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Human Sustainability in the Age of Technology: A Theological Proposal on Technomoral Human Futures

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Abstract. This paper seeks to trade on the Reformed archetype-ectype thinking to account for an ontological foundation of human sustainability in the age of technology. According to the technological Singularity, machines will eventually triumph over humans. As a result, human sustainability relies solely upon technology, and humans should transcend their biological conditions. By contrast, Reformed archetype-ectype thinking brings forth an ectypal ontology, which offers a holistic understanding of the human being and grounds human sustainability in the reality of the whole human person as the ectype and image of God. This holistic anthropology implies that human embodiment plays a significant role in human sustainability. From this vantage point, technology should not be seen as competing against human biological conditions. Rather, it extends human interaction with the physical world and strengthens human sustainability to create technomoral futures by embodying the moral quality of the imago Dei.

Key words: archetype-ectype; human embodiment; imago Dei; Reformed ontology; technological singularity

Human sustainability refers to the human capacity to endure. Whilst speaking of human sustainability, attention is normally drawn to ecological crises, climate change, and environmental issues. Much ink has been spilt on how capable humans are of enduring in the face of these issues. However, with the development of technology, we confront the question of how humans are capable of enduring in view of the challenges posed by technology. The rapid progress of technology, such as artificial intelligence (AI), cybernetics, and biomedical technology, seems to imply that humans will eventually be substituted by machines and that human existence is likely to be undermined because of our reliance upon technology in the future. Such points of view are closely associated with a worldview created by the technological Singularity (TS), which is a vision or philosophy that has superhumanity as its essence and anticipates an age in which machines triumph over humans. In this light, the TS implicitly turns down sustainability of humanity per se under the auspice of technology. Humans are only capable of enduring with the aid of technology. In responding to the TS’s challenge, I seek to address the following question: to what extent and in what sense are humans capable of enduring in face of rapid technological progress?

This paper will argue that human sustainability in the age of technology rests in the reality of the human being as the ectype of God, which lays an ontological foundation for a technomoral future. In the technological age, the human capacity to endure can be enhanced by technological advances in such a way that human morality can be embodied in our interaction with the world. I proceed to explain the ontology underlying TS, followed by an elaboration on Reformed ectypal ontology of humans. Finally, I shall spell out human sustainability in relation to technomoral futures that are underpinned by ectypal ontology, with a particular eye to the deployment of AI in human life.

TS’s Ontology

Although Vernor Vinge (30-31 March, 1993) coined the term ‘technological singularity’ in 1993, the TS’s core meaning came into play in cosmology more than six decades ago.
According to Ronald Cole-Turner, the term ‘singularity’ in cosmology referred partly to a future world where ‘the very laws of physics’ cease to be effective. He then infers that this cosmological notion of singularity may conceptually underpin the idea of a TS (Cole-Turner 2012: 788). As such, TS basically implies a future world that is radically different from the current one.

Vinge (2013: 366) refashions ‘singularity’ with the qualification of ‘technological,’ pointing us to human-machine relationships in the future. TS’s essence is superhumanity. ‘A central feature of strongly superhuman entities’, he argues, ‘will likely be their ability to communicate at variable bandwidths, including ones far higher than speech or written messages’ (Vinge 2013: 373). With an emphasis on informational communication, Vinge is convinced that an amplified intelligence will lead humans to a post-Singularity world. In the age of the TS, humans are able to transcend their own intelligence, which restrains the speed of human-human communications.

Vinge’s conceptions of the TS and post-Singularity were expanded and became popular via Ray Kurzweil’s work. Kurzweil (2005: 9) maintains that the ‘Singularity will represent the culmination of the merger of our biological thinking and existence with our technology, resulting in a world that is still human but that transcends our biological roots.’ Vinge pays attention to the amplification of human intelligence, whereas Kurzweil stresses the transcendence of humanity over biological conditions. By liberating humans from biological limitations, Kurzweil envisions that the TS will help human beings to gain immortal life.

In Kurzweil’s expansion and reformulation of Vinge’s conceptions of the TS and superhumanity, we perceive the TS’s ontological presupposition, which is comprised of two pivotal aspects.

First, the TS’s emphasis falls on the use of technology in improving, enhancing, and transforming human biological conditions to attain superhumanity. This idea of enhancement is widely received. A relevant instance is moral bioenhancement. Ingmar Persson and Julian Savulescu (2012: 412–413), two leading proponents of biotechnological enhancement of human morality, envisage the God machine, ‘the most powerful, self-learning, self-developing bioquantum computer,’ which can monitor and modify all human thoughts, beliefs, and intentions to make right moral decisions. They are convinced that such a computer can enhance human conditions so as to create a moral superhumanity. The idea of moral superhumanity or biotechnological enhancement of human morality has invited criticism from theological quarters. Simeon Zahl (2019: 216–228) suggests that biotechnological enhancement is prone to lift human biological limitations and downplay the everlasting necessity of divine grace in human sanctification and moral life. We will turn to this subject later to illustrate how the ectypal ontology sets a scene for technomoral futures while appreciatively deploying technology in human life.

Enhancing human biological conditions to attain superhumanity is characteristic of transhumanism and posthumanism. For transhumanists, current human nature is malleable in the sense that contemporary technoscience can improve human nature and broaden human potential. As Nick Bostrom (2005: 4) observes, ‘Transhumanists hope that by responsible use of science, technology, and other rational means we shall eventually manage to become posthuman, beings with vastly greater capacities than present human beings have.’ Although Russel Blackford (2010: 178) clarifies that the strand of transhumanism advocated by Ray Kurzweil is not generally accepted within the transhumanist movement, Bostrom’s remark shows a trans/post-humanist conviction that progress in technology will eventually make humans capable of enduring by transforming biological conditions with the aid of technology. It is in this sense that TS’s ontology is reflective of the belief that machines will triumph over humans.
Second, with an emphasis on superhumanity, the TS prioritises human becoming such
that human biological conditions are not essential to the being of humans. With the aid of
technology, the TS brings to light a human evolution that is, to borrow Noreen Herzfeld’s (2011:
591–601) words, ‘human directed’ and reluctant to ‘accept our bodily limitations.’ In tandem
with the belief that machines will triumph over humans, such a human-directed evolution
brings forth an ontology that human becoming takes precedence over human being through
transformation of human nature. Whilst the being of humans fades away, the idea of human
becoming undermines the possibility of determinate human nature insofar as human
embodiment is not the sine qua non of the understanding of being human. Grounded in its
optimistic position towards technology, TS proponents ‘have a trump card: the notion that
exponential technological advance is rewriting all the rule books’ (Boden 2016: 154). That is
to say, human nature and being can be rewritten through human becoming.

In short, TS produces an ontology that human becoming overshadows human being. In
this way, human sustainability lies in the idea that humans have to continue to become and
eventually need be transformed into either cyborgs or machines. The human capacity to endure
does not have anything to do with humans but rather is utterly determined by technology.
Humanity in se does not have anything as an ontological foundation of human sustainability
insofar as all things in and of humans can be changed and transformed. If this is the case,
questions arise: can we still speak of the being of humans? Is it still possible to define the reality
of being humans in the post-TS age?

Ectypal Ontology

In order to address the above two ontological questions, I draw on the Reformed
theology of archetype-ectype to construct an ectypal ontology in opposition to the TS’s
ontology. Archetype (ἀρχέτυπος) literally means the ultimate exemplar or pattern. Ectype
(ἔκτυπος) refers to a copy, replica, or reflection of the ultimate pattern. In Reformed traditions,
the archetype-ectype thinking is not esoteric. From the sixteenth century onwards, the
archetype-ectype thinking has occupied a significant place in Reformed theology and other
Protestant traditions.

It was Franciscus Junius (1545-1602), John Calvin’s student, who distinguished
between archetypal theology (theologia archetypa) and ectypal theology (theologia ectypa) for
the first time. Junius (2014: 107–113) contended that while archetypal theology refers to God’s
self-knowledge, ectypal theology to all knowledge of God revealed to creatures. The essential
difference between archetypal and ectypal theology lies in that

[ectypal theology] is created, it is dispositional; nor is it absolute except in its own mode,
but rather finite, discrete, and divinely communicated. It is, as it were, a true and definite
image of that theology [archetypal theology] which we have explained is uncreated,
essential or formal, most absolute, infinite, at once complete, and incomunicable
(Junius 2014: 117).

The distinction made by Junius shows that since its inception, the archetype-ectype thinking
has emphasised the qualitative distinction between the Creator and creatures, displaying a
strong ontological flavour.

The ideas of archetypal and ectypal theology, along with their differences, became a
key theme in Protestant theological writings of the post-Reformation era. Yet, most theologians
wrote of archetyp and ectyp in theological prolegomena. Few theologians deployed the
archetyp-ectyp thinking in constructing a theological anthropology. One exception was
Francis Turretin (1623-1687). In Institutio Theologiae Elencticae (1679-1685), a standard
textbook for Reformed theological education in the seventeenth and eighteenth centuries, Turretin (1992-1997: 5.10.3) argued that the human being is the image and ectype of God who is the archetype. Yet, he neither unpacked the meaning of ectype in relation to the image of God, nor spelled out the ontological implication of archetype-ectype thinking for theological anthropology.

The Dutch theologian Herman Bavinck (1854–1921) took a further step to use the ontological implication of the archetype-ectype thinking to account for the being of humans. For the purpose of this paper, I will concentrate on how he leverages the ideas of archetype and ectype as the conceptual instrument through which to spell out human ontology. In so doing, we can see that ectypal ontology underpins human sustainability.

Bavinck elucidates the archetype-ectype thinking in tandem with the imago Dei. He contends that the whole human being, encompassing both the soul and the body, does not have or bear the imago Dei but rather is the imago Dei (Bavinck 2004: 530). In order to flesh out the ontological meaning of ‘is,’ he draws on archetype-ectype thinking. Bavinck (2004: 532) argues: “‘Image’ expresses that God is the archetype and the human being is the ectype; ‘likeness’ adds that this image corresponds in all parts to the original. On the one hand, coupled with the imago Dei, the archetype-ectype thinking indicates that the human psychosomatic unity is predicated upon the fact that the human being is created as the ectype of God. As such, human ontology should be articulated with an eye both to the human body and soul. The significance of both the body and the soul rests with the ontological connection between God and humans. On the other hand, Bavinck trades on archetype-ectype thinking to highlight the ontological chasm between God and humans. He also argues elsewhere that God is ‘the imago increate or archetype’ and that the human being is ‘the imago creata or ectype’ (Bavinck 1928: 493).

Bavinck reformulates this ontological distinction between the archetype and the ectype with ‘being’ and ‘becoming.’ He contends: ‘The idea of God itself implies immutability. … He cannot change for better or worse, for he is the absolute, the complete, the true being. Becoming is an attribute of creatures, a form of change in space and time’ (2004: 158; emphasis added). In this light, becoming is not predicated of God but rather is characteristic of humans. To Bavinck’s (2004: 549–554) mind, human becoming is related to human morality insofar as the imago Dei – albeit that it includes both spiritual and physical dimensions – refers primarily to the spiritual and moral quality of human nature. As God’s ectype, human beings should continue to become moral in order that they can correspond in all parts to God by exhibiting God’s attributes. Furthermore, inasmuch as the human person who is the imago Dei ‘corresponds in all parts’ to the archetype who is the divine being, the idea of being must feature in human ontology, albeit that the human person is not immutable. As such, human ontology is being-and-becoming (Bavinck 1909: 140).

A question may arise here: does human becoming take precedence over the being of humans, or the other way around? Given that the whole human person is the imago Dei and the ectype of the immutable divine being, it suffices to say that the being of humans must be prioritised over their becoming. From this vantage point, we can see that archetype-ectype thinking lays an ontological foundation for human sustainability in confrontation with the TS’s challenges. With an emphasis on the machine’s triumph over humans in the future, the TS envisages that humans can create a post-Singularity future through their becoming under the auspices of technology. From this, it can be inferred that the human capacity to endure can only be actualised through becoming, and we cannot but speak of humans becoming sustainable rather than human sustainability.

In fact, archetype-ectype thinking exposes ontological questions lurking in the TS: is there anything in humanity that can serve as a solid foundation for the human capacity to endure? Is humanity per se sustainable? In the light of the TS, the being of humans and the imago Dei
alike will eventually fade away in the age of technology. If this were the case, what can guarantee human sustainability?

**The Sustainability of the Ectype**

My argumentation hitherto puts a spotlight on a contrast: the TS emphasises human becoming through technology in order to make humans capable of enduring, whereas the archetype-ectype thinking stresses the precedence of being over becoming, implying that instead of technology, the being of humans underlies human sustainability. The TS eventually makes human sustainability reliant upon technology such that humans may even need be transformed to be cyborgs or machines, which undermines the significance of human biological conditions. In this light, humans *de facto* become incapable of enduring insofar as human embodiment is part of the meaning of being human.

Human ontology constructed on the ground of the archetype-ectype thinking is an antidote to the TS’s overestimation of becoming. Human sustainability rests in an ectypal ontology – the human person’s identity as the ectype of the divine archetype – which means that human capacity to endure is, in essence, the sustainability of the ectype. Grounding human sustainability in this ectypal ontology brings forth two crucial implications.

First, from the perspective of ectypal ontology, technology cannot transform the being of humans insofar as it is merely the result of human ectypal creative work. The fact that human being *is* the *imago Dei* and the ectype that corresponds in all parts with God means that the human being does emulate God’s creativity in an ectypal sense. Specifically, God creates out of nothing, but humans create out of something. Human artefacts are always derived from what God has already created. If the being of humans – which was created out of nothing – can be changed and is overshadowed by becoming through technology, then one could assert that human creation out of something is on par with God’s creation out of nothing.

Philip Hefner’s idea of created co-creator may be drawn on to support the TS’s ideal of transforming humanity to be more sustainable. Hefner (1993: 27) claims that ‘[h]uman beings are God’s created co-creators whose purpose is to be the agency, acting in freedom, to birth the future that is most wholesome for the nature that has birthed us’. He affords us a conceptual apparatus through which to understand how humans, as created co-creators, participate in God’s continuing creation. Gregory Peterson (2004: 829; emphasis added) remarks that the prefix co- in co-creator ‘implies not simply that we are creating in and of our own right but that our creative acts are in cooperation with God’s creative acts in a way that suggests partnership rather than *subordination*.’ Yet, Peterson’s remark is at odd with Hefner’s (1993: 39) own sentiment that the term ‘co-creator’ in no way implies human ‘equality with God the creator’. It is apparent that for Hefner the idea of created co-creator is indicative of human partnership with God in *subordination*. Viewed in this light, rather than backing the TS’s ideal, the concept of humans as created co-creator, in fact, sits well with ectypal ontology and ectypal understanding of human creation.

This ectypal ontology does not overthrow technology; nor does it lead to a pessimistic position toward technological advancement. Instead, it endows technology with profound theological significance. In light of ectypal ontology, technology is embedded with a mission related to God’s whole creation. To put it in Stephen Monsma’s (1986: 8) words, ‘we are to develop technology in such a way that the blessings, riches, and potential God has put in creation are allowed to flower’. Ectypal ontology brings to light the contributions that technology can make to human sustainability. That is, technology is conducing to the actualisation of God’s blessings to all creation, such that the human capacity to endure can be strengthened.
Human sustainability rooted in ectypal ontology gives birth to the second implication: ectypal ontology foregrounds the technomoral future in relation to the human capacity to endure and to human embodiment. Unlike the TS’s emphasis on ontological becoming, ectypal ontology underlines human moral becoming and recognises the significance of the human body in human life. This is so because the *imago Dei* indicates the psychosomatic unity of the human being. Ectypal ontology gets around the TS’s mishandling of human biological conditions and opens up a way to include the human body within sustainable technomoral futures. The human capacity to endure lies in how humans can make use of technology to enhance their moral life in an *embodied* way. In what follows, I will draw on recent research on embodied morality in relation to AI.

In the 1980s, AI research had a paradigm shift towards embodiment. Rather than being preoccupied with virtual AI systems, researchers adopted the embodied approach to constructing an embodied AI artefact, say AI robots, in the physical world. This paradigm shift was caused by a general dissatisfaction with the classical approach, one that could not deal with problems such as sensations, locomotion and other issues that are related to embodiment (Pfeifer and Iida 2004: 2-4). This paradigm shift is largely concerned with technical issues.

With the introduction of embodied cognition theory into AI research, much attention becomes drawn to embodied AI as an embodied moral agent. Specifically, embodied cognition theory suggests that real cognition must be practiced in a physically embodied way and in the world of physical objects because cognitive activities take place through interaction with physical objects and agents. As a result, ‘a moral agent may need to be embodied in the world, have access to emotions or emotion-like information, and have an awareness of social dynamics and customs if it is to function properly in many contexts’ (Wallach and Allen 2009: 118; also see Ziemke 2007: 167–179). This idea of embodied moral agency plays a role in understanding AI’s place in human communities from a moral perspective.

Wendell Wallach and Shannon Vallor (2020) together explore how embodied virtues can address the question of human-level AI (artificial general intelligence) and artificial superintelligence. Their article is directed at theories of human-level AI and superintelligent systems, without discussing the possibilities of these AI systems. A discussion on this subject is beyond the scope of this paper, and I will focus attention on Wallach and Vallor’s view of embodied virtues in relation to AI machines.

Wallach and Vallor (2020: 383) suggest that human-level AI and superintelligent systems can be made safe and do not threaten humankind provided that something like human embodied moral virtue and character can be actualised in AI. This is so because moral phenomena are embedded with moral meaning that is intertwined with the moral agent’s embodiment. Hence they maintain that ‘[a]rtificially intelligent systems are likely to suffer significant deficits of moral competence without the embodied faculties that humans enact to cultivate and sustain their most reliable reservoirs of moral ability: their virtues’ (ibid.: 405).

Wallach and Vallor examine embodied virtues in relation to AI from different perspectives. For example, they suggest that moral reflection reminds us of the importance of human embodiment. Moral reflection means the capacity an agent possesses to ‘take a higher-order normative position’ to her own desires, actions, motivations, and other aspects of moral life (Wallach and Vallor 2020: 402). Moral reflection shows how the agent defines something vicious and wants to be better. Yet, Wallach and Vallor (2020: 402) insist that human moral reflection also includes the idea that humans ‘reflectively desire to be the better version of ourselves that we currently are not.’ This *self-reform* is closely related to the agent’s genuine life (e.g., the connection with a community) and thus necessitates ‘embodied capacities’ (Wallach and Vallor 2020: 402). Hence, a morally reliable AI system must be engineered with the replication of ‘embodied moral experience’ (Wallach and Vallor 2020: 405).
Wallach and Vallor’s argument for AI’s embodied virtue helps to bring to light the relationship between ectypal ontology and technomorphic futures. That is, ectypal ontology underpins human sustainability and, consequently, underlines the importance of human embodiment for technomorphic futures. In contrast with the TS’s ontology, ectypal ontology stresses that human beings continue to become moral without downplaying their biological bodies. From this we can draw two implications. First, the moral quality of the human being as the imago Dei can be embodied via technology to create sustainable life and society. In other words, the psychosomatic significance of the imago Dei implies that its moral quality should be related to human embodiment. Second, technology can extend human embodiment to enhance human moral agency through interaction with physical objects and environments. As such, technology is a tool with which humans can extend their moral quality proceeding from the imago Dei.

A case in point is the smart thermostat. Some companies have successfully developed AI thermostats to keep homes warm and comfortable while saving energy. The embedded AI system can monitor heating, ventilation, and air conditioning. For example, while the heating system is working, the user will be notified via the mobile application if windows are open. In this instance, technology helps humans to make a moral decision in their physical interaction with the environment (closing windows or turning off the heating system) to perform their responsibility to care for the earth. Indeed, it is the AI thermostat system that monitors and interacts with the environment. Nonetheless, this interaction can be viewed as delegated insofar as human interaction with the environment dominates in the decision-making of AI thermostats. On the other hand, AI thermostats visualise human physical interaction with the environment in a digital way (e.g., room temperature, air quality index, and humidity in a room) and make humans more sensitive about changes in their environment. To be sure, AI thermostats enhance human capacities to make a moral decision in building a comfortable environment, showing their care for other creatures.

Conclusion

This paper has explored human sustainability from an ontological perspective. By retrieving Reformed ectypal ontology, I have brought to light the implausibility of the TS’s ontology that downplays human biological conditions and makes humans reliant upon technology. In this light, the human capacity to endure has nothing to do with humanity per se.

Ectypal ontology provides a holistic understanding of the human person and pays attention to the human embodiment in relation to human sustainability. That is to say, human biological conditions play a significant role in human sustainability in the age of technology. Moreover, ectypal ontology helps us to get around technosolutionism – that is, technology is the only saviour – while speaking of human sustainability. Humans do not become sustainable through technology but rather are capable of enduring regardless of progress in technology. Nonetheless, ectypal ontology does not undermine the value of technology. Instead, the idea of humans as the created ectype of God steers technology towards a proper goal – that is, humans are capable of enduring by embodying the moral quality of the imago Dei with technology to create technomorphic futures.

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