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**ARE HUMANS CYBORGS?**  
**AN EXERCISE IN PHILOSOPHICAL AND THEOLOGICAL ANTHROPOLOGY<sup>1</sup>**

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**1 – INTRODUCTION: *THE MATRIX RELOADED***

For me, one of the most capturing moments of *The Matrix Reloaded* was the conversation between Neo and Counselor Hamann, at the Engineering Level of Zion. Counselor Hamann, an old man, is impressed by the power of the machines which keep the city and its people alive, so deep below the earth. Machines, Hamann argues, have the power to give life, and the power to end it. And just as the people on the earth are plugged into the Matrix, keep the machines alive, so the people of Zion are, in a sense, plugged into the machines that keep them alive. Neo, slightly confused by the Counselor's words, states that these machines do not control us, but we control them: "If we wanted to, we could shut them down." Counselor Hamann smiles. "Yes, if we wanted, we could smash them to bits. Although if we did, we would have to consider what would happen to our lights, our heat, our air." Neo replies: "So we need machines, and they need us. Is that your point?" Hamann shakes his head. "No, no point." As an old man, he doesn't make points any more.

Or is he? We, watching the film, know that other machines are underway, probably to destroy Zion and kill all of its people, the people who are 'awake,' no longer plugged into the Matrix. From a human perspective, those machines are downright evil. Yet, looked upon from another perspective, those machines simply are struggling for their survival. Humans, so we are told, initially created them in their struggle to find consciousness through Artificial Intelligence. And the dependence of machines on humans never diminished. They still need humans to stay alive, as sources of energy and power. If the rebellion of Zion succeeds, and the other humans, still plugged into the Matrix, were to be freed, the machines would have no

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more energy sources, no more food, and their extinction would be imminent. The attempt of the machines to reach Zion and destroy it is a tactic for the survival of the species.

Counselor Hamann's words seem to suggest that humans need machines, just as the machines need humans for their survival. Humans and machines are entwined in an intimate, symbiotic relationship. In the three *Matrix* films this relationship is portrayed as having devastating consequences for the human species, and as such these films are based on a very pessimistic view of technology, according to which technology stands opposed to nature, including human nature. *The Matrix* thus seems to prey on our fear of technology running amok – a fear that is also present in the Jewish Golem stories and Mary Shelley's *Frankenstein*. But is such a pessimistic view of technology always warranted? Can we not deal with the question of the relation between nature and technology in a different way? And what is the relation between humanity and nature? What is the relation between human nature and technology? These questions thus focus around three 'attractors': nature, human nature, and technology. From a theological perspective, these questions have another dimension, as they also relate to that Being that is considered worthy of worship and is called God, the Creator of heaven and earth.

In this paper – which I consider to be an exercise in philosophical and theological anthropology – I focus on the relation between human beings and their technology. Though a tricky word to define, in what follows, I will use the term 'technology' broadly as *the intelligent use and development of material elements which are designed, made, used, and modified for some purpose*. The central question I will ask is this: *How does our use of technology relate to our being human?* Or in other words: *What impact does the use of technology have on reflections on the nature of human beings?* As I will argue later on, these issues are theologically significant in that they touch upon the idea that humans are created in the 'image of God' (*imago Dei*). In other words, how we think about humans also affects the way we think about the relation between humans and God.

## **A. HUMANS AS 'NATURAL-BORN CYBORGS'**

### **2 – WHAT ARE HUMAN BEINGS?**

Let us begin by asking: What is the nature of human beings? This question belongs to the very core of the Western philosophical tradition. One could approach this question by asking for the *essence* of human persons, the one stable element or property that is common to all human persons individually, and that distinguishes ourselves from other species. One can easily identify some examples of this approach. Religious believers have traditionally talked about an *incorporeal soul* as the essence of humans. Rationalists have pointed to the use of our *ratio* as the very essence. Today, there are scholars who argue that *language* is the essence of humanity, something that perhaps can be linked to the structuring of the brains of *homo*

*sapiens sapiens*. Still others have argued that the human use of *tools* is what defines human beings.

I would say that the characteristic features of all these essentialist approaches is that they have proven inadequate to define what it means to be human. Under the influence of scientific thinking, many religious believers and theologians have given up their belief in an incorporeal soul and now defend some form of ‘non-reductive physicalism.’<sup>2</sup> Rationalists are proven to be misguided in their claim that the human *ratio* is such a unique feature. Some apes are also able, be it to a lesser extent than humans, to use inductive and deductive thinking to reach some conclusion. Language also is no longer a defining element, since many biologists have become convinced that other species, such as dolphins or whales, communicate by some form of language. Moreover, some apes are able, to some extent, to learn the use of sign language. Finally, there are many species that are able to use tools to get to food (think about otters using stones to crack shells, or apes using sticks to fish for termites). So what were once thought to be the defining characteristics of human beings, turned out to be already immanent in other species in nature. Perhaps it is simply misguided to search for one unique defining characteristic, as the essentialist approach does.

Thus, instead of an essentialist approach, I prefer a *relational* approach.<sup>3</sup> According to a relational approach, one should look at the whole and at the relations between its constitutive elements, and then ask what the function is of some element within that whole. Instead of looking for a single characteristic that defines the essence of human beings, a relational approach would urge one to simply look at all the characteristics of human beings and, moreover, to the way humans relate to nature and to other humans. In my view, the uniqueness of human beings cannot be reduced to one single defining element in individual humans, but is closely linked to an emergent whole constituted by the combination of naturally-given capacities, learned abilities, knowledge transmitted by social interaction, and the cognitive and material products of human activity – and it is that emergent whole we often refer to as *culture*.

In my view, what is special about human nature is *the way in which humans, through culture, are able to use their natural abilities to transcend the natural confines of their existence and to stretch the limits of their biological constitution*. Let me explain this by an example. Suppose you see a blind woman walking along a busy shopping street, using a stick as a probe to find out whether there are obstacles in her way that could harm her. Without the

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<sup>2</sup> Cf. W.S. BROWN, N. MURPHY, H.N. MALONY (eds.), *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature*. Minneapolis: Fortress Press 1998.

<sup>3</sup> In this, I follow the Dutch philosopher C.A. VAN PEURSEN, *Strategie van de Cultuur: Een Beeld van de Veranderingen in de Hedendaagse Denk- en Leefwereld*. Amsterdam/Brussel: Elsevier 1970; C.A. VAN PEURSEN, *Cultuur in Stroomversnelling*. Leiden: Martinus Nijhoff 1992<sup>8</sup>. What I call a ‘relational’ approach is denoted by Van Peursen as a ‘functional’ approach. Van Peursen uses ‘ontological’ or ‘substantialist’ thinking to depict what I call essentialism.

stick, she would not be able to move around so quickly, and she would probably have to use her hands to feel what is in front of her. But would she find a loose tile on time? Not unless she would crawl around on her hands and knees. In other words, without her stick, the woman's abilities would be seriously limited. However, using her stick, she is able to transcend her bodily limitations and safely find her way. The stick is a material element, used by a human being for a definite goal, and therefore would fall under our definition of technology. Thus, humans are able, by technology, to transcend their biological constitution, and to adapt to the needs of their lives.

But can we say more about the relationship between the blind person and her stick? The philosopher of science Michael Polanyi used the example of the blind person and her stick to establish the difference between focal and subsidiary awareness. The blind person is only subsidiarily aware of the stick, as her focal awareness is on what the stick touches upon: the stick is used as a tool or a probe.<sup>4</sup> Polanyi generalizes this example and concludes that this

subsidiary awareness of tools and probes can be regarded now as the act of making them form a part of our own body. ... While we rely on a tool or a probe, these are not handled as external objects. ... We pour ourselves out into them and assimilate them as parts of our own existence. We accept them existentially by dwelling in them.<sup>5</sup>

In other words, according to Polanyi, the blind person *uses* the stick as a probe, but in using it, she makes the stick form a *part of her body*. This very same phenomenon was observed by the famous French philosopher Maurice Merleau-Ponty, who writes:

The blind man's stick has ceased to be an object for him, and is no longer perceived for itself; its point has become an area of sensitivity, extending the scope and active radius of touch, and providing a parallel to sight. In the exploration of things, the length of the stick does not enter expressly as a middle term: the blind man is rather aware of it through the position of objects than of the position of objects through it.<sup>6</sup>

Merleau-Ponty concludes then by writing that “[t]o get used to a hat, a car or a stick is to be transplanted into them, or conversely, to incorporate them into the bulk of our own body.”<sup>7</sup> So, both Merleau-Ponty and Polanyi conclude that what happens with some of our technology is that in using it, we incorporate that technology into our body. What happens, to use the

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<sup>4</sup> M. POLANYI, *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago: The University of Chicago Press 1962, 55f., 58f.

<sup>5</sup> *Ibid.*, 59.

<sup>6</sup> M. MERLEAU-PONTY, *Phenomenology of Perception*. London: Routledge 1962, 143.

<sup>7</sup> *Ibid.*

words of Heidegger, is that the thing which is ‘ready-to-hand’ (*zuhanden*) withdraws itself in order to be really ‘ready-to-hand.’<sup>8</sup> The thing that is used is no longer a thing in itself, but in its use as a tool it is transformed. In its use, the thing can be seen under the aspect of ‘towards-which’ (*Wozu*).<sup>9</sup> Heidegger’s metaphor of the ‘towards-which’ is appropriate in that it has the connotation of both a spatial dimension (it is pointed towards something), and a teleological dimension (it is used for a specific purpose). In the blind person’s use of the stick in order to find her way around in this world, both the spatial and the teleological dimensions are present.

The point that Polanyi and Merleau-Ponty seem to have in mind is that physically or ontologically there may still be a difference and demarcation between the body and the tool, yet in *using* the tool that demarcation is transcended: the tool at hand becomes an extension and hence a bodily part of the person using the tool. In that sense we can say that humans can use their natural abilities (i.e. their abilities to use things as tools) to transcend the natural confines of their existence.

### **3 – TECHNOLOGY AND THE RELATION BETWEEN HUMANS AND THE WORLD**

As becomes clear in the example of the blind person and her stick, by using technology, humans are no longer prisoners of their biological constitution, but to a certain extent are able to transcend that constitution, to stretch the limitations of their biological existence. How far such stretching can go, is as yet indeterminable. We cannot yet predict how far our technology will take us. However, we do know that with our technology we are no longer victims of evolutionary processes, but can actually influence those processes, at least to some extent. But by our technology, we not only influence our own evolution, but the evolution of our entire biosphere. With our technology we affect the world around us. And this forces us to face the question how we are related to that world.

We are seriously handicapped in our reflections about the relation between humanity and the surrounding world because of the heritage of what I call a *digitalized worldview*: a worldview in which everything can be categorized in either one of two mutually exclusive categories: natural-supernatural, God-nature, ordinary experience vs. scientific theory, and humanity vs. nature. This digitalizing tendency in the Western worldview emerged with the rise and growing successes of science in the 17th century. In contrast to the Medieval worldview, in which people saw the world and its internal processes as being moved by the love of God (see e.g. Dante’s *Divine Comedy*), scientists and philosophers now started to view the world as autonomous, working in an orderly and lawful manner, like a machine. Furthermore, with the success of scientific investigation, somehow the idea emerged that humanity and nature were also two different categories of being. There grew a distinction

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<sup>8</sup> Cf. M. HEIDEGGER, *Being and Time*. Oxford: Blackwell 1962, 99.

<sup>9</sup> Ibid.

between the observer and the observed, between the knower and the known. According to the philosopher Louis Dupré, this distinction was already present in Scholastic thought but became more prominent in Nominalism, removing itself “from the position of ancient and early medieval philosophy, according to which to know consists in becoming in some way what one knows.”<sup>10</sup> According to some Christian interpretations of the *Genesis*-account, in creating humans with a dual nature of mind/soul and body (also a digital distinction!), God had so ordained as to place humans as intermediaries between the realm of the supernatural and the natural. Humans were seen as hybrid creatures, being linked to the realm of the supernatural by their immortal soul, being bound to earthly matters by their carnal bodies. In the words of the historian Lynn White Jr., “God planned all of this [= creation] explicitly for man’s benefit and rule: no item in the physical creation had any purpose save to serve man’s purposes. And, although man’s body is made of clay, he is not simply part of nature: he is made in God’s image.”<sup>11</sup> White writes that since it had cut off humans from their natural belonging, “Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects.”<sup>12</sup> It is this digitalized worldview, in which humanity together with culture are rigidly separated from nature, that is the default position of reflecting on our relationship with the world today.

However, as we have seen, the language of Polanyi, Merleau-Ponty, and Heidegger points to a different perspective. They seem to direct our attention to the possibility that the boundaries between our bodies and the world are not fixed but fluid. In the use of tools, we make technology parts of our bodies. Or perhaps, using a term of the neurologist V.S. Ramachandran, in the use of technology, we are redefining our *body image*. Ramachandran used the notion of body image in his dealing with patients who suffered from phantom limbs. In Ramachandran’s idea these patients’ brains were (temporarily) unable to redefine their body image. As a result, even though a patient knew or saw that his arm was missing, he still felt the presence of his missing arm because his brain as a whole was still communicating with – i.e. sending signals to and receiving signals from – those parts of the brain that used to be linked to sensations of his now missing arm. We could say that in the use of tools, we are also altering our body image in that we ‘project’ or extend our sensations to an external object linked to our bodies. Ramachandran uses as an example his “experience of ‘feeling’ that my car is part of my extended body image, so much so that I become infuriated if someone makes a small dent on it. But would I want to argue from this that the car had become part of my

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<sup>10</sup> L. DUPRÉ, *Passage to Modernity: An Essay in the Hermeneutics of Nature and Culture*. New Haven/London: Yale University Press 1993, 80.

<sup>11</sup> L. WHITE, JR., ‘The Historical Roots of Our Ecological Crisis,’ in: C. MITCHAM & R. MACKEY (eds.), *Philosophy and Technology: Reading in the Philosophical Problems of Technology*. New York: The Free Press 1972, 262f.

<sup>12</sup> *Ibid.*, 263.

body?”<sup>13</sup> Ramachandran does not dare give a direct answer, but elsewhere argues that “[y]our own body is a phantom, one that your brain has temporarily constructed purely for convenience.”<sup>14</sup> According to Ramachandran, my body is merely a construction of my brain. The feeling that my car is an extension of my body likewise is a construction of my brain. But if that is so, where does the construction stop? How can I be certain that my whole world is not a construction of my brain, perhaps of a brain in a vat?<sup>15</sup> The consequence of Ramachandran’s argument that the body is a construction of the brain, is that it ultimately amounts to idealism, according to which my entire reality is a phantom, a construction of my brain – a possibility which is explored in the *Matrix* films. In that case, in the words of Karl Popper, “our world is perhaps just our dream.”<sup>16</sup>

Another possibility is simply to accept, as do Polanyi and Merleau-Ponty, that the boundaries between subject and object, or between our bodies and the world can become fluid. So, the stick of the blind person becomes part of her body just as much as that the car Ramachandran mentions becomes a part of his body. This may seem farfetched at first, but consider how new technologies literally become part and parcel of our bodies. Think, e.g., about pacemakers or artificial hearts: people’s lives depend on these technological feats. The same goes for the act of taking medicine, which, according to theologian Gregory Peterson, “merges us in the most intimate way with our technology, as our bodies absorb chemicals that may never have existed in nature.”<sup>17</sup> Or think about prostheses and external hearing aids, but even more: cochlear implants, electronic implants in the inner ear with direct electrical connections into the nervous system. Technology supplements or in some cases even replaces biology. In many medical applications, our relation to technology is one of *symbiosis* between humans and machines.

#### 4 – HUMANS AS ‘NATURAL-BORN CYBORGS’

A perspective that focuses on the fluidity of the boundaries between mind and body, and body and world is that of humans as ‘natural-born cyborgs.’ The term ‘cyborg’ is a contraction of

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<sup>13</sup> V.S. RAMACHANDRAN & S. BLAKESLEE, *Phantoms in the Brain: Probing the Mysteries of the Human Mind*. New York: Quill 1998, 60f. See also A. CLARK, *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence*. New York/Oxford: Oxford University Press 2003, 59-87.

<sup>14</sup> RAMACHANDRAN & BLAKESLEE, *Phantoms in the Brain*, 58. Italics in original.

<sup>15</sup> The theme of the ‘brain in a vat’ was made famous by Hilary PUTNAM’s *Reason, Truth, and History*. Cambridge: Cambridge University Press 1981. It was also the leading theme of *The Matrix* films, cf. W. IRWIN (ed.), *The Matrix and Philosophy: Welcome to the Desert of the Real*. Chicago/La Salle: Open Court 2002.

<sup>16</sup> K.R. POPPER, *Objective Knowledge: An Evolutionary Approach*. Rev. ed. Oxford: Clarendon Press 1979, 38. Italics in original.

<sup>17</sup> G.R. PETERSON, *Minding God: Theology and the Cognitive Sciences*. Minneapolis: Fortress Press 2003, 217.

'cybernetic organism' and was coined by in 1960 by Manfred Clynes and Nathan Kline in a paper about space travel. Clynes and Kline wrote that space travel "invites man to take an active part in his own biological evolution. Scientific advances of the future may thus be utilized to permit man's existence in environments which differ radically from those provided by nature as we know it."<sup>18</sup> In other words, in order to survive in environments for which human biology is unsuited to survive, science may alter human biology in such a way that humans are able to adapt to new environments. Such altering of human biology may result in what Clynes and Kline call a cyborg. They define 'cyborg' in cybernetic terms as an organism that "deliberately incorporates exogenous components extending the self-regulatory control function of the organism in order to adapt it to new environments."<sup>19</sup> In other words, Clynes and Kline describe a cyborg as an entity that incorporates external elements in its own physical constitution as a survival strategy in order to adapt to changing environmental circumstances.

The cognitive scientist Andy Clark recently came up with the concept of 'natural-born cyborgs' to emphasize that "[w]hat makes us distinctively human is our capacity to continually restructure and rebuild our own mental circuitry, courtesy of an empowering web of culture, education, technology, and artifacts."<sup>20</sup> For Clark, the term 'cyborg' not only refers to the inhabitants of science fiction stories, but it signifies a fundamental human ability "to enter into deep and complex relationships with nonbiological constructs, props, and aids."<sup>21</sup> For Clark, this ability is as natural for us as is walking and talking. Yet, in our use of modern technology, this natural ability to extend our capacities through external elements has become much more sophisticated and has changed the way we live our lives and experience the world. Telescopes and microscopes are able to extend our visual sense, and looking through them is using them as extensions of our eyes to see what, without them, could not be seen by the naked eye. Moreover, as Gregory Peterson writes, "[s]o familiar has our technology become that it is often invisible to us. But any individual who wears glasses or contacts is in a sense a cyborg. So too is anyone who has an artificial hip."<sup>22</sup> Cars are used to extend our bodily motor capacities. A sports star's racket is an extension of his or her arm. Pens and pencils are used as extensions of our hands, and the paper used to write on is an extension of our cognitive

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<sup>18</sup> M.E. CLYNES & N.S. KLINE, 'Cyborgs and Space,' in: C.H. GRAY (ed.), *The Cyborg Handbook*. New York/London: Routledge 1995, 29.

<sup>19</sup> *Ibid.*, 31.

<sup>20</sup> A. CLARK, *Natural-Born Cyborgs*, 10. See also A. CLARK, *Being There: Putting Brain, Body, and World Together Again*. Cambridge, Mass.: The MIT Press 1997; A. CLARK, *Mindware: An Introduction to the Philosophy of Cognitive Science*. New York/Oxford: Oxford University Press 2001; A. CLARK, 'Reasons, Robots and the Extended Mind,' in: *Mind and Language* **16**, 2001, 121-145.

<sup>21</sup> CLARK, *Natural-Born Cyborgs*, 5.

<sup>22</sup> PETERSON, *Minding God*, 217.

apparatus: by writing something down, we no longer need to remember it, since it is now stored on the piece of paper. Pieces of paper with notes, but also encyclopedias, thus, are portions of the external world used as extraneural memory stores. And what about computers? The cyberspace of the Internet is becoming an increasingly important memory bank. E-mail and chat rooms enhance our communicative abilities (as the telegraph, telephone, and fax machines did earlier). And Artificial Intelligence and robotics might enhance our bodily abilities, especially in medical applications, beyond our present comprehension.

In short: I believe that Clark's concept of the natural-born cyborg captures in a powerful way that aspect of human beings that has to do with our fundamental, natural ability to intimately relate to non-biological, external tools and technology in the way that Polanyi, Merleau-Ponty and Heidegger described earlier. Moreover, it is an attempt to talk about the subtle and supple interactions between mind, body, and world in a way that transcends other models built on a digitalized worldview assuming dichotomies between mind and body, and between body and world. By technology we not only manipulate (human) nature, but by technology we extend ourselves beyond our bodily confines. It may seem, according to the old, digital Cartesian paradigm, that our skin is the demarcation between 'me' and what is outside of me, but according to Clark's, Polanyi's, Merleau-Ponty's, and Heidegger's penetrating analyses, that is no longer the case. Since the dawn of humanity, we have always been cyborgs. The implications of this perspective is that it forces us to revise both our view of technology as well as our view of the relation between culture/technology and nature.

## **B. A THEOLOGICAL PERSPECTIVE ON HUMANS AS 'NATURAL-BORN CYBORGS'**

### **5 – THE NATURAL-BORN CYBORG 'CREATED IN THE IMAGE OF GOD'**

Is the model of humans as natural-born cyborgs also theologically relevant? I believe so. The idea that humans are natural-born cyborgs from a theological perspective forces us to reconsider the relationship between humans, nature, and God. In what follows, I will focus on the notion of the *imago Dei*, the idea that humans are created in the image of God. The notion of *imago Dei* traditionally has been the focal point of reflections on the relations between God, humanity, and nature. According to the computer scientist and theologian Noreen Herzfeld, looking at the history of this concept, one can discern three main interpretations of the *imago Dei*:

1. The first interpretation Herzfeld calls a *substantive interpretation* in which the image of God is considered to be "a property or set of properties intrinsic to each of us as individuals ..."<sup>23</sup> One often finds human's cognitive abilities (reason or intelligence) as the property that God and humans have in common. Augustine, for instance, wrote:

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<sup>23</sup> N. HERZFELD, *In Our Image: Artificial Intelligence and the Human Spirit*. Minneapolis: Fortress Press 2002, 7.

“There is no doubt that man was made in the image of God that created him, not according to the body, nor according to any part of the soul, but according to the rational mind wherein the knowledge of God can exist.”<sup>24</sup> It were the cognitive abilities which supposedly set humanity apart from creation. The substantive interpretation has at least two problematic features. As Noreen Herzfeld writes, this position implies almost inevitably a mind-body dualism. Moreover, viewing human reasoning as the pinnacle of creation has often led to a neglect of or even hostility towards the body, especially in the Platonic-Augustinian traditions.<sup>25</sup>

2. A second, *functionalist interpretation*, “views the image, not as a property, but as a title given to humans by virtue of what we do, in particular, our function, as God’s representatives, of exercising dominion over the rest of creation.”<sup>26</sup> This notion has been used to emphasize humanity’s special place in and especially apart from the rest of creation. It has even been used to legitimize humanity’s dominion over the rest of creation, with disastrous effects for nature and, if we continue to destroy our natural habitat, for humanity itself. Technology has often been the instrument with which humans intervened in natural affairs. And since technology is a part of human culture, this has resulted in the view that culture (including technology) and nature somehow stand opposed to each other. Such interpretations of the *imago Dei* in terms of dominion and regency are no longer tenable in our society, considering all the environmental problems we ourselves have caused and still cause.
3. Finally, one can discern *relational interpretations*, which argue that the *imago Dei* manifests itself in the relations between humans and God, between humans and nature, and between different human individuals. According to the relational stance, the *imago Dei* is an emergent property, “not something found in any individual but ... always corporate in nature, arising in interaction.”<sup>27</sup> It is this relational interpretation of the *imago Dei* that Herzfeld argues to be the most constructive in theological reflections about our dealing with technology.

In her interesting study, Herzfeld argues for a curious analogy between the way we see God and the way we are dealing with technology, especially computers and artificial intelligence. Just as God created humans in God’s image, so humans create in their image. Humans are created according to the *imago Dei*, while artificial intelligence (AI) is technology created in the *imago hominis*.<sup>28</sup> The three distinctions which Herzfeld identified in the history

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<sup>24</sup> AUGUSTINE, *On the Trinity*, 12.7.10, quoted in HERZFELD, *In Our Image*, 16.

<sup>25</sup> Cf. HERZFELD, *In Our Image*, 19.

<sup>26</sup> HERZFELD, *In Our Image*, 7.

<sup>27</sup> *Ibid.*; cf. also 45-49.

<sup>28</sup> “As the *imago Dei* captures the way humans are like God, so the *imago hominis* of artificial intelligence seeks to capture the way computers could be like humans.” HERZFELD, *In Our Image*, 50.

of the *imago Dei* concept can also be found in different approaches to AI. The substantive interpretation can be found in symbolic AI<sup>29</sup>; the functionalist interpretation can be found in weak AI, according to which AI is used improve our understanding of certain functions of the human mind<sup>30</sup>; and the relational interpretation can be found among those scientists who emphasize that intelligence is a social activity<sup>31</sup>.

Herzfeld then goes on to argue that our attitude towards the computer as the *imago hominis* “holds ethical implications for both our self-understanding and our future coexistence with our own creations,”<sup>32</sup> and that the relational interpretation of both the *imago Dei* as well as the *imago hominis* is the most fruitful for ethical reflection. That humans are created in the image of God implies that there is first of all a relationship between each human being and God.<sup>33</sup> However, because each human being is created in the image of God, the relationship with God should also be extended to include relationality amongst human beings. To exist, in Herzfeld’s opinion, is to exist in relation. This can also be extended to the realm of the human-nonhuman relationships. For the relational interpretation of the *imago Dei* “focuses on the calling of human beings to be in relationship.”<sup>34</sup> Here she revolts against the implications of the substantive and functional interpretations of the image of God, which emphasize both a dualism of mind and body and of humanity and nature. Herzfeld argues that we must move

from a view of nature as a neutral backdrop against which the drama of human life is enacted, toward a view that acknowledges the mutuality of influence in our relationship with nature. A fully relational understanding of what it means to be human suggests that we must give serious thought to our relationship with and responsibility for the natural world.<sup>35</sup>

In the context of the human-computer relationship, she extends these ideas with reference to the Rule of St. Benedict, according to which the relationality among humans comes first and should never be superseded by human-material relationships, but to which is added a call to treat tools and goods as sacred and thus with respect.

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<sup>29</sup> HERZFELD, *In Our Image*, 35-41.

<sup>30</sup> HERZFELD, *In Our Image*, 41-45.

<sup>31</sup> HERZFELD, *In Our Image*, 45-49.

<sup>32</sup> HERZFELD, *In Our Image*, 85.

<sup>33</sup> It is here that the influence of Barthian theology on Herzfeld’s theological anthropology comes to the fore: first and foremost comes the relation between humans and God, thereafter the relation with other humans. See HERZFELD, *In Our Image*, 25-31, 82f., 86f.

<sup>34</sup> HERZFELD, *In Our Image*, 90.

<sup>35</sup> *Ibid.*

What we can gather from Herzfeld's analysis is that the relational interpretation of the *imago Dei* and the *imago hominis* leads to a holistic interpretation in which God, humanity, and nature are all closely intertwined. As I see it, her relational interpretation of the image of God is an attempt to move beyond the digitalized worldview. Moreover, it gives AI, and, I would like to add, technology in general, a definite place in that worldview, as the expression of the human urge to create. However, in what way does the model of the natural-born cyborg add something to the discussion concerning the concept of *imago Dei*? In the following and final section of my paper, I want to argue for a model that makes Herzberg's relational interpretation of the *imago Dei* more concrete, and that is able to take seriously from a theological perspective the idea that humans are natural-born cyborgs.

## **6 – THE NATURAL-BORN CYBORG AS ‘CREATED CO-CREATOR’**

Let us first look at two crucial aspects of the natural-born cyborg model.

(a.) First of all, if it is true that we are all in a sense natural-born cyborgs, linking mind, body, and world tightly together, then it is no longer possible to consider humanity as being separated from the rest of creation. As Polanyi and Merleau-Ponty have shown us, in our use of technology, we pour ourselves out into the world, we dwell in it.<sup>36</sup> In using technology, we connect with the world in such a way that the boundaries between us, our bodies, and the world become fluid. We are an inherent *part of* creation, not *apart from* it.

(b.) Secondly, the model of the natural-born cyborg leads to re-evaluate the role of the body. In Christianity it was particularly the Augustinian tradition that presupposed a duality between mind and body. Our model, however, presupposes or builds upon the notion of ‘embodied cognition,’ according to which cognition involves an interaction between mind, body, and world. Our mind is not merely some kind of information processing device, whose connections to the outside world are of little importance.

The model of the natural-born cyborg thus dismisses the view that humanity is distinct from creation. It argues instead for a continuity, and emphasizes the crucial role of our embodiment for our cognitive abilities. Theologically speaking, it thus emphasizes our createdness. Yet, at the same time it is true that there is nothing in creation that equals humanity's technological and cognitive skills. To illustrate this, let us consider three aspects:

1. It is now commonly assumed that earlier human species, such as *homo habilis* and *homo ergaster* as well as *homo erectus* and *homo neanderthalensis*, all used different kind of tools. And it is also been shown that other species use sticks and stones as tools to get to food sources. But *homo sapiens sapiens* is the only species able to use and shape tools so as to make them more effective, and to do so not by a process of trial-and-error, but by

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<sup>36</sup> POLANYI, *Personal Knowledge*, 59: “While we rely on a tool or a probe, these are not handled as external objects. ... We pour ourselves into them and assimilate them as parts of our own existence. We accept them existentially by dwelling in them.”

systematically gaining theoretical and practical knowledge about the underlying principles of the tools and of their use.

2. There is no species that has the power to influence nature the way we have. Other species are prisoners of their surrounding world. But humans have the power to shape their world in almost any way they want to. Other species are submitted to a process of evolution. But humanity has the potential to alter the process of evolution itself. Technology is itself a way of evolving, of acting, of making history.<sup>37</sup> The human use of tools and technology can be characterized by the duality of *adaptation to*, as well as *resistance against*, the natural environment and natural processes.<sup>38</sup> As I said before, the uniqueness of human nature is to be found in the way in which humans are able to use their natural abilities to stretch the natural confines of their existence.
3. There is also no other species that has become so dependent upon their use of tools as we have. The point Counselor Hamann makes is well taken: without our machines and our technological knowledge, we would not survive. For with the use of technology, certain other abilities disappear.<sup>39</sup> For instance, my dad is much better in doing quite complex calculative tasks without any help than I am, simply because in high school we were allowed to use pocket calculators to do such tasks, whilst he had nothing but his brains together with a pen and paper. So, in a sense, I lost the ability to do such calculations without the help of my pocket calculator. Similarly, it has been suggested that our ability to clean things may be harmful to our children, because their immune system is no longer triggered to respond to potentially harmful bacteria. Their resistance to bacterial infections diminishes because of our clean society. Letting children play in puddles of mud may actually benefit their health, or so it is said. The point is that with the growing impact of technology on our everyday lives, some natural abilities diminish and may even disappear. On the one hand, this may be a good thing, as many time-consuming tasks are now delegated to computers. However, this also enhances our dependency on machines in a potentially life-threatening way: our society is appropriately characterized to be a ‘risk society.’<sup>40</sup>

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<sup>37</sup> VAN PEURSEN, *Strategie van de Cultuur*, 108.

<sup>38</sup> Ibid., 105. Cf. also Philip HEFNER, ‘Hefner: Technology expresses our dynamic selves,’ in: *Science & Theology News* 4:4 (December) 2003, 20: “It seems that even though we are finite creatures, we seek to escape limitation at every opportunity. On the one hand, we have received a human nature from the past – the evolutionary past and our own genetic and familial past. Yet, on the other hand, we refuse to settle for the human nature we have received; we insist on denying it, stretching it and reshaping it.”

<sup>39</sup> Herzfeld argues that this reveals the vulnerability of the human use of computers and other technologies: “As we depend more and more on technology, we risk losing these skills that allow us to make decisions without that technology.” HERZFELD, *In Our Image*, 78.

<sup>40</sup> U. BECK, *Risk Society: Towards a New Modernity*. London, etc.: Sage Publications 1992.

Any model of the *imago Dei* should at least take into account these considerations, which follow from the idea that humans are natural-born cyborgs. But is there a model that does this? In my view, the American theologian Philip Hefner makes an interesting contribution to the current discussion. Hefner is keenly aware of the ambiguous status of human beings in nature outlined above: the continuity with the rest of nature, and the peculiarity and riskiness of humans with respect to their advanced cognitive abilities. He describes human beings as *created co-creators*, and recently described his view on the relation between humanity, technology, and nature as follows:

Now that we have broken down the walls that separate humans from both nature and technology, now that we are crossing the boundaries between these domains, we see that humans and their technology are a set of nature's possibilities. ... Technology is now a phase of evolution, and it is now creation, a vessel for the image of God.<sup>41</sup>

Hefner's concept of created co-creator attempts to solve a problem. It attempts to overcome humanity's *alienation* from nature which, ironically, is a result of our culture and technology. What Hefner suggests is that this alienation can be overcome by reconsidering the relationship between nature, culture, and technology, in the light of the awareness that technology is a perfectly natural phenomenon:

There is essentially no difference between the phenomenon of the bee producing honey and the human being fashioning a fast-food burger. The technological overlay that characterizes the production of the burger is as much a part of nature as is the bee, performing in a manner appropriate to the evolutionary context of human culture. That we may attach differing value judgments to the work of the bee and the work of technologically advanced food processing should not cloud our sense of the fundamental sameness of the two activities.<sup>42</sup>

In Hefner's view, "technology is a form or segment of nature, and its emergence is founded in the same neurobiological matrix as human beings and their culture."<sup>43</sup> Technology, as we know it, may seem more advanced than the simple use of tools of early humans and of other species, yet it still is part of the evolutionary processes.

Technology, as humans now use it, in Hefner's theological anthropology, is a natural phenomenon, but it is also closely linked to the nature of humans – a concept with which I

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<sup>41</sup> P. HEFNER, *Technology and Human Becoming*. Minneapolis: Fortress Press 2003, 77.

<sup>42</sup> P. HEFNER, *The Human Factor: Evolution, Culture, and Religion*. Minneapolis: Fortress Press 1993, 154.

<sup>43</sup> *Ibid.*

started this paper. For humans are creatures with a dual nature. This dual nature is mirrored in the concept of ‘created co-creator,’ and shows both our embeddedness in nature and the peculiar character of our creative and cognitive skills. The adjective ‘created’ for Hefner signifies the conditionedness of human beings by environmental, biological, and cultural factors. In Hefner’s words,

To be created is to be derived, to be dependent upon antecedent factors (environmental, biological, cultural) as well as contemporary sources (environmental, cultural). The term *created* indicates that the human species did not design its own nature or its role in the world. ... Since humans cannot credit themselves for their role in the process and their capabilities, they cannot be said to be morally superior or inferior to any other species or entity in the same ecosystem.<sup>44</sup>

So, even though humans may be able – as I argued – to stretch their biological limits, the adjective ‘created’ serves to point us to the irreducible contingency of human beings, their dependency on the natural world from which they emerged.

However, there is another aspect to human nature, suggested by the noun ‘co-creator,’ which signifies the freedom of human beings, that is, “the condition of existence in which humans unavoidably face the necessity both of making choices and of constructing the stories that contextualize and hence justify those choices.”<sup>45</sup> Note that Hefner writes that humans *unavoidably face the necessity* of making choices and rationalizing those choices: humans make choices in the light of the conditions they find themselves in, that is, they make choices in the light of their createdness. And our technology is one of the ways we have used that freedom in the light of the challenges of our world, it is “one of the ways that we have learned to live adequately; it has become one of the most dramatic elements of human culture today.”<sup>46</sup> In other words, Hefner’s argument is that our responses to the challenges of our world differ from other living beings, in that we “simply do not have the kind of automatic programming systems that can serve the requirements for adequate living.”<sup>47</sup> Other creatures may survive by having developed specific, instinctive capacities to respond to challenges from their environments. Humans do not have such capacities. We are, in the words of Arnold Gehlen, *Mängelwesen*, and our use and development of technology are ways in which we use our freedom to reduce the complexity of our environment, to manage the contingency of our

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<sup>44</sup> HEFNER, *The Human Factor*, 36.

<sup>45</sup> HEFNER, *The Human Factor*, 38.

<sup>46</sup> P. HEFNER, ‘Biocultural Evolution and the Created Co-Creator,’ in: T. PETERS (ed.), *Science & Theology: The New Consonance*. Boulder: Westview Press 1998, 176.

<sup>47</sup> *Ibid.*

existence.<sup>48</sup> But this freedom is not something that exceeds nature, but is interpreted by Hefner as “nature’s way of stretching itself toward newness.”<sup>49</sup>

It is this ‘stretching toward newness’ that also entails a strong theological aspect. It is Hefner’s opinion, based on his interpretation of the doctrine of creation, that the “meaning and purpose of human beings are conceived in terms of their placement within natural processes and their contribution to those same processes.”<sup>50</sup> In other words, we have to conclude about what the purpose and meaning is, not only of our existence but of the existence of the entire universe, from the existent universe itself.<sup>51</sup> Apparently Hefner seems to assume that the way things are is the way they were intended to be, which is of course consistent with the *Genesis*-account in which it is told that God saw that it was good. Hefner argues that our dual nature thus also reveals what God’s purpose is with our technological abilities: to enhance nature’s possibilities.

*The concept of the created co-creator proposes that the purpose of human being and human culture is to be the agency for birthing the future of the nature that has birthed us – the nature which is not only our own genetic heritage, but also the entire human community and the evolutionary and ecological reality in which and to which we belong – at least the nature that constitutes planet earth. ... Homo sapiens is God’s created co-creator, whose purpose is the ‘stretching/enabling’ of the systems of nature so that they can participate in God’s purposes in the mode of freedom, for which the paradigm is Jesus Christ, both in respect to his life and to his understanding of the world as God’s creation.*<sup>52</sup>

More could be said about Hefner’s proposal but I will leave it at this. I admit that there are some weak points in his approach that should be looked upon critically.<sup>53</sup> However, the value of Hefner’s approach lies

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<sup>48</sup> A. GEHLEN, *Der Mensch: Seine Natur und seine Stellung in der Welt*. Wiebelsheim: AULA-Verlag 2004. Both ‘complexity-reduction’ and ‘contingency management’ (*Kontingenzbewältigung*) are among the core concepts of the sociological framework of Nicholas Luhmann; see e.g. N. LUHMANN, *Soziale Systeme: Grundriss einer allgemeinen Theorie*. Frankfurt a.M.: Suhrkamp Verlag 1984, 45ff., 467ff.

<sup>49</sup> HEFNER, ‘Biocultural Evolution,’ 179.

<sup>50</sup> HEFNER, *The Human Factor*, 41.

<sup>51</sup> HEFNER, *The Human Factor*, 40f.

<sup>52</sup> HEFNER, ‘Biocultural Evolution,’ 181. Italics in original.

<sup>53</sup> To give but one example: his assumption that the way things are reveals how things are supposed to be reminds me of the so-called naturalistic fallacy. Moreover, if Hefner’s assumption is taken seriously, one should also conclude that apparently cruel behavior and suffering are also intended by the Creator God – a conclusion which is inconsistent with the Christian doctrine of God’s omnibenevolence.

- in the fact that the idea of the created co-creator is an attempt to overcome the digital dichotomy of nature versus culture/technology.
- Moreover, I see it as an attempt to relate theology and technology, and as such it is a valuable contribution to the religion-and-science debate in which the role of technology is still only of marginal interest.
- Furthermore, the idea that humans are created co-creators is compatible with, and can even be seen to be an instantiation of Herzfeld's relational interpretation of the *imago Dei*.
- Finally, it is compatible with the notion that humans are natural-born cyborgs, as Hefner sees technology not as opposed to but as a part of human nature. Hefner even argues that "[h]umans do use technology; we *are* technology, in the same sense that we not only use our hands and eyes, but we are our eyes and hands."<sup>54</sup> This comes close to both Polanyi's and Merleau-Ponty's respective stance towards tool use and technology.

As such, technology is no longer considered to be opposed to nature, but itself is now considered to be a product of natural, evolutionary processes: it is a matter of nature attempting to stretch its own limits, to enhance its own possibilities. Thus, from a theological perspective, the natural-born cyborg truly is a created co-creator.

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<sup>54</sup> HEFNER, *The Human Factor*, 155. Italics in original. Note, however, that Hefner prefers to speak about 'technosapiens' instead of 'cyborgs,' see HEFNER, *Technology and Human Becoming*, 73-88.