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## 8.

# The harmony of metal and flesh: Cybernetic futures

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### Abstract

Science fiction and philosophy are partners in providing certain fears found at the place where flesh meets metal. Thinking with embodied cyborgs reveals their dependencies, that is, specific examples of where the cyborg as aspirational figure can grow toward its liberatory potential. This growth is not into empty space, the liberatory cyborg presses against and ruptures networks of control woven from capital, ideology, law, and the many other systems of the world that have been part of this conversation. I recommend the use of the term *petite cyborg* to help us think about the vulnerable intermediate, a state that technological optimism and ecomodernism overlook, and a state that aspirational visions of the cybernetic future faithful to the cyborg as liberator cannot neglect.

**Keywords:** Cyborg, Cybernetics, Technology, Science Fiction, Ecology, Hybridity

"Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it" – Martin Heidegger (1977, 4)

### Introduction

I want to examine certain fears found at the place where flesh meets metal. The figure of the cyborg, the human-machine hybrid, aids in thinking through fears that through technological innovation we may fall prey to hubris, make ourselves monstrous, or make monsters that will destroy us and our world. Companion to such fears is the hope that we can develop a relationship with matter and technology that is not based on dangerous fantasies of domination and mastery. The fear and hope that swirl around the integration of technology with the human body, or the replication of human forms and functions by machines, can never be separated from the conditions that make

developing, manufacturing, and distributing such technologies possible. As physicist Stephen Hawking (2016) warned, an automated society may bring comfort to all, or misery to most and excess to a few. Technology that can liberate may be used to bind more tightly.<sup>1</sup> Hawking (quoted in Cellan-Jones, 2015) has also used his prominence to warn that if our relationship to technology such as artificial intelligence is a competitive one, we may soon create our own destroyers. To explore the themes of relationship to technology, and technology's potential for enhancement and harm, I draw together real cybernetically enhanced humans, philosophers of technology such as Donna Haraway and Martin Heidegger, and works of apocalyptic and utopian fiction from Japanese director Hayao Miyazaki and Scottish author Iain M. Banks. Miyazaki's corpus is exemplary as ecologically concerned fiction, replete with tales of complex, interpenetrating and relational experiences with technology, and the devastation of the natural world by technologically enhanced humans and their engineered agents. Advanced technologies involving the infiltration, modification, and replication of the human person such as genetic modification, cybernetics, robotics, and artificial intelligence carry real risks, and exceptional promises, and the promises can obscure the risks when the painful intermediate stages of technological salvation are ignored.

I honor the anxieties expressed by scientists, philosophers, and authors of fantasy and science-fiction, by proposing a term to track the overlooked intermediate stage between our present moment and a future state of imagined technologically crafted salvation. I suggest the term *petite cyborg* for hybrids of living tissue and fabricated components with certain social and material dependencies.<sup>2</sup> By making the *petite cyborg* a distinct figure, I aim to draw attention to the network of dependencies that make its emergence possible.

Moving beyond well-cooked debates over whether or not any use of technology, or small modifications such as implantable RFID tags (such as are

<sup>1</sup> "If machines produce everything we need, the outcome will depend on how things are distributed. Everyone can enjoy a life of luxurious leisure if the machine-produced wealth is shared, or most people can end up miserably poor if the machine-owners successfully lobby against wealth redistribution. So far, the trend seems to be toward the second option, with technology driving ever-increasing inequality" (Hawking, 2016).

<sup>2</sup> A friend who qualifies as a cyborg according to my framing, brought to my attention that the designation of '*petite*' should be evaluated carefully for its potential to echo gendered denigration of women. In my use, it springs from the Marxist category of the *petite bourgeoisie*, a social stratum of certain dependencies, powers, and aspirations.

used to find lost pets) make us cyborgs or not, I propose that our present engagement with pacemakers, cell phones, smart homes, smart glasses, hip replacements, insulin pumps, sophisticated prosthetic limbs, etc. should be usefully understood as making us *petite cyborgs*. Some further marks of the *petite cyborg* include: Limited scale of cyberization, limited utility of cybernetic implants, dependence on capital, research, and power from national and international organizations such as the Defense Advanced Research Projects Agency. The *petite cyborg* is defined through dependency. Reliable access to electricity, proprietary (and often life-sustaining) parts, and surgical expertise, are all challenges being lived by cyborg-aspirants today. If the cyborg is to be more attractive than a goddess, as Donna Haraway, author of the influential *A Cyborg Manifesto*, once proposed it was, it is going to have to demonstrate its power to *liberate* from systemic dependencies and structural inequalities. The cyborg then should be understood as an aspirational ideal. The fully realized cyborg will possess the ability to sustain, augment, extend, and replace the components of their body independent of the global energy, information, and capital systems that *petite cyborgs* depend on.

Material dependencies are of course always tangled up with discourse and thinking with cybernetics should force a confrontation in society at large over viewing bodies as inadequate or deficient. The *petite cyborg* is a simulacrum in that it is a production imagined as a reproduction.<sup>3</sup> This matters because there is no original 'arm' or 'leg' that can be reproduced in a factory. Cybernetic limbs are simultaneously mass-produced (in the case of prosthetics) and personalized in the sense that they are attempts to replicate or extend components of individual human bodies. All *petite cyborgs* are thus haunted by the cyborgs they *could* be, even when enjoying their augmentations. Cyborg studies must be informed by the scholarship of queerness, disability, age, gender, race, colonialism, all the ways in which bodies and identities are conceived and controlled. *Petite cyborgs* face a double haunting of limited flesh and metal, and even a little progress might be taken away, or go awry. As scholar of feminist theology Sheila Briggs (2006) argues, along with the promise of technologically facilitated bodily transformation comes the "fear that the self might be perpetually trapped in hideous or tortured flesh" (157). The fate of a *petite cyborg* is to be always at the mercy of their benefactors. A prototype arm might be taken away, a charity might not be able to pay for the ongoing maintenance of a cybernetic leg. A military research outfit might demand that so many hours of the *petite cyborg's* life be given over to testing and reporting on their implants. As

<sup>3</sup> See Baudrillard (1994) for more on how copies need no originals.

Haraway (1991) said, "the boundary between science fiction and social reality is an optical illusion" (149). Our bodies are changing to resemble the bodies of our imagined future, but the *petite cyborg* is not in control of the substance of their being. They are reliant on others to provide, fund, develop, install, repair, upgrade, and remove their cybernetic components. The current state of access to cybernetics is profoundly limited. A sophisticated cybernetic enhancement is beyond the ability of most humans to acquire due to both financial and clinical-discursive controls. Finding a way to liberate from limited access, as Haraway's better-than-divine cyborg must do, requires careful analysis of competing and overlapping visions for the cybernetic future.

In the following sections, I discuss how ecomodernists<sup>4</sup> such as Andrew Revkin and Ted Nordhaus promote a vision of a cybernetic future that is already upon us, without regard for the uneven global distribution of resources and research available in a world in which it is claimed that 'we' humanity, are now unified through technology. Political scientist Francois Gemenne's work on climate refugees and other bodies that vanish in the surging discourses of eco-politics problematizes the 'we' that Revkin delights in; I rely on Gemenne's observations as I explain in what ways the quest for a cybernetic future produces abject bodies or gives rise to a false sense of unity among humans.

To discuss ecology and cybernetics in science fiction, I turn to *Nausicaa of the Valley of Wind*, a graphic novel by Japanese director Hayao Miyazaki, whose animated works such as *Spirited Away* enjoy global acclaim. The titular character of *Nausicaa* struggles with machine technology, biologically altered humans, and a post-apocalyptic world haunted by the promise of extinction. My discussion of *Nausicaa*'s ultimate rejection of mastering the world through technology is entwined with Bruno Latour's (2010) concept of "continuing to care for unwanted consequences" (26). Latour urges us to maintain contact with the unpredictable products of our technological creations. We may be enchanted or horrified by the consequences of what we create, but as Latour sees it, the greatest sin would be to turn away from, abandon, or reject those technologies. Instead, Latour advocates that though we cannot know where it will lead us, or into what messes we will have to deal with, we should maintain our parental relationship to our technology.

<sup>4</sup> The ecomodernist movement argues for what they term 'decoupling', where the environmentally deleterious results of human industry are separated, through advanced technical means, from impacts on nature.

The other vision of the future considered here is a utopian symbiosis of humanoids and machine intelligences. Scottish author Iain M. Banks invites readers to experience what he calls 'The Culture', where scarcity, disease, aging, infirmity, dementia, and arguably death have been conquered by human-like beings and their fellow citizens, artificial intelligences of varying sophistication. The Culture provides a touchstone for exploring ideas of community and relationality between technologically enhanced humanoids and machine intelligences.

As intermediate beings, *petite cyborgs* have limited ability to recreate, augment, replace, and enhance their bodies. Generally, they are greatly dependent on states and social welfare programs, on the generosity of corporate sponsors, on not-for-profit charities, and military research and development. They depend on national power infrastructure to charge their components; they depend on international manufacturing and distribution to acquire the materials with which their bodies are altered. *Petite cyborgs* are real people living with partially fabricated bodies; their dependencies point beyond themselves, to the promise and peril of independent cybernetic life. That is, a cyborg who wields a robot arm is -right now- also a cyborg who must recharge their body parts, is compelled to remove them and pay a power company so that their body can continue functioning. These limitations are invitations to overcome cybernetic dependencies.

Many of the figures that appear in the discussion that follows are concerned with the Anthropocene, the idea that our Holocene epoch has been replaced with one in which human beings have become a geologic force. For some theorists, the Anthropocene is predicated upon a never before seen enmeshment of human activity and global, geologic consequences. Itself a term for certain kinds of enmeshment, cybernetics broadly can refer to entanglement between living bodies and the nonliving substances of the earth. Investigating *petite cyborgs* allows us to see how those who think the climate crisis is an opportunity to reshape the world and our bodies, taking evolution both personal and planetary into their hands, gloss over who gets left out of grand visions of human planetary dominance.

Let us look at some examples of *petite cyborgs*, in order to better understand their limited ability to acquire and maintain their abiotic components, and how these individuals describe the impact of living cybernetic lives. These *petite cyborgs* demonstrate that integrating technology with the human body holds promises both social and somatic, and that some *petite cyborgs* are aware that achieving independence requires transforming the systems that allowed their emergence.

### Living with cybernetics

In 2001 Jesse Sullivan was electrocuted so fiercely in a workplace accident that he lost both of his arms. Through the Rehabilitation Institute of Chicago, Sullivan was provided with a prosthetic arm responsive to his thoughts. Todd Kuiken, director of neuroengineering at the Center for Artificial Limbs at the Institute, describes Sullivan's prosthetic as a significant development in the quest to produce replacement limbs for injured soldiers. The Institute works in partnership with the National Institutes of Health and the Defense Advanced Research Projects Agency. Sullivan's cybernetics are notable for their ability to connect nerve clusters with a cybernetic limb and to provide sensations of pressure through the prosthetic. Sullivan is not a public figure, so little information is available about his cybernetic development since receiving the arm in the mid-2000s. Some of this may be due to Sullivan's desire to lead a private life, but I suggest that a significant factor that keeps Sullivan out of the public eye, compared to other *petite cyborgs*, is the aesthetic of his prosthetic. Sullivan's cybernetics are bulky and industrial in appearance, covering most of his upper torso and shoulders in plates, straps, wires, motors, sensors. The limbs themselves are plain, simple, functional; they are for doing, not exhibiting.

Nigel Ackland, who lost his arm in an industrial accident, is a public educator and amputee advocate. At WIRED Health in 2015, held at the Royal College of General Practitioners in London, Ackland gave a video recorded presentation on his experience. He began his journey into cybernetics when responsibility for his on-the-job injuries was disavowed by his employer. "I was told my company had really good insurance...a small piece of the insurance policy meant that instead of the private treatment I was told to expect I was dumped onto the National Health Service" (Ackland quoted in Wired UK Staff, 2015). Ackland's company used arcane insurance rules to avoid giving him superior care, forcing him to receive simple prosthetic devices from the public medical system. Ackland suffered from the incompatibility of his simple prosthetics with his body, resulting in pain, skin conditions, and limited limb function. The inadequacy of his prosthetics contributed to mental degradation, nightmares and rages. His family life and social life deteriorated, and he suffered heart problems. "This is what you get on the NHS after three or four years if you're lucky," he says in the video, holding up an 'arm' that looks like an industrial wrench (Ackland quoted in Wired UK Staff, 2015).

Ackland's turnaround came when he became a trial patient for RSL Steepler's bebionic prosthetic,<sup>5</sup> which is modeled on the human hand. The hand and its

mount work together to provide a replacement for Ackland's lost limb, a replacement designed to limit additional damage to his body. "This is the most important part of the whole thing," Ackland explains, "if you can't wear this every day all day without pain or discomfort it doesn't matter." Superior in dexterity and sensitivity to the NHS wrench-hand, Ackland's prosthetic hand is capable of delicate tasks such as cracking eggs and typing on a keyboard. "This is for shaking hands," he says, extending his hand, which appears metallic yet human, the fingers distinct, the joints articulated. "This is for being human." An article in *Wired* from May of 2015 reports that "from being stared at and laughed at, Ackland says he has now been accepted. He describes shaking hands with people using his bionic hand and seeing a genuine smile. Ackland reports that 'I see that smile as a sign of acceptance for who I am. Nobody ever asked to shake my hook'" (Artilec and Ackland quoted in Wired UK Staff, 2015).

What makes possible the availability of cutting-edge prosthetics at limb centers? "Foresight, empathy, balls," says Ackland, who also claims that "If you took the money the NHS uses to pay the Super-Managers you could provide 5,000 of these every year." Being one of the fortunate few to receive an advanced prosthetic, Ackland advocates for widespread adoption of similar technologies. He argues that cutting bloated administrative salaries would be a significant step toward making sophisticated prosthetics widely available. Ackland, who likens himself to a fortunate infant or toddler, equating his cyberization with rebirth, demonstrates how cyborgs are, as Haraway claimed, exceedingly unfaithful to their fathers. To move beyond the intermediate and dependent state of the *petite cyborg*, cyborg-aspirants must turn against the inequitable systems that birthed them.

Ackland makes the compelling argument that cybernetics can be a technology that restores us to humanity and restores our humanity to us. His case also demonstrates a core quality, and perhaps limitation, of what I count as a cyborg. Cybernetic limbs rely on interfacing with biotic components to control their movements. If a being were to have every scrap of flesh and tissue replaced with manufactured analogs, they would cease to be a cyborg as I have defined them, and would have become something else—intelligence supported by a machine substrate as imagined by transhumanists.<sup>6</sup> It may be that the only way to have autonomy is to cease being a cyborg.

Ackland attributes the lack of distribution of sophisticated cybernetic limbs to cost. The development, manufacturing, and distribution of cybernetics are

<sup>5</sup> The bebionic hand was acquired from Steepler by Ottobock HealthCare in 2017.

<sup>6</sup> See Rothblatt (2014), *Virtually Human*, Kurzweil (1990), *The Age of Intelligent Machines* (1990), and Moravec (1988), *Mind Children*.

totally dependent on capital, as is the *petite cyborg*. If the cyborg is to be a new socialist myth, as Haraway argues, it must be developed as a threat, not an aid, to capitalism. It must become subversive. The makers of cybernetics may be approaching the distribution of their devices cautiously, knowing that once cyborgs independent of the allocation of global energy and capital emerge from the ranks of *petite cyborgs*, their ability to capitalize on their human-machine dependents will evaporate.

Enthusiasm for a technologically innovative future that carries human beings into a new era of global wellbeing is espoused by ecomodernists, as exhibited in the collectively-authored *Ecomodernist Manifesto* (2015). In that document, ecomodernists present a picture of desirable development, great dense cities capable of supporting huge populations, vast fields of solar panels, even biodomes on the moon or Mars. Their naïve belief is that this techno-utopian bounty will be the inheritance of all humanity. Cybernetics is illustrative of the limitations in equitable funding and distribution faced by ecomodernist proposals. Sophisticated prosthetics are only available through great expense and investment in research. The authors of "Gender and Geoen지니어ing" push back against the utopian vision of the ecomodernists, whose rosy portrait of the future skips over the intermediate phase between our current world and the future they imagine. "History provides countless episodes of environmental injustice where damage to the earth accompanies disproportionate injury to disempowered demographics. Environmental harms are rarely simply ecological concerns; they are also social and political concerns" (Buck et. al., 2014, 658).<sup>7</sup> The authors point out how harm following from climate change falls disproportionately on women, children, and the impoverished. There can be no such thing as a harmless transformation of the globe. Techno-utopian visions, whether of the ecomodernist sort or the cybernetic variety, often fail to take seriously the interim phase in which technologies of transformation are dependent upon uneven and unequal regimes and resources.

The authors of the *Manifesto* do not account for the massive suffering that seems inevitable in the middle period between the present, and the author's realizing of their vision for remaking the world. Gemenne has linked this fatal oversight to a false sense of the size of our in-group. In "The Anthropocene and Its Victims" Gemenne (2015) warns us that we blind ourselves to the plight of the disenfranchised with the pretend-capaciousness of the embrace of 'our' progress: "The Anthropocene [our new era of progress] might produce the false impression of a unified humanity" (173). To help the reader

<sup>7</sup> Holly Jean Buck, Andrea R. Gammon, and Christopher J. Preston (2014).

understand the potential for disproportionate impacts that industrialization makes possible, Gemenne argues that climate change-induced migration is a result of the release of greenhouse gases, which should be understood as a form of political oppression. What links this to our discussion of cyborgs is that this political oppression moves human bodies around by force and alters the conditions under which they may have access to cybernetics. The *petite cyborg* is not only at the mercy of capital, but also subject to the shifting landscape, to an environment stricken by human-driven climate change.

### Topography of the noosphere

Let me provide a concrete example of the kind of global imaginary that Gemenne warns against. Andrew Revkin, an environmental journalist with ecomodernist sympathies, often highlights the importance of the Jesuit philosopher Pierre Teilhard de Chardin and his concept of the noosphere, which Revkin characterizes as global mind. Revkin connects the noosphere, an envelope of human thought or mind that is taken as enclosing the earth, to Darwin and his reading of the Darwinian concept of social sympathy. Revkin trades on the idea of evolution as progressive, insisting that Darwin saw differences between different human cultures as collapsible and believed? That the collapse of this distance is desirable and advantageous. The collapse of the barriers between human subjects is made possible, Revkin believes, through specific technologies that pierce an "artificial barrier" separating human beings from each other. Revkin (2014) claims that, thanks to communications technology, "we now have the ability to have a global *we*." Revkin (2014) identifies the most significant feature of the global mind as being that "an idea can move from here to Bangalore to Botswana right now. That's as important as the biogeophysical changes that are happening." In other words, Revkin believes that through technological means we are achieving Teilhard's vision. The global mind that Revkin describes is cybernetic in that it is composed of a latticework of fabricated strands and stations that convey data and translate that data into forms comprehensible to human users within that network. I challenge this conception of the 'global we', drawing on what I call the 'topography of the noosphere'.

The topography of the noosphere takes seriously the notion of global mind advanced by Revkin. How does Revkin's understanding of the global mind differ from Teilhard's? Teilhard was a Catholic theologian whose concept of a sphere of mind, while mediated through the scientific enterprise, was nevertheless grounded in a teleological process that found its resolution through union with a cosmic Christ. Revkin's global mind is a celebration of human technical inventiveness and industrial capacity. Revkin cites Teilhard in order to establish a foundation and lineage for his own concept of global mind but fails to explain



both that the noosphere is a theological construct, and how a cybernetic world-mind can derive from Teilhard's noosphere, depending as it does on the existence of a cosmic Christ to orient its evolution. Nor does Revkin attempt to reconcile his use of Darwin as an extension of Teilhard's thought, despite the collapse of barriers described by Teilhard being entirely unlike the evolutionary processes Darwin described. Darwin understood social animals as capable of expanding the range of their empathy, while Teilhard's participants in the noosphere undergo a transformation and fusion of *soul*. This distinction is important, because Darwin's argument concerns social and biological transformation, while Teilhard's describes a metaphysical transformation.

Revkin's imagined noosphere is not some seamless, smooth globe of sacred energy, some Christ-aura filling the space evenly around the Earth. Revkin does not acknowledge that his noosphere is cratered like the surface of the moon, inscribed with deep pits and trenches where human access to information and technology are distributed unequally and unreliably. The participants in Revkin's 'we', the minds that rise and join with his vision of the noosphere, are those who possess sufficient language skills, technical knowledge, capital, energy, and equipment to plug in. As Kate Raworth (2014) reports in a critique of the Anthropocene concept, the production of science and technology remains largely created by men for men, most of them residing in North America and Europe. Revkin's noosphere similarly participates in the creation of an imagined 'we' that simply excludes much of humanity. The International Energy Agency (2015) reports that 1.2 Billion humans do not have access to electricity, and in 2015 *The Atlantic* reported that the majority of humans are not "active or regular" internet users. Revkin's noosphere, like the *petite cyborg*, is a construct of technology requiring enormous investments and research to produce and maintain and is entirely vulnerable to global systems of capital and energy. Hardly a model for liberation, and bearing little relation to Teilhard's cosmic Christ, Revkin's noosphere is fully enmeshed within the neoliberal economy. It serves as a chastening example of the kind of exclusionary 'inclusion' that Gemenne warns against. If we let our desire to build a bigger aggregate 'we' blind us to those who remain outside the circle we draw, we make ourselves responsible for their exclusion.

With the troubling limitations of this global imaginary in mind, I turn now to discussing two ways in which the technologically sculpted future of humanity has been imagined in science fiction. In what follows, I put the utopian idealism of the ecomodernists (along with Bruno Latour's concepts of stewardship and breakthrough) into conversation with these science fiction visions. One of the goals of this discussion will be to see whether and to what extent it is possible to allay the concerns about human relationships to

technology as expressed by Martin Heidegger in *The Question Concerning Technology*. Heidegger worried that a fundamental connection between human beings who make things, the raw materials we use, the pure idea that is the template for a fabricated object, and the eventual product, has been lost. This relationship, according to Heidegger, once was characterized by a mutual appreciation and respect, expressed by an indebtedness between the components of made things.

### Science fiction – imagining bodies into being

The perennial question "What can we entrust to the future?," runs through Japanese animator Hayao Miyazaki's opus *Nausicaa of the Valley of Wind*, a graphic novel thick with environmental themes. *Nausicaa* tells the story of a young ruler struggling to lead her people to survival as the remnants of post-apocalyptic humanity fight over the few remaining resources in the poisoned earth.

Nausicaa is named for the princess who aids Odysseus. Her name means 'burner of ships' and it is her fate to choose if she will aid or founder the vessel containing the hopes of the past. In *Nausicaa*, humans have changed their bodies to survive a world filled with deadly plants, air, and soil. Unaltered humans could not survive in this environment. In a chaotic swirl of hope and desperation the reader learns alongside the titular character that the poisoned land is cleansing itself, but the altered humans will not be able to survive in the new decontaminated world. The rebirth of the world means the end of humanity.

In the climactic final confrontation of the series, the technologically projected will of the past, in the form of a holographic image, appears to Nausicaa, demanding that she place her trust in the inventions and judgments of her ancestors. A single data archive survived the apocalypse, stewarded by an artificial intelligence that explains its nature and purpose to Nausicaa, who is now regarded as both king and messiah for her exploits. The keeper of the archive explains that it can fix the bodies of those who inhabit the ruined earth so that they will be able to survive the cleansing and reclamation of the land. Deep within the archive are vats from which a new, untainted humanity will spring, knowing only art and nothing of violence. Horrified, Nausicaa retorts, "Why didn't those men and women [the creators of the archive] realize that both purity and corruption are the very stuff of life?" (Miyazaki, 2000, 248) Her companion scoffs at the idea of humans who are ignorant of violence and know only art and peace, doubting that such creatures could count as human.

Each party in this confrontation sees the other as an impossibility. The voice of the past invalidates her existence and the existence of her fellow toxic humans. To the tenders of the techno-utopia to come they are inadmissible as human, their polluted bodies cannot enter into the coming paradise and live. This does not faze Nausicaa, who explains that “we have lived all these centuries with the Sea of Corruption. Extinction has long since become a part of our lives” (Miyazaki, 2000, 249). The keeper of the archives is aghast when Nausicaa rejects the future that the archive exists to ensure, branding her a nihilist for leaving the survival of humanity in the hands of nature, when technology can ensure its continuation. Nausicaa asserts that what matters is not the survival of any *kind* of life, but rather life itself, unshackled from a hubristic human belief in mankind’s ability to control and direct it, to dictate survival and extinction. The term mankind is appropriate here, for the keeper of the archive appears through a projection of an older man, a scientist, explaining to the woman warrior-king-messiah that she must listen and obey him, or else humanity has no future.

Philosopher Bruno Latour has advanced a concept of ‘breakthrough’ in the relationship between humans and nature—or perhaps, in the dissolving of the boundaries between human and nature—that finds a devastatingly apt example in *Nausicaa*, where to continue to care is to shepherd nature on through to the destruction of the human species.<sup>8</sup> “But what is the breakthrough itself then?” Latour (2010) asks (26). “If I am right,” he further argues, “the breakthrough involves no longer seeing a contradiction between the spirit of emancipation and its catastrophic outcomes but accepting it as the normal duty of continuing to care for unwanted consequences, even if this means going further and further down into the imbroglios” (Latour, 2010, 26). How deep can these imbroglios go, if we resolve to continue to care for the consequences of our technology? *Nausicaa* provides the reader with no reasonable basis on which to expect that humanity will survive the purification of the earth. Nausicaa prefers to allow the planet to determine if human beings will be part of its future, rather than surviving through a process that imposes separation between humans and nature, or that establishes humans over nature as its masters.

What Latour is advocating with respect to the relationship between technology and humanity through his rereading of Frankenstein’s monster in his essay *Love Your Monsters*, is applicable to the example of *Nausicaa*. For Latour (2010) the monster represents our technological achievements

<sup>8</sup> Latour references breakthrough as an allusion to the Breakthrough Institute, an ecomodernist think tank.

disavowed, the unanticipated products of research we are embarrassed to be seen with. “Dr. Frankenstein’s crime,” Latour (2010) argues, “was not that he invented a creature through some combination of hubris and high technology, but rather that he abandoned the creature to itself” (21). Latour charges us with the sin of abandoning our spraying machines and gene therapies, our radiation consoles and selective breeding programs, all designed to seize control of the systems of the Earth. He proposes that abandonment is not the answer. Loving our monstrous creations may provide the opportunity to turn them to good ends. “Our sin is not that we created technologies but that we failed to love and care for them” (Latour, 2010, 22). Nausicaa wrestles with technology that has seized the role of father and master for humanity, while Latour suggests the image of humans as parents to technology who can either neglect or love their offspring.

I find Latour’s argument that we must continue to care for the unanticipated consequences of our technologies appealing, but he does not account for the dangers in human-object relations as described by environmental historian Tim Lecain. Lecain (2015) explains the neo-materialist perspective on the relationship between humans and things as “partnerships humans formed with powerful material things whose potentialities often pushed them in directions they neither envisioned nor intended” (20). Latour claims that we must both love technology instead of abandoning it once it is created and be willing to care for the unwanted consequences of our actions and interactions. We might say that Nausicaa’s solution to loving something that leads those that interact with it into a sense of division and mastery is to love it to death. She harnesses the technology of the ancient world in order to put an end to the same. “All things are born from darkness and all things return to darkness,” she tells the archive, “and now it is time for you to return to darkness” (Miyazaki, 2000, 250). In the end she breaks with technology that would allow control over the future, choosing to live alongside the bioengineered flora and fauna that will eventually make the earth uninhabitable for humans. Latour (2010) speaks approvingly of being willing to follow along with unintended consequences, to ‘roll with it’ instead of trying to arrest the unfolding of events. Where it seems Latour must break from *Nausicaa* is when she abandons mastery through technology, preferring to bury the devices forever. The kink or confusion in this tableau as it relates to Latour’s thinking is that Latour does not want humanity to abandon its technologies of mastering nature. But if we accept Lecain’s argument, it appears we are technology’s *followers*, not its masters, tricked like the people of *Nausicaa*’s wasted earth into believing we are the architects of our future. *Nausicaa* exposes and occupies space beyond the possibilities that Latour describes. Latour’s commitment to technologies of mastery stem, I speculate, from his enduring fascination with the work of political theorist and Nazi

jurist Carl Schmitt, and the significance of Schmitt's friend/enemy distinction to Latour's environmental project, where there are friends of the earth sciences to harness, and enemies to overcome.

To render Nausicaa's struggle in cybernetic terms, ultimately the entanglement of sophisticated technology and biology becomes unbearable for the people of the earth. They feel that whatever mastery technology once provided has been replaced with slavery to technology. They have become what Heidegger (1977) calls the "standing reserve" (8). The standing reserve is an image and a rubric. It is the image of the storage room, which expresses the stasis of being on call, subject at every moment to the possibility that you will be required to fulfill your responsibilities in accordance with your capacities. It is a rubric, in that by thinking through it, we are led to determine if we view any given thing as something we already understand, in its potential, form, and function. If we are fully convicted in our knowledge of a thing, what potential of action, as well as relation, has been foreclosed? In the standing reserve, held ever ready and ever bound, there is no possibility of a spontaneous unfolding. In Nausicaa's world, human beings who serve the Ark live lives arranged by technology; they are servants to a future they are physically incapable of inhabiting. True to her name, Nausicaa burns the ship carrying humanity inexorably forward. Where they end up, only the tides will tell, receiving them into the grave or delivering them to new shores.

If Nausicaa serves as a portrait of humanity captured within the standing-reserve, it is also a promise of human liberation from the prison of technologically imposed stasis. Nausicaa does not derail the plans of the technocrats in order to usher in an era of eco-primitivism, she does not replace one utopian vision with another. It is not that Nausicaa's people find freedom by living without technology, but that they are ultimately delivered into a world where technology is not associated with mastery over the earth and the future of life; a place where new possibilities have room to emerge. Here I return to 'The Culture', the space-faring civilization created by Scottish science fiction author Iain M. Banks, to compare the relationship to technology that Banks conceives of with that found in *Nausicaa*. In its optimism, technological mastery of matter, and sentient AI, The Culture resembles the future sought by transhumanists such as Rothblatt and Moravec, Culture citizens appear as uninhibited as imagination allows. In The Culture as described by Banks, humanoid and AI citizens live beyond scarcity, they do whatever they want. Citizens live on vast vessels that travel between stars, and in the tens of thousands of years of The Culture's development it has become unfashionable to live on worlds capable of supporting life. Banks (1994) explains that The Culture disdains to live on worlds because, "The Culture, as is made clear in *Use of Weapons*, regards terraforming generally as

ecologically unsound; the wilderness should be left as it is, when it is so easy to build paradise in space from so little." Consequently, AI-run manufactured ring-worlds and vast city-ships host most of the population.

There are hints even within Banks's work that nearly limitless power may not provide enduring satisfaction. On one of these manufactured worlds, in *The Player of Games*, two Culture citizens debate the joy possible in a life where everything is within reach. They play a game, which one enjoys and the other disdains. "Don't you get *any* pleasure from this sort of thing?" Asks the one. "No," says the other. "And neither will you, after a while." The first citizen shrugs, "Till then, then" (Banks, 1988, 3).

As a vision of a cybernetic future, it is unexcelled in its optimism and promise of what humans and machines can accomplish together. Citizens of The Culture, fleshy and machine, enjoy godlike powers to remake their bodies and environments. They are free from disease, have conquered aging, and can recover from almost any injury. If they die, they can restore themselves from a backed-up copy. Though they possess great power, their ability to instrumentalize all matter cuts them off from the possibility of new relations with matter. Heidegger (1977) anticipates the prevalence of this state of affairs, seeing it in his own time: "silver is that out of which the silver chalice is made. As this matter (*hyle*), it is co-responsible for the chalice. The chalice is indebted to, i.e. owes thanks to, the silver for that out of which it contains...at the same time indebted to the aspect (*eidos*) of chaliceness" (3). It is useful to the aspiring cyborg to see this as a description of a positive affective commitment between those who make objects, the substance the object is made out of, and the idea that guides the shaping of the object. When this has been broken, it is to our detriment. When our conception of objects and substances is restricted to certain views, and to their instrumental value, we have cut ourselves off from the ways in which they might surprise us with their potential. Moreover, failing to recognize that material, concept, and method are interdependent leads to an overconfidence that rests on the power to impose shapes on the universe, instead of a respectful commitment to the constituents of all shaping. As an aspirational ideal, the cyborg is aware of its substance, materially, ideologically, sociologically, and does not mistake reshaping the world as a fundamentally different practice than reshaping its own body.

The enfleshed and machine citizens of The Culture share respectful and grateful relations with each other, but as intelligent beings the machine lifeforms of The Culture no longer belong to the categories of technology with which Heidegger is concerned. What The Culture achieves is power, which can appear liberatory insofar as its wielders can dictate many of the conditions of their lives. By instrumentalizing all matter, The Culture makes it impossible



for objects to, in Heidegger's terms, reveal themselves. If the makers of things, whether human or AI, were not oriented to the world in terms of mastery and utility, then they could discover that objects have the capacity to reveal themselves to the respectful partner. The worldview that operationalizes all matter, and leads to standardized manufacturing through technologies of mastery, denies objects the opportunity to reveal themselves. If objects are not allowed to reveal themselves, we remain trapped in impoverished worldviews and relational possibilities because by lauding ourselves as the technological masters of manufacturing we have lost the perception of indebtedness that positions us respectfully toward matter. With the loss of this indebtedness, Heidegger argues, our creative capacities are dammed up. Consequently, just as standardized forms are imposed on matter, so too on relations, where we come to regard each other only in terms of standardized utility.

### Toward free relations

Thinking with embodied cyborgs reveals their dependencies, that is, specific examples of where the cyborg as aspirational figure can grow toward its liberatory potential. This growth is not into empty space, the liberatory cyborg presses against and ruptures networks of control woven from capital, ideology, law, and the many other systems of the world that have been part of this conversation. I recommend the use of the term *petite cyborg* to help us think about the vulnerable intermediate, a state that technological optimism and ecomodernism overlook, and a state that aspirational visions of the cybernetic future faithful to the cyborg as liberator cannot neglect. We captive beings have been augmented, infiltrated, enhanced, extended, or healed, and we remain unfree. Caring for the vulnerable intermediate requires proceeding in our cybernetic growth with the utmost consideration. Respect, and so consideration, can, as we've seen from Heidegger, can arise in the recognition of chains of dependency. Latour too recognizes the cybernetic world we live in, correctly observing that we are constantly engaged in the mutual unbinding and binding up of each other.<sup>9</sup> But recognition does not necessarily lead to respect or care, or partnership.

Does Latour invite partnership? Following from Schmitt he must at least extend an invitation among friends. As difficult as it is to pin Latour down, his

<sup>9</sup> Latour (2010) writes: "Every day in our newspapers we read about more entanglements of all those things that were once imagined to be separable — science, morality, religion, law, technology, finance, and politics. But these things are tangled up together everywhere" (23).

positions, though always colored with mastery, at least contain the possibility of partnership. We either (wrongly) seize control, or we stay with the trouble, allowing events to unfurl, committing to following the consequences of our attempts to enact mastery, though we may finally understand that mastery or influence of any kind is always interdependent and hybrid. Acknowledgment of hybridity opens the door to partnership between the human and nonhuman.

The mastery that is possible, once independent mastery is rejected, is one that is shared by interdependent beings. My reading of *The Culture* shows that extreme forms of technical mastery do not, in themselves, cultivate ethical orientations or liberate from narrow ways of thinking and conceiving. Nausicaa's story demonstrates the hubris and oppression that can arise from projects of technologically facilitated salvation.

Nausicaa and *The Culture* are both stories that involve negotiating human-machine relationships. Turning to nonhumans helps us think through possibilities of partnership and indebtedness beyond exclusively human relations. How would the thinkers I have engaged with include nonhumans in the pursuit of emancipation? An enduring partnership that acknowledges mutual indebtedness seems unlikely to emerge from Lecain's view. For Lecain (2015), substances and objects act on and shape human culture and experience; humanity is a product of matter. Lecain at times describes this relationship as a partnership, but claims that a substance like coal, for example, "shaped the humans who used it far more than humans shaped coal" (22). Lecain (2015) concludes that we "may have to undergo a very difficult process of disentangling ourselves from some very powerful material things that have increasingly come to dictate our collective fate" (22). Nausicaa would agree with Lecain on this point, while Banks provides a sympathetic view of human-AI partnership.

The cyborg ideal, liberating from structural and systemic inequities, exists in virtual worlds, and is embodied in us. Haraway called the barrier between the virtual and our lived social reality an optical illusion; the virtual is part of the Heideggerian chain of indebtedness, we dream with and through it. We are all *petite cyborgs*. There is no escaping technology. Plastics settle to the deepest parts of the ocean and nestle in our vital organs. Without iron in our blood, we could not live. Frankenstein's compounded creature is not alone, it is us. Recognizing we are patchwork cyborg beings from the start gives us certain opportunities to grapple with the challenges we envision in the pursuit of the cyborg ideal. The most significant challenges in manifesting our cyborg future are not, I believe, the challenges of technological inventiveness, but rather those posed by heartless capitalism, misguided yearnings for an imagined natural state for bodies, and a hubristic faith in our mastery of the material of the

universe. Revolution against socio-technological tyranny requires clear-eyed study of the promise and the threat that the *petite cyborg* represents. This entails allowing the *petite cyborg* to direct our analysis of systemic inequalities. As technologies are endlessly unfurled to the mingled cries of excitement and horror rising from *petite cyborgs*, we should understand both reactions as appropriate. In our pursuits we must not be so arrogant as to believe that humans can independently master the universe, or allow ourselves to be petrified into inaction by fears of undermining some essential quality of humanity. In the harmony of metal and flesh lies both the possibility of continued bondage and future freedoms.

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