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Technologies and technique: philosophy of technology before and after the empirical turn

Abstract: Contemporary philosophy of technology presents itself as a very diversified field, offering a wide range of different approaches and theories. The aim of this paper is to offer a short thematic introduction to a set of specific trends of inquiry that blossomed following the so-called *empirical turn* in philosophy of technology in the 1980s. These approaches are characterized by the refusal of certain core assumptions that informed so-called *classical philosophy of technology*, which framed technology as a monolithic and autonomous force that reorganizes human life according to its own rational logic of efficient production. The first section identifies these theoretical nodes by presenting fundamental aspects of technology as discussed by classical philosophers of technology. The second section elaborates on the critiques to classical assumptions that followed the empirical turn, and the different research programs it generated. The last section delves into a specific approach in more detail, namely, postphenomenology, to offer an illustrative example of the kinds of questions and methodologies that an empirical approach is able to address. In this way this paper provides some indicative guidelines into philosophy of technology to interested scholars, and encourages engagement across different traditions.

Introduction

Contemporary philosophy of technology presents itself as a very diversified field, offering a wide range of different approaches and theories. During the last century the increasing awareness of the societal impacts of modern technology spurred philosophers to produce more refined accounts of the relationship between technology and humanity. As the establishment of philosophy of technology as its own discipline is relatively recent, to the uninitiated the presence of reflections about technology throughout the history of philosophy might appear occasional and tangential. Philosophers of technology, however, have started engaging with and building upon traditional frameworks to conduct more accurate and systematic analyses of the complex interactions between technology and society.

The aim of this paper is not to provide a systematic overview of such a broad spectrum of approaches, but rather to offer a short thematic introduction to a set of specific trends of inquiry that blossomed following the so-called *empirical turn* in philosophy of technology in the 1980s and 1990s, especially in Northern Europe and in the Anglo-American world (Achterhuis 2001). These approaches are characterized by the refusal of certain core assumptions that informed so-called *classical philosophy of technology*, which marked the period roughly from the 1920s

to the 1980s (Brey 2010). Many of the criticized assumptions are prevalent in countries where traditional forms of continental philosophy, such as hermeneutics and phenomenology, still hold much sway. By offering a comparison between these different trends, this paper aims at identifying the main theoretical nodes that characterize the more recent approaches, in order to offer some indicative guidelines to the field to scholars who are developing an interest in technology and to encourage engagement across different traditions to stimulate reflection on how philosophy can help tackling the technological issues society faces today.

The first section presents the core aspects that characterize classical philosophy of technology. A brief historical overview of technology as an object of philosophical inquiry is followed by an examination of the overlapping ideas shared by some influential authors of the past century, with the aim of illustrating how the meaning of “technology” had shifted until their critiques of modern technique, which build around certain strong intuitions about the nature of modern industrial technologies and their effects on human beings. In the second, section a survey of the various critiques that have been leveled against these assumptions during the empirical turn illustrates how philosophical reflection on technology have advanced more recently and how this move opened the field to interdisciplinary influences, especially from the social sciences, which undermine long held beliefs about the social dynamics of technology. In the third and final section, a specific approach is examined in more detail. Postphenomenology is an ongoing research program established especially in northern Europe, which merges a phenomenological background with empirical methodologies inspired by contemporary science and technology studies (STS). An examination of its main concepts and ideas provides an illustrative example of an empirically oriented approach that might still appeal to scholars working on classical philosophy of technology.

Classical philosophy of technology

Philosophy of technology during the twentieth century was dominated by a series of related approaches now often identified as *classical philosophy of technology*. It included thinkers such as Martin Heidegger, Jacques Ellul, Lewis Mumford, Hans Jonas, Arnold Gehlen, Herbert Marcuse, Ortega y Gasset and others. In an epoch in which the social and cultural consequences of modern technological industrialization were becoming evident, the Enlightenment’s optimistic promise about the progressive forces of science and technology clashed against the Romantic critiques of their alienating and dehumanizing effects on human existence. Rousseau had been one of the first to provide a diagnosis of the dire consequences of civilization on the human soul, which would lead to decadence and corruption of character. Apart from a few exceptions, however, addressing technology as a proper object of philosophical inquiry was a relative novelty. Technology tended to remain a secondary issue throughout the history of philosophy, possibly because technical objects were considered mere derivative products of human faculties, neutral means to an end (Franssen, Lokhorst, and van de Poel 2018). But by the

nineteenth and twentieth century the apparent neutrality of technology had been eroded by the evident changes society was undergoing.

The idea that technology carried a profound power of change had become by then the crucial issue for classical philosophers of technology. These thinkers shared the idea that modern technology represented a radical novelty that was altering the foundations of human existence. Their diagnoses generally identified technology as a unitary and unprecedented phenomenon that was reorganizing society according to its own inner logic. This logic was one of maximum efficient production through the rational rearrangement of society at large. Within such a rational framework, vital impulses and human faculties such as creativity and imagination were stifled and constrained within a calculative mindset, that treated the world as a mere source of raw materials to be extracted and exploited. The “greatest danger” of modern technology, as Heidegger called it, was the direction of such a mindset to human beings, which would just become “human resources”, labor force to be put to efficient use.

Conceiving technology as an all-encompassing system, as represented for example by Heidegger’s *Gestell*, Ellul’s *Technique* or Mumford’s *Megamachine*, tended to frame the dynamics of technological development as broadly autonomous, deterministic and hardly resistible. Ellul’s *Technique*, for example, is a single unitary force that represents the modern way of making and using artifacts as the comprehensive pursuit of efficiency, a force that spreads and uniforms different fields of activity, resisting incorporation to nontechnical ways of thinking (Mitcham 1994).

To refer to this unprecedented and autonomous force, classical authors tended to speak of a unitary *Technique* (in German *Technik*, in Italian *Tecnica*), singular and capitalized, instead of “technologies”. Their critiques were aimed, in fact, at no concrete technology in particular, but rather to the general technological way of thinking that modern technology was thought to engender. The focus of classical philosophy of technology was thus more on the conditions of possibility of technology, the technological mindset or the rational organization of society, rather than on technologies themselves.

The general attitude of classical philosophers towards technology was therefore one of negative criticism. With its requirements of rational organization spilling over other human activities, modern technology threatened to deprive human beings of the opportunities to express vital impulses in the arts and spirituality. Their chief preoccupation was to set clear boundaries between technology and humanity, specifying where the former needed to be constrained and directed by human goals and values (Achterhuis 2001, pp. 5–6). Historian of philosophy of technology Carl Mitcham (1994) refers to this tradition as “humanities philosophy of technology” precisely because these authors considered philosophy and other humanities as primary keys of access to understand the impacts of modern technology on vital aspects of human life such as ethics, politics, social order, culture, art and religion.

To summarize, classical philosophers of technology emphasized the disruptive novelty and autonomy of modern technology. Their pessimistic analyses framed technology as *Technique*, an abstract and unitary force that generally stood for the conditions of possibility of concrete technologies. The oppressive ways in which

this force was thought to be reorganizing human thinking and living were criticized through philosophical and cultural critique, in order to safeguard more authentically human ways of life against the dehumanizing effects of Technique.

The empirical turn in philosophy of technology

The influence of classical philosophy of technology has been fundamental in sparking interest on the impacts of modern technology. However its methodological shortcomings came under attack as numerous scholars in the 1980s and 1990s argued for the need of an *empirical turn* in philosophy of technology (Kroes and Meijers 2000; Achterhuis 2001). If technology was to be thematically engaged with and its concrete impacts assessed, then the task was to “open up the black box of technology” and study how technical artifacts concretely come to be and influence society.

Consequently, philosophers and scholars interested in technology started to move away from the defining assumptions of classical thinkers. A first point of criticism concerned the abstract nature of their analyses, which by framing technology as an absolute and monolithic force of disruption could not provide detailed accounts of the development of concrete technologies and of their societal effects. This charge is sometimes framed in terms of *transcendentalism*: classical philosophers were not so much concerned with single concrete technologies, but rather with their transcendental conditions of possibility in terms of Technique, a technical way of thinking or a form of rational social organization (Verbeek 2005). This lack of methodological focus on the empirical aspects of technology was perceived as failing to offer adequate back up to the grand claims of classical philosophers, leaving little possibility for concrete and constructive suggestions on how technology should be developed and used in a better way.

Secondly, the autonomous and deterministic character of Technique was criticized on the basis of studies that showed the contingent and socially constructed nature of technological developments. Disciplines such as science and technology studies (STS) offered empirical evidence that the design, introduction, and subsequent effects of technologies crucially depend on the social and cultural context in which they take place (Pinch and Bijker 1984). The belief in an autonomously organizing force of rationalization was undermined by portrayals of technologies that could be designed and used in alternative ways.

Lastly, technology generally lost many of its negative overtones, becoming a more ambivalent force that could be used for good or for bad, while also not being a mere neutral tool. If classical philosophers of technology stood guard against the overreach of Technique into human existence, the challenge that empirical philosophers of technology set themselves was to understand how “concrete technological practices and developments [...] can rapidly alter the normative frameworks of culture” (Achterhuis 2001, p. 4). A proper understanding of the concrete social

and material processes that shape technological design and effects was required before being able to draw normative judgments.

The theoretical core of the empirical turn in philosophy of technology, then, consists in the necessity to study the more concrete developments of technology to disclose the possibility for alternative ways of making and using modern technologies. This insight has been translated in a variety of different frameworks and methodologies, that can be broadly categorized under two families, following Brey (2010), that can be called *society-oriented* and *engineering-oriented* philosophy of technology.

Society-oriented philosophy of technology shares with classical thinkers the goal of understanding the ways in which modern technology reshapes human societies, cultural values and ways of life. The difference lies in the multidisciplinary inclination of contemporary authors, who draw from social sciences and other humanities to study concrete technological developments and their contingent paths of evolution. Disciplines such as STS, cultural studies, and media and communication studies offered key insights on the dependence of technological effects to contextual social, cultural, and material factors. In this way, neo-Heideggerians such as Hubert Dreyfus and Albert Borgmann, neo-Critical Theorists like Andrew Feenberg, and postphenomenologists like Don Ihde developed less deterministic theories that emphasize the ambivalent nature of technology, providing more balanced and constructive forms of criticisms. Various brands of pragmatism (Larry Hickman), poststructuralism (Donna Haraway), and actor-network theory (Bruno Latour) were also developed with similar goals and results. Overall society-oriented philosophies retain a focus on the ethical, cultural and political aspects of technology, while the attention to empirical case studies makes these kinds of approaches generally less fatalistic and pessimistic compared to classical philosophy of technology.

Engineering-oriented philosophy of technology, on the other hand, formed around the 1990s and 2000s, growing out of a more radical dissatisfaction with classical approaches. Philosophers with an analytic background and engineers with a critical inclination considered the focus on societal issues as an obstacle to the task of addressing technology itself. They engage instead with analytic philosophy of science and philosophy of action in order to provide descriptive accounts of engineering design practices and artifacts (Franssen *et al.* 2016). The aim of this kind of analytic philosophy of technology, often practiced at technical universities, is to understand technology as grounded in the specific practice that produces it, namely, engineering science and design. Discussions within the field thus concern the relationship between science and technology, the relationship between form and functionality, and the metaphysical status of artifacts (Franssen, Lokhorst, and van de Poel 2018). The hope is that such investigations would provide a more grounded understanding of technology that also would help shed light on connected societal issues.

Going into more details would naturally require much more space. The next section presents then a specific approach in greater detail, namely postphenom-

enology, to provide an illustrative example of the adoption of an empirical orientation in philosophy of technology.

Postphenomenology: understanding technological mediation

What kind of experience of the world do artifacts make possible? How do artifacts shape human culture and knowledge? These are the types of questions posed by postphenomenology in regard to technology. By paying attention to how concrete technologies mediate the human experience of the world, postphenomenology combines an empirical orientation with a concern for the societal and cultural impacts of technology. American philosopher of technology Don Ihde laid the theoretical foundations during the 1980s and 1990s, providing the groundwork for later developments carried out in various directions by Dutch philosopher of technology Peter-Paul Verbeek, and others. Postphenomenology does not constitute a single methodology for carrying out empirical investigations; instead it is a family of related approaches that share certain theoretical vocabulary and methodological orientation.

Ihde describes postphenomenology as a blending of phenomenology, pragmatism, and the empirical turn (Ihde 2009). The resulting approach can be described as a phenomenology of artifacts that studies *technological mediation*, that is how concrete technologies shape human existence and experience of the world. Empirical case studies provide the starting points of philosophical reflection on *human-technology relations*, that aim to show technologies are neither neutral tools nor the manifestations of an absolute, alienating force. By going back “to the things themselves” in a literal interpretation of the Husserlian motto, postphenomenologists study the ambivalent effects that artifacts exert on society and culture.

Devising an accurate taxonomy of the different ways in which technical objects mediate human-technology relations has been one of the central concerns of the postphenomenological research program. In *Technology and the Lifeworld: From Garden to Earth* (1990), Ihde recognizes four basic modes in which technologies can mediate the relationship between human beings and the world: embodiment relations, hermeneutic relations, alterity relations, and background relations. Embodiment relations occur when tools such as hammers and eyeglasses recede from view when used, and the world is perceived through the tools themselves. A typical example is wearing eyeglasses, which are not seen directly but rather the world is experienced through their mediation. In hermeneutic relations the tool is not transparent, as it provides a representation of the world that must be interpreted, such as when gauging the temperature by reading a thermometer. Alterity relations occur instead when the object of attention is a technical object with which we are interacting, which appears as a “quasi-other”. A ticket machine, for example, possesses a certain degree of autonomy and enables a certain degree of interaction with the user that makes it appear almost as a “technological other” with which we

are interacting. In background relations technologies give form to the context of our experience without us noticing, such as when we feel a room's warmth thanks to the heating system working in the background.

These perceptual changes caused by technological mediation are the key to understand how postphenomenology frames the ambivalence of technology. By altering the intensity and the type of perception, technologies reshape how the world is presented to us and how we are present in the world. Certain sensory spheres are amplified or reduced compared to perception unmediated by technical artifacts: with a telescope I can see further away, but I do not hear or smell what I am seeing. This *amplification/reduction* dynamic explains the ambivalent role that technologies take in postphenomenology. Rather than just restricting the human experience of the world, technical artifacts reduce certain modes of experience while amplifying others at the same time. Experience is reorganized by technological mediation according to contextual elements of use and design, where both subject and object play a role. These transformations show that technologies do not constrain the human gaze through a rationalizing and manipulative attitude, as classical philosophers would have it; different technologies allow for different kinds of mediations that produce a wide range of possible ways to experience the world.

The way in which Ihde conceptualizes human-technology relations highlights another crucial point. The identities of the subject and object poles do not precede the relation, but they rather co-emerge and co-shape each other through the technological mediation. Technology, in this sense, does not exist on its own but only within a use context, that is to say, in a human-technology relational pair. In such a relationalist ontology technologies have no essence, as their effects change according to the specific cultural context in which they are immersed while also shaping back this context. Human-technology relations constitute the primitive entities of analysis, the specific context in which both human beings and technologies acquire their identities (Verbeek 2001). Ihde calls this ambiguity of technology *multistability*. Technologies acquire different meanings in different contexts as they become related to different users and communities; they thus come to bear multiple, different stabilized structures of meaning. This does not imply that technologies are mere neutral instruments: technical objects display a specific "robustness" which inclines toward certain trajectories of activity, and that Ihde calls "technological intentionality" (Ihde 1990, p. 141). The specific functionality of each technology invites certain uses and dissuades others, without this relation being deterministic. The pattern of development of human-technology relations thus remains open-ended and contingent to contextual factors.

By studying real-world examples of human-technology relations, postphenomenologists address philosophical (ontological, epistemic, ethical, aesthetical) issues about how technologies mediate human existence, concerning how instruments make scientific knowledge possible and how technical objects shape human existence, culture and society. Such an approach can be employed to analyze the effects of specific technologies on our perception of the world (e.g. prenatal diagnostics;

Verbeek 2008), providing an empirical basis for their ethical assessment. Understanding how technologies mediate users' experience can be useful to designers to anticipate and reflect upon desirable or problematic effects, and address them through design (Verbeek 2005). The field is still growing, as new kinds of human-technology relations are added to account for more complex forms of technological interaction, and scholars are probing into different possible applications of their results (Rosenberger and Verbeek 2015). Postphenomenology represents a set of contemporary approaches that strive to integrate the necessity of empirical accuracy with the need for philosophical depth in order to navigate the challenges of a technological world.

Conclusion

Philosophy of technology is a vibrant and growing field in which different questions concerning technology are addressed through a suitably broad range of alternative approaches, but which are generally characterized by an attention to the concrete dynamics of design practices and technology use. Classical philosophy of technology was characterized by its abstract and pessimist approach to technology, which was analyzed in its conditions of possibility as a form of technological thinking – Technique – an all-encompassing and inescapable force that alienates human beings through a form of rational exploitation.

The perceived limitations of this approach in accounting for the concrete effects of technological innovations called for the need of an empirical turn. Philosophers of technology felt the necessity to formulate empirically informed accounts, paying attention to concrete technological developments. Philosophy of technology thus became more optimistic or ambivalent concerning the dangers of technology, abandoning radical forms of technological determinism by studying the diverse effects that technologies exert in different social and cultural contexts.

To be sure, classical philosophy of technology is still practiced today in different forms, although it is no longer the dominant approach in English-speaking academia. Methods inspired by the continental tradition are benefiting from a dialogue with empirically oriented philosophies, in an effort to adapt concepts developed by classical authors to contemporary concrete technological challenges (Smith 2018; Lemmens, Blok, and Zwier 2017; Blok 2017).

As the field is so diverse, the risk that scholars working with different methodologies may not interact with each other is still high, as it was ten years ago (see Brey 2010). By sketching the differences and the overlaps of different families of approaches, I hope to have encouraged openness and curiosity to explore the theoretical and empirical richness that the field has to offer, and foster dialogue across traditions to tackle the numerous challenges that technology presents to today's world.

References

- Achterhuis, H. (ed.)
2001 *American Philosophy and Technology: The Empirical Turn*, Crease R.P. (tran.), Indiana University Press, Bloomington.
- Blok, V.
2017 Earthing Technology: Toward an Eco-Centric Concept of Biomimetic Technologies in the Anthropocene, *Techné: Research in Philosophy and Technology* 21(2/3): 127–149.
- Brey, P.
2010 Philosophy of Technology after the Empirical Turn, *Techné: Research in Philosophy and Technology* 14(1): 36–48.
- Franssen, M., Lokhorst, G.J., van de Poel, I.
2018 Philosophy of Technology, in Zalta, E.N. (ed.), *The Stanford Encyclopedia of Philosophy*.
- Franssen, M., Vermaas, P.E., Kroes, P., Meijers A.W.M. (eds.)
2016 *Philosophy of Technology after the Empirical Turn*, Springer, Berlin.
- Ihde, D.
1990 *Technology and the Lifeworld: From Garden to Earth*, Indiana University Press, Bloomington.
2009 *Postphenomenology and Technoscience: The Peking University Lectures*, SUNY Press, Albany.
- Kroes, P., Meijers, A.W.M. (eds.)
2000 *The Empirical Turn in the Philosophy of Technology*, JAI, Amsterdam.
- Lemmens, P., Blok, V., Zwier, J.
2017 Toward a Terrestrial Turn in Philosophy of Technology, *Techné: Research in Philosophy and Technology* 21(2/3): 114–126.
- Mitcham, C.
1994 *Thinking Through Technology: The Path Between Engineering and Philosophy*, University of Chicago Press, Chicago.
- Pinch, T.J., Bijker, W.E.
1984 The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other, *Social Studies of Science* 14(3): 399–441.
- Rosenberger, R., Verbeek, P.P.C.C. (eds.)
2015 *Postphenomenological Investigations: Essays on Human-Technology Relations*, Postphenomenology and the Philosophy of Technology, Lexington Books, Lanham.

Smith, D.

2018 *Exceptional Technologies: A Continental Philosophy of Technology*, Bloomsbury Academic, London.

Verbeek, P.P.C.C,

2001 Don Ihde: The Technological Lifeworld, in Achterhuis, H. (ed.), *American Philosophy and Technology: The Empirical Turn*, Crease, R.P. (tran.), pp. 119–146, Indiana University Press, Bloomington.

2005 *What Things Do: Philosophical Reflections on Technology, Agency, And Design*, Crease, R.P. (tran.), Pennsylvania State University Press, University Park.

2008 Obstetric Ultrasound and the Technological Mediation of Morality: A Postphenomenological Analysis, *Human Studies* 31(1): 11–26.