Information and Reality: Contributions from the Science and Religion Forum

with Finley I. Lawson, "The Science and Religion Forum Discuss Information and Reality: Questions for Religions and Science"; Niels Henrik Gregersen, "'The God with Clay': The Idea of Deep Incarnation and the Informational Universe," Michael Burdett and King-Ho Leung, "The Machine in the Ghost: Transhumanism and the Ontology of Information"; Marius Dorobantu and Fraser Watts, "Spiritual Intelligence: Processing Different *Information or Processing Information* Differently?*"; Matthew Kuan Johnson and Rachel Siow Robertson, "A Co-Liberatory Framework for Big Data"; Peter M. Phillips, "Digital Theology and a Potential Theological Approach to a Metaphysics of Information"; and Andrew Jackson, "Peacocke Prize Essay—Towards an Eastern Orthodox Contemplation of Evolution: Maximus the Confessor's Vision of the Phylogenetic Logoi."*

THE MACHINE IN THE GHOST: TRANSHUMANISM AND THE ONTOLOGY OF INFORMATION

by Michael Burdett and King-Ho Leung

Abstract. An ontology of information belies our common intuitions about reality today and animates and governs both explicit scholarly study in philosophy and the sciences as well as the ideologies that are growing out of them. Transhumanism is one such technoscientific ideology that holds to a very specific ontology of information which need not be the only one on offer. This article argues that the transhumanist ontology of information exhibits gnostic and docetic religious overtones in it and that it devalues physical existence. At the same time, despite claiming a rejection of supernature, hypothetical transhumanist practices (such as mind-uploading) posit the infosphere as a kind of supernatural realm that is often set in opposition to the natural world. This article presents a critique of transhumanist conceptions of information and offers an alternative ontology of information that more adequately accounts for the distinction between the natural and supernatural as well as the integrity of the physical world.

Keywords: Thomas Aquinas; extended mind; Luciano Floridi; information; mind-uploading; naturalism; ontology; supernatural; transhumanism

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Introduction

The impact of information on both our everyday lives and how we understand reality can hardly be overstated today. The natural and human sciences rely upon the processing and storing of information to make claims about natural and social relations. For example, natural laws are often represented by mathematical equations, which is information, and the social sciences often utilize mathematical statistics to find relevant patterns and correlations between behaviors and the significance of such correlations is represented by information. We live in an age where the storing and processing of our personal information is not only the current and future currency of big businesses but also one where the way in which that information is used or stored is of great ethical concern. Because information and our attention to it have become so pervasive it is not at all surprising that contemporary claims about fundamental reality—that is metaphysics—are articulated in terms of information as well. An ontology of information, either explicitly or implicitly, belies our common intuitions about reality today and animates and governs both explicit scholarly study in philosophy and the sciences as well as in the ideologies that are growing out of them.

Transhumanism[1] is one such technoscientific ideology that understands the significance information has for how we understand just about everything today. And indeed, transhumanism holds to a very specific ontology of information that requires identification and explicit uncovering because the ideology is so pervasive and influential in tech industries, and yet it need not be the only ontology of information on offer. Drawing on Luciano Floridi's philosophy of information and its influences from and resemblance to Thomas Aquinas' hylomorphic metaphysics of "form," this article shows that an informational ontology does not necessarily understand information or the infosphere as inherently purposeless. This article argues that the transhumanist ontology of information exhibits gnostic and docetic religious overtones in it and that, despite claiming a rejection of supernature, hypothetical transhumanist practices such as mind-uploading posit the infosphere as a kind of supernatural realm that is often set in opposition to the natural or physical world. We claim that information in transhumanist ontology is stripped of its teleological character and represented as divine sparks trapped in the physical world that, when manipulated properly, can lead to the transcendence and apotheosis of the subject into the pure infosphere.

The Metaphysics of Information

Before attending to the transhumanist ontology of information it is worth considering a more general account of the philosophy of information and its relation to metaphysics. Luciano Floridi provides excellent

commentary here. Although Floridi's philosophy of information is not the only account of the metaphysics of information in recent philosophy and information theory (see Bynum 2016), his bold and influential postulation of "philosophy of information" as "a new *philosophia prima*, or *first philosophy*" provides us with a philosophical framework that illuminates some of the unique ontological underpinnings of many transhumanists' visions for humanity's future and their implications for our understanding of "naturalism" (Floridi 2011, 24–25). Echoing Aristotle's designation of "first philosophy" as the study of Being *qua* Being in the *Metaphysics* (1003a21), Floridi's philosophy of information is directly concerned with "what Aristotle meant by a general metaphysics of Being *qua* Being" (Floridi 2011, 357).

Using the definition of "information" as mind-independent meaningful data (Floridi 2011, 80–84), Floridi argues that the emergence and advances of information and communication technology have brought about "a re-conceptualization of our ontology in informational terms" (Floridi 2013, 10). Floridi speaks of this as a turn to "the metaphysics of the infosphere":

> It is happening before our very eyes. It will become normal to consider the world as part of the infosphere… The infosphere will not be a virtual environment supported by a genuinely "material" world behind; rather, it will be the world itself that will be increasingly interpreted and understood informationally, as part of the infosphere. At the end of this shift, the infosphere will have moved from being a way to refer to the space of information to being synonymous with Being itself. (Floridi 2013, 10)

Floridi's infosphere is not a virtual realm to which one can upload one's mind or consciousness in the future nor is it a future quasi-eschatological state of being like Teilhard de Chardin's "Noosphere" to which human beings are progressing.[2] Instead, "infosphere" is a way of interpreting reality that Floridi argues *already* underlies the contemporary way of human existence, insofar as the everyday lives of many in the twenty-first century are embedded in informational environments in rather all-encompassing manners.

According to Floridi, once we start to see the infosphere as synonymous or coextensive with Being itself (see Floridi 2013, 6, 65, 70, 75, 302), we also begin to understand not only Being itself but also *beings* or entities in informational terms: to see "human beings as well as animals, plants, artefacts (and hence emails, the *Britannica* or Newton's *Principia*), and so forth… insofar as they are entities, as informational entities" (Floridi 2013, 308). To this extent, Floridi's metaphysics of the infosphere is very much in continuation with the earlier accounts of informational metaphysics put forward by the mathematician Norbert Wiener (1894–1964) and the theoretical physicist John Archibald Wheeler (1911–2008),[3] who are both

quoted at length in *The Philosophy of Information* (2011), the first volume of Floridi's ambitious *Principia Philosophiae Informationis* tetralogy:

> Information is information, not matter or energy. No materialism which does not admit this can survive at the present day. (Wiener 1948, 132; quoted in Floridi 2011, 91)

> *It from bit*. Otherwise put, every "it"—every particle, every field of force, even the space–time continuum itself—derives its function, its meaning, its very existence (even if in some contexts indirectly) from the apparatus-elicited answers to yes-or-no questions, binary choices, *bits*. "It from bit" symbolizes the idea that every item of the physical world has at bottom—a very deep bottom, in most instances—an immaterial source and explanation… that all things physical are information-theoretic in origin. (Wheeler 1990, 5; quoted in Floridi 2011, 90–91)

Following Wiener and Wheeler, Floridi postulates that "the ultimate nature of reality is informational": that not only is "the ultimate nature of reality" constituted by something that is "immaterial,"[4] but reality or indeed "Being" as we know it is moreover intrinsically "informed" and embedded with value and meaning (Floridi 2011, 361).[5]

As Floridi acknowledges, his *non*materialist or even immaterialist account of the ultimate nature of reality is by and large unfashionable or even unpalatable for the majority of contemporary philosophers who predominantly subscribe to variations of "naturalism" or materialism (cf. Floridi 2019, 53−68), and that his metaphysical outlook is by comparison "closer to that of pre-technological cultures, which interpreted all aspects of nature as inhabited by teleological forces" (Floridi 2013, 10). Indeed, in light of Floridi's quasi-teleological postulation of "the intrinsic value of the infosphere" (Floridi 2013, esp. 102−23), as well as his allusion to Thomas Aquinas' account of the coextension of Being and Goodness as a source of inspiration (Floridi 2013, 85; citing Aquinas, *Summa Contra Gentiles* III.69), the informational metaphysics envisioned by Floridi (and perhaps also Wiener and Wheeler) may be understood as a variation of hylomorphic metaphysics (cf. Capurro 2009).

As Albert Borgmann points out, the notion of "information" or *informatio* has its etymological and conceptual roots in the Latin verb *informare* ("to inform" or "to give form"), which plays a key role in the hylomorphism of medieval scholastic metaphysics:

> "Information" is an old word, and the verb "to inform" is older yet. Latin *informare*, as Cicero (106–43 BCE) used it, meant to impose a form on some thing… For the medieval scholastics, information was the companion of materialization. They thought of things as consisting of form and matter, the form informing matter, matter materializing the form. (Borgmann 1999, 9)

And, indeed, in Aquinas' medieval scholastic—Latin—rendition of Aristotle's hylomorphism, the term *informatio* is used to describe the "informing of matter" (*informatio materiae*), the way in which matter (Latin *materia*; Greek *hylē*) acquires form (*forma*; *morphē*) (*Summa Theologiae* I.110.2). Moreover, although Floridi does not mention this in his brief allusion to Aquinas' account of Being and Goodness, Aquinas (*De Veritate* 21.1, ad 7; cf. 3.1, ad 5) notably teaches that just as Being is given to creatures by God through the act of creation *ex nihilo*, Goodness is given to creatures by God "through information" (*per informationem*).

Considering all this, we can see why Floridi (2013, 133) says that his metaphysical insistence on "the intrinsic value of the infosphere" is "a perspective that makes much sense from many religious and spiritual traditions, including, but not only, the Judeo-Christian one, for which the whole universe is God's creation, is permeated by the divine, and is a gift to humanity worthy of care".[6] Not unlike the affirmation of the intrinsic goodness of the created order we often find in theistic metaphysics of creation, Floridi's philosophy of information "holds that every informational entity, insofar as it is an expression of Being, has a dignity constituted by its mode of existence and essence" (Floridi 2013, 68–69). However, despite his position that "all entities *qua* informational entities have an intrinsic moral value," Floridi (2013, 110) does not think that the moral worth and value of all these entities are simply equal.[7] As Floridi (2013, 323) notes, his metaphysics of the infosphere is "not about respecting a single grain of sand as much as one respects the whole earth… Nobody in his right mind would ever argue that this is equivalent to saying that a spider's and a human life are equally worthy of respect."

While Floridi argues that all existing entities *are* informational entities that possessing intrinsic value and indeed some degree of information, he nonetheless clearly states that "not all informational entities are agents" (Floridi 2013, 68).[8] To quote Floridi's definition of "agency":

> An agent is any entity [who is] capable of producing informational phenomena that can affect the infosphere. At its minimal level, agency is the mere presence of an implemented informational entity in terms that remind one of Heidegger's *Dasein*—the mere being-there or presence—of an informational entity in the infosphere. (Floridi 2013, 68)

Echoing Heidegger's formulation of Dasein as the entity who is defined by its "understanding of Being" in *Being and Time* (see Heidegger [1927] 1962, 32), as well as his account of human Dasein as the entity with the capacity for "world-formation" in his 1929–1930 lecture course at the University of Freiburg (see Heidegger [1983] 1995, esp. 285), Floridi (2013, 128) defines agents as "*creators* and not just *users* of their environment," for agents do not simply use or interpret the information of the infosphere

(which Floridi understands as "Being" itself) but also shape, form and in some sense "create" the informational environment that is the infosphere.[9]

Although he does not attribute agency exclusively to human beings, Floridi is clear that his metaphysics of the infosphere has important implications for philosophical anthropology (Floridi 2019, 233–36). As noted above, Floridi's informational metaphysics holds that all existing entities are informational entities that are intrinsically "informed" with value and worth in a not dissimilar way to the hylomorphic account of "form" in medieval scholastic metaphysics. As is well known, scholastic thinkers such as Aquinas teach that all things are composed of "form" and "matter," and in the case of the human, the soul is the form of the body, the immaterial principle that "informs" (*informare*)—gives meaning and value to—the matter that comprises the human body: it is what makes the material entity *human* and what defines and gives identity to the particular human individual—it is, so to speak, what makes me "me" (see Aquinas, *Summa Theologiae* I.75–76).

Not unlike Aquinas's account of the soul as the immaterial form that defines human identity, Floridi (2013, 243) argues that there is an "essentially informational nature of human being". Just as the human being is defined by her soul as her *form* for Aquinas, Floridi sees in*form*ation as that which constitutes human identity:

> Who am I? I am my, not anyone's, self. I am "me", but who or what is this constantly evolving object that constitutes "me", this selfhood of mine? A bundle of information… We *are* our information. (Floridi 2013, 259–60, emphasis added)

Indeed, for Floridi, immaterial information constitutes the human in a no less fundamental way than the material body: "an agent *is* her or his information. 'My' in 'my information' is not the same 'my' as in 'my car' but rather the same 'my' as in 'my body'" (Floridi 2013, 244). But while Floridi's informational metaphysics and proposition that "a person… is after all a packet of information" could indeed lend theoretical support to various transhumanist visions of mind or consciousness uploading (Floridi 2013, 259), it is worth stressing that Floridi himself remains a critic and sceptic who believes that transhumanism is full of "fanciful and fictional claims" and maintains that his philosophy of information "should not be confused with the sci-fi vision of a 'cyborged' humanity, or a revised version of the extended mind thesis" (Floridi 2013, 15).

Transhumanism and Mind-Uploading

Of course, Floridi's favored account of informational ontology is just one particular, albeit influential, brand of informational ontology. His reticence to fully agree with transhumanist accounts of information

presupposed in mind-uploading invites further speculation on these differences and how transhumanism relies upon a rather significant, if reductive, ontology of information. Furthermore, transhumanist commitments about ontology and information are the lynchpin to understanding how they conceive of both nature and supernature. In the following we will uncover these nascent commitments and how they impact a conception of the natural and supernatural.

The transhumanist avowal of an ontology of information belies one of their major proposals: mind-uploading. However, even though not all transhumanists subscribe to this proposal it is a commonly held belief and there is enough commitment to technological retrofitting and merging more generally to claim that all transhumanists affirm some kind of ontology of information (see, e.g., Schneider 2019). Let us take retrofitting and technological merging first before attending to mind-uploading.

Transhumanists argue that the human being is insufficient as it presently stands. The name itself is a conjunction of "trans" and "humanism" which points to their dissatisfaction. They claim that the human condition needs to be transcended beyond its present capabilities and that doing so will mean we can lead more satisfactory lives (see Burdett and Lorrimar 2019). Of course any anthropology worth the title recognizes that the human quality to reach out beyond oneself, to grow and get better is a necessary component of human nature and human life—even for relatively static accounts of the human being. But what is distinctive about transhumanist claims about transcending our current selves is the radicality with which they understand the very category of "the human" to be transcended and the means by which we might reach the posthuman state. Traditional humanists, both religious and nonreligious, speak about how to become better human beings—even while they recognize our current condition is not all it can be. But the very category of "the human"—some might even say "human nature"—is a good and that we can lead fully meaningful, happy and flourishing lives as human beings. What is more, they often focus on cultural and relational means to improve our current condition: education, art, bearing children, and developing friendships.

Transhumanists are uncomfortable with both of these tame humanist proposals. Instead transcending the human condition is achieved largely through direct manipulation of the human body and especially by utilizing and merging with technologies of all kinds. Brain machine interfaces, exoskeletons and performance enhancing drugs are just some of the proposed interventions and technologies transhumanists claim is necessary for the human being to transcend itself. The first stop on the way to a fully posthuman state is the cyborg, the merging of human beings with technology.

The reason technology is to be leveraged in this cause is because the human body, brain, and mind are weak. Brain processing is inferior to

the computing power of current silicon-based circuits (Kurzweil 2014). Our fleshly bodies are soft, prone to injury and disease and relatively feeble, whereas even other primates are stronger and other animals are more durable—not to mention the sophisticated materials we use every day that are harder, more flexible and can withstand harsh conditions. What is more, humans get angry easily, hold grudges, lose concentration, forget things and can develop all manner of unhealthy mental conditions. Brain machine interfaces and other pharmaceutical interventions can be used to make up for these weaknesses and, so transhumanists tell us, can even enhance, extend, and perhaps even develop new capabilities we currently do not have.

What is important to take notice of with the transhumanist use of technologies—especially in contradistinction to the way they might get used or understood by others—is the way those very technologies are incorporated into the very identity or we might say "nature" of the creature.[10] Andy Clark, David Chalmers, and N. Katherine Hayles' reflections are important to consider here. Clark and Chalmers' propose that human cognition is not entirely focused within the brain or human body. They propose a position called "active externalism" or more popularly rendered "extended mind" (Clark and Chalmers 1998). It is worth noting here that *information* plays a central role in Clark and Chalmers' account of cognition in their "extended mind" thesis.[11] As Clark and Chalmers illustrate this with the example of an Alzheimer's patient named Otto:

> Otto carries a notebook around with him everywhere he goes. When he learns new information, he writes it down. When he needs some old information, he looks it up. For Otto, his notebook plays the role usually played by a biological memory… The information in the notebook functions just like the information constituting an ordinary non-occurrent belief; it just happens that this information lies beyond the skin… The information in Otto's notebook… is a central part of his identity as a cognitive agent. (Clark and Chalmers 1998, 12–13, 18)

Essentially, Clark and Chalmers (1998, 8) claim that external actions that might aid the cognitive process should be understood as essential to the cognitive process: "If, as we confront some task, a part of the world functions as a process which, were it done in the head, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world is (so we claim) part of the cognitive process. Cognitive processes ain't (all) in the head!" In a way this is an ontological claim that is borne from an epistemic and pragmatic observation. Because it seems our cognitive processes are not solely located between our ears and solely within our body, how we parse out the agents doing the cognition becomes blurred.[12] It is a proto-transhumanist commitment because it raises the ontological status of the extension, the technology being used, to be a significant

component doing the epistemic and cognitive work. It is not merely an aid to the cognitive process occurring within the primary agent, rather the whole system (human being and technology) is doing the processing.[13]

Now, while Clark and Chalmers might not be explicitly promulgating a complete transhumanist equation of the human being and the technology that extends the mind,[14] it is clear that the extended mind thesis is an upgrade to the environment and technology that is reminiscent of a stronger claim being made by transhumanists. N. Katherine Hayles takes this a step further in parsing out the significance of technological retrofitting by claiming it has subjective significance, not just cognitive. As she states: "The posthuman subject is an amalgam, a collection of heterogeneous components, a material-informational entity whose boundaries undergo continuous construction and reconstruction" (Hayles 1999, 3). She even claims elsewhere that the addition of cyborg-like components to the body do not necessarily signify the tipping point in subscribing to posthuman subjectivity; all it takes is a difference in subjective models that are coming out of cognitive science and information technology (Hayles 1999, 4). In other words, our disposition toward the world, how subjects and actors work in it, and how we parse out the underlying ontology really matters. As such, cyborg retrofitting is just the manifestation of a diffused transhumanist-inspired subjectivity/identity that is becoming increasingly operative in the cognitive and information sciences. What we are arguing here is that this posthuman subjectivity relies upon a particular ontology of information, and transhumanist's collapse and reduce all entities and actors into this ontology of information. Indeed, what typifies the transhumanist ontology of information is the fungibility of the space and levelling of all entities to a single univocal status in terms of information.[15]

But before further characterizing the transhumanist ontology of information, what might make it unique relative to others, and how that might relate to nature and supernature, it is worth considering a further activity that illustrates even further how posthuman subjects relate to information beyond just the cyborg: mind-uploading. The proposal is to reverse engineer the human brain (or in some instances the entire nervous system) by mapping the neural networks of each individual human brain into a silicon-based computer system. As such it creates a model or, so uploading advocates say, a virtual copy of the most important elements of a person. The significant philosophical move is that transhumanists claim that virtual copy is now the human person. There is enough of a seamless continuity between the fleshly, organic person and the silicon-based model to transfer the personal identity across.

What makes this possible? First, it signals a belief that the material makes little difference to the identity of the person. The material cause is incidental. It might contribute the necessary inputs and sensory experiences needed for the person to develop and grow but the real center of

human identity seems to be outside of that material instantiation. In a way it is a docetic belief—materiality is just the clothing or husk we put on. In this way, mind-uploading depends on the prior ontological elevation of technology found in retrofitting. If material continuity does not matter, what is the means by which personal continuity occurs? Informational continuity derived from collapsing the mind into the brain. Quite literally copying the neural network and the supposed information encapsulated in it from one medium to another is enough to make sure the person carries on.[16] Of course, transhumanists have many more beliefs about what you do with that copy once it has been created (these religiously motivated beliefs will be discussed later), but what is important to note is that what is really real for transhumanists, what underlies everything, what makes up the quiddity of things is the information a thing bears. Therefore, attending to how transhumanists treat information—indeed how they see it as an ontology—and what characterizes the information space for transhumanists tells us something about what makes their beliefs unique and tells us something about how they might define something like "the supernatural".

It is worth noting that transhumanists, particularly of the secular variety, would likely reject any such claim that they appeal to or rely on anything like the supernatural. After all Max More (2013, 4) states explicitly in his foundational essay "Philosophy of Transhumanism": "Transhumanism could be described…as a type of nonreligious philosophy of life that rejects faith, worship, and the supernatural, instead emphasizing a meaningful and ethical approach to living informed by reason, science, progress, and the value of existence in our current life." In the same volume, *The Transhumanist Reader*, Russell Blackford (2013, 421) also claims "transhumanism posits no 'beyond': there are no gods, or supernatural powers or principles. Most typically, transhumanists embrace a naturalistic and purely secular worldview." It is a nearly foundational belief of transhumanism that only naturalistic causes, principles and forces govern our reality.

However, one can say that information or indeed "the infosphere" operates much like a "supernatural realm" in transhumanist proposals—perhaps enough to say that their conception of the supernatural is the informational space as a realm that enables and exhibits transcendence and apotheosis. For the infosphere appears to be "supernatural" not only as an otherworldly immaterial realm that *transcends* the physical "natural" world, but moreover as a crypto-eschatological final resting place where transhumanists seeks to upload their consciousness to find true bliss free from the biological—or indeed "natural"—processes of decay they find in the world. This is confirmed by the fact that much of transhumanist language, artwork and writings implicitly and explicitly draw on supernatural and religious themes. For example, David Pearce, co-founder of the international organization for transhumanism Humanity+, has explicitly

used religious and supernatural language to describe transhumanist activities:

> If we want to live in paradise, we will have to engineer it ourselves. If we want eternal life, then we'll need to rewrite our bug-ridden genetic code and become god-like. "May all that have life be delivered from suffering", said Gautama Buddha. It's a wonderful sentiment. Sadly, only hi-tech solutions can ever eradicate suffering from the living world. (Pearce in Bostrom and Pearce 2012–2013, 7–8)

Ray Kurzweil (2015) has similarly stated that technological evolution is moving us closer to the kinds of properties we associate with God: "Evolution creates structures and patterns that over time are more complicated, more knowledgeable, more intelligent, more creative, more capable of expressing higher sentiments like being loving…Evolution is a spiritual process and makes us more godlike."

Indeed, it is clear that transhumanists draw upon the nascent feeling of empowerment and transcendence that comes from using technology in our lives. One of the major reasons we develop and use technologies is to extend and increase our abilities and we often feel stronger and smarter when using them. Transhumanism takes that often transformative and elevating experience and exacerbates it, and often couches it in religious, that is supernatural, language and artistic productions. This is further visible in the futuristic speculations of technological transcendence that often come from retrofitting and mind-uploading that transhumanists advocate. The way transhumanists represent retrofitting and mind-uploading is reminiscent of mystical encounters with the supernatural and the glorified transfigurations we find in religious traditions. Several tropes in transhumanist images manifest such sentiments. Transhumanist art often depicts humanoid figures with cyborg-like hardware attached to the human body that bespeaks of the contention that human beings are just artefacts and that merging with the artificial is a goal. But a further trope often includes a humanoid figure foregrounded by a celestial or cosmic scene. The very transcendent nature of peering up at the cosmos gets embedded in our perception of the humanoid—this is a transcendent being! The humanoid might also be depicted with beams of light radiating from the body connoting that this transcendent being is in some state of glorification or deification. These images often superimpose pictures of circuitry or lines of binary numbers onto the humanoid or even from the light radiating from them into the vast cosmos.

Two common transhumanist images represent the supernatural and transcendent overtones in transhumanist images well. The first depicts ape-like ancestors evolving at the bottom of the picture with a transcendent humanoid figure rising above them with a double helix DNA body and angelic light radiating from the hands and head suggesting a kind of

apotheosis where the transhuman literally ascends over and above its natural evolutionary beginnings and forebearers in an extension of the common evolutionary pictures.[17] As Kurzeil (2005) often states, technological evolution takes over from biological evolution as a law of the universe and here it is depicted as in terms of religious transcendence. The second picture plays off of Michelangelo's famous "The Creation of Adam" image in the Sistine Chapel. Rather than having a human hand outstretched to touch God it is a robotic, humanoid hand.[18] The juxtaposition of the divine with the artificial arm highlights the very transcendent nature of the artificial and provocatively instills it with supernatural qualities.[19]

How does this all relate to information and indeed an informational ontology? Information is the key, the very avenue to a transcendent supernatural state. As David Pearce says above, "If we want to live in paradise, we will have to engineer it ourselves. If we want eternal life, then we'll need to rewrite our bug-ridden genetic code and become god-like." The transhumanist images depict DNA double helix strands (the very informational code of all biological beings) as the means of the humanoid arising above the ape-like ancestors to a glorified state. The beams of light have computer circuitry and binary numbers, the very representation of information, superimposed into them that manifests an underlying informational ontology. The infosphere operates like the supernatural in that it animates and pervades the natural but transhumanists often treat information like "divine sparks" to be released from nature or the physical world and that by manipulating such information one can ascend to the infosphere alone through mind-uploading and experience pure apotheosis.

Conclusion

In her articulation of "expansive naturalism" as "a middle way between reductive naturalism and supernaturalism," Fiona Ellis (2014, 50, 89) argues that there are certain phenomena in the world that clearly exist in the world which are "compatible with the findings of science [but] are irreducible to the things it can explain". Ellis' key example is "values," which she defines as evaluative properties in the world that have distinctive effects on sentient beings and elicits their response (Ellis 2014, esp. 51–56). Ellis argues:

> [V]alues are part of the natural world, [but] they *are* different from other things with which we are acquainted. They are different in the sense that they are irreducible to properties which form the focus of scientific interest. So they count as supernatural if "natural" is taken to be equivalent to "scientific". However, they are not supernatural if "natural" is understood in the expanded sense at issue here—a sense which allows that the boundaries of nature can be expanded beyond scientific parameters to accommodate value. (Ellis 2014, 58)

For Ellis, the existence of evaluative properties such as values in the natural world entails "an evaluative enchantment of the world" which recognizes that the natural world is a value-involving world whose limits are "no longer circumscribed by science" but is nonetheless "compatible with the findings of modern science, and acceptable to those who take seriously the scientific worldview" (Ellis 2014, 80).

Like value, information is irreducible to scientific explanation but nonetheless still compatible with contemporary scientific outlooks. Moreover, in comparison to value (which Ellis [2014, esp. 117–44] sees as having particular moral or even religious connotations), information is arguably a more relevant—or even fundamental—term for natural scientific inquiry, given that the acquirement and analysis of information are essential to the practice of any science.[20] Thus, echoing Ellis' account of value, one may say that while information is indeed "part of the natural world," it exists in a different way from material things. Information may count as supernatural if "natural" is taken to be equivalent to "scientific" or "material," but information is not supernatural if one does not simply equate the "natural" with the "physical" or limit the boundaries of nature to the confines of natural scientific inquiry. One might even say that recognizing information as an irreducible—and *immaterial*—part of the natural world not only expands our understanding and definition of "nature" or "the natural" beyond scientific—or indeed *material*—parameters, but moreover recovers an "enchanted" account of the world as intrinsically filled with meaning, purpose, or even moral value (cf. Ellis 2014, 73–93). To quote Floridi (2013, 84, 110) again: "all entities qua informational entities have an intrinsic moral value."

In this regard, an ontological outlook which sees immaterial information as an irreducible and irreplaceable part of reality may indeed be regarded as a "supernatural" one, insofar as "we avoid any implication that the supernatural is an extrinsic addition to the world—a mere "supernature" which can be removed whilst leaving everything in its place," and that we recognize that "the supernatural is a dimension of nature which serves to enrich our natural being and that of the nature we inhabit" (Ellis 2014, 152, 203). But this sense of the supernatural is by no means the super-material quasi-eschatological realm of the transhumanist imagination of the infosphere described above. As noted earlier, Floridi (2013, 10) acknowledges that the metaphysics of information and the infosphere he seeks to articulate is "paradoxically… closer to that of pre-technological cultures, which interpreted all aspects of nature as inhabited by teleological forces". The transhumanist "supernatural" runs roughshod over such "teleological forces" that are represented by the relation or permutation of information in the natural world. Transhumanists desire to abandon the physical, perhaps even the natural, altogether because it is the space typified by limitation. The extraction and manipulation of information

to reach the "supernatural" state in the infosphere belies a disposition to information in the natural world that simultaneously makes too much of information (by elevating it to a kind of supernature and thereby cleaving it from its naturalistic embedding and moorings) and functionalizes and instrumentalizes it such that it often disregards and disrespects the inherent purposefulness—or even teleology—of information (cf. Heidegger 1977). The purpose of information, for the transhumanist, is one's own individual *apotheosis* at all costs rather than a Heideggerian *Gelassenheit*.[21]

What we find in the transhumanist account of information is thus not only an account of "supernatural" in the sense that the infosphere is postulated as a "supernatural" realm of pure information where one uploads one's consciousness to escape or "transcend" the *natural* physical body that binds the mind or consciousness to the *natural* biological processes of decay and eventual demise. The immaterial "information" that the transhumanist associates with consciousness or personal identity is moreover also "supernatural" in the sense that informational consciousness is seen to be some "supernatural" element that does not belong properly to the "natural" realm. In other words, the "supernatural" immaterial information that is one's consciousness or identity is seen as something akin to a gnostic "divine spark" entrapped within the "natural" material body, awaiting liberation—or indeed salvation—through the process of mind-uploading to a pure infosphere where one's true being as an informational consciousness would find its proper belonging (cf. Peters 2019, 112).

Such a conception of information as some "supernatural" element alien or indeed opposed to the natural world is of course not an inevitable outcome of an informational ontological outlook. As noted in our discussion of Floridi's philosophy of information above, informational metaphysics can find much resonance with "many religious and spiritual traditions, including, but not only, the Judeo-Christian one, for which the whole universe is God's creation, is permeated by the divine, and is a *gift* to humanity worthy of care" (Floridi 2013, 133, emphasis added). As opposed to transhumanists who see the natural world as a purposeless realm to be manipulated, seeing information as an intrinsic part and dimension of the universe can show us that the natural world in which we find ourselves is not simply a "gift" given to us from a divine creator, but moreover an intrinsically *intelligible* world that is full of meaning which is given, as Aquinas would say, *per informationem*: through information (*De Veritate* 21.1, ad 7; cf. Leung 2022, 85). Accordingly, like the rest of the natural world that is a "gift to humanity worthy of care," the philosophy and ontology of information as a theoretical discourse—or indeed as a piece of information itself—also deserves our attention and care. Seen in this light, instead of being a resource for manipulation, the philosophy of information should be understood as nothing other than a "gift" to the philosophy

of religion and its endeavor to make sense of the world that is given to us—and perhaps even of the God who gives it its being and meaning.[22]

Notes

1. The working definition of transhumanism we assume here is taken from the Humanity+ organization and Nick Bostrom: "The intellectual and cultural movement that affirms the possibility and desirability of fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and to greatly enhance human intellectual, physical, and psychological capacities." See Bostrom (2014, 1).
2. For a critical discussion of Teilhard's notion of "Noosphere" and its corresponding technological optimism, see Burdett (2015, 113–40).
3. More specifically, Floridi (2011, 361) sees his own account of informational metaphysics as "reconcil[ing] two metaphysical views in the philosophy of information favorable to the proto-physical nature of information, [namely] Wiener's and Wheeler's".
4. For this reason, Floridi (2013, 10, 13) speaks of his "re-conceptualization of our ontology in informational terms" as a "de-physicalization" of things and processes.
5. It is, however, important to note that Floridi (2011, 316–71) adamantly distinguishes his informational metaphysics from what he calls "pan-computationalism" and "digital ontology," which believe that there could be a digital model or computational simulation of the ultimate nature of the physical universe (to which Wheeler's "*it from bit*" thesis could lend support).
6. See note 9 below for a further discussion of Floridi's notion of "gift".
7. Although Floridi maintains that there is an axiological hierarchy of moral worth and value among different entities, he nonetheless argues that there is a principle of "ontological equality" which lies at the heart of his informational metaphysics, for "any form of reality—that is, … any instance of information—simply for the fact of being what it is, enjoys an initial, overridable, minimal right to exist and develop in a way appropriate to its nature" (Floridi 2013, 69). In this regard, Floridi's informational metaphysics has certain similarities to recent articulations of an ontological equality of beings in contemporary European philosophy—broadly following Deleuze's account of "the plane of immanence" (see note 15 below; cf. Mullarkey, 2006). Moreover, just as these contemporary "immanentist" ontologies—for instance, Giorgio Agamben's or Alain Badiou's—partially recover a pre-modern sense of transcendentality, one can see Floridi's postulation that all entities are *informational* entities with gift-like intrinsic value as a secular version of the medieval metaphysical outlook which posits that all entities intrinsically bear the transcendental properties of oneness, truth, and indeed goodness—particularly in light of its similarities to Aquinas' aforementioned account of the way God gives to creation the transcendental property of goodness "through information" (*per informationem*). On the affirmation of ontological equality and partial recovery of pre-modern transcendentality in contemporary continental philosophy, see Leung (2021).
8. Floridi (2013, 68) further notes that there are a range of types and levels of agency among different agents: "not all informational entities are agents…. [and] not all agents are *accountable* (e.g., an earthquake). Furthermore, only some accountable agents are *responsible* (e.g., Alice), that is, able to be aware of the situation and capable of planning, withholding, and implementing their interactions with the infosphere with some degree of freedom and according to their evaluations." See also Floridi (2013, 134–60).
9. Following his account of agents as "users" and "creators" of information environment, Floridi (2013) describes the human *agent* as the "*homo poieticus*" (161–79), who is simultaneously engaged in *egopoiesis*—which Floridi defines as "moral construction of the self" (161)—*and* in *ecopoiesis*—"*creative stewardship* in which responsibility for the whole realm of Being, that is, the whole infosphere" (168). To this extent, Floridi's anthropology of *homo poieticus* not only resembles the theologian John Milbank's (1997, 124) account of "humanity as fundamentally poetic being," Floridi's (2013, 302) attention on *poiesis* and his assertion that "Existence begins with a gift" also echoes Milbank's (1997, 123–44) "Christological poetics" of the word and his theological ontology of the gift. See also the account of the human as the poetic "fabricating animal" or *homo creator* in Milbank (2013).

10. Our impression is that "nature" is not a term transhumanists would want to use even if it captures our sentiment here about the way technology has lasting, essential value for the creature. Technology becomes part of the quiddity of the being for transhumanism.

11. Moreover, in his now classic work *The Conscious Mind* and his landmark essay "Facing Up to the Problem of Consciousness," both published shortly before his "extended mind" thesis with Clark, Chalmers notably draws on informational ontology developed from John A. Wheeler's aforementioned "it from bit" outlook in his characterization of conscious experience in terms of "information-processing" (see Chalmers 1996, esp. 302–3; 1997, 9–30, esp. 26–28). Indeed, Chalmers' adherence to this theory is reaffirmed in his recent popular book, *Reality+: Virtual Worlds and the Problems of Philosophy* (Chalmers 2022, see esp. 145–66).

12. In this way, it bears remarkable similarities to Bruno Latour's (2005) "actor-network" theory.

13. One may compare this supra-human focus on the cognitive process of "the whole system" to Floridi's notion of the "infosophere".

14. Their commitments don't necessarily entail the *equal* parsing of significance between the human actor cognitively processing something and the extension.

15. Here one may compare this ontological outlook to Deleuze's influential notion of the plane of immanence in his reading of Spinoza as the exemplary exponent of the univocity of being. See Deleuze ([1970] 1988, 122–29; [1968] 1990, 165–181). As Blok and Jensen (2011, 14–15) point out, Bruno Latour's notion of "actor-network"—which, as argued above (note 12 above), bears certain resemblances to Clark and Chalmers' "extended mind" thesis—takes significant inspiration from Deleuze's "plane of immanence". Although Floridi (2013, 84, 124, 128) compares his informational ontology of Being as the infosphere to Spinoza's metaphysics and attributes agency to various nonhuman entities (see note 8 above), his engagement with Spinoza differs from the account of nonhuman (or indeed *post*-human) political agency in recent radical monist readings of Spinozist metaphysics following Deleuze (e.g., Braidotti 2013).

16. With this collapsing of the mind into the brain, the informational continuity held in transhumanist ontologies differs from Gregory of Nyssa's (1993, 45–48) account of a non-material formal—or even "informational"—continuity of the soul that upholds human identity throughout various material changes which one's physical body undergoes.

17. See the top main image graphic for Treseder (2017).

18. See the cover art of Cole-Turner (2011).

19. The notion of "supernatural" here clearly differs from that of the classical theological tradition, such as Aquinas'. For in Aquinas' view, the "supernatural" refers to capacities and ends that exceed those which human creatures can naturally possess without the assistance or elevation of divine grace. If the infosphere is a digital realm where one can upload their mind or consciousness without the assistance of grace, then, by Thomist standards, such a realm would not be a "supernatural" one. In other words, even though transhumanist participation in the infosphere may sound like Aquinas' account of the supernatural deifying participation in grace, in Thomist terms the infosphere is ontologically "natural" insofar it is reachable by means of natural human capacity. For a further discussion of this matter in relation to Aquinas' teachings on grace and nature, see Leung (2020).

20. In his defense of naturalism and "humanist" critique of religious thought, Larvor (2015) submits that abstract immaterial entities such as mathematical objects and conceptual arguments are not "spooky" entities but phenomena that "supervene" on material processes. Similarly, a naturalist humanist may argue that "information" *supervenes on* physical things. However, one may respond that "information" is a more basic and fundamental phenomenon than mathematics, and that the very idea of supervenience is not only itself a type of information, but the ways in which we recognize various phenomena as supervenient on others are informed by the information embedded in physical objects.

21. *Gelassenheit* is often translated "releasement" or a kind of "serenity" but in Heideggerian terms it is the suggested alternative disposition or attunement to Being by the technological subject that only sees "resources" in all reality. See Heidegger ([1995] 2010).

22. Many thanks to Daniel de Haan and Victoria Lorrimar for providing helpful information in the writing of this piece.

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