The Use of Examples in Philosophy of Technology

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Abstract

This paper is a contribution to a discussion in philosophy of technology by focusing on the epistemological status of the example. Of the various developments in the emerging, inchoate field of philosophy of technology, the "empirical turn" stands out as having left the most enduring mark on the trajectory contemporary research takes. From a historical point of view, the empirical turn can best be understood as a corrective to the overly "transcendentalizing" tendencies of "classical" philosophers of technology, such as Heidegger. Empirically oriented philosophy of technology emphasizes actual technologies through case-study research into the formation of technical objects and systems (constructivist studies) and how they, for example, transform our perceptions and conceptions (the phenomenological tradition) or pass on and propagate relations of power (critical theory). This paper explores the point of convergence of classical and contemporary approaches by means of the notion of the "example" or "paradigm." It starts with a discussion of the quintessential modern philosopher of technology, Martin Heidegger, and his thinking about technology in terms of the ontological difference. Heidegger's framing of technology in terms of this difference places the weight of intelligibility entirely on the side of being, to such an extent that his examples become heuristic rather than constitutive. The second part of the paper discusses the methodological and epistemological import of the "example" and the form of intelligibility it affords. Drawing on the work of Wittgenstein (standard metre), Foucault (panopticism), and Agamben (paradigm), we argue that the example offers an alternative way of understanding the study of technologies from that of empirical case studies.

Keywords Philosophy of technology · The empirical turn · Agamben · Foucault · Heidegger · Wittgenstein

1 Introduction: Classical and Contemporary Philosophy of Technology

Heidegger once remarked that *Dasein*, human being, is ontically closest to itself, but ontologically we are farthest removed from our being. Does not something similar hold for examples, that we give them all the time but do we know what they are? In *Philosophical*

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Investigations, Wittgenstein draws attention to a curious artifact that is not an example *of* something but an example *as* example:

> There is *one* thing of which one can neither say that it is one metre long, nor that it is notone metre long, and that is the standard metre in Paris.— But, this is, of course, not to ascribe any extraordinary property to it, but only to mark its peculiar role in the language-game of measuring with a metre-rule (Wittgenstein, 1953, 21, emphasis in original).

A few lines later we read: "It is a paradigm in our language-game: something with which comparison is made. And this may be an important observation; but it is nonetheless an observation concerning our language-game.—our method of representation" (ibid., 22). The standard metre rule (the physical object) is as mundane as it is extraordinary, or rather, it is extraordinary not because of some intrinsic quality of this specific platinum bar but for the very reason that it is *treated as a paradigm*. It is extraordinary in that we cannot attribute length to it in meters as such for the very reason that it renders intelligible what length in meters *is* (of course, nowadays, it does not fulfill this role anymore, given the transition to a definition based on lightspeed in vacuum, and has gone from paradigm to relic). The objective of this article is to understand the relevance of the structure of such artifacts for the philosophy of technology.

Of the various developments that have taken place over the last 30 years or so in the emerging, inchoate field of philosophy of technology, *the empirical turn* (Achterhuis, 2001) stands out as having left the most enduring mark on the trajectory contemporary research takes (Brey, 2010).[1] Roughly, the "empirical turn" is an umbrella term for a collection of approaches aimed at bringing philosophy of technology into dialogue with the well-developed body of literature in the sociology of science and technology, or what is generally referred to as "science and technology studies" (STS). A chief methodological tenet of empirically oriented philosophy is its adherence to *case-study* research (Gerring, 2007; Yin, 2013) and a *constructivist* outlook.[2] Whether it is politics (Winner, 1986) that is under investigation, or the technical mediation of experience (Ihde, 1993), or the reproduction of capitalist hegemony (Feenberg, 2002), empirically oriented philosophy of technology tends to highlight the *contingency* of technology, its development, its use, placing itself at a critical distance from earlier "substantive" theories. Bringing philosophy of technology into debate with STS is the position taken by representatives of empirically oriented

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[1] Mitcham (1994) makes a useful distinction between the "humanities" philosophy of technology, focused on the "external" relations that technology entertains with society and subjectivity, and "engineering" philosophy, which is concerned with the "internal" relations of technology as such; roughly, this difference coincides with the continental/analytic divide in philosophy. Accordingly, there have been two empirical turns in philosophy of technology at both sides of the specter, although in this article the weight lies on the continental side, without in any downplaying the insight and worth of analytical work. For a good and more complete overview than presented here see Lemmens and Hui (2021).

[2] Constructivism comes in many guises. Bijker et al. (1987), for example, advocate a *social* constructivism, in which social agents shape technology. Latour (2005) opts to drop the epithet and defends *constructivism* plain and simple, with no difference in kind between human and non-human actors. The *critical* constructivism endorsed by Feenberg (1999) is based on *instrumentalization theory*, in which an analytical difference exists between the functionality of technology and its social meaning. The common denominator in these approaches lies in the belief that technological development and design—*pace* whig theory—do not follow a linear, teleological path, but emerge out of competing, often mutually exclusive, options. Put differently: trivially, of course, technology is "man-made," but naive commonsense might uphold the belief that there is a strict separation between socio-logic and techno-logic.

thinkers such as Verbeek (2015), who believes that substantive theory adheres to outdated conceptions of human-society-technology relations, whereas Feenberg (1999) maintains the position that his main sources of inspiration (Marx and critical theory) can learn from the insights of (social) constructivism in terms of its study of particular cases, be it that Feenberg is much more reluctant to let go of "macro-concepts". While case-study research has many controversies surrounding it and its methodologies, another way of putting it is that the empirical turn is a turn to *things in concrete* (Coeckelbergh, 2018), as opposed to concepts in abstract, and perhaps more of an attitude than a methodology in the strict sense.

The empirical turn in the philosophy of technology has in many respects brought about what Thomas Kuhn's *The Structure of Scientific Revolutions* did a few decades earlier in the philosophy of science: just as historians and sociologists of science found that social practice was constitutive of scientific rationality, philosophers of technology came to see the practical factors implied in the formation of technical artifacts, and as philosophers of science started studying the intricacies of specific sciences as opposed to science as such, philosophers of technology began to recognize the specificities of technologies. Instead of understanding science and society as two separate realms only intersecting and interacting in terms of cause and effect, a discourse emerged that stressed the co-construction or co-evolution of science and society (i.e., how "external" social and economic factors influence science, and how science in a sense takes place *within* these relations), which, *mutatis mutandis*, was taken up and appropriated by philosophers of technology.

To be sure, this analogy only goes so far: the sociological turn in philosophy of science transformed the discipline from a *prescriptive* one (Popper, Vienna Circle) into a *descriptive* one. The stakes of the empirical turn in philosophy of technology are less clear. Achterhuis (2001) speaks of a difference in approach between "classical" philosophy of technology (Heidegger, Marcuse, Ellul, Jonas) and contemporary theory.[3] The distinction is made on the basis of the former's preoccupation with transcendental and historical conditions and the latter's with "real" empirical technologies. Feenberg (1999) distinguishes his own "critical constructivism" from Heidegger's essentialism by taxing Heidegger with a view which reduces technology to pure functionality, one that has Heidegger overlooking the social meanings of technologies, and how technology emerges from social relations. Feenberg's execution of the empirical turn, however, retains an element of transcendental discourse in its dual layer instrumentalization theory, in which the layers of function and meaning make up the a-historic essence of technology and empirical case studies reveal how instrumentalization is concretized.

Ihde's (2000) postphenomenological pluralism rejects transcendentalism and essentialism *tout court*, preferring to describe the effects of technologies on experience instead of the monolithic, reificatory character ascribed to technology by classical thinkers, arguing, for example, that Marcuse analyzed Technology with a capital "T" (1990, 6), or rather *techniques*. According to Van Den Eede et al. (2015), the chief virtue of classical philosophy of technology lay in the destruction of the neutrality thesis, sometimes called

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[3] Cressman (2014) observes that "classical" is used as code for "obsolete"; while hardly agreeing that the questions raised by Heidegger or Marcuse are obsolete, we may recognize that any classification of intellectual epochs implies a degree of rhetorical exaggeration (within this framework, for example, where would one place the work of Simondon, who "generationally" certainly belongs to the classical category yet can hardly be accused of not paying attention to the empirical?).

"instrumentalism," and that the empirical turn is the reinterpretation of real technologies having dispensed with the image of technology as a mere means to an end.

The empirical turn is not without its detractors, however, such as Scharff (2011), who argues that philosophy of technology has lost track of abstraction by venturing too much into the concrete. The reliance on case-study research at the micro-level, as practiced in STS, may reveal nuances and details, but case-study research is equally bad at what grand theory excels at, such as the elucidation of systematic technological developments, or, *a fortiori*, the relations between technology and modernity as such. Accordingly, there has been a call for a bridging of the gap between technology studies and modernity theory, and indeed, some steps have been taken in that direction (e.g., Misa et al., 2003). Nevertheless, the discarding of the transcendental perspective has met with considerable hostility, ranging from warnings about how the empirical turn "carries the danger of turning 'philosophy of technology' into a shallow and uncritical field, parasitically dependent on developments in industry" (Smith, 2014, 15) to assertions about "the necessity of a 'transcendental (re) turn'" (Lemmens, 2015, 4).

This ungenerous assessment is unwarranted insofar as empirically oriented philosophy of technology does not, in fact, advocate a wholesale abolition of philosophical abstraction, but, rather, desires to set out from the empirical description of actual technologies—aiming to determine the transformative character of technologies with regard to such philosophical fields such as politics or ethics. (Verbeek, 2015). One way of putting the matter differently is that there is no hard divide between "empirical" thinkers, who only make context-dependent claims and "transcendental" thinkers, who only engage in characterizations of technological epochs. Another way of making the same point is that the difference between the two schools of thought is not so much "real" as it is rhetorical or even "polemical".[4] For example, Feenberg (1999, 2002, 2010) construes his critical theory/critical constructivism by engaging with Marx, the Frankfurt school, and social constructivism, but is at the same reluctant to let go of macro-concepts, such as (the technical code of) capitalism, class/formal bias and its counter-hegemony in democratic rationalization, while not shying away from concrete analysis (user appropriation of the Minitel as an *exemplary* case). Put differently, the claim that "empirically" oriented philosophy of technology only engages with the concrete, and empirical, and neglects abstraction is a more difficult position to maintain. In that sense, the analysis that follows is akin to and indebted to the work of Borgmann (1984), who in fact gives an analysis of the contemporary technological era in a very Heideggerian spirit, but is methodically more difficult to put in one category or the other: in fact his analysis of the "device paradigm" is an "ontical" rewriting of Heideggerian insights by more supple concepts such as pattern, example, and paradigm.

Our own inclination in this debate is follow up on this style of analysis: the empirical turn has brought about a more nuanced and evenhanded view on the particularities of specific technologies in comparison to more classical thinkers and a more direct link to technology development, and has been helpful when one is interested in fields such as ethics and politics, but that it is more difficult to see how the repetition of case studies brings us closer to a *philosophy* of technology. In a certain sense, philosophy of technology is in an aporia, having to choose between the general form of the transcendental and the particular content of the empirical. Thus, we would ask, how can we *rethink* the opposition between the transcendental and the empirical within philosophy of technology? Indeed,

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[4] Earlier versions of this article gravitated towards seeing the distinction as "real". We owe this oversight to one of the anonymous reviewers of this article.

can the empirical and the transcendental meet? Is there a *point of convergence* where the two intertwine and become indistinguishable? Thus, is there a possibility of a philosophical approach to technology studies that starts off from "actual technologies" but does not treat them as empirical givens? In the following we will argue that the notion of the "paradigm" can cast the debate in a different light: empirically oriented philosophers may argue that transcendentalists should get out of their armchair, whereas the latter uphold the view that empirical philosophy is an oxymoron; the aporia resorts to polemics as to whether philosophy has its own proper object or is more or less in line with the sciences (such as STS).[5] Put simply, we argue that the empirical turn is a turn to examples of technologies, but in a very specific way, namely, by the formation of empirical case studies. In this paper we explore how the notion of "paradigm" can shed light on the philosophical meaning of technologies without treating them as empirical givens.

Any mention of "paradigm" will immediately evoke associations with, and cannot bypass, the aforementioned Thomas Kuhn's seminal work on the paradigmatic character of the development of the natural sciences. Though notoriously equivocal,[6] in *Structure* the notion of paradigm has at least two distinct meanings. First, paradigm is a *disciplinary matrix* or "the constellation of group commitments" (Kuhn, 1962, 182) that signifies the theories, beliefs, methods, and convictions upheld by and defining a community of scientists. This is indeed the meaning that paradigm has in common parlance, for example, when we say that Marxism was the dominant paradigm in technology studies in the 1970s, whereas nowadays it is STS. The second meaning, which Kuhn (1962, 187) considered to be "the most novel and least understood aspect" of his book, is that of shared example, or *exemplar*. Kuhn's own example is Newton's second law of motion, and his point is probably well known to any freshman in natural sciences. Becoming a scientist consists less in rational reflection, let alone in falsification or verification, than that it does in the *repetition* of such exemplars. Instead of understanding science as a rule-based enterprise, Kuhn's depiction emphasizes the normative character of exemplars, which need to be mastered in order to count as an accepted member of a scientific community.

Kuhn's interest in paradigms sprang from their guiding scientists' normative behavior; ours here lies in their ontological, epistemological and methodological import. This paper has a two-fold structure. First, we start off by looking at Heidegger's philosophy of technology, which has been described as too abstract, too gloomy, and lacking practical insight. Without wishing to settle these matters, we interpret his thinking in a particular way: as against thinking in paradigms, and as thinking in terms of *being*, making his examples in the end *heuristic* rather than *constitutive*; our main reason for discussing Heidegger is not so much to give a new interpretation of his work, but rather to show how his thinking, and in this context, his use of examples, has given rise to a turn away from the type of analysis he engages in. The second part of this paper contains its positive contribution through readings of Wittgenstein, Foucault, and Agamben. In Wittgenstein's analysis of the standard metre we find an *ontology* of paradigms vis-à-vis the Platonist metaphysical tradition

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[5] The question as to whether philosophy still has a proper object of study is a broader problematic within academic philosophy. One answer is: No, philosophy of language is fundamental linguistics, political philosophy abstract sociology, continental metaphysics literary sciences, and logic a branch of computer science, and precise disciplinary categorizations are a matter of administration. Another is the Heideggerian stance in which science is better at explaining reality and philosophy has *being* as its proper "object". In this broader philosophical context, we argue that perhaps this is a false dilemma.

[6] Masterman (1970) identifies 22 distinct meanings in which Kuhn uses the word.

(Sect. 3). In Sect. 4, we show that Foucault's analysis of the *panopticon* and *panopticism*, his most directly relevant contributions to the philosophy of technology, offer him a methodological way of evading the empirical/transcendental distinction he finds so problematic in the "Age of Man." Finally, we draw on the work of Agamben and his notion of example/paradigm as a generalization of Foucault's methodology, making explicit and systematic Foucault's *epistemological* and *methodological* relevance for the notion of *analogy* for philosophy of technology. The relation between the authors is thus a move from *ontology* (Wittgenstein), through exhibition (Foucault), towards systematization as method (Agamben). In the end our aim is to raise new questions about philosophical thinking about technology: the empirical turn has brought about a very fruitful and worthwhile turn towards things, and allows for a way about thinking about the *meaning* and *ontology* of the technological age, not so much in terms of abstract concepts such as "Enframing" or "Total mobilization," but we want to draw attention to *singularities,* which are at the basis of our technological age: in biotechnology we can think, for example, of the Arabidopsis plant (as a concrete paradigm), in computer science of the Turing Machine (as the standard metre of computationality); these remarks will however be preliminary, setting the stage for a research agenda. Accordingly, the paper does not end with conclusion perse, but rather as a question on how paradigm/analogy can raise overlooked questions in philosophical thinking about technology.

2 The Interior of Beings and the Exterior of Being: Heidegger and the Hydroelectric Plant

The difference between the transcendental and the empirical, as Achterhuis (2001) uses it, goes back to Kant, who employs it in an epistemic context, i.e., the conditions under which pure mathematics, physics, and metaphysics as a science are possible, and defines it as a mode of cognition "that is occupied not so much with objects but rather with our mode of cognition of objects insofar as this is to be possible a priori" (Kant, 1998, 133). In *Critique of Pure Reason*, Kant regards this project as too comprehensive to complete and limits himself to spelling out the necessary conditions of possibility for objects of experience, viz., the forms of intuition of space and time and the twelve categories of understanding. In the strict technical sense, an *argument* is transcendental when a given premise cannot be thought without assuming a nonobvious presupposition without which the premise cannot be thought (Rorty, 1971; Stroud, 1968); when reduced to its bare essentials, however, the difference between the transcendental and the empirical arguably boils down to a way of developing a more sophisticated jargon serving to rephrase the form/content dichotomy. That is to say, Kant finds in the *form* of the transcendental structures of experience a transhistorical basis that is exempt from the contingency of the content of that very experience. In philosophy of technology, more recently, there is no a consensus view on what to make of this distinction within the field. Lemmens (2021), for example, argues for a return to the transcendental in the historical *technological* sense, in effect arguing for a Stieglerian view in which *technics* is the transcendental, but also more generally, he argues that philosophy of technology needs to reckon with *totality* in view of the planetary crisis, or more popularly: the Anthropocene. Besmer (2021) argues that philosophy of technology also needs a turn away from the empirical but perhaps not towards the transcendental, in fact arguing that the very distinction is not very useful from the outset. Zwier et al. (2016), on the

other hand, argue for the continuing relevance of Heideggerian questioning for thinking about technology. Heidegger's philosophy of technology, as elaborated in *The Question Concerning Technology*, is often regarded as the most pregnant instantiation of a "classical, transcendental" approach, if only for the fact that it does not analyze technology in terms of technical artifacts or systems but identifies the essence of technology with something that "is by no means anything technological" (Heidegger, 1977, 4). This "something" is being.

> Perhaps there *is* no other being beyond what has been enumerated, but perhaps, as in the German idiom for "there is," (*es gibt* literally, it gives), still something else *is given*. Even more. In the end something is given which *must* be given if we are able to make beings accessible to us as beings and comport ourselves towards them, something which, to be sure, is not but which must be given if we are able to experience and understand any beings at all. We are able to grasp beings as such, as beings, only if we understand something like *being* (Heidegger, 1982, 10, emphasis in original).

From the outset, Heidegger's questioning is guided by his self-professed most profound contribution to philosophy, i.e., the *ontological difference*, the difference between beings (entities, the ontic) and that on the basis of which beings can show themselves as such, being (the ontological):

> It is a distinction which is first and foremost constitutive for ontology. We call it the *ontological difference*—the differentiation between being and beings. Only by making this distinction—krinein in Greek— not between one being and another being but between being and beings do we first enter the field of philosophical research (Heidegger, 1982, 17, emphasis in original).

In this context, a few things stand out regarding the ontological difference. Being precedes, or more precisely, is concomitant with any showing of beings; being is "no class or genus of entities" but "*the transcendens pure and simple*" (Heidegger, 1962, 62); being is the "object" proper of philosophy. In the traversal of the pathway of his thinking, Heidegger would gesture more and more towards being, to such an extent that beings would drop out of sight. In *Being and Time*, Heidegger tackles the question of the meaning of being by interrogating an "exemplary being"— lest we say paradigm—, i.e., human being, or, more precisely, the being that we are ourselves and to whose constitution a pre-understanding of being belongs and which has *questioning* itself as a mode of being.

Heidegger's ontology takes the form of a revealing or unveiling of being (to which concealing necessarily belongs) by means of the passing over of the implicit pre-understanding of *Dasein* of the being of beings into explicit understanding (Heidegger, 1962, 61, 188–94). This essentially circular *interpretation* rests on the distinction between implicit/explicit, or showing/not-showing; it is, in brief, *phenomenological* (Derrida, 1982, 126), relating not to the empirical *what* of things, but to their *how* (Heidegger, 1962, 50). Crowell and Malpas (2007) observed, the extent to which this involves the transcendental in the Kantian sense is unclear, as witnesses this passage:

> We also call the science of being, as critical science, *transcendental science*. In doing so we are not simply taking over unaltered the concept of the transcendental in Kant,

although we are indeed adopting its original sense and its true tendency, perhaps still concealed from Kant. (Heidegger, 1982, 17)[7]

It is clear that Heidegger wants to remove the transcendental from the epistemic context used by Kant and from its subjectivist conception. On a subtler note, Heidegger's reinterpretation of the Kantian project consists in the fact that his conception of the transcendental does not signify the a priori of an *object* of experience but rather the hermeneutic conditions under which a being can show itself *as* the being that it is (*as* an tool of practical circumspection, *as* an object of objective contemplation) (Carman, 2003).

In fact, it was only until 1930 that Heidegger would explicitly associate himself with transcendental philosophy and a conception of philosophy as a science, claiming in his lectures that philosophy is no science but something "*comparable with nothing else* in terms of which it could be positively determined. In that case, philosophy is something that *stands on its own*, something *ultimate*" (Heidegger, 1995, 2, emphasis in original). Heidegger's essays on technology belong to his post-1930s work, after the so-called "turning," in which he would no longer interrogate the meaning of being through the pre-understanding of *Dasein* but would venture into the historical destining of being.

Whether or not Heidegger's later work still adheres to the principles of phenomenology is unimportant here,[8] for the irreducible play between implicit/explicit, showing/not-showing, light/dark, concealment/unconcealment remains firmly intact. Heidegger enters the field of technological research equipped with the ontological difference—or, put differently, the question concerning technology was never a question concerning technologies; Heidegger's question concerning technology may have as its impetus the ever more pervasiveness of ontic technologies in the modern age, but he tackles this question at the level of being, not that of beings. Nevertheless, Heidegger does not shy away from analyzing an *example* of a *modern* technology that, at face value, exhibits archetypical exemplarity, the hydroelectric plant. Of the hydroelectric plant Heidegger writes:

> The hydroelectric plant is set into the current of the Rhine. It sets the Rhine to supplying its hydraulic pressure, which then sets the turbines turning. This turning sets those machines in motion whose thrust sets going the electric current for which the long-distance power station and its network of cables are set up to dispatch electricity. In the context of the interlocking processes pertaining to the orderly disposition of electrical energy, even the Rhine itself appears as something at our command. The hydroelectric plant is not built in the Rhine River as was the old wooden bridge that joined bank with bank for hundreds of years. Rather the river is dammed up into the power plant. What the river is now, namely a water supplier, derives from out of the essence of the power station. (Heidegger, 1977, 16)

For Heidegger, the construction and functioning of the hydroelectric plant *challenges* the Rhine to deliver energy, which is "unlocked," and "what is unlocked is transformed, what

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[7] Note that in his lectures Heidegger (1982, 27–76) sees the ontological difference not as presaged in Kant's distinction between the transcendental and the empirical but in Kant's dictum that being is not a real predicate (i.e., determination) of a being; in *Being and Time*, moreover, Heidegger wants to rob theoretical, disinterested contemplation, implied in empiricism, of its privilege in favor of the primacy of practice and lived, engaged experience; and the concept of phenomenology does not equate the given with the empirical *what* but with the phenomenological *how* (Heidegger, 1962, 50).

[8] In *Being and Time* Heidegger differentiates between a pre-discursive hermeneutic level of understanding and an apophantic discursive level. This differentiation is less clear in in his later work.

is transformed is stored up, what is stored up is, in turn, distributed, and what is distributed is switched about ever anew" (ibid.). This challenging character derives from, but does not have its ground in, the calculations of modern natural science, Heidegger alleges, and this is provocative about this assertion, that modern science is ontologically dependent on technology, *pace* the historical priority of the scientific revolution to the industrial one; challenging was not present in traditional, pre-modern technology. In the case of a windmill, for example, the wind was merely utilized, as something serviceable; its sails are "left entirely to the wind's blowing. But the windmill does not unlock energy from the air currents in order to store it" (ibid., 14). This contrast between modern industrial technology and traditional, artisanal technologies is expressed several times in the *Question*, such as in the peasant taking care of his land and the modern transformation of agriculture into a food industry (ibid., 15).

It is tempting to read Heidegger's differentiation between pre-modern and modern technology as the juxtaposition of two lists consisting of "good" traditional technologies on the one hand and "bad" modern ones on the other. But this would not do justice to his ontologizing of technology. To be sure, Heidegger *does* want to differentiate between pre-modern and modern technology, but on the level of being, and not of beings. The differentiation between the relationship with the manifest of the ancient Greeks and ours resides in a prior *revealing*, captured in the word *aletheia*, truth.[9] Technology, or *techne*, is rooted in such revealing and is a way of revealing. In Greek times, Heidegger alleges, such *techne* was intrinsically intertwined with *poiesis*, with bringing-forth (see also: Heidegger, 1993, 184).

Somewhat simplified, Heidegger points here to the phenomenon well known in popular culture by Michelangelo's remark that every stone has a statue inside it and the task of the sculptor is to dis-cover it. This *poiesis* brings-forth in such a manner that it brings-something-into-presence. In the epoch of modern technology, the poetry of technology has been lost. Modern technology brings-forth in such a manner that it does not bring beings-into-presence, but covers them over. Heidegger' name for the prior revealing that is at the basis of this kind of bringing-forth is *enframing* (*das Gestell*) (1977, pp., 19, 19). Enframing reveals reality, and, indeed, humanity itself as standing-reserve (*Bestand*), as a resource to be ordered, exploited and transferred at will. The character of enframing is to totalizing: "it drives out every possibility of revealing" (ibid., 27). The world *as such* shows itself as standing-reserve.

Heidegger's approach remains influential in contemporary technology studies and philosophical thinking about technology, but mostly through eliciting antagonism; his work on enframing usually functions as a good lesson on how not to do philosophy of technology. Two "continental" approaches representative of the empirical turn, Don Ihde's "postphenomenology" and Andrew Feenberg's "critical constructivism," share the assumption that Heideggerianism is an intellectual dead-end street. Ihde (1993, 106) speaks of Heidegger's nostalgic preference for artisanal technologies in favor of modern ones, while Feenberg (2010, 24) thinks that the ontological difference "may have once seemed more interesting than it does today," and that Heidegger "literally cannot discriminate between electricity

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[9] Cf. Heidegger (1962, 256–273; (1993, 138–212). A-letheia as un-concealment is the privation, but not the negation, of concealment, wherein the concealed is momentarily unconcealed. Wrathall (1999) denies that Heidegger ever regarded this conception of truth to be applicable to *propositional* truth, as argued for by Tugendhat (1992) in his influential interpretation, and that Heidegger's conception of propositional truth is fairly conventional to the extent that Heidegger regards *correspondence* as a benign but obfuscating metaphor, if only for the fact that correspondence implies a *subject* whose mental contents are in agreement with an *object* out there.

and atom bombs, agricultural techniques and the Holocaust" (1999, 187), since they "[a]ll are merely different expressions of the identical 'enframing',"[10] and that he "cannot take the notion of technological reform seriously because he reifies modern technology as something separate from society, as an inherently contextless force aiming at pure power" (2010, 25).

Both Ihde's and Feenberg's critiques are interesting because they assume that we *can* differentiate between atom bombs and agricultural techniques, between a windmill and a power plant. However, if we take Heidegger's claim seriously that ontology does not consist in any "cataloguing of the furniture of the universe" (Brandom, 1983, 388) and that enframing does not "mean the general concept of such resources" (Heidegger, 1977, 29), then talk of ontic technologies being "expressions" of "enframing" or "preferences" for one ontic technology in favor of the other becomes idle. Put differently, the hydroelectric plant is not a paradigm *of* enframing, but rather, *the example belongs to the interior of beings and the exterior of being.*[11] The point here is as follows: whereas in *Being and Time* it is clear that the understanding of being of *Dasein* is grounded ontically in its being ontological, or put differently: the *difference* between Dasein and the categories in *Being and Time* is to be understood in terms of the mode of being and understanding of being of Dasein (Brandom, 1983). In the *Question* this ontic rooting of ontology is much less clear, as observed by "empirical turner" Verbeek (2005, 63): "[Heidegger's] words reveal that, for him, what is happening is not that the construction of an electrical generating plant has brought about the transformation of the Rhine into standing-reserve, but rather the other way around—that the unlocking of the Rhine as standing-reserve has brought about the construction of an electrical power plant in it. This is underscored by his remark about the tourist industry[.]".

3 What is a Paradigm: Wittgenstein and the Standard Metre

Heidegger's ontological difference, by definition, precludes the possibility of a being coming-into-presence prior to any clearing of being; Heideggerian phenomenological showing is the showing of this prior clearing. In this section we argue, however, that Heidegger was not sensitive to another type of showing than of an object of hermeneutics, i.e., in terms of the prior disclosure of the whole from which a part is understood. We look for a different type of non-empirical showing in terms of a para-showing of the part towards the whole. In his early work *Tractatus-Logico Philosophicus*, indebted to Kantianism and associated

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[10] Feenberg (2000) responds to Thomson's (2000) critique of this fragment that enframing is not a genus by arguing that enframing is akin to Hegel's notion of a concrete universal, universal categories which only exist in their enactments, such as language in speech, or culture in practices. In this way Enframing essences itself in technologies, e.g., how the hydraulic plant changes the meaning of the river compared to Hölderlin's poem. But for Feenberg this signifies that "[an] impoverished general theory is here reflected in an impoverished understanding of particulars" (Feenberg, 2000, 448). It is beyond the scope of this article to settle these matters; we position Heidegger as a thinker of being and not of paradigms.

[11] While we position Heidegger as a thinker adverse to paradigms, his views on science approximate Kuhn's incommensurability thesis: "[I]t makes no sense whatsoever to suppose that that modern science is more exact than that of antiquity. Neither can we say that the Galilean doctrine of freely falling bodies is true and that Aristotle's teaching, that light bodies strive upward, is false; for the Greek understanding of the essence of body and place and the relation between the two rests upon a different interpretation of beings and hence conditions different kinds of seeing and questioning of natural events" (Heidegger, 1977, 117).

with logical positivism, Wittgenstein also struggled with the transcendental and showing/not-showing, declaring that "What *can* be shown, *cannot* be said" and that "Logic is transcendental" (Wittgenstein, 2001, 31, 78, emphasis in original). True or false (scientific) propositions belong to the realm of the sayable, but their form, the ground of the sayable, eludes enunciation, it is transcendental. By the time of his later work, of which such books as *Philosophical Investigations* and *On Certainty* are the precipitates, and in some sense close to post-structuralism (e.g., Staten, 1984), Wittgenstein would neither use metaphysical jargon such as "transcendental" nor entertain the belief that scientific propositions are the only bearers of genuine meaning, nor that logical form is the ground of the sayable:

> But if someone were to say: "So logic too is an empirical science" he would be wrong. Yet this is right: the same proposition may get treated at one time as something to test by experience, at another as a rule of testing. (Wittgenstein, 1969, 15)

Nevertheless, Wittgenstein's interest in finding the grounds of the sayable and the role showing plays in it did not wane (McGinn, 2001), to which his analysis of the meter rule attests. The standard metre is an empirical phenomenon but at the same time it is not: it is a material artifact that renders intelligible what a meter *is*. In this instance, talk of transcendental or empirical are problematized because we are dealing with a phenomenon the content of which expresses its own form. Wittgenstein's remark surfaces in his rejection of what might be called a Platonist treatment of universal categories, "the great sources of philosophical bewilderment: a substantive makes us look for a thing that corresponds to it" (Wittgenstein, 1958, 1), or the "indestructibles"(Wittgenstein, 1953, 24). There is no-thing that corresponds to length just as there is nothing that corresponds to the color red as such. The Platonist solution to this problem is *idealism*: the universals belong to a realm ontologically distinct from that of the empirical, the sensible.[12] Wittgenstein's position, however, is a problematization of this very distinction: the ideal here appears as the empirical and vice versa.

As a fundamentally anti-theoretical thinker (McGinn, 1997), Wittgenstein was never one to generalize his insights into a theory of paradigmatic intelligibility, but from his scattered remarks we can deduce that the standard metre is not the only artifact instantiating this structure. Thus, for example, we could imagine patches of colors in an archive, of which we would then not be able to say whether they were of the colors in question. Thus, there is a sense in which we cannot say that the standard metre is one meter long nor that it is; it is the "meter" that is not a meter.[13] In order to be able to determine the truth or falsity of such statements, we need a standard, a yardstick according to which this we make the determination, which is *ex hypothesi* impossible in the case when it *is* the yardstick that makes any determination of (in)correctness possible. The standard meter rule, in this sense, is *beyond* truth or falsity, it resides on the plane of what in *deconstruction* is called

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[12] Derrida (1982, 209) points out that the word *sensible* is ambiguous: it refers not only to the senses of empirical experience, but also to *sense* as in meaningful. We return to this ambiguity shortly.

[13] The most famous objection to Wittgenstein's position is that of Kripke (1980, 54–57), who argues that we *can* say whether the meter rule is one meter or not. Kripke's position is a sophisticated form of Platonism in that it regards names as "rigid designators," as pointing to a specific (in this case immaterial) object. The meter rule thus functions as *preliminarily* saying that the stick-at-this-temperature *refers* to the Platonic entity "one meter long", which might be proven false in the future. The current definition of the meter is based on the distance traveled by light in 1/299 792 458 of a second, and could thus be argued to approximate a meter better. For a defense of Wittgenstein's position, see Luckhardt (1977), who argues that Wittgenstein's target here is Platonism *tout court*.

the *undecidable*, that is, the implosion of the *basis* of any criteria on the *basis* of which a rational decision can be made.

Derrida's (e.g., 1988, 116) deconstruction, indeed, accounts for the existence of groundless undecidables by a generalization of undecidability, to wit, by a number of "non-concepts," such as *différance* (1982, 1–27), *iterability* (1988), and *pharmakon* (1981, 61–172),all of which have an irreducible double entendre implying constitution and deconstitution (differing/deferring, repetition/alteration, cure/poison). Deconstruction replaces transcendental and/or empirical discourse by that of "quasi-transcendental" discourse (Derrida, 1988, 127; see also Bennington & Derrida, 1993; Rorty, 1989): it takes, for example, the structure of empirical writing, which is repeatable in the absence of its originator and always possible to be misunderstood, and turns it into a transcendental structure, which stops being transcendental for the reason that it is infected by the empirical and both a condition of possibility and of impossibility, of understanding and misunderstanding. For deconstruction, there is the structural possibility that a paradigm misfires; when someone points at the standard metre and exclaims "meter," there is the structural possibility that one's interlocutor understands this as "platinum," or as "straight." Wittgenstein is well aware of this skeptical possibility,[14] but doesn't seem to be bothered: "What has to be accepted, the given, is—so one could say—*forms of life*" (1953, 192).

However, the undecidable character of the paradigm is no "extraordinary property" but a sign of "its peculiar role in the language-game of measuring with a metre-rule" (Wittgenstein, 1953, 21). Its peculiar role is derived from the fact that in order to function as a paradigm it must be treated-as such. This connects with the distinction Wittgenstein (1953, 168) makes between *seeing* and *seeing-as*. Whereas *seeing* refers to the *objective* properties an entity-within-the-world possesses, *seeing-as* refers to something neither wholly subjective nor objective, but to the very *relation* a subject entertains with regard to its object: *Positivism*, and its emphasis for stating *the facts*, elevates the report of objective properties to the status of *the only true form of knowledge*. But we need to keep in mind that "the concept of 'seeing' (…) is *tangled*" (Wittgenstein, 1953, 170). The sort of seeing involved in seeing the standard metre *as* a paradigm is comparable to seeing the duck-rabbit *as* a duck or *as* a rabbit; in order to indicate what one sees the ambiguous picture *as*, one cannot refer to the picture itself. Likewise, there is no objective property that differentiates the standard meter rule from other bars of the same length. The constitution of its paradigmatic character belongs solely to the practice of our treating it as such: "'Seeing as….' is not part of perception. And for that reason it is like seeing and again not like" (Wittgenstein, 1953, 168).

In a more systematic fashion Wittgensteinian paradigms display the following characteristics: (1) they function as yardsticks on the basis of which particular cases can be judged, but are at the same time outside of these particular cases; (2) paradigms need to be agreed

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[14] For example: "Now one can ostensively define a proper name, the name of a colour, the name of a material, a numeral, the name of a point of the compass and so on. The definition of the number two, "That is called 'two'"—pointing to two nuts—is perfectly exact.—But how can two be defined like that? The person one gives the definition to doesn't know what one wants to call "two"; he will suppose that "two" is the name given to *this* group of nuts!— He *may* suppose this; but perhaps he does not. He might make the opposite mistake; when I want to assign a name to this group of nuts, he might understand it as a numeral. And he might equally well take the name of a person, of which I give an ostensive definition, as that of a colour, of a race, or even point of the compass. That is to say: an ostensive definition can be variously interpreted in *every* case. (…) Any definition may be misunderstood" (Wittgenstein, 1953, 11–12, emphasis in original).

upon by a community that employs them; (3) it is impossible to determine whether the concept they render intelligible is applicable to them or not, they are undecidables (Luckhardt, 1978); (4) we do not relate to paradigms as we do to empirical phenomena, they reside in the limbo between the subjective and the objective; (5) the paradigm does not refer to the concept it renders intelligible, but rather it *shows* it.

4 The Hidden Standard Metre of Power: Foucault and the Panopticon

Anti-Platonism also animated the work of a thinker whose endeavors, at face value, were quite tangential to Wittgenstein's, Michel Foucault:

> Let's suppose that universals do not exist (…) My reasoning, my method, was not to examine whether history gives me or refers me to something like madness, and then to conclude, no, it does not, therefore madness does not exist. This was not the argument, the method, in fact. The method consisted in saying: Let's suppose madness does not exist (…) starting from the decision that universals do not exist, asking what kind of history we can do. (Foucault, 2008, 3)

In *The Order of Things* (subtitled *An Archaeology of the Human Sciences*) Foucault signaled a problematic within the human sciences, which characterizes the modern *episteme,* the Age of Man.[15] This problematic, which Foucault calls the analytic of finitude, is as simple as it is profound: '[M]an appears in his ambiguous position as an object of knowledge and as a subject that knows' (Foucault, 1989b, 312). This ambiguous position gives rises to a number of doubles: the empirical/transcendental, the cogito/unthought, and the retreat/return of the origin. We focus here on the empirical/transcendental.

Kant's differentiation between the empirical and the transcendental is based on a conception of man as both fact and condition of knowledge. Kant, however, relegates all contingency to the empirical and conceives of the transcendental as the a-historic, cross-cultural fundament. Immediately, however, we can question how empirical contingency influences the transcendental apparatus of cognition. This is indeed the path taken by naturalism. In the history of analytic philosophy, Quine (1969, 69–90) argued for "naturalizing epistemology" by turning philosophical epistemology into cognitive psychology. Marxism, on the other hand, historicizes the transcendental by referring to an eschatological truth in which man fulfills his history, communism. These ways of finding a discourse that validates its own truth, the positivist's and the eschatologist's, are two sides of one and the same uneven coin:

> [A]ttempting to be both empirical and critical [it] cannot but be both positivist and eschatological; man appears within it as a truth both reduced and promised. Pre-critical naïveté holds undivided rule (Foucault, 1989b, 349).

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[15] "Episteme" refers to Foucault's short-lived notion in *The Order of Things* and *The Archaeology of Knowledge* that signifies the historical a priori in the sciences of natural life, labor, and language and is defined as follows: "By *episteme*, we mean, in fact, the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems (…); it is the totality of relations that can be discovered, for a given period, between the sciences when one analyses them at the level of discursive regularities" (Foucault, 1989a, 211).

Phenomenology, which studies lived experience and its constitutive moments, is "a discourse whose tension would keep separate the empirical and the transcendental, while being directed at both" (Ibid.); in both Husserl's and Heidegger's versions of phenomenology the empirico-transcendental double emerges, respectively in the transcendental ego/natural attitude and the ontico-ontological privilege, as a tension not to be sublated but to be accepted. Foucault's famous thesis in *The Order of Things* that man is about to disappear from Western humanistic discourse finds its counterpart in his assertion that the ever subtler, and convoluted, ways of formulating the relations between the empirical and the transcendental show that this discourse is at an impasse.

According to Dreyfus and Rabinow (1982, 79–100), however, Foucault's archaeological method, developed in the 1960s books *The Order of Things* and *The Archaeology of Knowledge*, still remains caught within the difficulties he signals with the analytic of finitude. Foucault elaborated a highly-sophisticated account of discursive formations that nevertheless have a distinctly Kantian ring to them through the spelling out the transcendental a priori rules of discursive formations within a given episteme.[16] It was thus, as Dean (2012) explains, that the paradigmatic method grew, coming to fruition in the 1970s genealogies of *Discipline and Punish* and *The History of Sexuality*:

> Foucault develops this interpretation—and this we claim is his most original contribution—by pointing to agreed-upon examples of how a domain of human activity should be organized. (…) He is now proceeding through a description of discourse as the historical articulation of a paradigm, and approaching analytics in a manner that is heavily dependent on the isolation and description of social paradigms and their practical applications. For Foucault the analysis of discourse is no longer systematized in terms of the formation of rules of the episteme (Dreyfus & Rabinow, 1982, xxvii, 199).

The relevance of this method for philosophy of technology is best recognized in Foucault's analysis of Bentham's circular prison-design, the panopticon. In the archives, Foucault finds what might be called the hidden standard metre of power in modern society. The example of the panopticon is well known, and perhaps worn, in sociology and philosophy of technology as well as in surveillance studies (Galič et al., 2016; Kaplan, 2009). A popular way of reading this analysis is one along the lines of what Winner (1986) calls the politics of artifacts or what Feenberg (2002) calls the technical code of capitalism, i.e., that technological development takes place within relations of power, which are incorporated into the design of technical artifacts and systems that propagate and reproduce these relation of domination. It is equally tempting to interpret the panopticon *more metaphorico*, as Foucault figuratively claiming that Western society is a "big Panopticon".

One of Foucault's best-known critics, Steven Lukes, indeed, makes the claim that Foucault's method is not empirical but rather focused on understanding phenomena, such as power, in their ideal form: "One reason for this one-sidedness is doubtless that Foucault was, characteristically, not investigating actual disciplinary practices but their *design*.

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[16] Han (2002) argues that throughout his career Foucault would struggle to find the correct terms suitable for his blend of Nietzscheism and Kantianism, always keen to avoid anything such as a Husserlian phenomenological ego as the grounds for the transcendental, but that his endeavors remained aporetic in the end. Her interpretation is perhaps a more exegetically loyal reading of Foucault's method than that of Agamben we discuss in the next section, but our context is not that of Foucault studies, but that of philosophy of technology.

His purpose was to portray their idealized form—describing not how they work, or ever worked, but an ideal type of how they are meant to work" (Lukes, 2005, 93).

Lukes' remark is certainly correct, but "ideal form" can be interpreted not only in the sense of "non-empirical" but also in a paradigmatic way in its most technical sense (Agamben, 2001, 2009, 16–17), that is, as an example *as* example that elucidates a more general problematic: *panopticism*. It is clear that Foucault denies neither the existence of class nor that of class struggle (Foucault, 1977, 223; see also Deleuze, 1988, 22–23) but is out to give an interpretation of their formation differing from the Marxist one, or "at least a certain contemporary conception that passes for the Marxist conception" (Foucault, 2003, 13). Marx, while discussing the role of the use of machinery in the capitalist mode of production, gives pride of place to empirical description of the deployment of the steam engine and its pivotal position in the development of the productive forces (Marx, 1976, 594–603). As Foucault notes, "it must be recognized that, compared with the mining industries, the emerging chemical industries or methods of national accountancy, compared with the blast furnaces or the steam engine, panopticism has received little attention (…) But it would be unjust to compare the disciplinary techniques with such inventions as the steam engine or Amici's microscope. They are much less, and yet, in a way, they are much more" (1977, 224, 225). It is clear that the panopticon is less, since it is an architectural design that never was in fact constructed in the form Bentham envisaged. The way in which it is more is contained in its paradigmatic character. One manner to juxtapose of Foucault's analysis, over and against for example empirical postphenomenology, is as follows: a popular example in philosophy of technology is Verbeek's (2011) analysis of ultrasound in terms of how it mediates human-technology relations, i.e., how the ultrasound transforms the relation a father has to an unborn child, or how it objectifies the mother: this example can be seen as a paradigm to repeat in the Kuhnian sense (as normal science) but differs from Foucault's analysis in terms of *paradigmatic methodology* and the exhibition of analogical relation.

The panopticon is a "machine," a "diagram," and "a way of defining power relations in terms of the everyday functioning of men" (Foucault, 1977, 205). At the very end of the chapter on panopticism Foucault ponders: "Is it surprising that prisons resemble factories, schools, barracks, hospitals, which all resemble prisons?" (Foucault, 1977, 228).[17] It would of course be wrong to claim that the panopticon historically, in a literal sense, exercised influence over the architectural design of schools, hospitals, factories and barracks. Rather, the use of the panopticon is methodological: as an abstract paradigmatic machine, it not only draws attention to pre-existing similarities among them on an "ontic" level, as it were, but *constitutes* their homogeneity as an *ensemble* at the "ontological" (i.e. the manner the world and beings come in-to-presence) level (Agamben, 2009, 18; see also De la Durantaye, 2009, 224). In short, there are *analogical relations* between prisons, schools, hospitals, and suchlike in the manner in which they produce subjects, captured in the two functions of the pantopticon, aimed at placing subjects under constant surveillance so as to achieve docility and operating as a laboratory in order to attain knowledge about them. The panopticon thus stands for a whole variety of machines that characterize the disciplinary

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[17] The full title of Bentham's book, indeed, is *Panopticon, or the Inspection House: containing the idea of a new principle of construction applicable to any sort of establishment, in which persons of any description are to be kept under inspection; and in particular to Penitentiary Houses, Prisons, Houses of Industry, Work-houses, Poor-houses, manufactories, hospitals, mad-houses, and schools: with a Plan of Management adapted to the principle: in a series of letters, written in the year 1787, from Chrecheff in White Russia, to a friend in England* (Bentham, 1995, 29).

universe of the welfare state: the Machine-prison, the Machine-school, the Machine-hospital, etc. (cf. Deleuze, 1988, 34).

5 Paradigm as Method: Agamben and the Camp

Agamben's notions of example/exclusive inclusion/paradigm (1993, 9–12; 1998, 21–29; 2009, 9–32)[18] systematize Wittgenstein's loose remarks on the functioning of the grammar of language and generalize Foucault's[19] use of paradigms as a method for seeing and exhibiting analogies—or, widen the application for a paradigmatology that "methodologizes" what is first an ontological insight; similar to Heidegger's contention that ontology can only take place through phenomenology (method) (Heidegger, 1962, 61), or, indeed, that they are one and the same, Agamben takes the curious ontological structure of the paradigm and transforms it into method. But also akin to Adorno's (1982) implication that method in the human sciences is inevitably *violent* by molding the world according to its categories,[20] thus covering over the unique and singular, the paradigmatic method, is equally a non-method, an *against methodology*. Our understanding by means of paradigms is a way of escaping this violence, of seeing, thinking, and understanding outside of pre-established frameworks and concepts.

The word "paradigm" has the sense of modelling. Biologists make use of model organisms, such as the Drosophila (fruit fly) and Arabidopsis Thaliana (rockcress) as "both a means to and as a source of knowledge" (Morgan & Morisson, 1999, 35), where the aim is to integrate a diverse body of knowledge of a single organism (type) into a unique body of knowledge (as an end) in the belief that this knowledge is *representative* of the functioning of other (similar type) organisms. Gramsci (1971, 277–320) studied the mode of production and consumption of Henry Ford's car factories as the model for hegemonic American capitalism, coined "Fordism." The word "paradigm" also has the sense of a pattern, a recurring feature. This is well known in the philosophy of technology through the work of Albert Borgmann (1984), whose neo-Heideggerian analysis discerns a pattern running through modern techno-commodities in which most modern techno-commodities disengage their users, dubbed the "device-paradigm." For example, a micro-wave delivers food ready-to-go, whereas a fireplace compels people to actively take care of it, as a so-called focal pratice.

Agamben, however, draws attention to the Greek etymology of the word paradigm, composed of *para* (alongside) and *deiknumai* (to show) (1993, 9; 1998, 22; 2009, 24). A *para-digm* thus shows something alongside, in the manner in which parables and allegories illustrate a point—which can still be heard in the German word "*Bei-spiel*" (Agamben, 1993, 9). What a paradigm *shows alongside* is "both its own intelligibility and that of the class it constitutes" (Agamben, 2009, 24). This is indeed the same structure we saw earlier in Wittgenstein: there is a difference between an example *of* something (a typical example)

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[18] Agamben uses "paradigm" and "example" interchangeably: colloquially, one is inclined to say that all paradigms are example, but not all examples are paradigms. In this section we follow Agamben's use, and regard it mostly as a terminological issue.

[19] For a good overview of Agamben's controversial use of Foucauldian concepts, see Snoek (2010).

[20] One can argue that positivism shares this critique but doesn't take it to its extreme, since it still imposes *the form* on the world that it consists of *facts*.

and an example *as* example (exemplar, paradigm), just as the standard meter rule renders intelligible what a meter *is* and simultaneously constitutes a group of measurable things.

For Agamben, the notion of typical example is illustrative of how we experience our experience of language—our being linguistic beings—*through* language. For example, the word "tree" refers to trees in general and allows us to make general statements about trees. While taking a stroll, I can remark that I took a picture of this tree yesterday and receive the response "You mean this tree *here*, or a tree of this *kind*?" (i.e., which meaning of "tree" does the "this" refer to?). In short, language structures our experience into dichotomies of particular/universal, part/whole.

From a systematic point of view, the two major forms in which we acquire knowledge of the world emerge out of one or the other pole of these dichotomies. *Induction* consists in finding regularities in the world by means of the enumeration of particular *statements* so as to arrive at a general statement. Famously, David Hume (1978, 86–94) challenged the justificatory grounds of induction, its being a *logic stricto* sensu, by declaring it to be no more than a habit of the human mind, imposing causality on a set of heterogeneous experiences. Carnap would place induction in the context of relations between sentences, arguing that Hume's problem concerned *universal inference* (1950, 207) and that the object proper of induction is the inference of probabilities. Nevertheless, it is clear that induction aims at stating generalities in the form of a rule. *Deduction* functions in logic in the formal sense, such as in Aristotelian categorical logic, modern propositional logic, or nth-order predicate logic. *Natural deduction*, for example, is based on a set of rules of inference (of introduction and elimination) which serve as the basis upon which hypotheses can be postulated and inferences made. The best-known expressions of deductive reasoning are the syllogism (All men are mortal/Socrates is a man/Therefore, Socrates is mortal) and *modus ponens* (If it rains, then the sidewalk gets wet/It rains/Therefore the sidewalk is wet).

Practitioners of science can go about their business well in the absence of explicit rules—or, more strongly, as Thomas Kuhn (1962, 44) observed, "the existence of a paradigm need not even imply that any full set of rules exist," likening paradigmatic understanding to Wittgenstein's (1953, 27–28) notion of family resemblances (that such concepts as "game" cannot be defined in terms of necessary and sufficient conditions, but are formed by a network of crisscross similarities among members of a class). For Agamben, paradigmatic understanding consists of freeing *singularity* "from the false dilemma that obliges knowledge to choose between the ineffability of the individual and the intelligibility of the universal" (1993, 1)—from the canon of rules—by performing a double deactivation of its empirical givenness.[21] The clearest case of such deactivation is when one teaches someone, for example, what a performative *is* by exclaiming the words "I hereby name this ship the Pacific Princess"; my very uttering of these words does *not* function as a performative but suspends its performativity by standing as an example for the class of performative utterances. Example/paradigm is thus an "exclusive inclusion" (Agamben, 1998, 21). It not only suspends its normal usage by exhibiting its exemplarity, but, by this very act, it stands, so to speak, next to, or outside of, the class it is the paradigm of. A paradigm is both excluded (as paradigm) and included, insofar as its exclusion shows that it belongs to the class it constitutes, it is apart and *a* part: "It is thus impossible to clearly separate an example's

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[21] The deactivation of empirical givenness also animates Husserl's (2014) phenomenology in the form of the phenomenological reduction, which "brackets" the empirical existence of intentional objects so as to attain the proper phenomena of intentional consciousness.

paradigmatic character—its standing for all cases—from the fact that it is one case among others" (Agamben, 2009, 20).

The mirror image of the paradigm is indeed that of the exception.[22] It is the "inclusive exclusion" (ibid.), which, as exception, does not belong to the class it is the exception of, an exclusion that can only be exhibited within that very class (through inclusion). To the extent that an example is *exceptional* and an exception is *exemplary* the two concepts are correlative and only distinguishable in terms of emphasis. Agamben's most notorious technical paradigm is that of the concentration camp (Agamben, 1998, 20, 119–188; 2002, passim): whereas Foucault's prison-paradigm remains caught within the sphere where juridical sovereignty holds sway, the camp is for Agamben is the place where fact and law become indistinguishable; characteristic of our current epoch, he argues, is the state of exception, where the suspension of the norm (law) becomes the norm (fact).

In the fairly simple case of linguistics, a paradigm can stand for the rule of the class it stands for, but Agamben (2009, 21) is interested in cases where "the impossibility of the rule" is implied. The clearest case of such impossibility is aesthetic judgement, for example, when I stand in front of a tree and utter the words: "*This* is beauty!".

> The rule (if it is still possible to speak of rules here) is not a generality preexisting the singular cases and applicable to them, nor is it something resulting from the exhaustive enumeration of specific cases. Instead, it is the exhibition alone of the paradigmatic case that constitutes a rule, which as such cannot be applied or stated. (ibid.)

Grasping the knowability of paradigms "implies the total abandonment of the particular-general couple as the model of logical inference" (ibid.). Over and against classical either/or logic and its law of the excluded middle (it rains or it does not), the logic of the paradigm is one of neither/nor. Drawing upon the work of Aristotle and Melandri, Agamben defines the logic of the paradigm as one of *analogy*—defined by Hegel as identity in difference (in a sense, the mirror image of Wittgenstein's family resemblance, a difference in identity). This is a logic that does not move from the universal to the particular (as in deduction), or from the particular to universal (as in induction), but rather from the singular to the singular (2009, 19, 28). This logic, however, is no longer a logic in the strict sense, but a manner in which our seeing and understanding are engaged. As Wittgenstein (1953, 165, emphasis in original) had already pointed out, there are.

> [t]wo uses of the word "see". The one: "What do you see there?"—"I see *this*" (and then a description, a drawing, copy). The other: "I see a likeness between these two faces"—let the man I tell this to be seeing the faces as clearly as I do myself. The importance of this is the difference of category between the two 'objects' of sight.

In the former case, one files a phenomenon under a general category (a bird, a human, a mammal), whereas in the latter, two phenomena, perhaps seemingly disjunctive even, are placed in a relation of kinship to each other, which is nevertheless not a kinship in terms of genus and species, but something pertaining to the manner in which one wants to engage the seeing of one's interlocutor.

Becker, writing in the context of social scientific research, develops the notion of *reasoning from analogy*, "treating one case you know well as a model that will explain what you don't understand about another one, or at least point you in the right direction, and

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[22] Again, there is a similarity with Kuhn: an *anomaly* is an exceptional case that normal science cannot account for.

put you on the road to discover a general mechanism common both" (2014, 65). Suppose, for example, that one is interested in the phenomenon of how power-relations within pop bands shift, and is quite familiar with the manner in which Mick Jagger ousted Brian Jones as the leader of the Rolling Stones (Jones' drug use, "wrong friends," apathy, waning compositional skills and the presence of an ambitious lieutenant waiting to take over). Then, when one tries to understand how power-relations within the Beatles shifted (from Lennon towards McCartney), the case of the Rolling Stones does not offer you full certainty, but a sharp eye regarding what to look for (drug use, apathy, etc.).

Moreover, reasoning by analogy may also shed light on phenomena that at face value do not belong to the same group. In a manner similar to Foucault, Becker argues that, in their mechanism and effects, schools can resemble prisons, and prisons can resemble schools (ibid., 49–50). To the extent that the analogy works, the grouping is made (here, for example, the analogy groups as common the functioning of state institutions, as opposed to the different functions of educating children, punishing offenders, etc.). Exhibiting analogical relations among paradigms and singularities is a manner in which new, homogenous groupings (or ensembles) can arise, without, however, trying to *fit* these singularities in new, rigidly, reified categories or frameworks (Meskin & Shapiro, 2015).

The importance of paradigms' going from singularity to singularity lies in the fact that they never leave singularity, they never become (just) a part, or example, of a pre-constituted prior whole. Above all, paradigms are singularities that try to make intelligible a historical problematic context, exhibiting kinships between prima facie distinct phenomena. Alluding to Heidegger, Agamben even goes so far as to relate paradigms to *being* (Agamben, 2009, 32; see also Campbell, 2011, 45).

6 Between an Empirical Philosophy of Technology and Philosophical Thinking About Technology from Examples

In this essay we sketched a phenomenology of the manner in which examples can be used and its relevance for philosophical thinking about technology, or, more particularly, that the question concerning the debate about the transcendental vs. the empirical in "philosophy of technology" is to an extent a question concerning the epistemological and methodological status of examples. While the 'empirical turn' in philosophy of technology does not represent a monolithic block and is marked by internal opposing methodologies such as post-phenomenology, critical theory, and more rigid science and technology studies, and is to a certain extent characterized by what it is *against* (transcendentalism) than that it shares one unifying methodological assumption, the kind of questions it raises are of a particular kind, namely the relating of philosophical abstraction to concrete case study.

We have tried to explore how the distinctions between abstract/concrete are more problematic than is usually presumed in philosophy of technology and that, at least in the case of paradigms such as the standard metre, panopticon, and concentration camp, can collapse; what this means for philosophy of technology is that distinctions between "abstract" classical theory and "concrete" contemporary theory are more problematic than they appear at face value, indeed, that their very problematization is a core issue to bring the inchoate field further. Nevertheless, our aim here is to set a research agenda that tackles philosophical issues concerning technology with a difference of emphasis than most empirical theory does without wishing to set the philosophical clock back to Heideggerianism. What we believe is that what this affords is twofold: the notion of *paradigm* allows use to

look for and recognize *the source* that lies at the basis of our technological life-world. Put differently: contemporary philosophy of technology has focused much on epoch-defining technologies such as smartphones or medical devices, but to a lesser extent on the paradigms that form the basis for information technology as such (e.g., a Turing Machine, in a sense the standard metre of computationalism), or the Arabidopsis plant in biology. But also, a *shift* in paradigms (from the standard metre to lightspeed) is another underdeveloped topic philosophy of technology can tackle in the future. Second, the related notion of *analogy* raises questions as to how we can recognize similarities and symmetries, perhaps come to novel categorizations, and map new relations between distinct fields of technological development (e.g. agricultural technology and IT) without reducing them to abstract concepts such as enframing.

During a certain passage in *Being and Time*, Heidegger cryptically remarks that it is not a matter of avoiding the hermeneutic circle, but of entering it in the right manner. In *The Question Concerning Technology*, he laments how modern technology has lost its poetic origins. Taking these together, might we not wonder whether today's task in philosophical thinking about technology is to retrieve the poetics of the example?

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