus on theoretical contributions to postphenomenology that explicitly discuss their phenomenological legacy, thereby leaving out the many fascinating empirical analyses of human-technology relations that postphenomenologists have provided.

mediated by the technologies that we use (e.g., de Boer, 2021; Ihde, 1979; Verbeek, 2005).

With respect to the second point on the revealing of the world, as early as in *Technics and Praxis* (1979), Don Ihde indicates that because technologies mediate human-world relations, they have a crucial role in shaping how human beings experience reality. This is because technologies amplify certain aspects of reality, while turning our attention away from other aspects (Ihde, 1979, p. 121). Postphenomenologists thus emphasize that technologies are no neutral intermediaries but actively shape how reality becomes present to human beings (e.g., Rosenberger & Verbeek, 2015). Whereas Heidegger speaks of Technology in terms of enframing as the singular way in which reality appears as resource (*Bestand*), postphenomenologists tend to translate this insight to specific technologies that each involve a particular way of revealing reality (e.g., Ihde, 1991, p. 52). For instance, a thermometer reveals temperature in a numerical manner, thereby putting our bodily experience of warmth into the background. The idea that specific technologies reveal reality in a specific manner, then, forms the foundation for postphenomenology's call to investigate how exactly the non-neutrality of technologies manifests, and how they shape human-world relationships. This investigation, so postphenomenologists maintain, should refrain from singular overarching determinations such as Heidegger's enframing, to instead proceed by analyzing concrete technologies as they are used within particular practices (e.g., Rosenberger & Verbeek, 2015, pp. 9–10).

The focus on concrete human-technology relations brings us to the third way in which postphenomenology is inspired by phenomenology: namely a focus on how technologies give rise to particular forms of embodied being-in-the-world (e.g., Ihde, 2002). A central point of reference here is Merleau-Ponty's *The Phenomenology of Perception* mentioned before, in which Merleau-Ponty gives a variety of examples of how tools structure one's embodied being-in-the-world by becoming integrated into one's body schema (e.g., Merleau-Ponty, 2012, p. 144). It is relevant that technologies help to constitute embodiment for two reasons: on the one hand, by becoming part of one's embodiment, technologies actively shape how the world is perceived by an experiencing subject, whilst becoming transparent for the subject in question (e.g., Ihde, 1993,

p. 108). On the other hand, because technologies give rise to ingrained habits that in turn shape the projects in which people intend to engage (e.g., de Boer, 2020; Rosenberger, 2014).

These three points amply showcase that several central starting-points in postphenomenology are directly inspired by key concerns of the phenomenological movement: the focus on intentionality, the transparency of tools in use, and the ideas that understanding embodiment is critical for understanding being-in-the-world and that technologies shape the existence of humans qua embodied beings. Various chapters of the present volume pick up on this trail.

2.2 Terrestrial Turn

Phenomenology has further inspired a recent call for what is called a terrestrial turn in the philosophy of technology. To make sense of this call, it is fruitful to briefly contrast its aims with those of postphenomenology. While postphenomenology champions itself for its ability to perform detailed analyses of concrete technologies and/or human-technology relations, those who we may refer to as terrestrialists³ maintain that this renders postphenomenology blind for the larger whole within which these relations occur (e.g., Lemmens et al., 2017, p. 115). This is deemed problematic because we live in the age of the Anthropocene, a new geological epoch characterized by the planetary impact of human (technological) activity (cf. Zwier & Blok, 2017).⁴ Whereas postphenomenology might very well be capable of analyzing human-technology relations on the ontic level of particular artefacts and uses, they—so the terrestrialists maintain—remain unable to articulate the ontological shift occurring in the Anthropocene. This shift is not so much about particular artefacts, embodiments, and uses, but concerns the whole of being or the world as such, which on the one hand appears as a resource that must be manipulated to safeguard

3 Although this term suggests a similarity with what Latour (2017) has called the *terrestrials*, this school of thought typically bears no close of affinity to Latour's work.

4 Note that this criticism is different from the more common critique that postphenomenology does not pay sufficient attention to the socio-political conditions underlying specific human-technology relations (e.g., Coeckelbergh, 2017, p. 36; Feenberg, 2015).

habitability, while on the other hand hinting at the limits of total manipulation in the guise of an increasingly unruly planet. Articulating and investigating this becomes the self-set task of the terrestrialists. The idea to think technology terrestrially reflects central concepts in Heideggerian phenomenology: the difference between the ontic and the ontological, and the understanding of the essence of modern technology as enframing.

The central entry-point to a terrestrial analysis of Technology is Heidegger's distinction between the ontic and the ontological. Basically put, echoing the former remarks about being-in-the-world, this marks the difference between the beings and objects *in front of us* (ontic), and *how* we encounter things in a pre-structured and pre-understood meaningful whole in which we find ourselves (ontological) (cf. Zwier, Blok, & Lemmens, 2016). For the terrestrials, this distinction is of crucial relevance because it articulates Technology on an ontological level. This opens up the possibility to reflect on 'the relation between being and thinking that [...] structures the way in which objects are encountered' (Zwier & Blok, 2019, p. 624), and to be concerned with 'the whole of Being as the inclusive mode of appearance' (Zwier & Blok, 2017, p. 233). Insofar as philosophy of technology is to proceed phenomenologically, it should focus on this ontological level, as 'consideration of [the ontological] mode is precisely the concern of phenomenology' (Zwier et al., 2016, p. 314).

The distinction between the ontic and the ontological gives rise to a rehabilitation of—or better, a renewed critical interest in—Heidegger's notion of enframing. Recall that, for Heidegger, enframing denotes the essence of modern technology through which reality is revealed to human beings in terms of a challenging-forth. As Cera puts it, this revealing is characteristic of our current 'age of totalized technology, [which] is first and foremost the epoch in which "being" means "being raw material (*Rohstoff*)." Everything that is, is makeable' (Cera, 2017, p. 250). In a similar vein, Blok maintains that the Anthropocene is to be understood as an ontological phenomenon because it disrupts 'the way in which reality as a whole appears—the world as challenged forth—and the way human being is responsive to this new reality—human being as challenged forth' (Blok, 2022, p. 5). In this line of thinking, phenomenology remains important because it opens up an ontological

mode of questioning that allows articulation of how reality as a whole appears in the age of the Anthropocene.

The next concern for the terrestrialists is how it is possible to articulate this whole phenomenologically. On the one hand, borrowing from Heidegger, they maintain that the whole of the Anthropocene can be experienced through fundamental moods (*Grundstimmungen*): 'I will interpret both man's worldhood and animal's environmentality according to a *pathic presupposition*: namely, those *fundamental moods* (*Grundstimmungen*) that refer each of them to their respective findingness (*Befindlichkeit*)' (Cera, 2017, p. 261). Via the fundamental moods, it becomes possible to have an experience of one's place in an ontological whole that structures our relation with reality. On the other hand, it is maintained that—in the Anthropocene—the ontological can, *pace* Heidegger, be experienced on the ontic level, because of how, remarkably, the Earth is both a particular being and the contingent condition of any understanding of being and therefore of ontology. Accordingly, '[T]he Anthropocene [...] brings into view the Earth as ontic-ontological condition of possibility for responsiveness to the call of being' (Zwier & Blok, 2017, p. 235), whilst this experience can take place in our relationships with ontic technologies: '[T]echnology fosters [...] responsivity to being' (Zwier & Blok, 2019, p. 644). Whatever one makes of such analyses and claims, it may be clear that phenomenology here appears as a method that not only fleshes out the mediations and embodiments of particular technologies and human beings, but further addresses the ontological.

3. Overview of the Book

From the above two sections, it should have become clear that phenomenology is an important inspiration for these recent trends in the philosophy of technology, both of which explicitly position themselves in relation to the phenomenological tradition. However, insofar as our discussion is representative of the field, it also seems that mainstream philosophy of technology draws from phenomenology in quite a limited way: since discussions of phenomenology are often limited to the works of Husserl, Heidegger, and Merleau-Ponty, more recent developments within the phenomenological movement remain unaddressed. Besides

offering a survey of recent developments in the phenomenology of technology, the present edited volume also asks why it is that many philosophers take phenomenology to be an appropriate starting-point for a philosophy of technology; if and why the ‘big names’ of twentieth century remain to be a main reference-point; as well as whether and how different ways of phenomenologically approaching technology are surfacing. To develop such questions systematically, we have divided the chapters in this book into three sections: (1) philosophy of technology and the phenomenological method, (2) technology as phenomenon, and (3) phenomenology and technological practice.

The *first* section of the book is concerned with how *phenomenological methods* inform the philosophy of technology. The purpose of this section is to explore what it means to inquire into something *phenomenologically*, and the extent to which contemporary investigations into technology rely on key thinkers in the phenomenological tradition. Furthermore, the aim of this section is to explore to what extent phenomenology can be combined with other philosophical schools (e.g., hermeneutics, pragmatism, actor-network theory), and what the methodological implications of such combinations would be. These questions are especially pertinent since much contemporary philosophy of technology champions itself for conducting ‘empirical analyses of technology’. If such analyses are to be treated differently from those conducted by psychologists or sociologists, it is necessary to clarify how the world studied by the phenomenologist appears differently than the objects of the positive sciences. The section thus aims to contribute to the question of method in the philosophy of technology.

The *second* section of the book is concerned with the question of how the phenomenological tradition informs how technology appears as phenomenon and object of inquiry. Is this phenomenon something that can be analyzed as a whole, being a particular kind of thinking or relationship with the world, or should we rather speak about *technologies*, about particular artefacts that co-shape the embodied experience of users? The current tendency is to focus exclusively on individual technological artefacts, while being hesitant to take allegedly essentialist understandings of ‘Technology with a capital T’. Rather, so it is sometimes argued, philosophy of technology should be a philosophy *from technologies* (Rosenberger & Verbeek, 2015, p. 10), and should be

concerned with exploring how novel technological developments challenge existing phenomenological analyses and concepts. Simultaneously, philosophers routinely speak of the human being as technically conditioned, thereby seeming to reintroduce a more general conception of technical thinking that echoes Husserl's and Heidegger's analyses of technics. This section serves to address the basic question of what philosophers of technology refer to when claiming to provide analyses of 'technology'.

The *third* section is concerned with how philosophy of technology qua phenomenological enterprise informs how people make and make use of technologies. It accordingly asks whether and how phenomenological insights can be translated into technical action. On the one hand, one of the explicit goals of philosophy of technology is to inform design practices and make designers sensitive to the lived experience of prospective users (e.g., Verbeek, 2011). On the other hand, it is often argued that citizens—and democracy more generally—can benefit from a better insight into how technologies shape their experience and understanding of themselves and the world around them (e.g., Feenberg, 2017). How can phenomenology—as a method—play a role in these respects? As such, this section is primarily concerned with how phenomenological reflections are and can be practically applied.

3.1 The Phenomenological Method in the Philosophy of Technology

The first section focusing on methodical and methodological considerations comprises contributions from Vincent Blok, Alberto Romele, and Darian Meacham, all of whom are concerned with what it means to question technology phenomenologically.

In the chapter 'Ecological Hermeneutic Phenomenology: A Method to Explore the Ontic and Ontological Structure of Technologies in the World', Blok sets out to develop a phenomenological method to study technology in a way that moves beyond the one-sided essentialist or 'ontology-only' approach developed by Heidegger, as well as the 'ontic', 'empiricist', or 'thing-only' approach found in postphenomenology. Blok's phenomenological method instead seeks to demonstrate that a pre-understanding or *acceptio* such as the understanding of time as

linear finds its footing or 'founding' in things (e.g., mechanical clocks). As a result, ontological enactment *and* ontic content become central to what a phenomenon is, where neither can be 'bracketed' or viewed as derivative. The chapter suggests that this relation between the ontic and the ontological must be thought of as a transduction in order to address or 'move across' (*trans*) what is thematic *and* what remains non-thematic with respect to any phenomenon. Finally, the chapter explains why the proposed method bears the name of *ecological* hermeneutics, because if the ontological *acceptio* or 'enactment' (e.g., linear time) is always 'founded' in things (e.g., mechanical clocks), things today do not just appear *in* the world, but explicitly appear in terms of the ecological constraints *of* planet Earth.

Sharing Blok's emphasis on hermeneutics whilst presenting a differing articulation of it, the chapter 'Unveiling the Interplay: A Hermeneutic Phenomenology of Technology' by Alberto Romele aims to show why the philosophical study of technology cannot be limited to phenomenology, but necessarily requires a hermeneutic approach. By elucidating the relation between phenomenology and hermeneutics, Romele criticizes the idealist tendencies in Husserlian phenomenology, as well as the ontological hermeneutics developed by Heidegger and Gadamer. The chapter instead advocates an ontic and pragmatic hermeneutic approach. To make this approach relevant for the philosophy of technology, Romele argues that the 'material hermeneutics' as practiced in postphenomenology falls short and must be unmasked as a 'material idealism'. Notwithstanding its self-professed 'empirical' interest in 'the things themselves', such idealism jettisons everything about the appearance of things that cannot be captured in terms of 'technological mediation', thus ignoring the sphere of symbolic, social, and cultural mediations that always already shapes how 'the things themselves' are and can be interpreted. The chapter closes by illustrating how a hermeneutic phenomenology of technology opens to a multidisciplinary political hermeneutics of technology.

In the third chapter entitled 'The Institution of Technology', Darian Meacham explores if the concept of 'institution' can help to better articulate how phenomenology can contribute to the philosophy of technology. He analyzes the development of this concept throughout

Merleau-Ponty's work and shows how it arose in response to György Lukács's criticism that phenomenology would be inapt to deal with political affairs and/or to articulate the totality that humans are immersed in. Roughly speaking, Meacham defines institutions as durable forms of common life. By focusing on institutions, he addresses Lukács's criticism by acknowledging the possibility of intersubjective relations that are shared over time as well as the creation and maintenance of social and technical objects through expressive actions. Meacham sketches the beginnings of a phenomenological method of studying technologies as institutions, which enables us to articulate how they structure different domains of intersubjective life.

3.2 The Phenomenon of Technology

The four chapters in this section each answer how their understanding of technology is informed by the phenomenological tradition, but also provide a critique of the limited conceptualization of technology offered by this very tradition. Is phenomenology sufficient to fulfil the task(s) of a philosophy of technology as it is understood in the field? Are prevalent approaches such as postphenomenology on the right track when taking 'concrete technological artefacts' as their primary object of concern? And to what extent are the concepts developed in past phenomenological accounts still useful for understanding questions around new and emerging fields such as Artificial Intelligence (AI)?

In the chapter 'The Activist Potential of Postmodern Phenomenology of Technology', Robert Rosenberger suggests that one of the key tasks of a phenomenological philosophy of technology should be to contribute to the goals and aims of political activism. In this sense, his chapter concurs with more general developments in the phenomenology tradition towards a critical or activist phenomenology. He argues that postphenomenology offers a fruitful starting-point for an activist phenomenology because it provides three avenues that can be directly applied to political debates in general and political activism in particular: (1) the notion of technological mediation enables us to understand how the political context as well as the relevant political actors are co-shaped by technological developments, (2) the notion of multistability helps to reveal the alternative ways in which technologies can be used other than

their dominant stability, and (3) our perception in general is mediated by the hidden political assumptions of the technologies that we use routinely.

Martin Ritter's chapter 'Technological Mediation without Empirical Borders' provides a critique of the postphenomenological understanding of 'technology' as something referring to empirically observable artefacts. He argues that postphenomenology suffers from three main shortcomings: (1) it fails to engage with the question of what constitutes a technology, (2) it mistakenly reduces technological mediations to observable interactions between humans and technologies, and (3) its commitment to the empirical turn in the philosophy of technology and its corresponding emphasis on case studies provides only limited access to postphenomenology's self-proclaimed object of study: human-technology relations. In offering these critiques, the chapter presents a substantial general critique of the empirical turn in the philosophy of technology, as well as pointing towards the need to find a language to articulate how the notion of 'technological mediation' is not bounded by particular empirical circumstances.

Dana Belu's chapter 'Seeing the Phenomenon: The Radical Disembodiment of In Vitro Human Reproduction' discusses the radical technologization of women's reproductive body in assisted reproductive technology (ART). This discussion centres around the claim that neither phenomenology nor social constructivism is by itself able to discuss this technologization. The reason for this is that phenomenology is insufficiently empirically sensitive to what is involved in ART, whereas (critical) social constructivism remains trapped in a 'productivist' dialectic that misses relations between nature and technology that fall outside the scope of production. By critically discussing and recombining Heidegger's and Andrew Feenberg's work, the chapter claims that ART frames women's bodies neither as subjects nor objects of technical action, but as resources. However, such technologization is itself forgotten, leading not only to self-objectification but—particularly in the case of IVG (*in vitro gametogenesis*)—to the dissolution of the subject/object boundary rather than the subject becoming a more or less stable object. The chapter explores the notion of vocation, as well as Heidegger's meditative questioning of technology to explore the limits of such technologization.

In ‘Artificial Intelligence and the Need to Redefine Human Traits’, Galit Wellner argues that digital and virtual technologies like AI not only change how we experience the world, but also transform human mental capacities. While industrial technologies predominantly concern embodiment relations (e.g., extending or replacing manual labour), technologies like AI bear on the mind, notably in terms of imagination and attention. Wellner argues that Ihde’s phenomenological analyses insufficiently articulate this contrast because of their emphasis on embodied perception, which appears less relevant in technologies like cryptocurrency and generative AI. Turning to the theme of attention, the chapter first presents Husserl’s classical phenomenological interpretation of attention as ‘searchlight’, as well as Merleau-Ponty’s critique of this interpretation. Wellner subsequently indicates the limits of Merleau-Ponty’s ‘field of attention’ which, like Ihde, unduly prioritizes embodiment and fails to account for the phenomenon of multi-tasking. Wellner accordingly calls for supplanting the phenomenological first-person perspective with a layered approach focusing on plateaus, where embodiment relations make way for embrainment relations.

3.3 Phenomenology and Technological Practices

The three chapters in the final section all show how a phenomenological perspective yields novel insights about the relationships between users and technologies in everyday life. Phenomenology sheds a specific light on the problems that technologies might pose, about how we can develop more desirable practices around such technologies, or about how design choices can be better aligned with the lifeworld of users. In doing so, they point to the practical benefit of adopting a phenomenological perspective when inquiring about how technologies shape our lifeworld.

Annie Kurz’s chapter combines postphenomenology and Sartrean phenomenology to analyze how social media technologies shape our subjectivity. Her focus is on how our self-understanding changes as a result of the ways we manifest ourselves online, and specifically by the profiles we (need to) make in order to become visible on social media platforms. She uses Sartre’s notion of ‘nothingness’ to indicate that self-understanding always implies a relationship to something that one is not. Elaborating on this notion, she indicates that one particular form of not-

self, namely one's online presence, has become key in self-development due to the ubiquity of social media. To capture this dimension of social media use, she introduces the *absence relation*; a human-technology relation that is explanatory for how many individuals or professions rely on social media even when not directly using it. Recognizing this aspect of social media use enables us to question the extent to which many aspects of our (professional) lives should be reliant on manifesting oneself in an online environment.

Lavinia Marin draws from phenomenology to lay bare another aspect of the ubiquitous presence of social media. By taking the phenomenology of attention as a starting-point, she shows that attention is—rather than only a scarce resource, as analysts departing from the perspective of the attention economy would have it—foundational for our moral relations to other beings. She argues that there is a distinctive form of other-oriented attention that enables us to perceive other beings as living beings that are worthy of care. This mode of attention presupposes a form of affectivity and involves the recognition of the other as a moral being capable of forming judgments, as well as someone having certain vulnerabilities. Her analysis shows that by prioritizing homogenous interactions and standardization, social media platforms hinder us from engaging in this mode of attention, thereby undermining our capacity to recognize others as surprising, changing, and fallible beings.

In the last chapter, Janna van Grunsven, Caroline Bollen, and Bouke van Balen show how the phenomenology of communication can inform the field of augmented or alternative communication technology (AAC tech). AAC tech is a set of technologies developed for people who are unable to use some of their bodily expressive resources due to congenital or acquired disability. This inability often makes it very difficult for those people to communicate. Developers of AAC tech often take a cognitivist starting-point, thereby missing out on the subtle ways in which embodiment shapes communication. The phenomenological description of the lived experiences of these people offers a fruitful starting-point for recognizing the often-forgotten embodied dimension of communication, and enables the authors to formulate desiderata for how AAC tech should be developed: AAC tech should take into account (1) embodied address, (2) embodied enrichment, and (3) embodied diversity. Focusing on the lived experience of potential users of AAC

tech has, according to van Grunsven, Bollen, and van Balen, not only direct practical applications for technology development but also the potential to inform phenomenology methodologically: focusing on a limit case such as the one discussed in this chapter elucidates that communication takes place in a wide variety of ways and that it is not the task of the phenomenologist to lay bare a general or essential structure of communication that can be taken as a standard.

In closing, we recall the ambition of phenomenology to develop the original or primordial how-question: how is it that things appear or show themselves the way they do? In what was perhaps a comment on defecting followers, or perhaps a self-criticism, Husserl once remarked that, with respect to the idea of phenomenology uncovering the primordial 'how' in transcendental consciousness and thus offering a solid ground for the positive sciences, 'the dream is over' (*Die Traum ist ausgeträumt*) (Husserl, 1970, p. 389). In the philosophy of technology, few researchers indeed would still embrace this eidetic understanding of phenomenology as capable of revealing essences. However, this does not mean that the phenomenological project is exhausted; rather, it shows how phenomenology continues to reinvent itself in light of the central problems of different times. The three trajectories pursued in this volume demonstrate how phenomenology can be of ongoing interest in posing and reframing problems arising in the interactions between humans and technologies.

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