

Essay

# Vulnerability, Embodiment and Emerging Technologies: A Still Open Issue

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**Abstract:** When reflecting on the human condition, vulnerability is a characteristic which is clearly evident, because anyone is exposed to the possibility of being wounded (and is, therefore, vulnerable, from the Latin word "vulnus", wound). In fact, human vulnerability, intended as a universal condition affecting finite and mortal human beings, is closely linked to embodiment, intended as the constitutive bond every human has with a physical body, subject to changes and to the passing of time. In today's cultural context, permeated by emerging technologies, theories in favor of the so-called human enhancement through the use of the Genetics–Nanotechnology–Robotics (GNR) Revolution or NBIC Convergence technologies, in particular transhumanism, are emerging in the bioethical debate and seem to question the fundamentally vulnerable nature of human beings, by proposing not only abstract theories, but also concrete techno-scientific projects for its overcoming. Such a project, however, could turn out to be fallacious and inconsistent and could lead to ethically unacceptable consequences. Instead, a coherent (and ethical) way of responding to constitutive human vulnerability seems to be its understanding and acceptance.

**Keywords:** dematerialization; embodiment; enhancement; transhumanism; uploading; vulnerability



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## 1. To Improve a Man

Twenty years have passed since the publication of the President's Council on Bioethics report, *Beyond Therapy. Biotechnology and the Pursuit of Happiness* [1]. Since then, the literature on the topic of Human Techno-Enhancement, which means the improvement of the human species through the use of technology, has been growing steadily, both from advocates and critical thinkers, even in the wake of techno-scientific progress stimulating reflections on the future development of human potential. Central to the ongoing stimulation of such debates is the so-called Genetics–Nanotechnology–Robotics (GNR) Revolution, which denotes the syncretic action of genetics, nanotechnology, and robotics [2] (p. 17), so-called *emerging technologies*. This Revolution is also known as "technological convergence". The interest in such technoscientific development, in the direction of human improvement (or enhancement), is also demonstrated by the publication of the 2002 report by the National Science Foundation and the Department of Commerce in the United States, titled *Converging Technologies for Improving Human Performance* [3]. As Palazzani clarifies, the so-called *converging technologies revolution* stems from the unified and synergistic combination of research and applications that configure scenarios predominantly projected into the future and that belong to four scientific fields, referred to by the acronym NBIC: Nano (nanotechnology), Bio (biotechnology), Info (information technology) and Cogno (sciences and technologies that study thinking system cognition) [4]. Technologies can be classified into three categories. The existing technologies indicate the interventions already widespread in practice and, therefore, the subject of reflection in the field of medical ethics and bioethics, such as cosmetic surgery and doping in sport. Emerging technologies refer to the new fields of intervention that are emerging in recent years and in the present, in areas that have only recently been analyzed by moral reflection and include devices

belonging to the genetic, biological and neuro-cognitive fields. The expression “convergent technologies”, finally, refers to the unified and synergistic combination of different research and applications that configure scenarios predominantly projected into the future and fall within the scientific fields of NBIC, previously outlined [4].

Such areas of techno-scientific progress uncover astonishing possibilities, with implications in a variety of “traditional” areas of human existence, from economics to health care, from education to art<sup>1</sup>. But, in the same way as extraordinary natural events in the past stimulated the creation of stories and myths about gods and heroes, the new biotechnologies, in contemporary times, have also inspired sci-fi visions, in which the image of the “new man”, the post-human, a kind of techno-Homo Sapiens 2.0, emerges and is endowed with unprecedented optimal psycho-physical capabilities. These science fiction theories include transhumanism, a cultural and philosophical movement that advocates techno-scientific progress for human empowerment.

The words of Nick Bostrom<sup>2</sup>, principal thinker of the transhumanism<sup>3</sup>, are emblematic. Along with Max More<sup>4</sup>, he writes:

«let us suppose that you were to develop into a being that has posthuman healthspan and posthuman cognitive and emotional capacities. At the early steps of this process, you enjoy your enhanced capacities. You cherish your improved health: you feel stronger, more energetic, and more balanced. Your skin looks younger and is more elastic. A minor ailment in your knee is cured. You also discover a greater clarity of mind. You can concentrate on difficult material more easily and it begins making sense to you. You start seeing connections that eluded you before» [11] (p. 5).

Therefore, in the transhumanist view, inspired by an evident perfectionism [12] (p. 14), new technologies (from existing to emerging and to converging ones) are instrumental in the human development and, particularly, in the empowerment of human beings, in all their dimensions (physical, cognitive, emotional). Initially, the goal is to improve the human condition as much as possible, but, in a long-term view, the holy grail is the attainment of a stage called “transhuman”, which, as Bostrom explains in the *Transhumanist FAQ* [13] (p. 6), refers to an intermediate transition between the human, i.e., the current condition of the human species, and the endpoint of the enhancement trajectory: the posthuman.

## 2. You Got to Remove Her Body

The term *trans-human* was coined by futurist FM-2030<sup>5</sup> in 1989 to refer to the “transitional man” [15], that is, Homo Sapiens enhancing their bodies and minds through the use of cyborg technologies<sup>6</sup>, including cosmetic surgery, bodybuilding, drugs (cognitive enhancers, mood enhancers, psychotropic drugs), genetic, biological, neuro-cognitive interventions [4,14], and brain–computer interfaces<sup>7</sup>. As Palazzani comments, from a critical perspective, the machinization of man and the humanization of the machine are delineated. A kind of “pan-technologism” seems to emerge, in which it is the human being who becomes machine [18] (p. 72). This is what Bostrom and other authors explicitly call for in the *Transhumanist Declaration*:

«humanity stands to be profoundly affected by science and technology in the future. We envision the possibility of broadening human potential by overcoming aging, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth<sup>8</sup>» [19] (p. 1).

The initial goal is enfranchisement from biological, body-bound limitations: transhumanists intend to free human beings from disease, aging, physical and cognitive disabilities, and, in so doing, separate them from pain and suffering as well. Inspired, in fact, by a hedonism devoted to the idea of a utilitarian and unlimited summation of pleasures [20] (p. 35), transhuman theorists, particularly Pearce<sup>9</sup>, insist on the constant pursuit of opportunities for happiness (evidently understood as pleasure) and by the parallel avoidance of

unhappiness [20] (p. 36). To achieve this, the first step is the technological modification of the body, its techno-powering. As Allegra explains, for transhumanists, the body is the enemy that threatens us from within. Flesh and bones, organs and cells are unreliable and perishable material, marked by biological processes that probably cannot function forever [20] (p. 30). The body, therefore, must be enhanced and strengthened, through cyborg replacements, to make it progressively immune from decay and generally from threats to its integrity [20] (p. 28).

This methodology of technological surrogacy, however, is insufficient and ineffective in solving the real problem that plagues transhumanists: death. As Bostrom narrates, in the apologetic *The Fable of the Dragon-Tyrant* [22], in fact, humans must use the weapon of technology to defeat the Great Dragon, which forces humans to take a constant toll of blood [20] (p. 24). Upon closer inspection, cyborg technologies, such as artificial prosthetics and genetic engineering, do not appear to be suitable for achieving immortality: they do not, in fact, allow for the permanent shedding of the caducous broil [20] (p. 26), the burden of flesh and bone. According to transhumanists, death, the Great Dragon, the supreme enemy, must be eliminated for good, and in order to do so, it is necessary to break free from the human condition itself, to technically transcend it, detaching oneself from the weight of Earth's gravity [20] (p. 26). The trajectory of human enhancement would thus result in the posthuman condition, understood as virtual, cybernetic, disembodied immortality [12] (p. 14), achieved through the so-called "mind uploading", also referred to as whole brain emulation (WBE): the hypothetical process of transferring or copying a conscious mind from a brain to a nonbiological substrate such as a computer or robot [23] (p. 53)<sup>10</sup>.

Cyborgization is ultimately aimed at immanent transcendence, at the liberation from the bodily "prison", of the immaterial self, reduced to the information contained in the brain, downloadable into inorganic media that are absolutely long-lived and, in any case, infinitely replaceable [20] (p. 28).

### 3. Something Doesn't Add Up: Uncomfortable in Your Own Skin

From what has been said above, it emerges how, in the transhumanist view, the human condition, in its natural configuration, is fundamentally flawed and imperfect: in the desire to achieve a phantom "digital immortality" through uploading, the rejection of oneself as a bodily, vulnerable, senescent, and periturious being is clearly manifested. What is rejected, then, is not only death, the "fall into nothingness", but also the biological process that leads to it, the aging of the organism, and with it, in general, the ontological vulnerability, resulting from the finitude inscribed in being entities made of flesh and bone, exposed to internal and external risks.

For transhumanist theorists, it is irrational to passively accept human vulnerability, as the «very essence of our anthropological condition», strictly linked «to the experience of 'human finitude' (. . .), to the certainty of death and the 'fundamental uncertainty' characterizing the human condition» [25] (pp. 8, 10). If humans, by nature, are vulnerable beings who can be exposed to violence, slavery, or even destruction [26] (p. 150), it is necessary to change that nature and pursue, through technology, an ideal of youth and psycho-physical integrity, which, as Allegra explains, expresses, ideally, the pattern of non-fragility (of invulnerability) and that of openness to invention and variation [20] (p. 39). Human nature becomes the object of intentional, technologically mediated programming with a view to unlimited perfection [27], located in a disembodied cyberspace.

Moving from this negative view of the human condition, Bostrom and the transhumanists argue that it is necessary, first and foremost, to optimize the organism, which is deemed deficient, limited, imperfect. The thinking "spirit" must be freed through enhancement interventions, both physical and cognitive, in order to later replace it with the artificial surrogate. In discourses of this kind, what transpires, overall, is the devaluation of the peculiarities of human beings, which are inescapably characterized by the bodily dimension. To theorize the pharmacological (and technological) enhancement of healthy people does not only mean medicalizing health, but also elaborating an image of the human condition

as a pathology that one needs to cure [28] (p. 149). Indeed, as Bostrom states himself in his works devoted to transhumanism, the human condition, in its bodily dimension, is considered defective, marked by limitations, such as aging and mortality, that represent imperfections to be eliminated. As we have seen, in the transhumanist project, a need to escape from the limits of the human condition and to head, as uploaded mind, into cyberspace, is something that is highly felt.

Hannah Arendt had already guessed this kind of development on other sides of techno-scientific research in the struggle against the mortal condition. In the Prologue of *The Human Condition*, Arendt in a few lines summarized the techno-scientific projects of Human Enhancement, particularly the control of generation through genetic engineering and the aspiration for so-called life extension, saying that, recently, many scientific projects have been directed at trying to make even life “artificial”, to sever the last link between humans and other living beings [29]. Underlying the attempt to create life in test tubes, there is the same desire to escape from the prison of the Earth. The same is true for the aspiration for immortality, and the dream to extend the lifespan beyond the 100-year limit. The fundamental motive is the desire to escape from the human condition [29].

In transhumanist projects, animated by La Mettrie’s ideal of the *homme machine*, the target is the motionless, unchanging, static body without metabolism of the statue or robot [20] (p. 30). Machines are attractive as a model for a (post) human existence because they seem to allow an escape from the confusion of the human body [30] (p. 93). Man on the journey to posthumanity, desiring to be a kind of artificial, immortal, (seemingly) flawless, (seemingly) eternally repairable instrument, seems to be driven by a “cyborg envy”, a sociopathic condition, in which one is driven by a desire for technological enhancement, motivated by the view of human bodies as somewhat deficient and “sickly” cyborgs [31] (p. 348).

At the root of transhuman, in fact, there is an economic and techno-scientific abundance, which is welded to existential “poverty” and cyborg envy as dissatisfaction with one’s bodily being, that is, dependent and limited. Such dissatisfaction is an ontological category that affects human nature itself, that is, what everyone is by reason of being born, that is, of the original not being able to be other than men [28] (p. 124). The root of the desire to transform one’s mind into a software, replicable and downloadable to any computational device, is thus located in man’s aspiration to constitute a new antidote to escape the deterministic logic of birth [28] (p. 126). In so doing, however, the reference model of perfection, now identified in technology, changes: with this, the project of human improvement is also transformed. A real metamorphosis of perfection is introduced: perfection is now commensurate with the technical product, the impersonal, the function of the machine [28] (p. 76).

In the transhumanist project, viewed as a technocratic and optimistic religion [20] (p. 23), the idealization of technology is evident in the gnostic aspiration to achieve disincarnation, the dematerialization of man [32] (p. 167). *Uploading* can be understood as emblematic of the search for a “technological elsewhere”, which in turn is rooted in the contemporary inability to reconcile with the human condition [33] (p. 470). The aspiration for this “elsewhere” in time and space in which we are not and do not yet live [33] (p. 470) is the fundamental characteristic of technological melancholia, which recalls Kierkegaard’s melancholia: the sin of not wanting deeply and sincerely, the fact of not being able to adapt within the world, of coming into the world either too late or too early, of not knowing how to find one’s place in life [34] (pp. 61–62). The transhumanist project of escaping into cyberspace, as a supposed place of true freedom and self-realization, arises from the melancholy of contemporary man, unable to adapt in the world and find his place in life [34] (p. 62), to recognize the historicity of human existence, bodily, therefore, vulnerable, limited and becoming.

As will be seen in the next section, however, transhumanist aspirations prove to be fallacious upon careful analysis (theoretically, as well as practically) and ethically unaccept-

able, not only because of their obvious paradoxicality, but also because of their potential sociopolitical consequences.

#### 4. A Riddle of Useless Paradoxes

In the gnostic transhumanist view, technological salvation, from death, old age, and disease, involves the liberation of the very pneumatic essence of man [20] (p. 90), understood, in the immanentist horizon of contemporary techno-science, as the flow of information. Human techno-enhancement in the direction of post humanity would culminate, then, with downloading in the dematerialization, in terms of implementable information, of pure abstraction to which identity is reduced [20] (p. 73).

The fallacy, both theoretical and practical, of such a project stems from an intuitive consideration: to claim that a computer can reproduce all human faculties is to deny the evidence, especially with regard to the centrality of incarnation and the fundamental and indispensable contribution of the senses in human experience. Experience imposes the truth of the unity of man, a truth that enables us to eliminate the pseudo-problem of the relationship between soul and body, currently translated into the relationship between mind and brain/body [35] (p. 178). Indeed, our experience attests, in the first place, to the union of spiritual soul and material body. The body, for human beings, is fundamental, because they perceive themselves immediately as corporeal [35] (p. 174); in the first instance, humans perceive themselves as a sexed body, moving in space and transforming in time, experiencing and becoming. Only at a later stage can subjects infer the presence of a spiritual principle, exceeding the body and responsible for such intellectual and abstracting activities. Such a principle is, precisely, the soul. The fundamental unity of man is also attested by the inseparability of the moments of knowledge: sensation, intellect, consciousness of self, and knowledge of reality.

For the human person, the experience of the body is essential: what follows is self-consciousness as a thinking, willing, desiring being. A man does not perceive himself, in the first instance, as a set of mental, disembodied states, but as a bodily being. It is enough, in this regard, to reflect on a trivial example, such as the experience of physical pain, intolerable and uncontrollable by means of thought: this shows that corporeality is a fundamental determination of the human condition and is intertwined with consciousness. Therefore, it is not possible to remain silent about the absurdity and untenability of the informational anthropology endorsed by transhumanists.

Bostrom, like other transhumanist thinkers, does not seem to realize the paradoxes of his position and proposes an idea of man who is divided internally into a cognitive part, authentically “human”, and a bodily part, associated, according to the evolutionary view, with animality. For the author, the human body would have no relevance, neither from the physical point of view, for sensory experience and the emergence of mental states, nor from the moral point of view. Indeed, in another paper, Bostrom argues that «it makes no moral difference whether a being is made of silicon or carbon, or whether its brain uses semi-conductors or neurotransmitters» [36] (p. 323). According to the Swedish philosopher, embodiment is indifferent as far as the meaning of existence and the human condition, in general, is concerned. The body has no value. This thesis is, however, disproved once again by the evidence of everyday life: of our bodies we take care; we try to heal when we are sick; our bodies enable us to adequately express emotions, for which sometimes language is not enough. The body, in its fundamental difference between the sexes, is what allows us to give life and express love for the other person. The meaningfulness of corporeality is also attested, unfortunately, by negative facts: its vulnerability is a problem for us and makes us dependent; the instrumentalization of another person’s body, especially if it is a woman or a minor, is perceived as an outrage and/or an abjection; physical violence, in all its forms, represents an affront to human dignity. And, indeed, this is also proven by the experience of compassion, as understood by Hume [37]: human beings can empathize with the suffering of others by virtue of their ability to experience bodily sensations [38] (p. 255).

«Human beings have a natural tendency (. . .) to mirror emotional states of others. We care about their welfare, in other words, because we vicariously feel their pain» [38] (p. 255).

On the other hand, according to Bostrom, the person could survive without the body precisely because he/she could be reduced to cognitive activity, understood as a set of information. But there are no faculties and qualities without a subject to inherit. A set of information, saved in a strange way, would be nothing but a set of information and not a someone. The human person, then, is not reducible to a single organ or set of cognitive activities or extrapolated data. The human person is corporeal, has a lived body, with which he or she interacts with other persons, who, in turn, are recognizable primarily because they have a body [39] (p. 103). This is attested, for example, also (and unfortunately) by the possibility of violence: the human subject is violable in its corporeal dimension. Murder is always the killing of a concrete corporeal being [39] (p. 102). As Hegel notes, each of us can “withdraw” from corporeal existence and wander with thought, but, for others, each is in her own body, and violence that others do to someone’s body is violence done to that person [40].

To claim that the human body is irrelevant to lived experience is to deny the evidence. And indeed, in a paradoxical twist, even Bostrom seems to doubt the project of enfranchisement from bodily “burden”. Emily, one of his characters in *The World in 2050*, states:

«even though our virtual reality is pretty good at vision and sound, I still think it can’t compete with the meatspace in the other sensory modalities. Virtual sex is great, but I prefer to touch my husband’s body directly» [41].

Bostrom himself, therefore, is forced to acknowledge the importance and even the beauty of owning a body. The theorist is addressing an eventual human reader who aspires to leave his or her bodily “cage” and who should, therefore, hypothetically feel attracted to these scenarios. Actually, the transformation of which the Swedish philosopher speaks is so radical that the result would be too strange to be of interest. Truly transhuman forms of life and values [20] (p. 128), such as those of uploaded minds, would also be something that, quite simply, interests us as much as a cat may care to live as a human. Transhuman qualities may be a goal and an optimum for transhumans, precisely, not for humans [20] (p. 128). This means that all of Bostrom’s theories about life in cyberspace, with property scales and values which are radically different from ours, are for us inconceivable [20] (p. 128), foreign and lacking in appeal. That being which is uploaded onto the computer, bodiless, would not be me; Bostrom’s fantasies, therefore, simply do not concern or emotionally engage me.

A final non-negligible point that highlights the absurdity of the entire transhumanist project, from enhancement by cyborg technologies to uploading, concerns the claimed liberation of human capabilities from constraints and the enhancement of human autonomy. As transhumanist theorists themselves are forced to admit, this is a false freedom, substituting the bodily burden with the weight of technological ballast. The technological enhancement processes are, therefore, contradictory. Indeed, transhuman cyborgs, in their attempts at physical, cognitive and emotional enhancement, risk becoming seriously dependent on drugs and artificial prosthetics. Similarly, the cyberpunk dream of posthuman “immortality” and the supposed security of virtual existence of uploaded minds show their aporias. As Ekersley and Sandberg note, in fact,

«emulations can be instantly deleted by whoever controls the hardware or the operating system, including the distant author of a virus or other type of malware. (. . .) Humans are of course similarly vulnerable to assassination, although it is rare for this threat to exist with the same level of distance and anonymity that malware authors commonly attain. It is also relevant that an emulation which erases another emulation may be able to take those CPU cycles for itself. This may turn out to mean that emulations have more reasons to fear violence than humans do» [42] (p. 173).

Once uploaded, therefore, posthumans would still be tethered to artificial devices, which would themselves be “vulnerable”, e.g., due to potential malfunction or lack of power sources. The foregoing allows one to show how all transhumanist discourses on mind uploading and the conquest of death lose validity. In fact, it can theoretically make some sense and, practically, have a hold on the man in the street, only provided that the anthropology underlying brain downloading is true. But, as we have tried to show, Bostrom’s view is untenable and paradoxical. And even if in some technologically advanced future, such a procedure becomes feasible, the entity that runs on the computer would be a completely alien being, as opposed to the human being, which is a bodily, conscious and free subject.

### 5. Sometimes a Simple Solution Is Enough

Therefore, as much as mind uploading represents a significant source of interest, pursued through concrete studies and remunerated and economically fruitful research projects, it is based on untenable assumptions: first and foremost, on the absurd belief that it is possible to dissect a person’s brain, separating the mind from the body, without thereby causing the subject’s death. It follows that transhumanist discourses create expectations and endorse hopes that are not only devoid of foundation and justification, but are not even attractive and desirable, because of the fact that following these projects, the corporeal subject would, in the meantime, die due to the various interventions imagined. The assumptions of the transhumanist philosophy are fallacious, and the attempt to eliminate vulnerability is doomed in any case to failure. Given these premises, even the moral vision that develops from these premises is fallacious, because it is based on an erroneous and theoretically inconsistent anthropology.

As Pessina points out, discourses on the perfection of man, on improving the quality of life, on strategies for overcoming fatigue, depression, disease, and aging, are interesting because they purport to speak not only to a generic Western man, but personally to each individual and, in a sense, about that individual [28] (p. 3). Instead, transhumanist projects seem to be just unrealistic ramblings, which, moreover, have no solutions to propose for people who have difficult problems to deal with today, such as the management of aging and its comorbidities and psycho-physical disability. What is more, by endorsing such views on a large scale, even at the sociopolitical level, the risk is to take away space for the recognition and discussion of such pressing issues, which affect an increasingly significant segment of the world’s population, especially in the West. Discourses on the perfection of man and on improving the quality of life, in order to be effective, must discuss everyday life, that is, the concrete issues that people, in their vulnerability, actually face.

This means that, first and foremost, man, of today, but also of the future, must accept and *live* their own finite, mortal, becoming, senescent condition, that is, their own ontological, existential vulnerability. As explained by Sanchini et al. with reference to the virtue ethics approach, it is essential «to recognize and experience existential vulnerability in order to fully express one’s human nature» [25] (p. 13). Such vulnerability, in fact, does not only have a negative connotation: the «basic human vulnerability means also being open to the possibility of being affected in life by both pleasures and sufferings, as well as experiencing the condition of inter-human dependency» [25] (p. 10), which is the hallmark of human freedom, understood as relational autonomy [43]. Recognition of vulnerability is also the ethical essence of good caring practice, according to the relational ethics of care [44]: «ethics arises from the appeal to be susceptible to the vulnerability of the person who is in need of care. Essentially, nursing care aims to lessen the vulnerability of a fellow human being or to deal with it in an appropriate way» [44] (p. 7). It is clear, therefore, that denying this vulnerability compromises not only the ethicality of care practices, but also, in practice, the very possibility of receiving care, for those who need it. The importance of recognizing and taking care of vulnerability is also emphasized by authors who embrace the traditional bioethical perspective of principlism [45], anchoring, in particular, the concept of protection to the principle of respect for persons set out in the Belmont Report [46]. For example,

Agu [47] and Körtner [48] develop such a perspective, in relation to the condition of elderly persons, whose vulnerability should be subject to appropriate protection measures, which, however, also allow for the preservation of people's self-determination while also promoting their well-being.

Recognizing basic human vulnerability as a constitutive trait of all human beings is, from a social-ethical point of view, a fundamental starting point for taking into due account other vulnerabilities, which characterize some individuals more than others, for example the elderly, and for finding appropriate strategies and solutions at a societal level. These are situational vulnerabilities, «affecting only some agents who are more likely to be harmed and/or injured than others, due to situational contingent circumstances; these can be social, political, or economic» [25] (p. 10). In particular, intervention through socio-political and economic measures is advocated by the proponents of public health ethics approaches [49,50]: in this view, vulnerability is a "multi-layered condition", which results from different simultaneous conditions [49]. In order to deal with it and manage it, it is, therefore, necessary to break it down into its various components and, then, to find contextual and targeted strategies [25], e.g., improving the pension system and providing resources for formal and informal caregiving.

In rejecting the transhumanist philosophy, we do not intend to assert that vulnerability, whether in the sense of an essential human characteristic, or in the sense of an extrinsic, contingent, situational condition, should be considered a value tout court. Vulnerability, as mentioned above, presents an ambivalence that prevents such transvaluation: and indeed, through our care practices (*latu sensu*), we respond to and attempt to address vulnerability. The objective of the care practice is to assist a human being, in a vulnerable condition, because we recognize his/her value and dignity, *despite* this condition of vulnerability, discomfort, physical and/or psychic disability [39] (p. 101). The argument here is that, given the radical impossibility of permanently eliminating vulnerability<sup>11</sup>, which is part of the human condition as such, (and the paradoxes arising from the attempt to deny it), in order to fully express one's nature as a human being, it is necessary to become aware of it and try to live with it as best one can.

## 6. Conclusions

It appears evident how the logic which denies human vulnerability, advocated by transhumanists, entails insoluble dissatisfaction for human beings. From the ethical and sociopolitical point of view, it determines, as a consequence, the impossibility to recognize and respond to the needs and requirements of vulnerable people, who are not only the elderly, children, the economically disadvantaged, or other, but, potentially, all human beings, at certain stages of their existence.

Conversely, adequate reflection on the human condition, in all its facets, including finitude, vulnerability, ageing, mortality, allows us to adopt, from an ethical and socio-political point of view, projects and strategies to enable all individuals in society, at various moments of life, to find protection and assistance and tools to express their abilities and to address their contingent vulnerabilities.

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## Notes

- <sup>1</sup> A prime example is the use of emerging technologies (e.g., wearable devices, socially assistive robots, and virtual reality) in aged care, particularly for seniors with cognitive disorders, such as dementia. On this topic, Howes et al. [5] provide a content analysis of company websites of wearable devices for people with dementia. In [6], a systematic review of argument-based ethics literature concerning the use of electronic tracking devices in dementia care is provided. Finally, recently, Fasoli et al. [7] carried out an in-depth online study to provide a comprehensive and updated overview of the technologies currently employed in elderly care.
- <sup>2</sup> Born in 1973, Bostrom is a lecturer at Oxford University. In Oxford, Bostrom heads the Future of Humanity Institute, an interdisciplinary research center, which involves in particular computer science, engineering, ethics, economics and political science, to investigate wide-ranging issues for human civilization and explore what can be done now to ensure a thriving long-term future. The website of the institute can be found at the following link: <https://www.fhi.ox.ac.uk/> (last accessed on 16 August 2023). Bostrom is also director of the Strategic Artificial Intelligence Research Center, which deals with the means and strategies for the safe and "beneficial" implementation of Artificial Intelligence. The center's website can be found at the following link: <https://www.fhi.ox.ac.uk/research/research-areas/strategic-centre-for-artificial-intelligence-policy/> (last accessed on 16 August 2023).
- <sup>3</sup> Bostrom founded the World Transhumanist Association (WTA), a non-profit organization, in 1998, along with David Pearce (1959–), another prominent figure of transhumanism. Subsequently, the WTA was joined to the Extropy Institute, creating Humanity+, the current Executive Director of which is Natasha Vita-More (1950–). Vita-More is a designer, author, and speaker, belonging to the transhumanist movement since the early 1980s. She changed her surname to Vita-More (More Life), to underline her adherence to transhumanist aspirations, including continuous self-improvement, the extension of life, the expansion of human possibilities. Vita-More is best remembered for writing numerous posters dedicated to transhumanism and, in particular, transhumanist art. See [8]. The Extropy Institute was founded in the early 1990s by another transhumanist thinker, Max More (1964–), along with Tom Morrow. It should be noted that, recently, the intellectual path of Bostrom has taken a different direction than the origins: the Oxford professor has, in fact, said he no longer recognizes himself in the mainstream transhumanist trend. Journalist Marc O'Connell talks to Bostrom, who says that he continues to believe that the potential of the species must be developed, but now he no longer has links with the movement. Bostrom believes that in transhumanism there is too much uncritical enthusiasm for technology, too much faith in an exponential improvement of things: the prevailing mentality is to let progress take its course. Therefore, he has distanced himself from it [9].
- <sup>4</sup> More, born Max O'Connor, is a transhumanist and futurist philosopher; married to Vita-More, he is the main exponent of extropianism. Extropianism represents the first current of transhumanism, born in the late 1980s. As Bostrom explains, the term derives from "extropy", as a metaphorical opposite of entropy [10] (p. 14). Among the fundamental principles of extropianism, as reported in the 1998 manifesto, *The Extropian Principles*, are Perpetual Progress, Self-Transformation, Practical Optimism, Intelligent Technology, Open Society, Self-Direction and Rational Thinking. As Bostrom recalls, if in the first phase extropianism had a libertarian vocation, more recently More has moved away from this perspective, abandoning the «spontaneous order», in the direction of an «open society», a principle that opposes authoritarian social control and promotes decentralization of power and responsibility» [10] (p. 15). O'Connor changed his name to More to reveal the objectives of his philosophy of life, devoted to the enhancement and expansion of human existence, beyond the biological limits. In the interview with O'Connell, More says that the surname seemed to really encompass the essence of his goal: to always improve and escape from stasis. He wanted to progress in everything, to become smarter and healthier. It was a way to remind himself every moment of the need to move forward [9].
- <sup>5</sup> Fereidoun M. Esfandiary (1930–2000), a futurist writer, was a professor in the 1960s at the New School for Social Research in New York; Esfandiary formed a group of optimistic futurists, the Upwingers. Esfandiary changed its name to FM-2030 to show the hope of arriving, with the help of technological improvements, to celebrate his 100th birthday in 2030 and, secondly, to indicate a break with what he believed a convention rooted in a collectivist and tribal mentality that consists in assigning a collective identity that generates stereotypes, factions and discrimination [14] (p. 131).
- <sup>6</sup> Cyborg is a term coined in 1960 by researchers of the Laboratories of Biocybernetics of the Rockland State Hospital in Orangeburg, New York, engineer Manfred E. Clynes and psychiatrist Nathan S. Kline, following a military conference on space medicine at the Air Force School of Medicine. Cyborg is the fusion of cybernetic and organism and indicates a new entity, the hybrid of living being (animal or human) and machine. Clynes and Kline, in fact, use this expression in their research project for future space exploration, to indicate a 220 g mouse, which is implanted with an osmotic pump that injects, in a controlled and continuous way, active chemicals, without any "conscious" intervention by the animal. Cyborg is an artificially extended homeostatic control system that works unconsciously [16] (pp. 347–348), that is without direct control by the living being. Their work aroused an interest that resulted in NASA's NASw-512 study, *Engineering Man for Space: The Cyborg Study*. By applying mouse-cyborg studies to the astronaut, the use of technological equipment would allow the human body, similar to that of the non-human animal, to adapt to environmental changes: in this way, man would no longer be bound, linked to its habitat and could move freely outside of it.

- 7 Currently, brain–computer interfaces represent one of the privileged ways for human enhancement, pursued by the South African entrepreneur, Elon Musk (1971–), founder, CEO and CTO of Space Exploration Technologies Corporation (SpaceX), co-founder, CEO and product architect of Tesla and co-founder and CEO of Neuralink. Recently called «transhumanist» [17], Musk is carrying out projects in his companies that can be considered the first attempts of a practical realization of transhumanist theories.
- 8 Here, too, we note the reference to the project of space exploration, through the creation of the cyborg, of Clynes and Kline, that is, to the possibility of freeing man from the binding bond with the planet Earth.
- 9 Pearce is the proponent of so-called *paradise engineering* and, in *The Hedonistic Imperative* [21], he writes: «over the next thousand years or so, the biological substrates of suffering will be eradicated completely. (...) The states of mind of our descendants (...) will share at least one common feature: a sublime and all-pervasive happiness».
- 10 These scenarios may seem like the right subject matter for a science fiction novel rather than a document written by respected researchers and academics. And, in fact, an immediate analysis reveals the absurdity of a project that aims to virtually “reproduce” the human person, reduced to a mass of data, separating him from his own body. Studying the work of 2008, written by Bostrom and Adam Sandberg, dedicated specifically to the WBE, one realizes, however, how much such theories are understood literally, despite their theoretical and practical fallacy. The authors are convinced of this proposal: the perspective offered is concrete and, from their point of view, based on in-depth scientific-technological studies. The two authors compiled the results of a conference, held in Oxford in 2007, of philosophers, technicians and other experts, listing the steps for the development of mind uploading technology [24].
- 11 This radical impossibility originates, fundamentally and metaphysically speaking, in the contingent character of reality as such. To be invulnerable, reality would have to be God [51].

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