DIGITAL SALVATION AS A GIFT: A CATHOLIC UNDERSTANDING OF DIGITAL SALVATION IN CONTRAST TO KURZWEILIAN TRANSHUMANISM

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ABSTRACT

This article proposes three distinct categories of how Christian theologians over the centuries have viewed the transhumanistic endeavor of (*self*-?) salvation: (a) reversing the effects of the Fall, (b) transformation of creation, and (c) salvation as a gift. These categories are juxtaposed with Ray Kurzweil's transhumanist attempts at achieving digital salvation (technological salvation in a digital age), outlining three main attempts: human enhancement, the quest for immortality, and salvation from sin. This article argues that despite the human effort, salvation remains a gift. Hence rather than shunning death, the Christian is claimed to be called to embrace it as the "sister death" and thus, as the gateway to theosis.

KEYWORDS

soteriology, transhumanism, theosis, salvation, thanatology

"God saw everything that he had made, and indeed, it was very good" (Gen 1:31).[1] According to commonly held Christian tradition, the human is created in the image and likeness of God (and thus able to freely love, create, and choose to do good, and also able to know and understand goodness and love [CCC1704–1705]), humans were tempted and sinned, and from that moment onward the ones who once conversed with God face to face needed redemption. The redemption, which started with creation itself, was promised to Abraham, and culminated in the soteriological sacrifice of the Cross, inaugurated the New Age. According to Thomas Aquinas, only the Second Person of the Trinity could redeem humankind: "For an adequate satisfaction it is necessary that the act of him who satisfies should possess an infinite value and proceed from one who is both God and Man" (III, Q. 1, a. 2, ad 2um). This theology was confirmed

by the Council of Trent, which declared that only through the merits of the One Mediator can the human be justified (Seas. V, cc. iii, vii, xvi and canons iii, x). Through Christ's cross we enjoy again the supernatural gifts lost by sin, namely grace (John 1:14, 16) and salvation (1 Cor 15:22). On the other hand, Catholic theology holds that the preternatural gifts enjoyed pre-lapse (before our sin) are not, at least in this world, restored by the merits of redemption. This is rooted in the Pauline understanding that Christ wishes us to suffer with Him so that we may be glorified with Him (Rom 8:17).

Throughout history, theologians tried to figure out how we are saved. Particularly, one can highlight the dispute between Augustine and Pelagius, that is, between God's saving grace and humans' free will. Paul also started the discussion as to who/what is saved: whether it is the whole *kosmos* (Rom 11:15) or only the universal humanity (Rom 3:23–4). Fitzmyer speaks of the (proto-)Pauline understanding of salvation as justification; salvation; reconciliation; redemption; freedom; transformation/metamorphosis; new creation; expiation; new life; adoptive sonship; sanctification; forgiveness/pardon of sins (1991, 83).

In transhumanistic theological discourse, often one reads an urge to salvage the prelapsarian state of being. Yet, as Fitzmyer highlights, the Christian vocation is deeper than a return to that state; instead, the Christian is called to a glorified new life as adopted children of God. Salvation is not an individualistic act but a "social" reality. Since the Patristic era, sin has been considered as an attack on this communal salvation (Benedict XVI 2008, para. 14). Thus, explains *Spe Salvi*, salvation appears as the reestablishment of this unity. However, this communal salvation is not limited to the "world to come" but is to be enjoyed pre-death. This truth, however, comes with a caveat. Humankind's temptation is to no longer expect it from faith but from technology, which Francis Bacon labels as "faith in progress" (2008 [1627]).

The essay will first unpack the theological understanding of God the Artisan – the *techne*-ologist God, who invites humankind to participate in the refashioning of nature through *techne*/artisanry. It will proceed to review seven Christian theologians who have discussed humankind's desire to self-transcend. These theologians will be grouped into three categories. Echoing a Chardinian interpretation of a nonradical Augustinian's anti-Pelagian tradition, I shall posit that it is the third category, that of accepting salvation as a gift, that is the Christian vocation of collaborating with God. This article will argue that while humanity is called to enhance its fallen condition, this should not become a quest for immortality, nor can it save us from sin. It is in this triad of enhancement, immortality, and sin that I shall be rooting my conclusions. This triad is inspired by the Christian transhumanist[2] affirmation, which sees the Christian's mission as feeding, restoring life, and healing. In dialogue with

literature, where possible, the article will engage with non-Catholic discourse to allow the Catholic tradition to learn from the Protestant tradition using the ecumenical methodology of receptive ecumenism (Centre for Catholic Studies n.d.). It aims to help Catholic theology to engage non-Catholic theologians in the spirit of ecclesial learning.

EXCURSUS: DEFINITIONS

Before the main argument proceeds, a dictionary of terms is proper. Transhumanism advocates the transformation of the human condition to enhance the human intellect and physiology. In my definition I echo the philosopher Nick Bostrom's definition that transhumanism is an attempt of human beings to transform themselves into different beings with abilities greatly expanded from the current condition, best summarized in Julian Huxley's definition of "man [sic] remaining man, but transcending himself, by realising new possibilities of and for his human nature" (1957).

Referring to the first article of the Transhumanist Declaration, the striving toward salvation from the current human condition is highlighted:

> We envision the possibility of broadening human potential by overcoming ageing, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth. (Humanity+ 2009)

From this article, it is evident that "hardliner" Kurzweilian transhumanism wishes to "overcome" the current human condition by increasing our cognitive capabilities, "saving" humanity from aging – a quest for youth and an escape from death – and ultimately save us from a corrupted earth. In theological parlance, this can be reinterpreted as salvation from the current structures of sin.

THE TECHNOLOGICAL-GENESIS GOD

The Eastern theologian Sergii Bulgakov (2000) interprets God asking Adam to grasp the animals' essence and name them as a participation in *techne* (artistry) – co-laboring that transfigures the world with divine love. In human history, it seems we have two ways out from our fallen state: either we allow God to continue moving humanity through a timeline, and technology to play a role subservient to the true author of salvation; or through our advancements, we hope for a techno-future and thus, through transhumanism, we can transcend our weak bodily state.

According to Philip Hefner, humanity is created as "created co-creators" of a technological God (Hefner 2012). We are free agents commissioned by God as God's instruments to enable creation to fulfil God's purposes. He speaks of the human as a cyborg by nature, for technology is so intrinsic to human nature that we are amid technologizing nature. Similarly, Ronald Cole-Turner reminds us of our innate desire for human enhancement, which not only is manifested in our use of technology but also is exhibited in the mundane things of our lives, such as parenting, education, and religiosity (2011).

John Dyer (2011) speaks of humankind as created for the garden, but post-Fall a new ontologically different scenario emerged. Post-Fall, technology became a mediation-medium to communicate with God, which was not shunned by God, but rather upgraded, symbolized by change from the couple's initial fig-leaf clothing to God's animal-skin upgrade. What I term the technological-artisan God is presented as suggesting that Noah use technology to "make"[3] the ark to save his family. Technology is thus presented as both able to "offer relief from suffering and in some cases help us (to) avoid death" (Dyer 2011, 102) and Dyer affirms that the "redemptive capacity of technology is limited and temporary" (2011, 103). In fact, Dyer describes technological advances as giving only "a tragic and distracting" (2011, 103) illusion of overcoming death, because our tools lack the "foreshadowing of what is to come" (2011, 143). This promise provides the setting for a review of seven Christian theologians who have theologized on the race to transhumanism's journey of searching for (*self*-?) salvation.

THREE CATEGORIES OF ACHIEVING SALVATION THROUGH TECHNOLOGY

In the literature, this article notes three ways that humankind negotiates salvation. In this section, a selection of three theological schools represented by Bacon and Fedorov, de Chardin, and Ratzinger will be introduced. The first category attempts to reverse the effects of the Fall (A-REF) and thus recover the preternatural gifts;[4] the second is a future-oriented one that attempts to transform creation (B-TC) and highlights the spiritual dimension over the material; and the third, rooted in a Teilhardian Catholic understanding, views salvation as a gift (C-SAAG), and while the Christian is called on to collaborate in the technological artisan's school, creation and salvation remain God's prerogatives.

As evident from the authors to be engaged, the theologians span some five hundred years, and while their writings are not essentially tied to transhumanism, their worldviews shed light on evaluation and ultimately rebuttal of a digital soteriological strategy. Since humanity is living in a digital age, I believe that the term digital salvation encompasses all biological, medical, mechanical, and other technological attempts at achieving humankind's salvation. Acknowledging that there are other Christian theologians who influenced trans-/

posthumanism, the aforementioned theologians would represent the major Christian strides of contemporary discourse in salvation through technology.

A. REVERSING THE EFFECTS OF THE FALL (A-REF)

Francis Bacon speaks of the relationship between science, technology, and religion as ways to reverse the fall (1844). In his *Novum Organon* he outlines four postlapsarian repercussions, termed "idols," which epistemologically hinder humanity's ability to fathom the world:

- Tribe: the inherent error in humankind's sensory data;
- Personal prejudices: projecting on the outside world what we think we should see – what Bacon termed the "idol of the cave," inspired by Plato;
- Marketplace: our language can function as a hindrance in describing reality;
- Theatre: the misleading consequences of knowledge-seeking philosophy.

Bacon speaks of the Fall as the source of losing our innocence and our dominion over creation. He insists that the former can be repaired by religion and faith, and the latter through arts and sciences. Esteeming technology, Bacon puts religion, science, and technology on the same plateau (Burdett 2009, 24). I interpret this equally valued triad as what is helping Pope Francis' call to the modern human to rise back to the rightful position of stewarding rather than lording over creation per the Genesis commission. Inspired by Patriarch Bartholomew, in *Laudato Sí'* (2015), Pope Francis notes that humanity ought to

> look for solutions not only in technology but in a change of humanity; otherwise we would be dealing merely with symptoms . . . As Christians, we are also called "to accept the world as a sacrament of communion, as a way of sharing with God and our neighbours on a global scale."(para. 9)

Building my understanding on Fedorov, I believe that a Trinitarian-rooted technology may serve to steward nature for humanity's goals. Similarly, the Christian philosopher Nikolai Berdyaev reads Fedorov's materialistic resurrection of the dead as achievable through the Redeeming Christ; spiritual/moral human efforts; and the scientific, physical, and technical activity of people (1950, 33).

B. TRANSFORMATION OF CREATION (B-TC)

The cosmic Christologist Pierre Teilhard de Chardin sees technology as able to usher in this second type of salvation. De Chardin postulates a cosmic process

of ascent from matter to mind, and thus an attraction toward what he labels the Omega Point (OP) – the Christification of the universe. This supreme state of consciousness has as its distinct center the OP, and all entities in the created universe are ontologically related and externally attracted toward this ultimate point. De Chardin's emerging personal God is a differentiator and communicator of love, albeit God is "all in everyone" (1961, 310). The world (Noosphere) represents a "whole that is not only closed but also centred" (1961, 285). Since humanity is attracted to this convergence point, everyone evolves into an individual with greater consciousness, "personalisation," and thus, the Noosphere itself becomes personalized: Noogenesis (1961). In his worldview, humanity is pulled toward a heightening of vision (1961, 267).

The positive Baconian outlook is too narrow for de Chardin, for he sees technology as evolution's necessary tool and as enhancing humanity. He speaks of a symbiotic relationship between technology and consciousness, one that is germinated in the relationship of the mind and body. Humanity is hence pulled toward a heightening of vision (1961, 267).

As the noosphere becomes centered, it leads toward pointing to a *Person,* whom he refers to as the "Ultra-Human" or the "Trans-Human."[5] In a "Christian transhumanist" understanding, the eschaton will be introduced by the final development of the Ultra-Human, who will be drawn up into the supernatural Christ after the material world is discarded (Burdett 2009, 32). A similar understanding is echoed by the technologist Ray Kurzweil, who predicts that "evolution moves inexorably toward our conception of God, albeit never reaching this ideal" (2006, 476).

My reading of de Chardin is that he does not view technology as a redeemer of humanity but focuses more on technology's role in evolution as steered and purified by the *Logos*. However, as will be explored further below, his theology has been used by the posthumanists in their race toward digital salvation. His work has stirred the Catholic Church, and the Holy Office has issued a *monitum* on his writings. While four popes quoted his works especially on the cosmic liturgy and the cosmos becoming a living host at length, this *monitum* still holds, although recently the Pontifical Council for Culture unanimously requested Pope Francis to waive it, while another petition is garnering signatures not just to rehabilitate him, but even to name him a doctor of the church (Schlumpf 2018).

C. SALVATION AS A GIFT (C-SAAG)

This third category highlights that salvation only comes from God as a gift – humankind is asked only to accept and collaborate.

During the Second Vatican Council, the young Ratzinger strongly rejected de Chardin's "unacceptable" (2009, 228) prophecy of "technological utopia and Christian hope in the kingdom merg(ing) into one" (2009, 226) – a Christo-genesis. Ratzinger also attacks the Baconian notion of faith in progress, for, he prophesies, it will create a kingdom of humankind, not herald God's Kingdom (2009, paras. 16–17, 25). He speaks of what I am referring to as digital salvation as an improper and insufficient content of our hope. Our Christian hope lies in God, who

> can bestow upon us what we, by ourselves, cannot attain. The fact that it comes to us as a gift is actually part of hope. God is the foundation of hope: not any god, but the God who has a human face and who has loved us to the end, each one of us and humanity in its entirety. (2009, para. 31)

His assessment builds a case for the need to start soteriological reflection from a Christological dimension. Perhaps his dictum that "the world is not redeemed by machinery but by love" (2009, 229), speaking about God's love, leaves little room for interpretation.

For Ratzinger, the role of God's agency in salvation is lessened by any agency attributed to the human mind (2009, 227–228). Salvation of the human *in toto* is God's free gift rooted in an eschatological hope and not obtained through human agency, except for accepting it in synergy between both parties (Catholic Church 2000, paras. 153–162). Thus, what saves us is not technology, but the grace of conversion of the heart, through love – which gives meaning (Ratzinger 2009) and saves at the ontological level of existence (Ratzinger 1987).

My understanding of Ratzinger is that he creates a strongly delineated boundary between *techne* and God the technological-artisan God as described above. Whereas through *techne* humanity is participating in the transfiguration of creation (Bulgakov and Evtuhov 2000; Kuiper 2019), for Ratzinger, God ultimately remains the complete Other. Ultimately it is God, and only God, who continues moving humanity through history. What technology can achieve and what can only be achieved through God's grace remain utterly distinct.

A CHRISTIAN ANTHROPOLOGY FOR THE DIGITAL AGE

Since the early Church, Christians have been discerning the effects of both a transformation of creation (B-TC) and a return to the preternatural state (A-REF), while reinterpreting the gift of salvation (C-SAAG). The Christian/Catholic church has been discerning and attempting to attain A-REF since the

desert fathers. Fasting was one way to stop the body's decay and thus, Platonically, realign the body with the soul to achieve what was lost in the lapse (Daly 2011). Through technology and the quest for knowledge, humanity *can* attempt to restore these freedoms as long as grace-directed technology cultivates an act of togetherness (Dyer 2011, 176–179).

Summarizing centuries of definitions, and rooted in the Catholic tradition, this article outlines four understandings of soteriology and eschatology, with each one progressively building on the previous model:

1. Sanctification as sharing in holiness: The International Theological Commission speaks of sanctification as a sharing in the holiness of God, who progressively modifies human existence to shape it according to Christ (1995, para. 70).
2. The Spirit who draws the eschaton: Irenaeus speaks of the Paschal outpouring of the Holy Spirit as introducing *oeconomia* directing history toward the *eschaton* (Irenaeus of Lyons n.d.). Some liberation theologians would claim that it is only at the *parousia* that God's kingdom can be established, an action that depends solely on God (International Theological Commission 1995, para. 29).
3. The Incarnate God who communicates Himself: Karl Rahner asserts the before end-of-times salvation, but notes that accepting the inner self-communication of God liberates humankind to give less emphasis to moralistic limitations and emphasizes God's initiative (1982, paras. 194–195). This position is echoed by Lieven Boeve's invitation for Christians to value their experience of the encounter with Christ (Boeve 2005).
4. Humanity's value: Per previous Rahnerian understanding, humans are valuable in the process of heralding a transhuman epoch, but we are not only important for what we might create (Rahner 1966a, 138), but rather because of what God might be creating through us. Rahner's position is an active position as opposed to the first two models. Echoing Rahner's words, that "man [sic] and nature can reach their one common goal only by activity which is spiritual and by spirituality which is activity" (1966b, 168), it becomes evident that God is inviting the Christian to participate in God's doing (Cole-Turner 2015, 26). This model celebrates both God's incarnation to unite all things in Godself and God's vocation of creating humanity as created stewards of the *eschaton* (Francis 2015).

TRANSHUMANIST ATTEMPTS AT DIGITAL SALVATION

This section aims to engage with current posthumanist attempts at achieving humanity's own salvation. One can postulate that the urge to enhance the

human condition is steered by the pull toward the cosmic Christ as introduced in Catholic circles by de Chardin. As described by David Grumett (2011), and outlined in Table 1, the "prototypical transhumanist" de Chardin converges at many a point with the transhumanist agenda, which makes him the ideal partner for this reflection.

Acknowledging the many voices within the transhumanist camp, I opt to use the far-reaching Ray Kurzweil as my conversation partner. By presenting such an "extremist" view I intend to enclose the bookends of dialogue between a Chardinian theology and a spiritualist understanding by Kurzweil. His book *The Age of Spiritual Machines* (2008) popularized the concept of "singularity": a moment where artificial intelligence improves itself beyond human collective capacity. Attempting a hazardous claim, Kurzweil can be classified as one of the main evangelists of the transhumanist movement, who presents himself as a prophet of the end of the biological human, and thus a perfect partner to be juxtaposed with de Chardin, given their similar understanding of the Omega Point and "singularity."

This article outlines three fundamental areas that Kurzweilian technologists are using:

1. human enhancement by attempting to remove the limitations currently observed in our human condition;
2. achieving immortality through postponing/eliminating death; and ultimately
3. salvation from the social effects of sin.

1. HUMAN ENHANCEMENT

Considering that transhumanists view nature as "a work-in-progress," humanity is not seen as the climax of evolution, but only as a prequel to a being with "vastly greater capacities than present human beings have" (Bostrom 2003b, 4). Similarly, de Chardin understands the world as continually evolving and changing, and thus, he speaks of humanity as seeking out its own digital salvation. While death and aging appear to be the ultimate enemy of the transhumanist movement, humanity enhancers would speak of removing the limitation on human and artificial intellects, tackling psychological and cognitive shadows and physical confinement (Humanity+ 2009).

De Chardin believes in humanity's agency in heralding the Omega Point. Echoing Marshall McLuhan's mantra that technology builds humanity, Kurzweil and his followers attempt to transform humankind's broken state into an intelligible one – "freeing our minds," as Kurzweil holds (Dyer 2011). It is interesting that both schools speak of a communal achievement of a "global consciousness"

Table 1. De Chardin's and Kurzweil's transhumanism – adapted from Grumet (2011)

De Chardin's position	Kurzweil's position	Comments
Direction and purpose in biological evolution and history.	Acknowledges that evolution is guided by intelligence, design, and order (Kurzweil 2008).	Both positions see a designed purpose in history.
No nonhuman species will evolve from humans (de Chardin 1966, 72–78).	Highlights human centrality and lauds our creative ability to usher in a technological evolution that alters humanity's consciousness and biology. This will not cease "until the entire universe is at our fingertips" (Kurzweil 2008, 487).	Both positions hold that while history evolves, the human remains in the center.
From intelligence as (biological) survival to intelligible consciousness ushered in by the "Ultra-Human" (de Chardin 2004).	Speaks of enhancing our intelligence while overcoming our biological limitations (Kurzweil 2006).	Both agree on purpose, but de Chardin highlights the expansion of consciousness while Kurzweil highlights the need to overcome biological limitations.
Centers of consciousness are multiplying and converging (de Chardin 1966, 110).	Imagines the WWW as churning information swarming around the borderless globe (Kurzweil 2008), reminiscent of de Chardin's Noosphere encircling the earth.	Both agree that humanity is achieving high levels of intelligence.
Points of exponential transition pioneered new phases in our history: de Chardin acknowledges that we are currently passing through a nascent phase in our history as part of this perennial transformation (de Chardin 2004).	Highlights the Singularity as the ultimate phase of human history (Kurzweil 2006).	Both agree that humanity is passing through epochal shifts and aims at arriving at a single destination point. However, that destination point is different.
Acknowledges that humanity is increasingly free to determine its future (de Chardin 1975, 181).	This ongoing transformation is not due to human deficiency, but rather, because creation is continuing.	Both highlight human evolution as a "work-in-progress" (Bostrom 2003b, 4).

(Grumett 2011, 37) as opposed to a single individual. In this light, Grumett notes that concrete human activities, such as artistic creativity and theological discernment come into play. These are human manifestations *par excellence* (Pulis, Camilleri, and Massa 2021).

Whereas for transhumanists, singularity is the endpoint of evolution, and so where the collective mind is freed from physical boundaries (Platonic thought) and awakened, de Chardin speaks of another stage: Christification.

Teilhard steers away from the problem of humankind being saved through technology, but by focusing on the Omega Point, he presents Christ as the one "pulling" evolution toward Himself. In de Chardin's metaphysics, God is not just a primary mover, but the One who pulls "creatures towards fuller being." One can deduce that real technological progress is not arbitrary but rather limited to the enlargement of moral capacity. While de Chardin does not scorn human enhancements to correct our broken bodies, such as insulin controllers and exoskeletons, he reserves greater value to technology that increases human socialization. Hence, the invention of the Internet must be extremely laudable in de Chardin's eyes.

Humankind has always been transhumanist. As part of evolution, humanity always tried to "fix," "enhance," and "outlive" itself. These three actions echo Brent Waters' (2011)[6] classification of transhumanists' efforts:

- fixing aging: aiming to abolish our bodies' expiry dates by replacing deteriorating body parts, correcting genetic defects, and improving the immune system;
- enhancing the capabilities of the body and cognition, while limiting potentially damaged parts, which would virtually leave the human body to expire only due to trauma;
- nonbodily immortality: a brain-in-a-vet type of immortality where the mind outlives the body.

Medicine has been aggressively active in the first two approaches. Transhumanists' attempt at alleviating pain brings no theological qualms, given that Christ's centrality remains. Hence, Christian theology can somehow welcome the first two approaches as enhancement, albeit with a caveat: the importance of the allness of humanity, which demands preferential attention to the most deprived. This warning echoes Jurgen Habermas's (2003), which speaks of a trans-species society composed of (non-)/humans as naturally fostering inequality.

However, while speaking of prolonging life, and bettering one's quality of life through technology, and thus salvation from the broken human condition (A-REF), this article warns of crossing to the third approach, discussed later.

2. THE QUEST FOR IMMORTALITY

A perennial theophilosophical concern has always been to rationalize death. While the Presocratics and later Nietzsche would resign in front of death and accept their defeat, Aristotle and Hegel would use any technological means possible to overcome this old enemy. It is within this Aristotle–Hegelian mindset that AI researcher Hans Moravec speaks of downloading[7] the brain into a computer, and thus achieving mind immortality beyond the biological condition (Hayles 1999).

The third action introduced above is the most speculative of the three, and thus requires a special homing in because it requires asking what makes us human. Hence, an excursus will be offered on the perennial discussion between the self and the brain.

The self

Physicalists claim that we are reducible to our brains (Judge 2010), but others acknowledge that the total is bigger than the sum of parts (Satel and Lilienfeld 2013; Smart 2017; Calef n.d.). Kurzweil sees the next step of evolution as inhabited by nonbiological humans, for they would be made up of a machine substrate.

Transhumanists describe the biological body as a "natural prosthetic" hosting one's personality, itself understood as organized patterns of information. Hence, they would see the biological substrate as too fragile to host the mind's potential, and thus speak of humankind's incessant drive toward self-improvement, which is hindered by the biological limits.

While dualist transhumanists, speak of liberating the mind from the biological condition, and obtaining salvation through cheating death, mainstream Christian theology has rejected mind–body dualism and believes that the human person is at once corporeal and spiritual.

Echoing Chardinian theology, death is envisioned as God's personal act on the human person. Hence, death is transformed from "the end" to a gateway to immortality, achieved through incorporation into a conscious reality enduring past the material body.

While de Chardin has a positive regard for death, his writings can also allow space for a transhumanist interpretation that shuns the body. In fact, Kurzweil imagines a future of connected minds akin to de Chardin's Noosphere. In this "communal network of shared intelligence" (Hansell et al. 2011, 162), Kurzweil prophesies that we "will be able to live as long as we want" (2006, 25). This power to cheat our own fate is met with strong criticism by Celia Deane-Drummond, who labels it as "intense hubris marked with political overtones of eugenics" (2017, 874–75).

While de Chardin speaks of immortality, he values death's transformative value, for it gives human life its ultimate meaning. Through the thanatological gateway, humanity encounters the Omega Point, where the Christian is assured convergence, synthesis, and unification. Heidegger speaks of death as meaning-making: "(o)nly in dying can I to some extent say absolutely, 'I am'" (Guignon 1993, 222). This view contrasts with de Chardin's understanding because humanity still needs to undergo a final transformative action by a superior agent, what we may describe as the *eschaton*. Only through this *eschaton* can one be freed from a time-bound reality, an achievement that the singularity cannot obtain. While humanity can cheat death even for several millennia, to reach the ultimate *eschaton,* we still need to pass this gateway. Death is not a leap into the void but a transforming gateway to Christ's embrace, a communion with God – what de Chardin aptly labels as Christification.

Transhumanists can do their utmost to exile the brain from a deteriorating body, but this article contends that from a Catholic perspective, death can never be reversed, only postponed. Moravec would take exception to this claim, because he sees *Homo cyberneticus* as an immortalized species (1988, 44).

In sum, while there are many shared interpretations between de Chardin and Kurzweil and his followers, a stark difference remains. While death for de Chardin remains a positive event and permanently avoiding death is an intrinsic violation of human nature, for Kurzweil this would be tantamount to humanity's next evolution.

Death and natality

With every generation, the biological species has the possibility of improving on the previous generation. Biologically, the fact that naturally we are impelled to procreate is a way for the human species to avoid extinction. However, if one generation manages to find the immortality equation, as the transhumanists endeavor, natality may too be negatively affected (Rosofsky 2009; O'Byrne 2010; Gavrilov and Gavrilova 2010). Already, mathematicians such as Andrew Hwang (2018) suggest curtailing birth rates due to the current earth's capacity,[8] let alone if humanity manages to postpone death infinitely.

On a cultural platform, having biological children can be seen as an immortality project. Speaking from a Jewish mindset, David Segal (2015) speaks of how the Talmudic sages describe this type of immortality as a self-propagation and a "glimpse of life eternal." Waters further states that when death is perceived as "a cruel fate, natality is robbed of its power to renew and regenerate" (Waters 2011). Hence it is contended that death is emphasized as *the* human condition par excellence, because if transhumanists curtail humankind's finality, natality

will too be affected. The two are so intrinsically knit that one cannot speak of either ending. In celebrating birth, Christians may be tempted to forget that procreation is a postlapsarian and a postdeath instruction (Gen 3:16).

While thanatological phobia is a given, a Christian understanding of death calls for a hopeful embrace. The frenzy to avoid death necessarily corrupts humanity's journey inaugurated with the gift of life.

If life is viewed in this natural direction, and death is embraced through a Christian hope, the Christian can avoid fatalistic potholes such as seeing a neonate as starting a hopeless journey. In St. Francis's canticle to the sun, Marovich (2013) observes a creaturization of "sister death," and thus making it a means through which we can comprehend our immortality.

Considering the above, death may be qualified as *the important existential condition* for humankind, since it highlights the standing deserving to natality. Ignoring or negating either of these bookends results in rejecting our humanity.
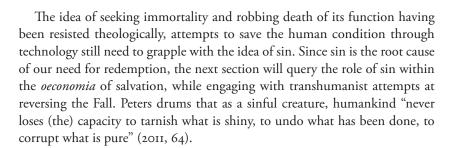
Rationalizing death

Kurzweil strongly attacks religion's primary role as being a "deathist rationalization" (2006, 372). In contrast to Kurzweil's understanding, Christianity has applauded the advances of positive medical technology (PMT). By PMT is understood technology that respects the integral ecology; promotes a sense of quality of life beyond the biological parameters; and respects the dignity and sanctity of life (Życiński 2006; The National Catholic Bioethics Center and the Catholic Medical Association 2008; R. Grosse 2009; Massey 2019). In this regard, mainstream Catholic magisterial theology does not create any barriers to research but rejects ways that dehumanize us. Hence Pope Francis (2015) speaks of protecting humanity from self-destruction by retaining the natural laws placed by the Creator. Similarly to Haraway's (2015) recognition of the intrinsic worth and connectivity of all creatures, the Pope acknowledges that the *anthropos* remains central.

If humanity were to embark on Kurzweil's journey and attempt to postpone death indefinitely, it is contended that humankind would be directly attacking its own humanity. We are robbing natality of its joy, and death of its gateway function. If death is seen as "the end," then one may tend to agree with Kurzweil that as humans, we ought to postpone it as much as possible, but Christian hope dictates otherwise. Inspired by the words of the *Our Father,* Christians are invited to hope for the unfolding of the Kingdom, and thus the coming of the *eschaton*. Ergo, the process is top-to-bottom. Theological issues arise when one tries to replace the second with the first.

The idea of seeking immortality and robbing death of its function having been resisted theologically, attempts to save the human condition through technology still need to grapple with the idea of sin. Since sin is the root cause of our need for redemption, the next section will query the role of sin within the *oeconomia* of salvation, while engaging with transhumanist attempts at reversing the Fall. Peters drums that as a sinful creature, humankind "never loses (the) capacity to tarnish what is shiny, to undo what has been done, to corrupt what is pure" (2011, 64).

3. SALVATION FROM SIN

Reinhold Niebuhr speaks of sin as natural to universal humankind, but that does not mean that it is a necessity (Peters 2011). Catholic theology describes original sin as contracted, not committed, and thus it is "a state not an act" (Catholic Church 2000, para. 220). It is a deprivation that creates an ecology that is subject to injustice, brokenness, and ultimately death. Postlapsarian humankind is subject to ignorance and is inclined to (the state of) sin, and thus creates an environment of accumulated failings. In our technological advances, it is believed that it is inevitable that humanity taints the emerging posthuman with sin. It is natural to our lapsarian condition.

Peters underscores that there is no warranty that selfish humanity with our "history of economic injustice and ecologically unhealthy habits [is] willing or able, on our own, to eliminate poverty and protect the ecosphere" (2011, para. 82). In this light, I would like to highlight the illogical conclusion that egocentric humanity can dream of creating an altruistic posthuman. Peters is clear: "No amount of increased intelligence will redeem us from what the theologians call sin" (2011, 82).

This brokenness should not stop technology from its sacred work. It is thus our duty as "created co-creators," or better, as "created heralds" (Song 2019), to continuously steward creation and repair the fallen ecological condition (Peters 1995). I prefer to use "created heralds" since it has a more Catholic nuance, in the sense that "created co-creators" might imply that humankind "has *full right* of disposal over [our] own biological nature." (International Theological Commission 2002, para. 91) On the other hand, "created heralds" allows God to keep His identity as Creator and highlights the invitation received in Genesis to steward creation. This heralding emphasizes God's ongoing creative work in transforming creation (B-TOC). Yet even these optimist views would still respect God's role as the redeemer and author of salvation. In sum, only God can heal our brokenness – we can only collaborate in the healing by accepting it (C-SAAG).

CONCLUSION

Considering that God is an artisan God who invites humanity to collaborate in God's project, it is my understanding that Christians are to approach any technological advances with a discerning yet optimistic eye to listen to the Spirit's work within our (digital) culture. Technological attempts rooted in love, centralized around the marginalized, and envisioning equal dignity among all humans should be welcomed. I concur with Stephen Garner's bold statement that automatic rejection of technology found in bioconservatism "would be antithetical to the calling to love and serve others" (2005, 37).

The transhumanist attempt at reconfiguring the human to self-achieve digital salvation comes with several warnings. While I believe that Christians are invited to embrace technologies that help us restore to some extent the four preternatural freedoms lost in Eden, anthropological centrity must remain key. The human is a communal and ecological being, and thus we speak of a togetherness with "the other" and with the rest of the stewarded creation. If any technology either challenges human centricity or unbalances the ecological paradigm, I argue that it should be discarded.

Attempts at improving our brokenness should not conflate the tree of knowledge with the tree of life. Arguing from a Thomistic Teilhardian mindset, I believe that Christians can ultimately be saved only through the new tree of life, through the Cross. The resurrected Christ has ultimately won against humankind's perennial enemies of brokenness, death, and sin. Hence, it is only through collaboration and participation in the Paschal mystery that one can ultimately speak of salvation. Hence, I shun Kurzweilian transhumanist strategies of self-attained salvation for reasons similar to earlier rejection of Gnostic, Manichean, and Pelagian heresies. According to the Vatican's International Theological Commission's document, humanity should not usurp the role of God. "Neither science nor technology are ends in themselves; what is technically possible is not necessarily also reasonable or ethical" (2002, para. 61).

Kurzweilian transhumanism tends to see the human as saved from the human condition – technological salvation as a final salvation of sorts. I categorically reject this position. Christians do not share in transhumanist contempt for the broken body and await no liberation of the mind/(soul?) from the body. Christian eschatology relies on the "logic of the future" and speaks of the doctrine of bodily resurrection, just as Jesus did (Esteves 2016).

In conclusion, I propose the further development of an ecological technology that both embraces our vulnerability and evaluates "sister death" as the ultimate human condition where God existentially meets the human.

In partaking of God's "great gratuitousness" (Francis 2014), Christians are invited to accept and collaborate with the gift of glorification. Through His incarnation, God partook of our human condition, and the baptized Christian is invited to partake of God's holiness and glory and ultimately become deified. Through an ecological use of technology (similar to the second category – "transformation of creation"), the Christian is allowed to partake in the Spirit's sanctifying divine liturgy of making creation beautiful. But, while through discernment the Christian can collaborate with God's grace in lessening the effects of the fall, the Christian is invited to remember that humanity is not the author of salvation, for theosis is ultimately God's grace-filled gift – a gift that one can accept and collaborate with or reject, but that remains a gift nonetheless.

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NOTES

1. All scriptural quotations taken from the New Revised Standard Version Catholic Edition.
2. Christian Transhumanist Association (n.d.).
3. The same word was used as when God made the pair's clothing.
4. Prelapsarian humankind possessed four preternatural freedoms that were lost: freedom from pain (impassibility), from death (immortality), from disordered desires (integrity), and from ignorance in existential matters (infused knowledge).
5. Not to be confused with Bostrom's transhumanist definition of "someone who advocates transhumanism" (Bostrom 2003a, 6).
6. Waters speaks of immortalities, but I think it would be best to speak of actions in order not to confuse the concepts. Moreover, while keeping his basic tenets, I opt to change the nomenclature, because I believe what I am offering here is clearer due to its simplicity.
7. I am quite captured by "downloading." Normally this verb is used for when one gets data from a server, and thus, in the hierarchy of entities the server is superior to the download client. Thus, in order to ensure the hierarchical entity of the human source, I believe Moravec would have been more precise were he to use "uploading" instead of "downloading."
8. I acknowledge that Hwang's warning is related to biological personhood, and if Kurzweil et al. propose a brain-in-vat scenario, this formulation needs to be redone. Needless to say, to keep all the servers powered and online is another Pandora's box, which is beyond our scope here. One can also counter my argument with philosophical ramblings such as offered by Gacheva (2018).

WORKS CITED

Bacon, Francis. 2008 [1627]. *The New Atlantis*. Project Gutenberg. Available at https://www
.gutenberg.org/files/2434/2434-h/2434-h.htm. Accessed 23 February 2023.

Bacon, Francis. 1844. *Novum Organum: Or, True Suggestions for the Interpretation of Nature*.
London: Pickering. Available at https://books.google.com.mt/books?id=t7INAAAAQAA-
J&source=gbs_navlinks_s. Accessed 16 February 2023.

Benedict XVI. 2008. *Spe Salvi*. Vatican City:: Vatican Press. Available at http://w2.vatican.va/
content/benedict-xvi/en/encyclicals/documents/hf_ben-xvi_enc_20071130_spe-salvi.html.
Accessed 16 February 2023.

Berdyaev, Nicholas. 1950. "N. F. Fedorov." *The Russian Review* 9(2): 124–130. Available at https://
www.jstor.org/stable/125457. Accessed November 7, 2019.

Boeve, Lieven. 2005. "Theology and the Interruption of Experience." Available at https://lirias.
kuleuven.be/bitstream/123456789/117449/1/5.5.pdf. Accessed 16 February 2023.

Bostrom, Nick. 2003a. *The Transhumanist FAQ: A General Introduction*. Version 3.1. World
Transhumanist Association. Available at https://nickbostrom.com/views/transhumanist.pdf.
Accessed 16 February 2023.

Bostrom, Nick. 2003b. "Transhumanist Values." In *Ethical Issues for the 21st Century*, ed. Frederick
Adams. Oxford: Philosophical Documentation Center Press.

Bulgakov, Sergiĭ, and Catherine Evtuhov. 2000. *Philosophy of Economy: The World as Household*.
New Haven, CT: Yale University Press.

Burdett, Micheal S. 2009. "Contextualizing a Christian Perspective on Transcendence and Human
Enhancement: Francis Bacon, N. F. Fedorov, and Pierre Teilhard de Chardin." In *Transhu-
manism and Transcendence: Christian Hope in an Age of Technological Enhancement*, ed. Ronald
Cole-Turner, 19–37. Washington, DC: Georgetown University Press.

Calef, Scott. n.d. "Dualism and Mind." In *The Internet Encyclopedia of Philosophy*. Availab at
https://www.iep.utm.edu/dualism/. Accessed 20 May 2019.

Catholic Church. 2000. *Catechism of the Catholic Church*. London: Burns and Oates.

Centre for Catholic Studies. n.d. "Receptive Ecumenism." Durham University. Available at
https://www.dur.ac.uk/theology.religion/ccs/constructivetheology/receptiveecumensim/.
Accessed 8 June 2019.

Christian Transhumanist Association. n.d. Available at https://www.christiantranshumanism.org.
Accessed 16 February 2023.

Cole-Turner, Ronald. 2015. "Going beyond the Human: Christians and Other Transhumanists."
Dialog: A Journal of Theology 54 (1): 20–26. https://doi.org/10.1080/14746700.2015.1023525.
Accessed 16 February 2023.

Daly, Todd T. W. 2011. "Chasing Methusaleh: Transhumanism and Christian Theosis in Critical
Perspective." In *Transhumanism and Transcendence: Christian Hope in an Age of Technological
Enhancement*, ed. Ronald Cole-Turner, 131–145. Washington, DC: Georgetown University Press.

Daly, Todd T. W. 2011. "The Transhumanist Challenge." In *Transhumanism and Transcendence:
Christian Hope in an Age of Technological Enhancement*, ed. Ronald Cole-Turner, 1–19. Washington,
DC: Georgetown University Press.

Deane-Drummond, Celia. 2017. "*Eschatology and the Technological Future*, by Michael S. Burdett."
Journal of Theological Studies 68 (2): 874–876. https://doi.org/10.1093/jts/flx106.

de Chardin, Pierre Teilhard. 1961. *The Phenomenon of Man*. Harper Perennial Modern Thought.
New York: Harper and Row.

de Chardin, Pierre Teilhard. 1966. *Man's Place in Nature: The Human Zoological Group*. London: Collins.

de Chardin, Pierre Teilhard. 1975. *Toward the Future*. London: Collins.

de Chardin, Pierre Teilhard. 2004. *The Future of Man*. New York: Image Books/Doubleday.

Dyer, John. 2011. *From the Garden to the City: The Redeeming and Corrupting Power of Technology*. Grand Rapids, MI: Kregel.

Esteves, Junno Arocho. 2016. "Pope Insists Bodily Resurrection Is Real, Not a Mere Metaphor." *Crux*, September 2016. Available at https://cruxnow.com/vatican/2016/09/pope-insists-bodi-ly-resurrection-real-not-mere-metaphor. Accessed 16 February 2023.

Fitzmyer, Joseph A. 1991. *A Christological Catechism: New Testament Answers*. New York: Paulist Press.

Francis. 2014. "God's Gift Is Free." Available at https://w2.vatican.va/content/francesco/en/cotidie/2014/documents/papa-francesco-cotidie_20141104_god-s-gift-is-free.html. Accessed 16 February 2023.

Francis. 2015. "Laudato Si'." Vatican: Vatican Press. Available at http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html. Accessed 16 February 2023.

Gacheva, Anastasia. 2018. "Art as the Overcoming of Death." *E-Flux Journal*, March (issue 89). Available at https://www.e-flux.com/journal/89/180332/art-as-the-overcoming-of-death-from-nikolai-fedorov-to-the-cosmists-of-the-1920s/. Accessed 16 February 2023.

Garner, Stephen. 2005. "Transhumanism and Christian Social Concern." *Journal of Evolution and Technology* 14 (2): 29–43. Available at https://jetpress.org/volume14/garner.html. Accessed 16 February 2023.

Gavrilov, Leonid A, and Natalia S Gavrilova. 2010. "Demographic Consequences of Defeating Aging." *Rejuvenation Research* 13 (2–3): 329–334. https://doi.org/10.1089/rej.2009.0977.

Grosse, Jeremiah. 2009. "A Brief Summary of Catholic Teaching on Medical Ethics Issues," May. https://web.archive.org/web/20211206024828/https://www.lifeissues.net/writers/gro/gro_052medicalethics.html. Accessed 18 February 2023.

Grumett, David. 2011. "Transformation and the End of Enhancement: Insights from Pierre Teilhard de Chardin." In *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, ed. Ronald Cole-Turner, 37–49. Washington, DC: Georgetown University Press.

Guignon, Charles B. 1993. *The Cambridge Companion to Heidegger*. Cambridge: Cambridge University Press.

Habermas, Jürgen. 2003. *The Future of Human Nature*. Cambridge: Polity Press.

Hansell, Gregory R., William Grassie, Russell Blackford, Nick Bostrom, Jean-Pierre Dupuy, and Metanexus Institute. 2011. *H± : Transhumanism and Its Critics*. Victoria, BC: Metanexus Institute.

Haraway, Donna. 2015. "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin." *Environmental Humanities* 6 (1): 159–165. https://doi.org/10.1215/22011919-3615934.

Hayles, Katherine. 1999. *How We Became Posthuman : Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago: University of Chicago Press.

Hefner, Philip. 2012. "A Fuller Concept Of Evolution – Big Bang To Spirit." *Zygon* 47 (2): 298–307. https://doi.org/10.1111/j.1467-9744.2012.01255.x.

Humanity+. 2009. "Transhumanist Declaration." Available at https://humanityplus.org/philosophy/transhumanist-declaration/. Accessed 16 February 2023.

Huxley, Julian. 1957. "Transhumanism." In *New Bottles for New Wine*, 13–18. London: Chatto and Windus. Available at https://archive.org/details/NewBottlesForNewWine/page/n5. Accessed 16 February 2023.

Hwang, Andrew D. 2018. "7.5 Billion and Counting: How Many Humans Can the Earth Support?" *The Conversation*, July. Available at https://theconversation.com/7-5-billion-and-counting-how-many-humans-can-the-earth-support-98797. Accessed 16 February 2023.

International Theological Commission. 1995. "Select Questions on the Theology of God the Redeemer." Vatican City. Available at http://www.vatican.va/roman_curia/congregations/cfaith/cti_documents/rc_cti_1995_teologia-redenzione_en.html. Accessed 16 February 2023.

International Theological Commission. 2002. "Communion and Stewardship: Human Persons Created in the Image of God." Rome: Vatican.va. Available at https://www.vatican.va/roman_curia/congregations/cfaith/cti_documents/rc_con_cfaith_doc_20040723_communion-stewardship_en.html. Accessed 16 February, 2023.

Irenaeus of Lyons. n.d. "Adversus Haereses." Ante-Nicene Fathers. Available at http://www.newadvent.org/fathers/0103.htm. Accessed 20 May 2019.

Judge, Stuart. 2010. "Nothing But a Pack of Neurons?" Faraday Paper 16. BeThinking. Available at https://www.bethinking.org/human-life/nothing-but-a-pack-of-neurons. Accessed 16 February, 2023.

Kuiper, Andrew. 2019. "A Garden Lurking Beneath the Floorboards." *Church Life Journal*. Available at https://churchlifejournal.nd.edu/articles/a-garden-lurking-beneath-the-floorboards/. Accessed 16 February, 2023.

Kurzweil, Ray. 2006. *The Singularity Is Near: When Humans Transcend Biology*. New York: Penguin.

Kurzweil, Ray. 2008. *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. New York: Penguin Putnam.

Marovich, Beatrice. 2013. "The Mystical Text When Death Became a Creature: Saint Francis and Sister Death." *Glossator* (7): 95–116. Available at https://www.academia.edu/2897453/_When_Death_Became_a_Creature_Saint_Francis_and_Sister_Death_. Accessed 16 February, 2023.

Massey, Wyatt. 2019. "5 Ethical Issues in Science for Catholics to Consider." *U.S. Catholic* 84 (1): 12–18. Available at https://www.uscatholic.org/articles/201901/5-ethical-issues-science-catholics-consider-31607. Accessed 16 February, 2023.

Moravec, Hans P. 1988. *Mind Children: The Future of Robot and Human Intelligence*. Cambridge, MA: Harvard University Press.

O'Byrne, Anne E. 2010. *Natality and Finitude*. Bloomington: Indiana University Press. Available at https://ndpr.nd.edu/news/natality-and-finitude/. Accessed 16 February, 2023.

Peters, Ted. 1995. "'Playing God' and Germline Intervention." *Journal of Medicine and Philosophy* 20 (4): 365–386. Available at https://academic.oup.com/jmp/article-abstract/20/4/365/854813. Accessed 16 February, 2023.

Peters, Ted. 2011. "Progress and Provulution: Will Transhumanism Leave Sin Behind?" In *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, ed. Ronald Cole-Turner, 63–87. Washington, DC: Georgetown University Press.

Pulis, Matthew, Charlo Camilleri, and Tero Massa. 2021. "A SPIRITUAL Artificial General Intelligence?" *Melita Theologica* 71 (2): 65–94.

Rahner, Karl. 1966a. *Christianity and the "New Man,"* trans. Karl Kruger. Theological Investigations. Baltimore: Helicon.

Rahner, Karl. 1966b. *Christology within an Evolutionary View of the World*, trans. K Kruger. Theological Interpretations. Baltimore: Helicon.

Rahner, Karl. 1982. *Foundations of Christian Faith : An Introduction to the Idea of Christianity*. New York: Crossroad.

Ratzinger, Joseph. 1987. *Principles of Catholic Theology:Building Stones for a Fundamental Theology*. Translated by Mary Frances McCarthy. San Francisco: Ignatius Press.

Ratzinger, Joseph. 2009. *Theological Highlights of Vatican II*. New York: Paulist Press.

Rosofsky, Ira. 2009. "Would Immortality Become an Overpopulation Nightmare?" *Psychology Today*, December 2009. Available at https://www.psychologytoday.com/us/blog/adventures-in-old-age/200912/would-immortality-become-overpopulation-nightmare. Accessed 18 February 2023.

Satel, Sally, and Scott O Lilienfeld. 2013. "Human Behaviour: Is It All in the Brain – Or the Mind?" *Observer*, 30 June. Available at https://www.theguardian.com/science/2013/jun/30/brain-mind-behaviour-neuroscience-neuroimaging. Accessed 18 February 2023.

Schlumpf, Heidi. 2018. "Time to Rehabilitate Teilhard de Chardin?" *National Catholic Reporter*, January. Available at https://www.ncronline.org/news/people/time-rehabilitate-teilhard-de-chardin. Accessed 18 February 2023.

Segal, David. 2015. "Living On after Death." Reform Judaism. Available at https://reformjudaism.org/learning/torah-study/va-ychi/living-after-death. Accessed 18 February 2023.

Smart, J. J. C. 2017. "The Mind/Brain Identity Theory." *Stanford Encyclopedia of Philosophy*. Metaphysics Research Lab, Stanford University. Available at https://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=mind-identity. Accessed 18 February 2023.

Song, Robert. 2019. "Digital Theology: Transhumanism and Transcendence." Durham, NC: University of Durham.

The National Catholic Bioethics Center and the Catholic Medical Association. 2008. "A Catholic Guide to Ethical Clinical Research:" *Linacre Quarterly* 75 (3): 181–224. https://doi.org/10.1179/002436308803889521.

Waters, Brent. 2011. "Whose Salvation? Which Eschatology? Transhumanism and Christianity as Contending Salvific Religions." In *Transhumanism and Transcendence: Christian Hope in an Age of Technological Enhancement*, ed. Ronald Cole-Turner, 219. Washington, DC: Georgetown University Press.

Życiński, Joseph. 2006. "Ethics in Medical Technologies: The Roman Catholic Viewpoint." *Journal of Clinical Neuroscience* 13 (5): 518–523. https://doi.org/10.1016/j.jocn.2005.12.002.