Review of Stefan Lorenz Sorgner's *We Have Always Been Cyborgs*

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We Have Always Been Cyborgs: Digital Data, Gene Technologies, and an Ethics of Transhumanism
Stefan Lorenz Sorgner
Bristol University Press and Policy Press, 2021
240 pp.

The concept of transhumanism has risen to prominence in the early 21ˢᵗ century. Work from futurist thinkers such as Ray Kurzweil,[1] Nick Bostrom,[2] and Max Tegmark have fueled a popular understanding of artificial intelligence and genetic enhancement.[3] Mainstream culture has become aware of forward leaning digital technologies such as nanobots, brainmachine interfaces, and cyborg augmentation as keys to immortality. To the public, transhumanism and posthumanism are synonymous with technologies so advanced it is beyond comprehension (i.e., a Singularity).

Transhumanism seeks to push humanity beyond the visible horizon. Julian Huxley described transhumanism as what awaits Man on the other side of an evolutionary threshold.[4] Like current thinkers such as Kurzweil, Huxley based his assertion on observational evidence of the inexorable march towards becoming *more*, of reaching and perhaps surpassing a potential. To Huxley and similar transhumanists, the eventual transcendence of mankind had an implicit link to existing, natural processes. On the other hand, modern thinkers such as Kurzweil, Bostrom, and so forth seem to consider transcendence only as a consequence of advanced digital technology intervention. Thus, the means of pushing, the specific evolutionary technology employed, is what differentiates transhuman and posthuman schools of thought. Still, until now there has not been a rigorous attempt to develop a philosophy of transhumanism.

The monograph *We Have Always Been Cyborgs. Digital Data, Gene Technologies, and an Ethics of Transhumanism* provides a focused philosophy for the evolution of mankind's ability to transcend our cognitive and physical limits. Unlike the brand of transhumanism hyped by popular media which hinges on landmark events such as the Technological Singularity espoused by futurists such as Kurzweil, Stefan Lorenz Sorgner situates transhumanism in our past as a type of selective pressure occurring in lockstep with biological evolution. In this context, the work examines technologies and their relation to maximizing the ethical good, or lack therein. This is juxtaposed against mainstream views of transhumanism which uniformly obsess over immortality, artificial intelligence, and mind uploading.

An existing review suggested the overall structure of the monograph is that of a crescendo.[5] While an accurate statement, it may be more precise to describe the structure as a series of crescendos. There is an overarching crescendo in the chapter structure and each chapter follows an inner crescendo across the subsections. I believe that was the intended feeling.

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[1] Ray Kurzweil. 2005. *The Singularity is Near: When Humans Transcend Biology.* Penguin.
[2] Nick Bostrom. 2016. *Superintelligence: Paths, Dangers, Strategies.* Oxford University Press.
[3] Max Tegmark. 2018. *Life 3.0: Being Human in the Age of Artificial Intelligence.* Vintage.
[4] Julian Huxley. 1968 "Transhumanism." *Journal of Humanistic Psychology* 8 (1): 73–76.
[5] Aura Elena Schussler. 2022. "We Have Always Been Cyborgs. Digital Data, Gene Technologies, and an Ethics of Transhumanism." *NanoEthics* 16: 7–11.

The structure, pacing, and writing are all superb. Sorgner outlines a clear logic and provides timely, relevant examples throughout.

Overall, the critical themes of the work include *cultural movement*, *appropriate technologies*, and a gradual shift from ontological beginnings to ethical premises. With such in mind, I have organized this review according to the monograph's structure.[6] I offer a summary of each chapter in the following four sections. I highlight the main themes, definitions, and arguments presented by Sorgner. Then, in the last section, I provide a critical analysis of the monograph from the perspective of a theoretical computer scientist. I do so in an attempt to extend the direction of thought in several critical areas.

The Nutshell

In the opening chapter, Sorgner makes the case for transhumanism being a nihilistic positive pessimism. The nihilism is an inevitable result from "continual becoming". He then goes on to assert, "most human beings indeed identify an increase of the health span with a higher likelihood of living a good life" (6). One on hand, this assertion forms the basis for what the author considers the transhumanism position on *ethical good*. On the other hand, the assertion also serves to delimit the mainstream notion of transhumanistic immortality. Sorgner is explicit in positioning immortality as unrealistic and, furthermore, inconsistent with serious transhumanism thinking.

Furthering our existing transhumanism and increasing health span is achievable through the *appropriate technologies*. To this end, historical use of steering technologies such as education (specifically, language acquisition), surgery, and pharmacological enhancement represent mankind's tradition of cyborg augmentation. In the modern context, the appropriate technologies in Sorgner's view are gene technologies, cyborg enhancements, digital technologies, and moral bioenhancement.

Sorgner defines the term *cyborg* as, "... a governed, a steered organism" (9). Thus, the *positive* aspect of Sorgner's transhumanism is connected to the notion of a cyborg insofar as we have a history of "self-overcoming" (1). We continually innovate new technologies to extend the depth and breadth of such overcoming. Whether there are or ought to be limitations to our self-overcoming is addressed specifically in the context of two technological concepts: mind-uploading and simulation theory.

Recognizing those two mainstream transhumanist ideas as being unlikely may, at first, come across as anti-technology. However, Sorgner goes on to describe *positivity* in terms of how well technology nullifies or dampens suffering. In this way, the positivity embedded with nihilistic pessimism is aligned with our cyborg nature. Part of our nature then, the transhuman part, is ostensibly a collection of "as good as it gets solutions" (15) which work individually and in concert to "improve the quality of life for most human beings" (16). Taken in this context, Sorgner's transhumanism is a natural inevitability predicated on a pre-existing cyborg baseline.

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[6] Stefan Lorenz Sorgner. 2021. *We Have Always Been Cyborgs: Digital Data, Gene Technologies, and an Ethics of Transhumanism.* Bristol University Press and Policy Press.

Silicon-Based Transhumanism

Silicon-based transhumanism implies the use of digital technologies towards extending human health span. Sorgner refers to these technologies, their democratization across cultural boundaries, as a "pragmatic necessity" (22). Fundamentally, silicon-based transhumanism is less about moonshot digital technologies and more about dealing with the side effects of existing technologies. To this end, Sorgner uses this chapter to describe a philosophical position for the relevance of privacy, the value of digital surveillance, and the rational tenets for digital data collection.

The majority of this chapter is devoted to exploring *total surveillance*, *privacy*, and *negative freedom*. These moral concerns, Sorgner argues, are emergent consequences of unbridled and unrestricted digital technology innovation. The temptation to construe the associated line of reasoning with an anti-technology stance is strong at first glance. However, the careful eye will ascertain the point in furthering a philosophy related to such moral concerns is to ensure our continued cyborgization is not unduly shunted. To wit, Sorgner asserts it is vital we integrate our biology with digital technologies. Better said, it is vital we continue to integrate our biology with digital technologies.

Ultimately, we have no evidence of silicon-based lifeforms unless we are willing to accept the definition of life to include (computer) viruses. Sorgner does not seem to rule the computer virus example out, citing *replication* as an indicator of life. At the same time, Sorgner does not explicitly affirm the position except to point out the binary consequence of one's position on the matter. Overall, according to Sorgner, the lack of evidence of legitimate silicon-based life forms the basis for the unlikelihood of two prototypical, mainstream transhumanist technological ideas. Those ideas are mind uploading and simulation theory.

Sorgner does not use the unlikelihood of mind uploading or simulation theory to discredit transhumanism. Rather, the point of the argument is to focus silicon-based transhumanism on those appropriate digital technologies with the highest likelihood of extending human health spans. Gene technologies and augmentative digital technologies (e.g. RFID chips) are strong examples.

Sorgner asserts, "The more personalized data we have concerning the correlations between genes and ageing, life-style choices and well-being, and genes and well-being, the more reliable our data is for biotechnological research and medical interventions" (33). Simultaneously, we cannot ignore the growing social consternation related to the enormous volume of digital data collected through the computer systems and software at the heart of modern life. The social anxiety is less about personal data collection and more to do with the political interests. Here, Sorgner establishes an apt analogy between the traditional natural resource economy (e.g., oil) and the modern information economy. In short, just as much as the 20th century could not afford to not collect natural resources, the 21st century and beyond cannot forgo data collection. Nevertheless, there are, and will be, compromises hoisted upon us as a consequence of bulk data collection.

Technological innovations such as the mobile computing, internet-of-things, and wearables have transformed daily life for the better. Be that as it may, these same technologies have enabled an internet powered panopticon. The challenge to privacy is direct and, in some cases, powerful. Sorgner differentiates here between a *theory of property* and a *theory of sanction for privacy*. Such theories point towards the necessity of algorithms accessing the collected bulk data and not humans. Further, the difficulty in balancing data collection and privacy leads to a need for negative freedom particularly in the case of the theory of sanction for privacy.

In simple terms, negative freedom is a rational response to the potential for sanctions related to privacy information. The core of the idea, as presented by Sorgner, is "the absence of coercion" (41). Such coercion seems possible from a state actor, a cultural group, or even oneself. Certainly, silicon-based transhumanism necessitates a balance between appropriate technologies, data collection, and privacy. To flourish, humanity must accept some degree of internet panopticon. However, we can, and should, push for negative freedom as we continue to develop non silicon-based technologies. After all, as Sorgner reminds us in this part of the monograph, there is most likely no perfect solution to transhumanist challenges, only as-good-as-it-gets for the time period and level of technology.

Carbon-Based Transhumanism

The silicon-based and carbon-based notions of transhumanism are inexorably linked in the digital age. Data collection related to personal health drives new carbon-based transhumanism innovations. New innovations drive higher fidelity data collections and so on and so forth. Because of this relationship, carbon-based transhumanism presents a second and, per Sorgner, more likely pathway to increase *good*, reduce suffering, and extend human health spans. Appropriately, this chapter details a set of appropriate gene technologies forming the heart of carbon-based transhumanism. The carbon-based transhuman technologies are gene editing, gene modification, and gene selection. Sorgner refers to these as mankind's, "most important scientific invention" (61). Sorgner also uses this chapter to situate his philosophy of transhumanism in a non-utopian radically pluralistic framework.

Naturally, the selection and subsequent modification of the human genome is not without controversy or moral issue. Thus, an open question Sorgner addresses throughout this part of the monograph is how to morally situate gene technologies in the fabric of transhumanism. Here, he leverages Nietzsche admirably to this end. The connection between transhumanism and Nietzsche can be summarized in the view that human beings are, "...part of this one natural world, integrated in dynamic processes and merely gradually different from other animals; it is plausible that they have come about solely as a consequence of evolutionary processes, and it is highly likely that human beings will have to continuously adapt themselves to their environment in order to survive" (64).

The implication is our cyborg nature drives us to adapt ourselves and such adaption is necessarily transhuman in basis. On one hand, we have always been cyborgs through the external technology of evolution through natural selection. On the other hand, we are developing into something more than our current humanity much akin to Nietzsche's concept of the *overhuman*. To what extent we are free to explore, discover, and implement the

necessary carbon-based transhuman technologies to reach full potential is intertwined with the degree we reject the dualist ideals inculcated by culture.

Indeed, an important aspect Sorgner discusses early in this section of the monograph is the relation between gene technologies and culture. The culture-relation is, in part, inclusive of religion. Sorgner frames this by asking, "Do we live in a Christian society or do we live in a liberal democratic one" (64)? His assessment is transhumanism (in any form) is more aligned with Eastern thinking in terms of the pursuit for cultural good. At an extreme, bioenhancement through carbon-based transhumanism can be viewed as a moral obligation because of its inarguable ability to increase good.

Gene modification is, "structurally analogous to traditional parental education" (97) and thus morally as well. Meaning, we educate our children towards an idealized moral *good* and the spirit of such modification is akin to the goal of gene modification. Therefore, gene modification, through a philosophical connection to negative freedom, ought to have the same moral stance.

Vaccinations are a timely and relevant example, especially due to the cultural debate about compulsory mandates. In the (near) future we might identify a genetic basis for moral *good* or *not good* behavior. In this case, and assuming we want to culturally select for the good, should gene modification be not only available but mandatory? As Sorgner asserts in so many words, awareness of the issue is required but not a definitive answer.

The construct holding some measure of answer for us is the connection from bioenhancement back to the one of the original cyborg technologies, education. The direct link is visible through the inevitable effect on cognitive ability. This works because, as Sorgner discusses, education and bioenhancement through carbon-based transhumanism are "structurally analogous" (99). Said differently, "education enhances the mind while gene modification enhances the body" (86). Perhaps unintentionally, the duality here is a mirror of the moral, dualist arguments discussed previously in the chapter.

Fictive Ethics

The last chapter of the monograph is also, in my view, the most extensive in terms of developing a robust philosophy for transhumanism. The robustness stems from the core of the chapter subject- what Sornger refers to as, "the most important ethical issues concerning transhumanism" (109). The chapter builds on the simplest interrogative: what is a good life? Sorgner uses the question to differentiate between transhumanists "who affirm a utopian perspective as a realistic goal, and others who do not" (171). The potential answers have complex outcomes. For example, if anything is possible because of transhumanism, to what extent should everything in the pursuit of a transhumanist good life or utopia be permissible? From there, natural and immediate ideas of the related morality and ethics become visible.

Here, Sorgner develops the argument against the transhumanist utopian perspective with a clever convention of linking our natural cyborg nature to Nietzsche's naturalizing morality.

In doing so, there is a sound refutation of moral and ethical opposition to appropriate transhumanist technologies such as gene modification. The point made is utopia is not required, or a laudable undertaking for that matter, while neither is abandonment of vital innovations. One only need to consider, as does much of the Fictive Ethic, how parents leverage appropriate technologies to select desirable traits in children through IVF, modify them during development, and so forth. The implicit connotation is one of future planning rather than fabrication of an idealized future.

Perhaps the most notable contribution of this chapter, and unique amongst transhumanist literature, is the consideration for *harm*. Universally, we can understand every action has a reaction, an effect. Thus, transhumanism and its appropriate technologies cannot be viewed as entirely safe or free from negative consequence. Sorgner suitably probes this theme in weighing the enormous good the appropriate technologies included in his transhumanism are potentially offset by the potential harm caused by their application. While we are, in Sorgner's words, "... constantly changing hybrid cyborgs", we must be way of allowing the cyborg to fully replace the humanity.

Sorgner fully explores the rationale for accepting a radical pluralist concept of good while taking an anti-communitarian view. To a large degree, the argument is a counterpoint to the unlikely, improbable digital technological innovations espoused by mainstream transhumanists. The philosophy extends Nietzschean principles. The concept of the *overhuman* is apropos because of the relation between biological, evolutionary ethics and the transhumanism push to bend both towards the greater good. Based on the articulated ideal of the good life, the next question becomes, *what constitutes moral rightness*. The answer is presented in the context of, "non-anthropocentric, a non-essentialist, and a non-dualistic concept of personhood" (109). This is in contrast to the Renaissance and Common-Sense accounts of transhumanism.

Continuing the chapter theme, Sorgner goes on to discuss a wide range of issues facing transhumanism. This section begins with wondering whether transhumanism necessarily entails pursuing a different meaning of life. Fundamentally, the issue of immortality provides a pathway despite having a close-to-zero probability for coming to fruition. In other words, the quantity of related innovations emerging from the pursuit of transhumanist immortality might outweigh the low probability of reaching the goal. Thus, there is a net gain to human health span.

"Transhumanism is characterized by positivity concerning technologies" (183) is an astute observation not because of its inherent truth but more so because of the underlying assumptions associated with extending human health spans. In this context, Sorgner analyzes cryonics and revisits mind-uploading. Both represent the ultimate transhumanist technology, the type of technology to guarantee immortality. In prior chapters, we come to understand Sorgner's view that such goals are implausible. In this section, he extends his philosophy with an ethic encompassing increased meaning of life as the effect of not obtaining utopia, of not hinging the entirety of transhuman of moonshot silicon or carbon-based technologies. With that, Sorgner leaves us with the idea that what his philosophy should lead towards is a metahumanistic worldview. The worldview ought to exist somewhere between post and transhumanism. The worldview recognizes we have always been cyborgs while promoting an ethic for continued development of the appropriate transhuman technologies.

Review Summary

"Even though the current situation is not without challenges, it has never been better for people on Earth."[7] This of course does not imply we, as a species, cannot do anything to solve such challenges and increase the net good of our existences. Along these lines, Sorgner argues we have always been cyborgs. Given the thoughts contained in the monograph, I find myself agreeing for the most part. What remains unclear- which to Sorgner's credit seems to be an intentional cliffhanger- is whether we will remain cyborgs. In other words, if transhumanism is about transcending human biological limitations, but we accept we have always been cyborgs, then we are not becoming cyborgs. Indeed, we are either increasing our inner, innate *cyborg* or we are becoming something else entirely as the output of the transcendence.

The relations between human activities such as language development, education, and digital innovations to the appropriate technologies outlined in the monograph is clever. Beyond clever, the relations are logical and expressed well. With that being said, there are several points I wish to expand on.

While I find Sorgner's definition of transhumanism compelling, I am surprised to not have found a rigorous definition of *cyborg* more associated with information given the monograph's privacy of information is a critical component in the overall thesis. To wit, the definition offered by A.N. Kolmogorov may provide some measure of philosophical extension here: "the study of systems of any nature which are capable of receiving, storing, and processing information to use it for control." [8] Using Sorgner's philosophy, we can say silicon-based transhumanism provides a means to generate, process, and update the Self through technological augmentations. It is not a stretch to conceptualize Sorgner's gene technologies in this context. Yet, cyborg technologies in general, and digital technologies in specific, seem to not fit as the monograph presents such.

At a low level of resolution, we can take a cyborg to be, "...a hybrid of organism and machine, biology and technology".[9] A higher, more detailed resolution we can take a cyborg to be something resulting from the union of biological and nonbiological cybernetics where *cybernetics* are taken to be systems of systems. I think it is critical for research to conform to existing definition rather than redefine existing terms unless absolutely necessary. To that end, I do not feel Sorgner's use of *cyborg* is out of bounds. I do, however, think the usage lacks the gravity of the common definition because there is a weak acknowledgement of complex systems and systems thinking, especially in silicon-based transhumanism digital technologies.

As a specific example, entirely missing from the set of cyborg and digital technologies is the augmentative role of narrow artificial intelligence. While transhumanist futures thinkers such as Kurzweil consider artificial general intelligence (AGI) to be an important, perhaps

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7 Sorgner 2021, 20.
8 Dan C. Marinescu. 2017. *Complex Systems and Clouds*. Elsevier, 33–63.
9 Wolfhart Totschnig. 2022. "Am I a Cyborg? Are You?" *Philosophia* 1–10, August 18, page 1.

unavoidable, silicon-based milestone, the likelihood of narrow AI being used to augment our biology is much higher.[10] The moral and ethical implications therein seems to be something for consideration in the Silicon-based Transhumanism and Fictive Ethics sections of the monograph.[11] If nothing else, there might be useful analogies between augmentative digital technologies such as narrow AI and the physical education of children much in the same vein as Sorgner's connection between general education of children and transhumanism.

At the same time, I find the position on computer viruses being equivalent or roughly equivalent to biological viruses, in terms of life, problematic. Typically, an organism to deemed to be *life* when it consumes some other form of life to produce energy, self-regulates its life systems (e.g., respiration, temperature, etc.), and engages in the act of reproduction. At most, biological viruses replicate but entirely depend on a host's cellular machinery to do so. Likewise, computer viruses depend upon another program or file to replicate. Thus, if a computer virus is alive as is a biological virus in some arguments, then we must accept a word processing program, a search engine, and a video player as the same on the basis of each being software. Rather, I suggest software serves as an embodiment of at least one computational algorithm. At best, as existing research has demonstrated,[12] we can say a computer virus is an exemplar for *artificial life*. Here, the term *artificial* is synonymous with *imitation* and thus not indicative of actual life.

Lastly, the position on simulation theory (i.e., simulation hypothesis) struck me as out of place in the overarching context of the monograph. Foremost, it is not obvious why simulation theory is considered a transhumanistic technology compared to mind uploading. Mind uploading is a technology applied in the direction of the ethical good as defined by Sorgner. It is the epitome of a *cyborg* technology in many ways. On the other hand, a simulation, even if created with the intent of goodness, is not nearly the same level or category of technology. Unless the simulation is of a single mind only, the compute power requirements far exceed what is theoretically required to perform a mind transfer. Further, there is no basis to suppose the simulated minds need to be real minds. They could just be simulacra of sorts. There is also no reason to think any simulation is necessarily in the direction of ethical good. Perhaps, at best, the simulation is built with curious indifference. The worst case is the simulation is malevolently motivated. Recent work provides a detailed analysis of how simulation theory must work (if true) from computer science and philosophy perspectives.[13]

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[10] William B. Rouse and James C. Spohrer. 2018 "Automating Versus Augmenting Intelligence." *Journal of Enterprise Transformation* 8 (1-2): 1–21, 2018, page 1.

[11] José Hernández-Orallo and Karina Vold. 2019. "AI Extenders: The Ethical and Societal Implications of Humans Cognitively Extended by AI." In *Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society* 507–513; Dorian Peters, Karina Vold, Diana Robinson, and Rafael A Calvo. 2020. "Responsible AI—Two Frameworks for Ethical Design Practice." *IEEE Transactions on Technology and Society*, 1 (1): 34–47.

[12] Eugene H Spafford. 1994. "Computer Viruses as Artificial Life. *Artificial Life* 1 (3): 249–265.

[13] Jason M. Pittman and Frank Scalambrino. 2022. *Artifacts of the Simulation: A Reference Book for Simulation Theory*. Pirino Books.