

# Sven Ove Hansson's contribution to Philosophy of Technology and Engineering<sup>1</sup>

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When I was asked by the organisers of this symposium to write something about the contribution of Sven Ove Hansson to Philosophy of Technology, I was not sure whether that was the label that I would have chosen myself to reflect Sven Ove's contribution to the field the organizers had in mind. So I asked the symposium organisers whether I could broaden to scope to philosophy of technology *and engineering*, not only because that would better fit my own background but also because I think that it is a label that has a better fit with Sven Ove's own approach or at least, does better justice, to Sven Ove's contribution.

But before elaborating Sven Ove's contribution to philosophy of technology and engineering, I will start with a historical account of how I was introduced to the work of Sven Ove and also how I came to know Sven Ove personally.

## **My introduction to the work of Sven Ove Hansson and the person Sven Ove**

I first came across Sven Ove's work when I was exploring the possibility of writing a PhD thesis at the philosophy section of Delft University of Technology. Originally trained as a civil engineer, I had just finished my second degree, which was philosophy. At that time, I still worked as a research engineer at the water research institute Deltares (then WL | DELFT HYDRAULICS), primarily on flood risks but also on hydraulic engineering more generally, and I was looking for a PhD position at the interface of engineering, technological risks and ethics. I had encountered some continental literature about the phenomenon of technology in my master programme, but I felt that this was not the direction that I wanted to go. So I was extremely happy when I came across Sven Ove's seminal paper about different senses of the word risk (Hansson, 2004b). It was one of the first philosophy papers in which I felt addressed both as an engineer and as a philosopher. I will not dwell on every paper or book authored by Sven Ove that I have read since then, but I just want to make clear that this paper already sparked an interest with me to meet Sven Ove. So when I finally got a position as PhD candidate and when I was encouraged to spend a couple of months abroad, it was not a difficult choice for me where I wanted to go: Sven Ove's group at the Royal Institute of Technology in Stockholm. I was happy that Sven Ove accepted my request and in February 2010, I arrived in Stockholm. My stay that semester in

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<sup>1</sup> This paper was presented at the symposium on the occasion of the retirement of Sven Ove Hansson. The symposium took place on 13-14 December 2019 at the Royal Institute of Technology in Stockholm, Sweden.

2010 led to a fruitful collaboration and several co-authored publications (Doorn, 2016; Doorn & Hansson, 2011, 2015, 2017).

## Sven Ove's style

Since my visit to Stockholm, I have been in a wide range of meetings with Sven Ove, ranging from small-scale workshops to large conferences and this, together with his written work, led me to the following categorisation of his style: "Know your topic!" and "Know your methods!".

### *Know your topic!*

Every time it strikes me how knowledgeable Sven Ove is about the topic that is being discussed, whether it is radiation and nuclear energy, toxicology, or norms in the building industry. And although part of this knowledge is unmistakably an accumulation of knowledge gained during earlier work or earlier projects, Sven Ove once also revealed to me that when he starts writing a new paper, he has an enormous pile of papers that he wants to read before putting his philosophical analysis on paper and that he sometimes hides this pile – or at least wants to hide it – in order not to scare young researchers. So one side of Sven Ove's reputation is that he obviously is a very knowledgeable person who contributes to a wide range of topics, but he does not take the easy route by talking at abstract levels about these topics and simply applying the same trick over and over again. His in-depth knowledge of the different topics allows him to get into the nasty details. And this becomes especially relevant when we talk about philosophy of *technology and engineering*, where abstract and general analyses often overlook the extremely relevant details. For example, without comprehension of extreme value analysis, it is difficult to grasp the impact of distribution arbitrariness (Möller & Hansson, 2008).

### *Know your methods!*

I labelled this section "Know your methods!" but I may as well have called it "Know your discipline!". Sven Ove has always been very keen on what a certain method or discipline has to offer and what we can justifiably conclude based on either empirical research or philosophical argumentation. As an illustration, in a contribution to a Special Issue on Experiments, Ethics, and New Technologies that I co-edited with two colleagues in the journal *Science and Engineering Ethics* (Doorn, Spruit, & Robaey, 2016), Sven Ove carefully explained how we should distinguish between different types of observations (experimental and non-experimental observations), and even between different types of experimental observations, each with their own usefulness and shortcomings (Hansson, 2016a). Although this may sound trivial for scholars working in the empirical sciences, for philosophers who often do not perform empirical research themselves Sven Ove's analysis is as simple and elegant as it is forcing us to be more rigorous in our use of scientific evidence. But his appeal to more rigorous science also goes to the empirical sciences, where Sven Ove will not leave unnoticed allegedly value-

neutral claims in papers reporting empirical research output that are in fact based on certain value-laden assumptions or simplifications (e.g. Hansson, 2006a; Hansson & Rudén, 2006).

In a recent paper in *Science and Engineering Ethics*, Sven Ove discussed the ethics of doing ethics research (Hansson, 2017), where he mentioned the lack of discussion about the various ethical aspects of the activities performed by professional ethicists. The importance and relevance of his conclusion that “publications in ethics should adhere to the common scholarly style of writing with its strict standards for references to previous research” (p. 117) could not be overestimated.

## **Sven Ove’s contribution to philosophy of technology and engineering**

So far my personal introduction to Sven Ove’s work and his style, let us now turn to Sven Ove’s contribution to philosophy of technology and engineering.

One way to look at Sven Ove’s contribution to this field is by looking at his output. Simply looking at the, arguably, three most important academic journals in philosophy of technology and engineering shows Sven Ove as a prolific author. I counted five papers in *Science and Engineering Ethics*<sup>2</sup>, four papers in *Philosophy and Technology*<sup>3</sup>, a journal that published its first issue in 2010, and seven papers in the journal *Techné: Research in Philosophy and Technology*<sup>4</sup>, the oldest journal specifically focused on philosophy of technology. And I think it does not need mentioning that this is only a selection of his published papers on topics in philosophy of technology and engineering and that all these papers have high numbers of citations.

In addition to these journal publications, Sven Ove gave countless presentations and organized several specialized tracks at the biannual meetings of the Society of Philosophy of Technology, authored and edited many books, to which I will come back later, and he initiated and currently edits the book series *Philosophy, Technology and Society*, published with Rowman & Littlefield International.

### *Sven Ove and the empirical turn in Philosophy of Technology*

So far, this is mostly about numbers. In my view, much more interesting than simply looking at quantitative numbers is to look at Sven Ove’s contribution content-wise and I would like to discuss two specific contributions.

The first concerns his contribution to analytical philosophy of technology and engineering. An important ‘change’ in the field of Philosophy of Technology over the last thirty years is the shift from what is often called classical philosophy of technology towards more empirically informed approaches

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<sup>2</sup> Publications in *Science and Engineering Ethics* (Hansson, 2011b, 2016a, 2017; Jebari & Hansson, 2013; Svensson & Hansson, 2007).

<sup>3</sup> Publications in *Philosophy & Technology* (Doorn & Hansson, 2011; Hansson, 2011a, 2011c, forthcoming)

<sup>4</sup> Publications in *Techné* (Hansson, 2004a, 2004b, 2005, 2006b, 2006c, 2012, 2013a).

within philosophy of technology (Brey, 2010). Inspired by increasing interaction with the field of Science and Technology Studies (Bijker, 1995; Latour, 1994) and an increasing attention for the activity of engineering (Mitcham, 1994), the attention of philosophy of technology shifted from Technology – with capital T – as a “broad social and cultural phenomenon”, towards a reflection on specific technologies (Verbeek, 2010: p. 50). With this shift, often referred to as the empirical turn in philosophy of technology, there has been more attention for the technological artifact itself, the ethical values embedded in particular designs and for the ethics of engineering practice (Kroes & Meijers, 2000). It is around this time that the term engineering (and later also design) got a more prominent position in the labelling the field (cf. the book series *Philosophy of Engineering and Technology*, in which Sven Ove also edited and co-edited several volumes: de Vries, Hansson, & Meijers, 2013; Hansson, 2015, 2018b).

In their volume on the empirical turn in philosophy of technology and engineering, Kroes and Meijers considered the empirical turn as a shift towards a descriptive analysis of methodological, epistemological and ontological issues on the one hand and as a shift away from moral issues about the *use* of technology in general to the moral issues that could rise in the design, development, production and implementation of specific technologies (Franssen, Vermaas, Kroes, & Meijers, 2016).

In their first book on the empirical turn in the philosophy of technology, Kroes and Meijers (2000) argue for a philosophy of technology that “should turn away from normative/evaluative matters towards empirical/descriptive ones” (p. xxi), later in the book formulated as a shift towards “epistemological, ontological, or methodological issues” (p. xxii). Kroes and Meijers admit that philosophy of technology cannot and should not hide from the moral issues related to technology – and their plea could probably best be read as a reaction to the negative stance towards technology in classical philosophy of technology that dominated philosophy of technology since the Second World War – but they stress that these methodological, epistemological, and metaphysical (ontological) questions are interesting in their own right and that they are logically prior to studying the normative issues (cf. Pitt, 1999). For Kroes and Meijers, philosophers of technology should “base their philosophical analysis concerning technology on reliable and empirically adequate descriptions of technology (and its effects)” (Kroes & Meijers, 2000: p. xxiv). With his enormous knowledge of the topics he discusses, it does not need mentioning that Sven Ove fits this ideal of how to do philosophy of technology. And in his contribution to the workshop and a volume revisiting the empirical turn that was edited on the occasion of Peter Kroes’ retirement in 2016, Sven Ove mentioned that the first book by Kroes and Meijers on the empirical turn in philosophy of technology was his guide when he arrived in 2000 at KTH to set up a philosophy department at a technical university (Hansson, 2016b). However, where the research agenda proposed by Kroes and Meijers may give the impression that ethics of philosophy of technology

and engineering is merely applied work and that the “real” or “foundational” work is done at the descriptive level, one of Sven Ove’s contributions to analytical philosophy of technology and engineering lies exactly in showing the many foundational issues in ethics of technology and engineering. In that sense, Sven Ove’s contribution could probably best be seen as a complement to Kroes’ and Meijers’ project with a solid analytical ethics of technology and engineering. For example, in a volume on *Norms in Technology* co-edited by Sven Ove, Marc de Vries and Anthonie Meijers, Sven Ove presents a clear classification of different types of value statements and normative statements that are made about technology, which sheds light on how macro level statements about technology as a whole relate to micro level statements about specific technological objects and practices (Hansson, 2013b). Those are the contributions that convincingly show that, also after the empirical turn, there is room and need for foundational work in analytical ethics of technology and engineering. It also shows Sven Ove’s focus on *engineering* as the practice where particular technologies are designed, developed, constructed, and not just abstract technology.

### Sven Ove and the position of philosophy of technology and engineering vis-à-vis other philosophical disciplines

The second contribution that I would like to discuss in a more detail is Sven Ove’s effort to give philosophy of technology and engineering the academic recognition it deserves. To do so, I will start with Sven Ove’s Presidential address at the biannual meeting of the Society of Philosophy and Technology in July 2013. Above I mentioned *Techné* as one of the three key journals in philosophy of technology and engineering. *Techné* is not only the oldest journal devoted to philosophy and technology, it is also the official journal of the international Society of Philosophy and Technology. Between the 17th SPT meeting in 2011 in Denton, Texas and the 18th SPT meeting in Lisbon, Portugal, in 2013, Sven Ove served as the President of SPT.<sup>5</sup>

In this Presidential address, Sven Ove argued that philosophy of technology should reach out to other fields and more particularly, he argued for more philosophy research into how technology feeds into other fields. Too often is technology only seen as the end of the chain of knowledge production. With this research agenda, Sven Ove also wanted to explore the other direction: that is, how technology or certain technological means are instrumental to knowledge production in other disciplines. So not too long after this address, two edited volumes appeared in the Springer series *Philosophy of Engineering and Technology*: one dedicated to *The Role of Technology in Science* (Hansson, 2015) and one to *Technology and Mathematics* (Hansson, 2018b).

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<sup>5</sup> I had the privilege of being elected the new editor-in-chief of the journal, a co-editorship together with Diane Michelfelder, under Sven Ove’s Presidency

In the introductory chapter of the volume on technology and mathematics, Sven Ove describes the relation between mathematics and technology as a reciprocal one. One needs only look at the rigorous mathematical training that engineering students receive to see the importance of mathematics for engineering. Mathematics is relevant not only for the scientific theories on which technology is based – Sven Ove mentions solid and fluid mechanics, electrodynamics, thermodynamics, and quantum mechanics as examples – but also in typical engineering activities such as simulation, optimisation, and statistical analysis. However, the other direction – that is, where mathematics uses technology – is less widely discussed in the literature and this volume is exactly meant to fill that gap. In this volume, Sven Ove has compiled several contributions that illustrate how technology, and especially now with increasing computer power, has advanced mathematics, for instance in the epistemology of computer-mediated proofs, in exploring the very notion of computability and its central role in the foundations of mathematics (cf. the Turing machine), the privileged role of information and the importance of information-processing capabilities for the formulation of a quantum theory, and the relation between complexity theory and computability theory.

The volume *The Role of Technology in Science* has a similar set-up by showing how science does not only play a role in technology but that science is also largely dependent on technology. This dependence concerns both the use of technological devices (such as microscopes or thermometers) but also includes methodological and conceptual insights, for example about the relation between science in general and technological science and about the role of technological practice in science.

In line with these two volumes, in a forthcoming contribution to the *Routledge Handbook of Philosophy of Engineering* (Michelfelder & Doorn, 2020), Sven Ove systematically debunks the view of engineering as applied science showing how engineering science has several important metaphysical and epistemological features that distinguish it from the natural sciences and that makes it worthy of considering it as “a major branch of science, on a par for instance with natural, social, behavioural, and medical science” (Hansson, 2020: Chapter 5).

### **Concluding remarks**

It is clear that these two points, analytical ethics of technology and the position of technology and philosophy of technology vis-à-vis other disciplines, are just two examples of a much longer list, but content-wise, they give a good idea of Sven Ove’s contribution to the philosophy of engineering and technology. There is one point with which I would like to end this contribution.

We all know Sven Ove’s commitment to high quality academic work, but I think most people here also know Sven Ove’s commitment to fair chances and equal opportunities, both in academia and elsewhere. I think that Sven Ove’s contribution to making the field more diverse is something that

deserves to be mentioned as an academic legacy as well. He has done so not only by supporting the promotion of female academics to important positions, but also by recognizing the contribution of women to certain fields. For instance, in his volume on *Technology and Mathematics*, Sven Ove recognises the importance, predominantly female, weavers as one of the earliest advanced mathematical activities carried out in history (Hansson, 2018a: p. 16).

When I wrote this contribution, I found the analogy between his emancipatory contribution to minorities and his emancipatory contribution to the field of philosophy of technology and engineering vis-à-vis other philosophical fields (philosophy of science, philosophy of mathematics) quite striking. His recent editorial in *Theoria* about the “assault on Brazilian philosophy and sociology” (Hansson, 2019) could also be seen in this light. Given the impact that Sven Ove has had on the various disciplines in which he has been active, I trust that his dedication and commitment to these emancipatory movements will inspire next generations to continue that aspect of Sven Ove’s work as well.

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