New Waves in Philosophy of Technology, edited by Jan Kyrre Berg Olsen, Evan Selinger, and Søren Riis, London: Palgrave Macmillan, 2009.

Abstract
This review-essay examines the multi-author collection *New Waves in Philosophy of Technology*. Particular attention is given to the difference between Marx's and Heidegger's philosophies of technology. The differential impact of Marx and Heidegger on the essays in the collection is assessed, with some implications drawn about the theoretical background of the philosophy of technology as a whole.

Keywords
technology, philosophy of technology, Marx, Heidegger, media- and communications-studies, phenomenology, humanism, posthumanity, Marxist feminism, automation, class-struggle, alienation, Marcuse, Habermas, globalisation.

Don Ihde, in the foreword to this volume, writes that Heidegger, albeit 'a highly revisionist Heidegger', is 'the remaining spectre' in the new waves of philosophy of technology (p. xii). When we turn to the essays themselves, we find that only five of the fifteen essays, in which count we have included the Foreword and the Introduction, do not mention Heidegger explicitly. Even this count could be challenged: two of the five essays that are free of this veritable Heideggerian enframing cite the work of Don Ihde, who draws heavily on the Heideggerian conceptual apparatus in his own work.

Given this, the intellectual historian and the historian of philosophy, to say nothing of the historical materialist, must ask: why does it continue to be Heidegger, and not Marx, who haunts philosophy of technology? What impact have the syntheses of Marx and Heidegger's thought on technology, most notably Marcuse and the early Habermas, had on thought about technology? And is the Heideggerian techno-hauntology true of all fields in which the impact of technology on social relations is a defining element, such as media- and communication-studies, or is the preference for Heidegger over Marx most prominent in the discipline of philosophy?

Marx is certainly present within the analysis of media-technology. Media-Marxists, such as Robert W. McChesney and Todd Gitlin, claim that the mass-media of a capitalist society is manipulated by dominant classes, producing and distributing hegemonic values conducive to capitalist interests. Alongside this, alternative media such as the internet have both hegemonic and counter-hegemonic, participatory dimensions that can be deployed as revolutionary tools. Jinsun Lee's citation of McChesney and Gitlin's work indicates that it is possible 'to liberate communication technology for popular use'.[1] In communications-studies, Heidegger has begun to have a presence, particularly via the hermeneutic tradition of examining rhetoric, but has had little direct influence on empirically-based studies of communication-technologies. Marx remains a much more prominent figure in the field. Why then, when Marx had an impact upon discussions of media-technologies so directly, has he not also haunted the philosophy of technology, in general?

We will return to these questions at some length at the close of this essay, after a more careful sketch of the contents of the *New Waves in Philosophy of Technology*.

1. Lee 2007, p. 6.

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Let us begin with those essays from the volume influenced, in some way, by Heidegger. To be sure, the essays in the collection do not draw on Heidegger uniformly, uncritically, or in the same way. Due to this, Ihde is right to claim that the Heidegger who emerges as the spectre of the collection is a highly revisionist Heidegger.

Ihde could have gone still further with this claim, since the Heidegger of *New Waves in Philosophy of Technology* is not only a revisionist Heidegger, but also an excellent, sophisticated and meticulously-researched Heidegger. More than one of the essays drawing heavily on Heidegger, and those of Søren Riis and Iain Thomson in particular, link the Heideggerian meditation on technology in the famous 'The Question Concerning Technology' to all of Heidegger's later work, contextualising this meditation in light of works such as the 'Origin of the Work of Art' and the 'Beiträge zur Philosophie (Vom Ereignis)'.

Furthermore, in the essays from the volume that do draw on Heidegger, Heidegger's thought about technology is not limited to what he says in 'The Question Concerning Technology' and the later works, but draws upon he says in his earlier work, including *Being and Time*. There, Heidegger offers a materialist inversion that relates the movements in scientific thought to changed technological possibilities. As Heidegger writes in *Being and Time*, in a passage that has been far less examined than his more summary treatment of technology in 'The Question Concerning Technology',

> reading off the measurements that result from an experiment often requires a complicated 'technological' set-up for the experimental arrangement. Observing with the microscope is dependent upon the production of 'prepared slides'. Archaeological excavation that precedes any interpretation of the 'findings' demands the most massive manual labour. But even the most 'abstract' working out of problems and refining what has been gained, uses, for example, writing materials. As 'uninteresting' and 'obvious' as these components of scientific investigation may be, they are by no means ontologically indifferent. The explicit reference to the fact that scientific behaviour as a way of being-in-the-world is not only a 'purely intellectual activity' might seem unnecessarily complicated and superfluous. If only it did not become clear from this triviality that it is by no means obvious where the ontological boundary between 'theoretical' and 'atheoretical' behaviour really lies.[2]

Efforts to contextualise Heidegger by linking his earlier and later thought on technology to his more summary work in 'The Question Concerning Technology' not only allows us to understand Heidegger and his thought about technology better. It also allows us to understand why the philosophy of science cannot operate in a pristine vacuum that excludes insights from the philosophy of technology.

Nearly every thinker in the volume is committed to the intimacies of science and technology, if not the stronger point of a causal relationship that looks at technological change as the more fundamental phenomenon and scientific theorising as a kind of epiphenomenon. This is an important point for historical materialism, whose tendency,

2. Heidegger 1996, p. 328.

following both Marx and Heidegger, should be to regard technology as the materialist element of science and to regard science itself as an historical and material practice.

In *New Waves in Philosophy of Technology*, alongside celebratory treatments of Heidegger's thought, there are also essays that treat Heidegger or his insights at some length as a vehicle for setting to the side this figure and the norms he has imposed on the philosophy of technology. While the essays of Riis and Thomson deepen our understanding of Heidegger and his thought, the essays of Graham Harman and Evan Selinger attempt an exorcism. Harman writes that Heidegger's account of technology is 'sadly monotonous' and that he is 'horribly overrated as a philosopher of technology' (p. 112), while Selinger extends this point to claim that in important instances, evocations of Heidegger in the philosophy of technology 'diminish, rather than enhance, analysis' (p. 273).

We will try to deepen this line of argument at the end of this review-essay, when we return to Marx's distinctive contributions to the philosophy of technology and show the influence of these contributions on the two final essays of the volume: Selinger's discussion of microcredit and Casper Bruun Jensen and Christopher Gad's discussion of the different historical eras of navigational technologies that are present aboard a single ship. Marx's echoes can also be seen in Peter-Paul Verbeek's essay, though here these insights are filtered through the figures of Bruno Latour[3] and Michel Foucault,[4] rather than directly attributed to Marx. Finally, Marx's insight that technology is political is heartily endorsed and deepened in the work of David M. Kaplan.

To be sure, there are other intellectual affinities in the volume besides Heidegger and Marx, though nearly all of these remain influenced by phenomenology – or, in the words of contributor Robert Rosenberger, post-phenomenology – broadly construed. Lest they receive short shrift, this review will also mention those essays that draw on Heidegger not positively or negatively, but only incidentally.

Among the essays influenced by extra-Heideggerian phenomenology or post-phenomenology are the contributions of Jan Kyle Berg Olsen, Benjamin Hale, Peter-Paul Verbeek, Philip Brey and Nick Bostrom. Olsen's historical meditation on entropy and temporality draws on Edmund Husserl in order to sketch the relationships that develop between internal time-consciousness and more objective, natural, or technological measures of time. Hale's argument that technological artefacts are not ethically considerable draws on the later Jürgen Habermas's interesting blend of phenomenology with Anglo-American philosophy of language. Verbeek offers a direct and convincing counter-argument to Hale's position, asking readers to consider that technological objects might be ethically considerable. This argument is imbedded in Verbeek's critique of Enlightenment-humanism, a humanism that posits a very particular and strong but ultimately ideological split between subject and object. The status of humanism is also a flash-point in the comparison of Marx and Heidegger's philosophies, a theme to which we will return.

Verbeek's position is ultimately stronger than Hale's, since Hale relies on the notion that human intentionality is imbedded in technological objects. Hale claims that technological objects are used for the same purposes and in the same ways as their original designer intentionally projects. On the contrary, histories of technologies often reveal that

3. Latour 1993.
4. Foucault 1990/2.

technological artefacts are an amalgamation of accident, cross-fertilisation, considerations of materials and nature, and reapplication beyond the intents of the creator. To use a simple example, and one that Marx meditates on in the *Grundrisse* and again in *Capital*: the Jacquard loom, a French technology designed for weaving patterns into rugs, was later transformed by Charles Babbage into a machine for calculation.

While Hale does consider the objection that technological objects exceed the intentionality of their creators (pp. 228–9), his answer is not satisfactory, since he argues that re-application beyond these intents reverts the object in question to the domain of nature. Hale also mobilises somewhat naïve notions of intentionality and nature. He does not consider that the intentionality that creates the technological artefact may be multiple or that it may go on 'behind the backs' of the human creator or creators, channelling implicit and explicit social, political, and economic norms into the lived realities of objects.

Andrew Feenberg's work offers a very powerful example of this phenomenon. Some machines from the Industrial Revolution were designed to accommodate only the bodies of children.[5] Subsequently, arguments were made that only children could work on the machines thus designed, since only their bodies were on the level the machines required. In a sense, this shows that the machines had reverted, in Hale's terms, to become part of nature in the sense of a built and fixed world that offers itself as an unquestioned ground. But, here, the notion of 'nature' must be placed in brackets, because it too becomes shot through with social and political relations, as Marx argued. Once this consideration is added, one is pushed not towards Hale's conclusion but towards Verbeek's: technological artefacts do in fact themselves embody dimensions that ethical theory ought to address.

Brey and Bostrom pick up on a theme that Verbeek also turns to late in his essay: the idea of posthumanity. Brey draws on Habermas's later work, Francis Fukuyama, and Donna Haraway in order to argue about some potential ethical pitfalls that may plague the condition of posthumanity.[6] Most important for thinkers in the Marxian and Marxist traditions may be the prospect of a new class-system that springs up between humans who receive certain enhancements and alterations and those who do not. Bostrom's more abstract consideration of the future of humanity posits posthumanity as a possible future alongside other possible patterns for the human species, patterns such as extinction, cyclical recurrent collapse, and plateau-states.

Among the contributions in which Heidegger is incidental rather than central are the essays of Keekok Lee, Robert Rosenberger, David M. Kaplan and Graham Harman. Lee's philosophically dense article argues forcefully for the theme we have already seen in both Heidegger and Marx: a synchronicity between the history of technology and the history of scientific theory. According to Lee, this synchronicity has intensified in the post-1850 period, and technology, rather than scientific theory, has taken the lead.

Rosenberger's essay, which deals with the hermeneutics of imaging technologies in neurobiology, also draws on the Heideggerian and Marxist notion of a materialist inversion. However, beyond this theoretical framing, Rosenberger's essay exhibits the kind of empirical consideration of an actual technology that will be so powerful in the Marx-influenced essays that we will discuss towards the end of this review. Rosenberger shows

5. Feenberg 1999, pp. 86–7.
6. Habermas 2003, Fukuyama 2002, and Haraway 1991.

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how images produced by technologies are multivalent and subject to multiple stable theoretical interpretations. In order to be encapsulated in an image, an ongoing process must be frozen at a particular instant. This can become the source of debate about what the thus-frozen image actually shows, as it is in the neurobiological case Rosenberger describes. However, the parameters of the imaging technologies themselves tightly circumscribe the domain of possible hermeneutic variations in interpreting the resulting frozen images. Because of this, the images and the ways of interpreting them are, in Rosenberger's words, 'deeply imbedded within the nuances of the specific technologies that make the visualisation of the phenomena at issue possible' (p. 75). Such considerations include the fact that certain phenomena are visualised at all rather than retaining a non-visual status, an issue that has become prominent for feminists and others over the last fifty years in the context of the abortion debate.

Kaplan's essay offers some very effective summary-lists that simplify the terrain of the philosophy of technology. For this reason, it would be an excellent essay for the beginner in the field to read first. Kaplan's lists include a map of how prominent philosophers of technology frame the relationship between the social and the technical (pp. 84–5); a list of culturally dominant technological narratives (p. 89); a list of conventional readings of technology (p. 91); a list of strategies for enabling more critical readings of technology (p. 92); and a list of contemporary films and books that have effectively deployed these strategies, including *Who Killed the Electric Car*,[7] *Fast Food Nation*,[8] and *The Travels of a T-Shirt in the Global Economy*.[9]

Among the critical strategies Kaplan suggests are many already dear to historical materialists, including 'uncovering overlooked or forgotten victims' (p. 92); 'showing how seeming universals are in fact historical' (ibid.); and, in general, showing how technologies are not natural and universal artefacts but political and social ones. Since conventional views of technology-development exclude political considerations by definition and by long habit, Kaplan correctly observes that '[a]nyone who engages in the politics of technology has already stepped out of the conventional view, regardless of one's political convictions' (p. 91).

Harman's contribution is unique to the volume and perhaps to the field of philosophy because it takes a serious look at the famous work of Marshall McLuhan and his son Eric, figures whose texts have rarely been investigated carefully in this way within the discipline of philosophy, even as these theories have been examined and used to a much greater degree in media- and communications-studies and related fields. In particular, Harman looks at four concepts outlined by the McLuhans: enhancement, which 'extends or amplifies some organ or capacity of the user' (p. 109); obsolescence, in which various media are retired; retrieval, in which 'every medium has an older medium [or aspects of an older medium] as its content' (p. 112); and reversal, in which particular media are used in new ways that exceed or even reverse expected uses. Harman argues that the four concepts of enhancement, obsolescence, retrieval and reversal apply not only to technological artefacts but can serve as guides for a metaphysics of nearly all objects.

7. Sony Pictures Classics 2006.
8. Schlosser 2001.
9. Rivoli 2006.

To summarise, the volume *New Waves in Philosophy of Technology* is notable for this set of remarkably diverse contributions. To the editors' credit, the authors' diversity of theme is reflected in the diversity of their training, institutional affiliation, and national location.

Parts I and II of the book are dedicated, respectively, to historical and epistemic/metaphysical treatments of technology. Part III of the book is dedicated to ethical and political issues. The posthumanist discussions and the Hale/Verbeek debate that we sketched above are in Part III, and this sub-section is the freest from the Heideggerian spectre. Part IV of the book, dedicated to comparative treatments of technology, is easily the most critical of Heidegger, favouring empirical examples and some tools garnered from Marx and Marxist feminism, including actor-network theory. This is unsurprising given Heidegger's own allergy to the ethical, political, and empirical in favour of the ontological, metaphysical, and speculative.

With this, let us return to the theme with which we opened the essay: namely, the relative prominence of Heidegger and Marx within the philosophy of technology. To be sure, Heidegger lingers as the more prominent figure in part because of the tradition that has grown up around him. But is that not simply to beg the question: why has that tradition grown up around this figure? And why has it not grown up around Marx's very rich thinking about technology? Particularly, why has it not grown up around a Marx who, in his thinking about technology, has all of the analytical tools offered by Heidegger, plus an explanation for Heidegger's own thought? Let us substantiate these claims.

As is well known, Heidegger's central most parsed and most celebrated insight about technology derives from his short essay 'The Question Concerning Technology'. He argues there that technology's essence is to turn everything into a resource for something else. This essence enables us to see the world as having no solid, primary, substantive goods of value apart from how they can be deployed. Heidegger calls this the tendency of technology to 'enframe' resources. He claims that modernity turns everything into a 'standing reserve' with only instrumental value: as technology gains hold, this instrumentalisation escalates. Heidegger then charts a 'saving power' of technology that occurs through the realisation that this system is unsustainable.

But has Marx not already offered us this critique in his sweeping indictment of the subjugation of use-value to exchange-value, and in the increasing tendency of the capitalist mode of production to effect this subjugation, since as capitalism develops, so does the tyranny of exchange-value? Has Marx not already offered us a vision of the 'saving power' in the form of his discussion of alienated life forms that, driven to the breaking point, spill over into revolution? Prior to Heidegger, Marx put forward the materialist idea that the scientific possibilities of a culture would be reliant on technological infrastructure rather than vice versa.

Marx was led to these ideas by his consideration of class-struggle and, in particular, by his discovery that technology is a site where class-struggle can become particularly fraught. For this reason, Marx – and, following him, theorists of automation such as Georges Friedmann and Raniero Panzieri[10] – begin to pay particular attention to the political dimensions and implications of technological infrastructures. Friedmann, for example, develops Marx's critique of the alienating aspects of nineteenth-century factory-labour into a detailed history of twentieth-century automation. Freidmann offers the insight that

10. Friedmann 1955 and Panzieri 1980.

capitalism does not always develop technology, as is sometimes presupposed by philosophers of technology, but also hinders its development in sites where changes might improve conditions of comfort or safety for workers. This fettering of development – Friedmann calls it the 'hidebound' aspect of certain industries – occurs even when instituting conditions of greater comfort and safety would ultimately also increase profit margins.[11]

Also developing Marx's theory of technology using the lens of class-struggle, Panzieri argues that technologies developed under capitalism embody not the abstract rationality of rendering a system of production more efficient, as is often presupposed, but direct political mechanisms for the consolidation and control of capitalist power. Panzieri thus gestures both to a notion of rationality that is not co-extensive with capitalism and to a different, socialist use of machines.

Marx's theories and the theories of those who follow him are both historically prior to Heidegger's and offer many similar powerful critiques, as the early Herbert Marcuse noted best. However, Marx's thought about technology is superior to Heidegger's because it offers us one additional crucial theoretical tool. Marx does not consider technology as having an essence. Using the lens of class-struggle, Marx explains how the instrumental essence of technology is brought about by its immersion in the capitalist mode of production. In the *Grundrisse*, Marx imagines a use of technology outside of the instrumentalist capitalist confines in which the constant increase of exchange-value is the bottom-line. However negative about technology Marx's account from *Capital* may seem, readers must understand that this account is itself bracketed by the understanding that Marx is talking about technology as it is deployed not in any possible mode of production, but the capitalist mode of production specifically.[12]

Technology does not enframe resources and turn everything into a standing-reserve because of its essence, but because of an historical and political process. We can thus understand Heidegger to have documented not the essence of technology as such, but rather, the essence of capitalist technology.

Marx also shows that it is in the interests of capital for us to understand historical and political processes as natural and inevitable. So long as we understand enframing to be the essence of technology, rather than the essence of technology as it occurs in the capitalist mode of production, we collude with this mode of production by making its historicity disappear. This collusion is the mark of Heidegger's inattention to social and political philosophy, dialectical thought, and politicised epistemologies in favour of ontology, metaphysics, and more traditional epistemological strategies.

Just as technology does not have an essence for Marx, so the human being does not have an essence either, at least in the traditional sense in which the term 'essence' is understood by philosophers. In his account of human beings, Marx is much closer to Aristotle's notion of a 'second nature' that is developed in historical circumstances than he is to the philosophical notion of a human essence, a notion that, by definition, excludes the accidents of history and circumstance. This is why, for Marx, the lives of working-class humans can be alienated and stunted by abhorrent labour-conditions.

11. Friedmann 1955, pp. 173–90.
12. Wendling 2009, pp. 1–11.

In his 'Letter on Humanism', Heidegger famously accuses Marx – along with everyone else except himself and perhaps certain Greek thinkers – of being bound to a traditional humanism shared with Christianity and all of Western philosophy. Heidegger then claims that all such humanism carries metaphysical assumptions along with it, either explicitly or implicitly. Not only is this sweeping set of accusations a flattening out of the many important differences among modern thinkers, it is also wrong in a more specific way in Marx's case. Let us grant, for argument's sake, Heidegger's accusation that Marx is a humanist. Even still, Heidegger would be wrong to suggest that Marx's humanism was grounded in a traditional metaphysics or a non-historical determination of the essence of man.[13]

One additional way to understand the margins of similarity and difference between Marx's and Heidegger's thought about technology comes when we consider the Heidegger-Marx syntheses that we find in Marcuse and the early Habermas. These syntheses are revealing, particularly because both Marcuse and the early Habermas, having worked through both Marx's and Heidegger's theories carefully, ultimately indicate a preference for Marx over against Heidegger. Unsurprisingly, this preference emerges from already-familiar theoretical considerations.

Some of Marcuse's thought on technology, especially *One Dimensional Man*, first published in 1964, seems to remains closer to Heidegger's sense of the technological enframing, and has certainly been read as such. But even in *One Dimensional Man*, Marcuse is never without a sense that this enframing is due to capitalism, a Marxian insight that he acknowledges explicitly. When we look beyond *One Dimensional Man* into both Marcuse's earlier and later work, this becomes clearer.

Ten years earlier, in 1955's *Eros and Civilization*, Marcuse retains Marx's utopian view that technology could produce the material wealth needed to found a liberated society. Marcuse claims there that 'the excuse of scarcity, which has justified institutionalized repression since its inception, weakens as man's knowledge and control over nature enhances the means for fulfilling human needs with a minimum of toil'.[14]

Marcuse also explicitly recognises the political dangers of technophobic primitivism, and here it is not difficult to detect the criticism of the figure he had stopped mentioning: Martin Heidegger. In a recently translated text from his collected papers called 'Some Social Implications of Modern Technology', Marcuse writes:

> Technics hampers individual development only insofar as they are tied to a social apparatus that perpetuates scarcity, and this same apparatus has realized forces that may shatter the specialized historical form in which technics is utilized. For this reason, all programs of an anti-technological character, all propaganda for an anti-industrial revolution, serve only those who regard human needs as a by-product of the [current] utilization of technics. The energies of technics readily join forces with a terroristic technocracy [and, here, Marcuse footnotes the Nazi 'ideology of blood and soil and the glorification of the peasant [as] an integral part of the imperialistic mobilization of industry and labor']. [...] The philosophy of the simple life, the struggle against big cities and their culture

13. Heidegger 1977, pp. 225–6.
14. Marcuse 1966, p. 92.

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> frequently serves to teach men distrust of the potential instruments that could liberate them.[15]

Marcuse is very close, in this passage, to the Marx who criticises Luddite workers who are smashing machinery, targeting the Luddite inability to distinguish between the means of production, machines, and the mode in which these machines are being deployed. He is much closer to Marx here than he is to Heidegger's sweeping indictment of technology as a whole: in fact, he implicitly accuses Heidegger of taking the essence of technology as it is developed under capitalism for the essence of technology as such. He then shows how this elision enables an anti-modern ideology.

Ultimately, the Luddites and Heidegger suffer from the same inability to distinguish between the production of material wealth by machines and the system of value in which this use of machines is currently imprisoned: they lack of a concept of material wealth separate from value. Opposition to machinery is therefore a tempting but insidious form of false consciousness, a form of false consciousness that philosophies like Heidegger's can be used to abet and to extend. According to Marcuse, following Marx, when we smash machines, we go to work against material wealth, and thus against our own freedom from labour.

According to Ben Agger, Marcusian thought about technology thus includes the concept of 'a new science and technology' liberated from capitalist confines.[16] Marcuse develops this concept most fully in *An Essay on Liberation* (1969). In Marcuse's vision, new, socialist technologies not delimited to capitalist shaping would be accompanied by a new science and new forms of cognition. According to Agger, these new forms of cognition would be 'freed from positivist fact-fetishism and a dualist theory of knowledge'.[17] We might also add that these new forms of cognition would be freed from the split between speculative/theoretical and empirical/practical knowledge, a split that has plagued not only the philosophy of technology and Marxian thought, but Western epistemology as a whole.

Marcuse's notion of a new science and technology is helpful because it drew direct criticism, in 1968, from Habermas. It thus allows us to understand what the two thinkers share in addition to that which divides them, as direct points of contention nearly always describe an area where two thinkers share enough conceptual terrain to formulate an explicit dispute.

When Habermas criticises Marcuse, in 1968, for the idea of a new science and technology, it is on the grounds that this new science and technology is not possible. As Agger puts it, for Habermas, and particularly for the early Habermas of *Knowledge and Human Interests*, 'cognition is in principle oriented to the mastery of nature (society and the environment)'.[18] Agger thinks he detects a conservatism in Habermas here, a conservatism that ultimately points to 'un-Marxian' political reformism.[19]

15. Marcuse 1998, p. 63.
16. Agger 1976.
17. Agger 1976, p. 161.
18. Ibid.
19. Agger 1976, pp. 174–81.

This supposed Habermasian conservatism with regard to Marcuse's notion of a new science and technology takes us deep into the debates within critical theory about the nature of instrumental reason as a whole. These complex debates bear on the issue of the operation of reason in modernity, and they make up a terrain in which the question of technology is only a small part. We will only gesture to them here.

Whatever conservatism we may detect, however, in the early Habermas, is certainly not conservatism of the Heideggerian strain. In early encounters with both Heidegger and Marx, whatever his subsequent and numerous criticisms of Marx have been, Habermas indicated a clear propensity for Marx's thought. This is most evident in the early Habermas's choices of guiding figures to criticise and develop, since Marx is especially prominent. Moreover, in an interview, Habermas claims that his encounter with Marxist thought '[was the point that] philosophical and political things began to come together for the first time'.[20]

Conversely, Habermas's 1959 essay 'Martin Heidegger: The Great Influence', even as it acknowledges Heidegger's importance to systematic philosophical thought 'in the framework of the university'[21] remains a sweeping criticism of some of the mystification of the Heideggerian language, influence, philosophical abstraction, and, in Habermas's own words, 'mode of contact with reality'.[22] Interestingly, Habermas's 1959 essay also highlights Marcuse's early work comparing the insights of *Being and Time* to those found in Marx's thought.[23]

Habermas's early work on the issue of technology and, more broadly, on the interaction between Heidegger and Marx is both more voluminous and more ambiguous than we have been able to sketch here. We hope only to have given enough of a sampling that the interested reader will be able to follow out these threads on his or her own. We can, nonetheless, note a pronounced preference for Marx over Heidegger in both Marcuse and the early Habermas.

Let us use these insights to return to the essays that make up the *New Waves of Philosophy of Technology*. When we do so, we observe that those essays that draw on Marx instead of Heidegger tend to have absorbed the critical point, drawn from the history of class-struggles around technology, that technology does not have a singular essence. For this reason, these essays are especially strong. There is a practical outcome of this orientation. The essays take what Don Ihde, in the Foreword, calls an 'empirical turn' (p. x). Because of this turn, the essays do not speak of technology monolithically or as having a singular essence. Rather, they look at very particular technological objects, networks, systems, practices, or constellations in order to discover and uncover the epistemological, moral, and political complexities of how they operate.

Though Marx appears already in Ihde's Foreword, his ideas appear in Verbeek and Kaplan as discussed above, and the empirical turn can be observed in many of the volume's essays, Marx has the most direct influence on the collaborative essay by Casper Bruun Jensen and Christopher Gad and the single-author treatment of globalisation by Evan

20. Habermas 1986, p. 77.
21. Habermas 1983, p. 53.
22. Habermas 1983, p. 54.
23. Ibid.

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that those essays that draw on Marx
ical point, drawn from the history of
does not have a singular essence. For
ıere is a practical outcome of this
e Foreword, calls an 'empirical turn'
k of technology monolithically or as
ery particular technological objects,
order to discover and uncover the
how they operate.
ırd, his ideas appear in Verbeek and
n be observed in many of the volumes'
collaborative essay by Casper Bruun
r treatment of globalisation by Evan

Selinger. Together, the two essays make up Part IV of *New Waves in Philosophy of Technology*.

Early in the Jensen/Gad treatment of technology, they note their commitment to the empirical turn, writing that 'we do not know a priori what technologies must be like or what they can do' (p. 293). Jensen and Gad proceed from this fundamental methodological orientation, an approach that they call 'the radically de-essentialising approach to the question of what technology is and does' (p. 300). Jensen and Gad look at two specific technologies: the Zimbabwe bush-water pump and a fishery inspection-vessel. Jensen and Gad use these examples to show how technologies entering new environments are adapted for contextual use in a complex web of actors and agents that include both humans and non-humans. For example, the bacterium e coli is an agent in the complex network that develops around the water-pump in Zimbabwe. The differences in social class and nationality between pump-designers and pump-users are also part of this network. Jensen and Gad show that technologies thus considered in context exceed many of the philosophical categories ascribed to them from a more abstract perspective: they 'are neither autonomous nor fully determined by their users' (p. 298). Citing the work of feminist philosopher of actor-network theory Marilyn Strathern,[24] Jensen and Gad show that technologies 'create simultaneously more and less of both modernity and tradition' (p. 301).

Jensen and Gad thereby offer not only a criticism of some essential strains of the philosophy of technology, especially those we find in Heidegger, but a critique of the discipline of philosophy itself. Jensen and Gad explicitly target philosophy's 'craving for generality' (p. 299) and its hesitance to deal with 'the philosophically relevant concerns [that are] dealt with outside of university departments' (p. 297). As an example of the latter, Jensen and Gad suggest that the multiple navigational technologies from different generations that are aboard a single fishing vessel present a real, practical epistemological problem. It is not hard to recognise in the Jensen-Gad critique of philosophy an echo of the critique of philosophy mobilised so famously, and so many years before, by Marx.

Indeed, perhaps the *New Waves in Philosophy of Technology*'s location in the discipline of philosophy partly contributes to Heidegger's prominence in the essays over against Marx, who remains a figure that philosophy as a discipline has never fully embraced. When philosophy has embraced Marx, it has been in its more marginal historical and continental schools, and there only with hesitation. Sometimes Marx's philosophical value is attributed only to his early works, thereby eliminating the continuing philosophical content of his later works along with all of his substantive philosophy of technology.

Beginning with a deconstructive reading of how canonical databases such as the Philosopher's Index prioritise abstract topics such as 'ethics', 'metaphysics' and 'aesthetics' over more concrete issues such as 'globalisation', 'development ethics' and 'technology transfer', Selinger's essay also worries over whether philosophy as a discipline works 'to perpetuate the long-standing and unfortunate stereotype that philosophy is an esoteric and other-worldly enterprise' (p. 268). In his argument, Selinger acknowledges the influence of Marx directly (p. 281). He asks the properly Marxist question of whether what we perceive as moral values are not implicitly capitalist values (p. 285). Selinger applies this question, explicitly mobilising the method of analysing class-struggle around

24. Strathern 1996, pp. 37–52.

technology to describe the forms of subjectivity experienced by women who rent out time on mobile phones in Bangladesh. Selinger then uses his finding to criticise development-narratives that identify the time-renting practice as a straightforward way for Bangladeshi women to access economic and social power.

As a whole, the *New Waves in Philosophy of Technology* will be useful to the historical materialist who wishes to orient herself to the norms and fractures of the philosophy of technology, a discipline which has grown up enough to begin to have its own history.

Amy E. Wendling
Creighton University, Omaha, Nebraska
wendling@creighton.edu
Elizabeth M. Sokolowski
Creighton University, Omaha, Nebraska
elizabethsokolowski@creighton.edu

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