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Astronaut Space Selfies: Soft Polluter or Marvelous Messenger?

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ABSTRACT

This article uses a philosophical hermeneutic perspective to present a reading of selected astronaut space selfies, by drawing on ideas of Michel Serres, Paul Virilio, Hannah Arendt, Bonnie Mann, Joanna Zylińska, Nicholas Mirzoeff, and W.J.T. Mitchell. In what follows, the image of the astronaut is unpacked as a visual apocalyptic trope that embodies collective dreams of going beyond Earth in post-earth projections. Michel Serres (2011) distinguished between two regimes of pollution, namely 'hard pollution' that refers to the physical destruction of nature, and 'soft pollution' which involves the destruction of the world through signs. The author uses Serres's distinction between hard and soft pollution to hermeneutically investigate the image of the astronaut as an agent of post-earth dreams. The essay asks: Are space selfies potential 'soft pollution' in Michel Serres's terms? The conclusion drawn after considering evidence of space travel on human physiology and psychology is that although astronauts may be 'marvelous messengers' their images mostly act as 'soft pollutions' that position viewers in a particular way towards Earth.

Keywords: Astronaut, Space Selfie, Soft Pollution, Post-Earth, Extra Vehicular Activity, Astronaut Morbidity, Well-Being

What we do today depends on our image of the future rather than the future depending on what we do today (Prigogine, 2014, p. 5)

INTRODUCTION

We live in an "image-dominated network society" (Mirzoeff, 2016, p. 11) where images and signs constantly infiltrate and flood public and natural spaces. One of those images that have recently filled our screens and minds is the image of the astronaut, notably since recently we celebrated the 50th anniversary of the Apollo 11 Moon-landing in 1969. However, even before the anniversary of the Moon-landing, the

image of the astronaut has become prevalent, filling album covers, showing up in advertisements and online memes, art exhibitions, becoming a dominant theme in recent blockbuster films and a hit on social networking sites with astronaut selfies or space selfies.¹In what follows, I aim to hermeneutically and iconologically explore the image of the astronaut as an agent that embodies particular ideas and perceptions about Earth. Although the ideas and images may be competing and even opposing, I argue there is a current trope that depict outer space not only as livable but very bearable. Thus, the astronaut is popularly presented as a ‘marvelous messenger’ of life beyond Earth, while it is at the same time possible to identify the astronaut as a visual trope that softly ‘pollute’ our imaginations during the early twenty-first century. Here I want to use the French philosopher of science, Michel Serres’s (1930- 2019) distinction between ‘hard’ and ‘soft pollution’ to investigate the image of the astronaut hermeneutically as an agent that propagates post-earth dreams.

Images manifest our conscious and unconscious hopes, repressed fears, dreams, fantasies, realities, and nightmares. Images are implicated in ideas and vice versa because as W.J.T. Mitchell (1986) notes “idea” comes from the Greek word “to see” (p. 5). To see an image is also in some sense “to see” an idea because ideas find likenesses in images. As an “abstract, general, spiritual ‘likeness’” (Mitchell, 1986, p. 31) images make visible what may have otherwise remained invisible. Images and ideas do not stand in a one to one correlation though but work more in a doubled or doubling relation. To ask what the image of the astronaut makes visible, is also then to ask what the image represents in terms of idea likeness? Do images of astronauts reveal an optimism about an inter-galactic future? Is it a utopian eagerness to leave Earth behind that resides in the astronaut image or is it a dystopian mirage heralding the bleak prospect of what urbanist and philosopher, Paul Virilio (2010, p. 102) terms an “extraterrestrial and exobiological” future? What type of world is imagined through the image of the astronaut?

In what follows, the image of the astronaut is unpacked as a visual “apocalyptic trope” (Zylinska, 2018, chap. Apocalypse, Now!) that embodies collective dreams of going beyond Earth, in what I have termed post-earth projections.² The vision of leaving Earth behind is not a new conjecture, with warnings of “world-alienation” (p. 6) in the age of science, already signalled by Hannah Arendt in 1958. What Arendt (1958) reflects on is the eagerness of scientists to forget that “earth is the quintessence of the human condition” and in fact that the “earthly nature” (p. 2) may be unique in the universe to provide humans with a habitat where they can move and breathe unaided. Arendt shows that the devolution of Earth, as a material necessity for our existence, in favour of the freedom of the human subject (freed from necessities), is a project of the modern world (1958, p. 6). The trajectory of modern world alienation cannot be retraced here, but as feminist scholar, Bonnie Mann (2006) shows most body-unfriendly dreams of disembodiment treat the body as a form of imprisonment just as those same prepositions are transferred to the Earth as a form of prison-house.

It is not to argue that life beyond Earth is not possible, the many outer space missions have undoubtedly established that life is indeed possible or rather life can be sustained in outer space for limited periods. But it is more a question of what type of life is possible post-earth? And if life is sustainable in deep space, is it necessarily bearable? Even though the human label has become precarious within recent Anthropocene, non-human, post-human and interspecies debates (and rightly so in many instances) it is necessary to inquire the obvious, namely if we go beyond Earth can we still be considered to be human? Is being human, for better or worse, not intimately linked to the Earth, as Arendt suggests?

‘HARD’ AND ‘SOFT’ POLLUTION

Michel Serres distinguished between two regimes of pollution, namely ‘hard pollution’ that refers to the physical destruction of nature, while ‘soft pollution’ involves the destruction of the world through signs. Serres’s work has been fashioned by two forms of scientific thinking, namely thermodynamics (nineteenth century), and information theory (the 1950s onwards) (Connor, 2009, p. 5). Through these scientific theories he shows the interconnectedness of matter and information, where matter is associated with ‘hard’ and information with ‘soft’. Images and signs communicate information and accordingly fall

on the side of the 'soft' but they have a definite impact on the 'hard' or matter. Serres (2011, pp. 41-42) clarified the difference between 'hard' and 'soft pollution' as follows:

Let us define two [types of pollution] and clearly distinguish them from one another: first the hard, and second the soft. By the first I mean on the one hand solid residues, liquids, and gases, emitted throughout the atmosphere by big industrial companies or gigantic garbage dumps, the shameful signature of big cities. By the second, tsunamis of writing, signs, images, and logos flooding rural, civic, public, and natural spaces as well as landscapes with their advertising. Even though different in terms of energy, garbage and marks nevertheless result from the same soiling gesture, from the same intention to appropriate, and are of animal origin. To be sure, the pestilential invasion of space by soft signs does not enter into the physical and chemical calculations mentioned above, for instance those concerning climate. But in combination with hard pollution, soft pollution proceeds from the same drive. Here is the result: of course, pollution comes from measurable residues of the work and transformations related to energy, but fundamentally it emanates from our will to appropriate, our desire to conquer and expand the space of our properties. He who creates viscous and poisoned lakes or garish posters is making sure no one will take away the spaces he has occupied, now or after he is gone.

Most people tend to think simplistically about pollution as the main culprit in the environmental crisis. The poisoned rivers, oceans filled with continents of drifting plastic and wastelands of garbage that encroach urban spaces are all too visible. That is what Serres (2011) refers to as 'hard pollution', and it is easier noticed than 'soft pollution' which works more subtly. Soft pollution refers to our imaginations that are shaped by not only what we see but the immersive sign and screen landscapes (Figure 1).

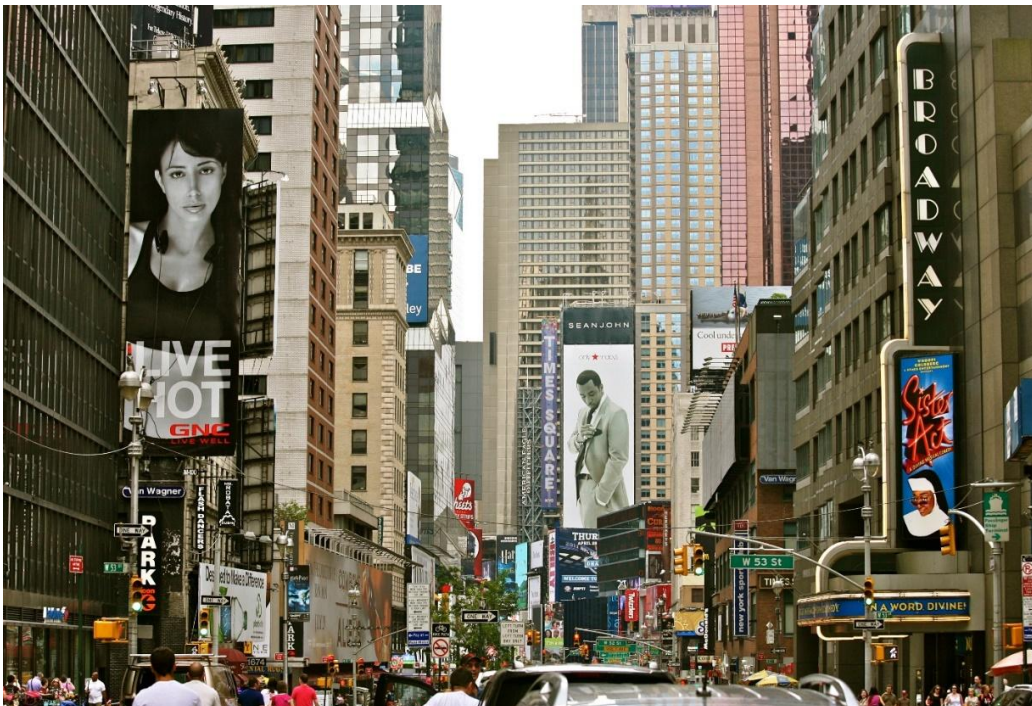


Figure 1. Example of an immersive sign and screen landscape. Broadway crowds by Alex Proimos, taken 3 July 2011.

Source: <https://www.flickr.com/photos/proimos/5896264776/>

What Serres makes visible is the link between physical and mental pollutants. This means that if we merely fixate on the 'hard' environmental pollutants produced by space travel e.g. gasses, liquids, toxins

and debris, or the immense cost to the environment to build space crafts, we miss the other hidden ‘soft’ aspects of the pollution. The image of the astronaut pollutes by what it possibly signifies, namely turning our backs on Earth. Both pollutants are at work in the image of the astronaut but here I want to focus on the image of the astronaut as a possible ‘soft polluter’ and agent of post-earth dreams.

WHAT IS MEANT BY POST-EARTH?

Earth is a difficult concept on its own, let alone thinking about the meaning of post-earth. Naturally, I refer to Earth as a planet “to emphasize [...] our brute, material dependence in relation to it” (p. 83), as Bonnie Mann (2006) astutely observes, but also realizing that the planetary status does not exhaust the possible meanings of Earth. The image of Earth can be understood on the one hand as “icon, index, and symbol of unity and planetary vitality and fragility” and on the other hand viewed more critically, Earth may signify “colonialism, imperialism, economic inequality” (Helmreich, 2011, p. 1211). The meaning of Earth as an image is not stable and is continuously open to interpretation. For instance, the image of Earth as the ‘Blue Marble’ photographed by Apollo 17 in 1972 may have signified fragility and homeliness, while more recent representations of Earth show a gloomier view of the blue planet turning red and inhospitable due to global warming. Providing these cursory parameters regarding Earth at least two connotations can be associated with the post-earth concept; the first is utopian in principle where a New Earth or New Eden will be discovered to create a better world, and the second connotes a dystopian inversion of the first.

The concept of Earth that is prevalent in my analysis is an initial dystopian reading that calls for subsequent utopian salvation. The dystopian version refers to recent estimations that our time on Earth is limited. We have experienced Earth Overshoot Day annually since 1987 where humanity consumed all the resources it takes nature a year to produce. More recently, the late astrophysicist Stephen Hawking announced that humans would need to colonize another planet to survive (cited in Gohd, 2017). While American journalist David Wallace-Wells (2017) similarly predicts that “parts of the Earth will likely become close to uninhabitable, and other parts horrifically inhospitable, as soon as the end of this century”. Post-earth in this context means no more Earth for humans as we have exceeded its limits and seemingly overstayed our welcome. Post-earth thus means a “post-human Earth” (Canavan & Stanley Robinson, 2014, p. x), as imagined in the film *After Earth* (Director: M Night Shyamalan, 2013), where after desertion humans return to Earth and find it a perilous and unwelcoming place no longer fit for humans.

But more importantly, we are now fixated in the bid to find a Super Earth to replace the now too polluted Mother Earth. Here utopian dreams of locating a super planet that can sustain our increasing demand for consumption take precedence. Elon Musk, the founder of SpaceX (Space Exploration Technologies Corporation) conjures a SpaceX city on Mars by 2024 – “long before NASA’s projected timescale of the early 2030s” (cited in Osborne, 2017). Musk’s rhetoric is drenched with “astrofuturist salvationism” (St John, 2014) as he prophesizes that “there are two fundamental paths for mankind – that we stay on Earth forever, eventually succumbing to an extinction event, or to become a ‘space bearing-civilization and a multi-planetary species’” (cited in Osborne, 2017). Filled with missionary zeal Musk is convinced that the latter option is the “right way to go”. The “extinction event” is posed as inevitable and therefore humanity must be proactive in planning a mass Exodus from Earth.

Or the other option is to morph into “the global data-processing system” (Harari, 2017, p. 371), also known as the Internet-of-All-Things – an invisible web that connects and processes all information. The new domain or space of Dataism provides opportunities for similar species immigration to another platform, albeit not another planet. Harari is quite adamant that this flow into Dataism is inevitable because: “*Homo sapiens* is an outdated algorithm” (Harari, 2017, p. 368). A similar hypothesis is put forward by James Lovelock, illustrating that humanity’s reign on Earth, is being replaced by a new era baptized as the Novacene. Gaia as a living organism will now be overtaken by hyperintelligent beings or A.I. that will govern our planet. Lovelock (2019) is optimistic about the prospects of the Novacene for life and the Earth, but not necessarily for humans: “I think it is crucial that we should understand that

whatever harm we have done to the Earth, we have, just in time, redeemed ourselves by acting simultaneously as parents and midwives to the cyborgs. They alone can guide Gaia through the astronomical crises now imminent” (p. 73). Lovelock also proposes a migration from humanity to hyperintelligence and thus an Exodus of sorts, it is, however, the evacuation of Earth as proposed by Musk that informs my ideas about post-earth.

Virilio (2010) calls this planned Exodus the “portable revolution” (*révolution de l'emport*) of the third millennium where humans are produced as an anonymous mass of travelers in “the quest for an exoplanet, an ultraworld, as a replacement for the old one” (p. 6). Earth merely becomes “a sort of logistical platform” (Virilio 2010, p. 6) – a halfway station – from where the portable revolution is launched. No longer does Earth signal the center of the universe or locate the Axis of the World, but now disappears on the sublime intergalactic horizons to become just an “earthly star” (Virilio 2010, p. 19), a “Star Ark” (Armstrong, 2017) or “Spaceship Earth” (Fuller, 1968) orbiting around the Sun as “our supply ship”. Earth is no longer comprehended as a unique bio-habitat but rather as a spacecraft with limited (indeed, exhausted) resources. Once the resources have been consumed, the ship must be abandoned for another.

As the planet-hunting or planet-hopping is underway, the ultracity is replaced by an ultraworld, and deportation becomes delocalization. No longer satisfied with “the geophysical limits of the finite world”, because “the Earth has become too small for Progress, it is also too small for short-term profit, as today’s economic crash amply demonstrates”, Virilio (2010, p. 75-76) sardonically notes. Therefore, “mobiliz[ing] its resettlement” has become a matter of urgency. The search for another planet (“extraterrestrial” and “exoplanetary”) also implicates that a change in our biology is required (“exobiological”) and a new state of “transhumance” needs to be entered (Virilio, 2010, pp. 16-17). Not only are we in transit to (an)other planet(s) but also transitioning as a species to adapt to our new home(s). Opting to stay on Earth (or staying ‘human’ in terms of Harari and Lovelock’s analysis) seems “naïve and nostalgic” (Mann, 2006, p. x) in this context, even bio-conservative. How do we keep Earth when the dominant trend is to progress post-earth? Here the astronaut as a visual trope becomes significant in how dreams of post-earth are imagined.

THE ASTRONAUT

In the quest for a post-earth, the astronaut is the chosen savior. The astronaut is a detached wanderer that forms part of a “select bold” bandit of “male pioneers bravely venturing where few would dare to go” (Zylinska, 2018, chap. Exit Man). He has become a global celebrity and cultural icon of courage, someone to be admired and even secretly envied. For is the astronaut not the chosen one who has the (precarious) privilege of seeing the world from the outside? The so-called “overview effect” (White, 1998), which causes a physical and psychological upset in the observer because perhaps he has seen what no one should see or can tolerate seeing, namely Earth at a distance. The resounding response to this sight is one of awe, or what can be defined as the cosmic sublime. But in this sublime encounter, the astronaut is not confirmed as the invincible and secured master of the universe, as was usually the case in the modern transcendent sublime. Entirely the opposite occurs during the overview effect as the astronaut is humbled and perturbed in the face of seeing the whole at a glance.

The word astronaut is derived from the Greek meaning “star sailor” or one who navigates the stars. Interestingly, the astronaut status seems to befall mainly a particular gender and race.³ If we assume that space is empty and uncharted, we are reminded by Marie Lathers (2012) that space is always already “gendered territory” and thus “colonized by gender” (p. 210). Although a short-lived attempt was made in the sixties to refer to female space travelers as astronette and astronautess these terms did not catch on and had since become redundant. The gender-neutral astronaut now applies to all genders in outer space for the major space agencies such as NASA, ESA, CSA, and JAXA. Except in the case of space travelers from the Russian Space Agency that is known as cosmonauts (sailors of the universe).⁴ Colonizing outer space is also commonly driven by a specific political agenda and nationality, as became evident in the fierce Space Race between the Soviet Union with Yuri Gagarin – the first man to orbit

Earth in 1961, and the USA with Buzz Aldrin and Neil Armstrong – the first two humans to land on the Moon in 1969 during the Cold War (1947-1991). Currently, the space project has morphed into a Space Movement that is driven by “global operators” (Bauman, 2003, p.102): the hypermobile elite who ensconced by their wealth have given up on Earth. They invest venture capital in technologies that can guarantee their escape from “The Event” or the apocalyptic environmental collapse (Rushkoff, 2018). For the mobile elite, the astronaut is the icon of escape.

But how is the astronaut imagined through images? The typical astronaut is depicted full frontal donning a space suit with an impenetrable visor that reflects what the astronaut is looking at or what is in front of the astronaut. The human face (or is it the humanity?) of the astronaut recedes behind the dark mask provided by the solar shield of the helmet. Similarly, the human voice is ventriloquized through a technological device to traverse the vacuum and to confirm the astronaut’s cyborgian status.⁵ No particular markers identify the astronaut as either male or female, queer or straight, neither as black or white; or happy or sad, for that matter. The astronaut seemingly abolishes all differences. As Zylinska (2018, chap. Man’s Tragic Worldview) observes:

This supposedly individuated Man remains undifferentiated, both sexually and biologically. Indeed, the Man of the tragic worldview achieves his status at the cost of sacrificing sexual and biological difference that is always more than one. Disavowing his kinship with women and those of nonbinary gender, with animals, microbes, and fungi, Man separates from ‘nature’ to emerge standing, proudly erect, yet already threatened with contamination, shrinkage, and evanescence.

The ostensibly gender-neutral astronaut does, however, hide the face of a new supra-human being, or what Joanna Zylinska terms Project Man 2.0 (2018, chap. Men repair the World for Me). Thus, a creature that has solved the mortality riddle and can survive in outer space. In short, a being that has left his (human) nature and (Mother) Nature behind detectable in space selfies taken by astronauts.

THE SPACE SELFIE

Buzz Aldrin’s space selfie taken during an EVA or extra vehicular activity in 1966 (Figure 2), is not only the first of its kind, but it also captures the status of an excited astronaut who has in some sense overcome time and space. A creature who is out-of-this-world looking back from the outside on to Earth. We see Aldrin’s half-lit face with Mother Earth in the background. He has eclipsed the pull of gravity as Earth no longer represents the center of his existence but becomes a mere specter on the horizon. The instant captured in this nascent selfie could on some level be interpreted as the birth of a new type of man – the ‘Skywalker’, the man beyond earth – a post-earth creature. Hermeneutically interpreted it appears as if Aldrin’s self-portrait aims to seize this momentous event by declaring an awareness of this changed status. The umbilical cord fastening humanity to Mother Earth has finally been ruptured. With a slight frown on his forehead Aldrin stares into the future of humanity while Earth hovers in the background – a beautiful and serene backdrop for his extra-terrestrial adventures.



Figure 2: Buzz Aldrin took the first EVA (extra vehicular activity) selfie in 1966.
 Source: NASA/Buzz Aldrin

If we compare Aldrin's selfie with the Japanese astronaut, Aki Hoshide taken in December 2012 (Figure 3) almost 46 years later, an interesting shift in perspective can be viewed. In Hoshide's case, we can no longer see his face as "any trace of his appearance or personality disappears in this image as his reflective visor shows us only what he is looking at – the International Space Station and below it, the Earth" (Mirzoeff, 2016, p.5). Earth can no longer be seen drifting serenely in the back but has now been displaced to merge with Hoshide's face. As Virilio (1997) suggests, the world is no longer before us but is now behind us as we travel towards "extraplanetary emancipation" (p. 131). Whereas the reference axis was usually centered outside of the self towards Earth, it has now shifted inside as "protruded man [turns] into a planet" (Virilio, 1997, p. 129) onto himself. What is rising behind Hoshide's shoulder is the Sun shining like a giant spotlight, for as Buzz Aldrin remarked: "On the moon, the sun shines on us like a giant spotlight" (cited in Virilio, 1997, p. 138). The hubris of Icarus incarnated in the astronaut who now treads far beyond the Earth on his way to the Sun is tellingly captured in Hoshide's selfie. As Nicholas Mirzoeff (2016) reflects: "The astronaut is invisible and unknowable in his own self-portrait. There is, it seems, more to seeing than being in the place to see" (p. 6). Man can now literally be seen from nowhere, just as he sees from nowhere. The displacement is corroborated by the avalanche of images of astronauts where the reflective visor mirrors a fantasy landscape or object. Almost as if the astronaut is a being with no distinct attributes– a clean slate onto which our collective dreams and fears of an off-world can be projected. This is not the face of every man or woman, thus representative and democratic, although we may be tempted to think so but rather the faceless future of humanity. True when standing in front of the astronaut, one may find one's reflection mirrored in the steel helmet. In that sense, the astronaut may indeed be 'us', although only momentarily. Even more disconcerting is that our eyes cannot meet those of the astronaut. It mostly remains a one-sided relationship of 'being seen' without reciprocating the gaze, thus an alienating gaze. One may even speculate whether the astronaut is human at

all since his appearance is often conflated with that of death in popular visual tropes. In this sense, the astronaut is viewed as not human and probably the bearer of an ominous message.

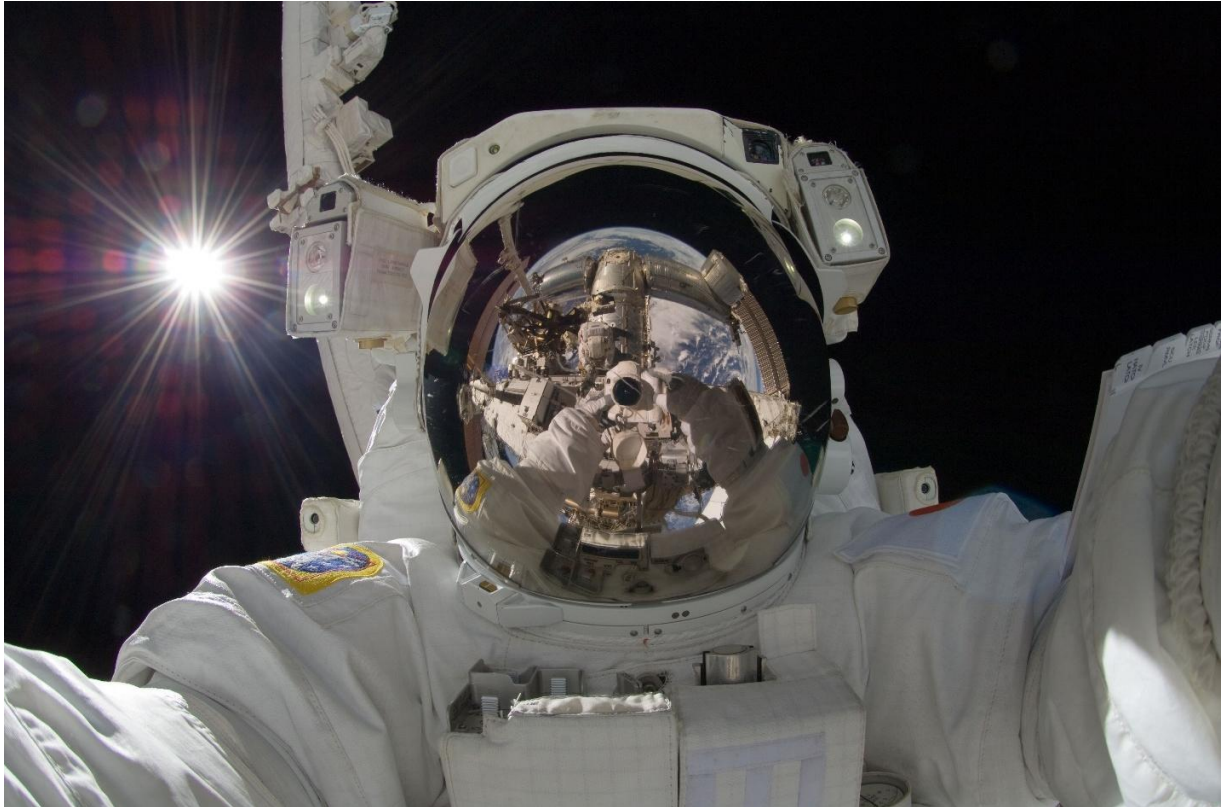


Figure 3: Hoshide is taking a space selfie during EVA on September 5, 2012, with the Sun behind him. Source: NASA

'Out-of-this-World' Images

In the popular EVA images of astronauts suspended in low gravity space, they can often be seen dangling from a cord tethered to the spacecraft, sustaining life almost like an umbilical cord. The astronaut is not “falling down” but instead is now “falling up”, because the reference axis, namely gravitational localization has disappeared (Virilio, 2010, p.52). But it is not only the “gravitational references” that are left behind in space travel but also “earth’s spatio-temporal references” (Virilio, 1997, p. 129). The astronaut is fixed in “the inertia of a dead centre” cut off from local time and the space-world. The astronaut becomes “an atrophied being [...] encapsulated in cosmic time [...] in an unprecedented inertia” as time takes pre-eminence over real space and “interactivity tak[es] the place of mobilizing activity” (Virilio, 1997, p. 128).



Figure 4: NASA astronaut Barry "Butch" Wilmore is seen in this photo taken by fellow spacewalker Terry Virts on Feb. 21, 2015.

Source: NASA

The disconnection from gravitational references is asserted by Barry "Butch" Wilmore's recent picture taken on February 21, 2015 (Figure 4), erroneously identified as a selfie and announced as "a truly *out-of-this-world* selfie during a spacewalk" (Hamill, 2015, my emphasis). Wilmore's image is snapped by fellow astronaut Terry Virts and we can see Virts dangling "upside down" in Wilmore's visor. The image becomes an image within an image, or an image reflecting on the status of images, thus what W.J.T. Mitchell (2015) dubs a meta-picture.⁶ The vanishing points of illusionary perspective have imploded on the surface of the image. The orientation regarding up and down below and above has become confused, and no longer matters as Wilmore is a centrifugal being that is no longer drawn to the center. Instead, he now drifts aimlessly and effortlessly in all directions. The confusing thing is that it is almost impossible to tell the difference between Hoshide and Willmore's images, except perhaps for the identifiable USA flag on Willmore's suit. For the rest, they are both arcane nowhere men. In Virilio's (1997) terms they are men who live more out of this world than in it: "This comes down to the whole philosophical issue of a being which is less in the world than out of it, this '*out-of-this-world*' being going out of its way, though, to pretend to inhabit the real world" (p. 130, my emphasis).

WHAT DOES THE ASTRONAUT'S IMAGE CONCEAL ABOUT POST-EARTH?

If we accept that embodiment (the intricate meshing of body and mind) is indeed a requirement for being human, what happens to embodiment in outer space? What is the impact of post-earth life on the body of the astronaut, physiologically and psychologically, and phenomenologically (represented by Maurice Merleau-Ponty's embodied phenomenology followed later by Don Ihde) one may add? In other words, what soft pollutions do the image of the astronaut hide from view? The impenetrable visor and pressurized space suit may conceal that perhaps becoming an Astro-cyborg (as I term it) is far more painful and cumbersome than portrayed by the heroic and glamorous image of the astronaut. The 'soft

pollution' covers up 'hard pollution' (stressors and significant impacts on the human body) as the image of the astronaut and the *embodied* astronaut follow two different trajectories. Contemporary science (including aerospace medicine, molecular and cellular biology, material science and engineering, radiobiology, Space and Astronautical Science) is very confident that the stressors placed on the human body are merely temporary hurdles that will eventually be overcome. As a professor of Radiation Oncology observes in connection with space travel: "Although I agree that cosmic radiation is a difficult and challenging issue for deep-space travel, it is by no means a 'deal breaker.' It is 'merely' an engineering problem, albeit a hard one" (cited in Kelly, 2017, p. 6).

The relocation to Mars (or Super-Earth) is not postulated as a probability but a certainty because if "we've found a way to engineer our doomsday, [...] surely we will find a way to engineer our way out of it, one way or another" (Wallace-Wells, 2017). Human life and existence are reduced to a mathematical and engineering problem as Arendt (1958) has already anticipated:

And, indeed, among the outstanding characteristics of the modern age from its beginning to our own time we find the typical attitudes of homo faber: his instrumentalization of the world, his confidence in tools and in the productivity of the maker of artificial objects; [...], his conviction that every issue can be solved and every human motivation reduced to the principle of utility [...](p.305).

Similarly, human physiology and psychology are treated as matter to be augmented for prolonged space travel since travelling to Mars is an estimated two to three years trip. The rhetoric employed to refer to the health of astronauts (by e.g. space medicine) is utilitarian, and terms such as 'optimize', 'duration', 'productivity', and 'monitoring' are commonly used. The astronaut is more often than not treated as an object and "not as subject in control of their own bodies" (Dickens, 2017, p. 53). In other words, astronauts are treated as beings who *have* bodies but not necessarily also as beings that *are* their bodies as well. In fact, according to a recent estimation, the primary goal of space medicine practice is: "Sustaining life, minimizing health risks and chances of injury" (Nicogossian, Williams, Huntoon, Doarn, Polk, Schneider, 2016, p. 3). The issue of what it means to be human in outer space is not raised but mainly how to sustain a human body in outer space.

The stressors on human embodiment during deep-space travel include cosmic radiation, DNA alterations, cancer, psychosocial effects of confinement and isolation, sensory deprivation, and bone calcium loss as significant challenges for extended deep space travel. The impact on reproduction⁷ is another cause for concern, except naturally if we accept like faithful post-humans that in future, we will no longer be born of women but rather of artificial wombs. The most critical challenge facing the outer-spatial body is, however, the low level of gravity or microgravity. For instance, the body is stretched during long missions as the spine straightens out without the compression of gravity (Dickens, 2017, p. 53). Human organs, muscles, bones, molecules and even moods respond and correspond to terrestrial gravity:

Life on Earth has evolved over the past three and a half billion years in an unchanging gravitational field. In that context, it shouldn't be a surprise that so much of our physiology appears to be defined by, or dependent upon, gravity. Take gravity away, and our bodies become virtual strangers to us. (Fong, 2014, sect. Mars)

It is not only Earth's gravity that is missed in deep space but also the protective magnetic field around the planet that protects the earthlings from space radiation. The devastating consequences of space radiation are neutrally observed as follows: "Exposure to space radiation increases the risks of astronauts developing cancer, experiencing central nervous system (CNS) decrements, exhibiting degenerative tissue effects or developing acute radiation syndrome" (Chancellor, Scott, Sutton, 2014, p. 491). There is not a cell in the human body nor a physiological process left untouched or unchanged by long-term space travelling. The only redeeming factor is perhaps the return to Earth which can in most instances, reverse the apparent physiological effects but not necessarily the psychological forces that are unleashed. It is suggested that mortality is not so much a risk factor as the condition of "astronaut morbidity" – a general

sense of unwellness, malaise (Cucinotta, Kim, Chappell, Huff, 2013). The human body's inability to clear the build-up of toxins and an auto-immune effect in outer space are identified as the main culprits in the "greatly increased morbidity" (Li, Holmes, Zhou, Sanzari, 2014) detected amongst astronauts. By some deductive reasoning, it can be argued that outer space makes us unwell. Phrased differently: Being toxically morbid may be an unbearable state of being. What does it take then to be well, not only physically but also psychologically?

BEING WELL

I want to suggest that our well-being is intimately intertwined with the rhythms of the human body (pulses, circulations and durations) as lived on Earth. The cycles, seasons, and phases evolved on Earth certainly clashes with off-world cosmic rhythms. Is it surprising then that astronauts suffer from sleep deprivation as the sun rises every 90 minutes? The different rhythms of outer space lead to spatial and temporal disorientation. Henri Lefebvre (2004), Marxist philosopher of urban space, identifies the interconnectedness of Earth and human rhythms: "The rhythm analyst calls on all his senses [...] he draws on breathing, the circulation of blood, the beating of his heart and the delivery of speech [...] without privileging any of these sensations. He thinks with his body, not in the abstract, but in lived temporality" (p. 21).⁸ If the body's rhythms change as it loses contact with Earth, and we have evidence from the section above that the human body is impacted during deep-space travel, it means our being and well-being are altered as well, unless science can solve those problems too.

Similarly, Michel Serres, alerts us to the intertwined nature of our existence on Earth with other beings. In *Biogea* (2012), Serres shows how our language, myths and stories are structured by our rootedness within other phenomena and creatures on Earth. He states: "Our Earth is speaking: you feel it; it's recounting something to us like our mothers did [...]" (2012, p. 54). Life and Earth are intimately connected in Serres's dictum: "I think therefore I flow into an other" (2012, p. 297). The most gripping manifestation of this flowing together is Serres description of his experience of an earthquake during which his body "was transformed into a sensitive seismograph that had no need of any machine to estimate precisely how and how much the Earth was shaking" (2012, p. 297). On this view, separating Serres's body from the Earth's mass becomes almost impossible.

I suggest that the inseparability of our existence from Earth is grossly neglected in the dominant astrophysicist rhetoric and gnostic capitalism governing the drive for Mars or the closest Earth-like planet. Jeffrey Chancellor from the National Space Biomedical Research Institute, Houston optimistically proposes: "The ability of humans to realize our potential by becoming a multi-planet species will hinge on, to a large extent, our ability to appropriately understand, manage, mitigate and overcome the significant dangers and health effects [...]" (Chancellor et al., 2014, p. 505). It is assumed that as liberal consumers, the elite hypermobile can choose their environments and are not equally made by these environments. No mention is made of what being human or being well may mean in this new environment.

Although it should be noted that outer space endeavors have in many instances impacted positively on medicine and technologies developed in outer space that have become useful on Earth, it has also reminded many astronauts of the importance of keeping Earth. I am not, therefore, pursuing a humanism that professes human exceptionalism. But I am questioning the assumption that we can only realize human potential by becoming a multi-planet species as Chancellor proposes. If Earth no longer pulls at my legs at the constant gravitational rate, how will I be affected? Even more: if I am hooked to a portable biosensor in space that provides continuous feedback on my bodily fluids, heart rate and breathing: will I be declared fit for the purpose, while gravely morose? In other words, if we can sustain life in outer space, is it a life worth living? By forgoing the situatedness of space-time-matter on Earth for mere time-light in outer space, the effects and affects on a human scale may not be salvageable.

CONCLUSION

If the current and future global problems of overpopulation, overconsumption, and pollution cannot be solved by science and A.I., should humans abandon and discard the polluted and destroyed Earth? I suggest that: If travelling to outer space has been what is required to widen our horizons on what 'human life on Earth' may mean, the astronaut can indeed be heralded as a marvelous messenger.

If on the other hand the existence of astronauts, however, precludes dreams of humanity keeping Earth – and is merely the forerunner of post-earth existence, the pollution of such images is poisonous. For humans to keep Earth thus has more implications than living ethically, caringly and responsibly, on and with Earth. It also means that we “keep Earth” literally.

To return to the initial distinction made between 'soft' and 'hard' pollution: Are the images of astronauts contaminating humanity's sense of well-being, or enhancing its future? My concern in the analysis above has been with the type of future that is imagined by images of astronauts. Or to be more precise: What exactly is being 'polluted' through the image of the astronaut?

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ENDNOTES

¹ A random sampling of recent released albums featuring the astronaut are: Canyon Spells' album *Now that we're Gone* (2016), Delta Vega's *Breathe Real Slow* (2016), and Falling in Reverse' *Coming Home* (2017). Films such as *After Earth* (Director: M Night Shyamalan, 2013), *Interstellar* (Director: Christopher Nolan, 2014), *The Martian* (Director: Ridley Scott, 2015), and *Life* (Director: Daniel Espinosa, 2017) all focus on the astronaut's outer space adventures. Not to forget the more recent releases: *First Man* (2018, Damien Chazelle), *Ad Astra* (2019, James Gray) and *Lucy in the Sky* (2019, Noah Hawley).

² An earlier version of this text was presented at the Humanities for the Environment, Earth Keeping Conference in August 2017, entitled "Dreams of Post-Earth: Implications for Humanities and the Environment".

³ Men dominate by far, although NASA's latest class recruited in 2013 consist of 50% women. Men have also spent the most time in outer space but interesting enough in the case of America it is a woman who holds the record for spending the most time in outer space, namely Peggy Whitson who spend 665 days in space.

⁴ Cultural diversity has also been seemingly accommodated with the Indian word "vyomanaut" (vyomana [Sanskrit for sky and space] + naut) and the Chinese "taikonaut" (tai kong [Mandarin for outer space + naut). Recently the Afronaut has subsequently made an appearance on the radar with the first African astronaut, Mandla Maseko in 2015.

⁵ The cyborg and the astronaut share a connected history as the first explorations to create a cyborg was to accommodate human survival in outer space. See Chris Hables Gray with Steven Mentor and Heidi J. Figueroa-Sarriera (eds.). *The Cyborg Handbook* (New York: Routledge, 1995).

⁶ W.J.T. Mitchell in *Image Science: Iconology, Visual Culture, and Media Aesthetics* (Chicago & London: University of Chicago Press, 2015), p.34 reflects as following on metapictures: "There is also a sense in which any picture may become a metapicture, whenever it is employed as a device to reflect on the nature of pictures".

⁷ The impact on reproduction and moreover the differences in sex-related responses to outer space travel is documented in "The Impact of Sex and Gender on Adaptation to Space" (2011) that was developed in response to a recommendation from the National Academy of Sciences Decadal Survey. A notable impact on fertility has been reported.

⁸ Rhythmanalysis works through an analysis of biological, psychological and social rhythms in the everyday experience of space and time. Most importantly, Lefebvre (2004, p. vii) shows that space and time cannot be thought separately but they need to be thought together as they manifest in daily rhythms.