## V1

### Experiment 1 is The Cyborg

#### Enter the Cold War: The year is 1960 and the United States of America (USA) and the Union of Soviet Socialist Republics (USSR) are amidst the Space Race. Each superpower seeks to become the first to put a human being into space, to secure a strategic advantage. It was in this context that Clynes and Kline wrote the paper “Cyborgs and Space” coining the term used to describe a cybernetic organism. [[1]](#footnote-1)

#### The cyborg was not merely a hybrid between human and machine. Instead, it represented a means for the human to expand its worldly experience, to have more time to “spend” being human, by delegating rudimentary work to computation.

Madrigal 10 [Alexis C. Madrigal is a contributing writer at The Atlantic, a co-founder of the COVID Tracking Project, and the author of Powering the Dream: The History and Promise of Green Technology. He is also a co-host of Forum on KQED., 9-30-2010, "The Man Who First Said 'Cyborg,' 50 Years Later," Atlantic, [https://www.theatlantic.com/technology/archive/2010/09/the-man-who-first-said-cyborg-50-years-later/63821/]//Lex](https://www.theatlantic.com/technology/archive/2010/09/the-man-who-first-said-cyborg-50-years-later/63821/%5d//Lex) VM

We're gathered here today to celebrate Manfred Clynes. Fifty years ago, he coined the word "cyborg" to describe an emerging hybrid of man's machines and man himself. The word itself combined cybernetics, the then-emerging discipline of feedback and control, and organism. The word appeared in an article called "Cyborgs and Space," in the journal Astronautics' September 1960 issue. Just to be precise, here's how the word was introduced: "For the exogenously extended organizational complex functioning as an integrated homeostatic system unconsciously, we propose the term 'Cyborg,'" wrote Clynes and his co-author Nathan Kline, both of Rockland State University. From that catchy description, it might not have been immediately apparent that Cyborg was destined to become the label for a profound myth, hope and fear specific to our era. But Clynes knew from the beginning that the phenomenon he'd identified was deeply important. I reached him at his home in Sonoma, California, where the 85 year old is working away on perfecting Beethoven's last quartets. "I expected the word cyborg to survive," Clynes said, although he realizes it has been emptied of some of its original meaning. "It's interesting in the history to see how a word can have a life of its own." Tim Maly's incredible project to catalog 50 responses to the word cyborg ends with this post -- and the breadth and depth of the contributions is a testament to the vigor of the word's post-Clynes life. But his original conception is still important, and captures something that I think has been lost in our current definitions. Here's the thing: For most of us, cyborg ends at the human-machine hybrid. The point of the cyborg is to be a cyborg; it's an end unto itself. But for Clynes, the interface between the organism and the technology was just a means, a way of enlarging the human experience. That knotty first definition? It ran under this section headline: "Cyborgs -- Frees Man to Explore." The cyborg was not less human, but more. "The purpose of the Cyborg, as well as his own homeostatic systems, is to provide an organizational system in which such robot-like problems are taken care of automatically and unconsciously, leaving man free to explore, to create, to think, and to feel," Clynes and Kline wrote. They offered up this idea in the context of MAN IN SPACE, the grand scientific project of the 60s. "Space travel challenges mankind not only technologically but spiritually, in that it invites man to take an active part in his own biological evolution," the Astronautics paper began. "Scientific advances of the future may thus be utilized to permit man's existence in environments which differ radically from those provided by nature as we know it." They criticized the idea of creating human-ready environments up in space, arguing humans should adapt themselves to extraterrestrial conditions, whatever those might be. It's important to remember that they wrote all this stuff before Yuri Gagarin became the first man to travel in space. Quite honestly, we had no idea what space would do to our bodies over the long-haul, but space scientists were not shy about hazarding and testing hypotheses.

#### Determining who is and is not capable of entering space is a racist eugenic project that has littered history with disabled people who haunt the very nature of the astronaut. The premise of space appropriation assumes bodies that have “the right stuff” and erases the history of the cyborg.

Williams 19 [Williams, Damien P., Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization (June 8, 2019). Available at SSRN: https://ssrn.com/abstract=3401342 or [http://dx.doi.org/10.2139/ssrn.3401342]//Lex](http://dx.doi.org/10.2139/ssrn.3401342%5d//Lex) VM

Clynes and others saw much wider potential value in this work, especially as in the late 1950’s and early 1960, the United States of America (USA) and the Union of Soviet Socialist Republics (USSR) were in the throes of both the Cold War at the Space Race. Each superpower sought to become the first to put a human being into space, to claim it for their nations and the people therein, and it was in this context that Clynes and Kline wrote the paper “Cyborgs and Space,” and coined the term “Cyborg.”[7] In this paper, Clynes and Kline described a cyborg (a portmanteau of “cybernetic organism”) as a being which would have the means to regulate and alter previously autonomic bodily processes, through the use of chemical alterations, in a cybernetic feedback loop. The paper was largely a theoretical exploration of how we might use chemical biotechnological interventions to regulate autonomic nervous and pulmonary function, and also to make unconscious certain intentional functions and processes.[8] A cyborg would be able to survive the rigors of space travel—such as increased gravitational forces and radiation, long lightless stretches, and bodily degradation—by regulating the chemical processes of their body to adapt to each new situation, as necessary. But as the Space Race wore on, and more and more humans actually went into space, there was an increasingly smaller focus on the alterations and adaptations that would be necessary to survive in space, and greater public emphasis placed on a narrative of the triumphalism of the human will and ingenuity. The narrative regarding humans in space became primarily about those who had “the right stuff,” rather than a question of what we would have to do in order to adapt and thrive, and so the image of the cyborg fell away and was altered. And a whole suite of possibilities for how we might have understood—and treated—different kinds of embodiment altered, along with it. As Alison Kafer discusses in her book Feminist, Queer, Crip, feminist and ecological discourses in the 1970’s, 80’s, and 90’s gave rise to widely-read theorists such as Donna Haraway who use the “cyborg” concept in a rhetorical mode that locks it to particular ideals about bodily integrity and outdated notions like “Severe Handicaps.”[9] (Below, we’ll discuss how, in her Robo Sapiens Japanicus, Jennifer Robertson relates this to the Japanese concept of Gotai, or “Five Body.”) Kafer links this discussion to the history of how Kline and Clynes’ work on neurochemical antidepressants at the Rockland Institute was very likely predicated on testing and treating patients—both via drugs and instrumental interventions—against their will. Additionally, throughout the 1940’s, 50’s and 60’s, Rockland was subject to multiple accusations of patient mistreatment and mismanagement, including physical abuse, malnourishment, and even rape.[10] While it certainly might not have be the case that any of those more horrifying things happened under Kline and Clynes’ direction, they did happen on their watch, and the culture of testing institutionalized patients without their consent was widespread in the United States, well into the 1970’s.[11] Throughout the long history of eugenics in the United States, ideas about what constitutes the “right kind” of person—be that on the basis of ethnicity, gender, physical or mental ability, or all of the above—led to events in which people institutionalized against their will were forcibly sterilized due to claims of their reduced “fitness” and mental facilities. People with uteri were given forcible hysterectomies and people with testes were chemically or physically castrated, and certain people were simply put to death because they were seen as “unfit” to ever reintegrate with society. All of these things happened starting at very early ages and as one might guess, issues of race complicated every facet of them. As Harriet Washington notes in her book Medical Apartheid: Unfortunately, a black child is more likely than a white one to have his parent completely removed from the informed-consent equation. Black children are far more likely than whites to be institutionalized, in which case the parents are often unable to consent freely or are not consulted at all.12 Often, and to this day, children judged as even possibly having a higher likelihood “mentally unfitness” are just aborted outright, as in the case of Iceland and the Netherlands’ use of in vitro imaging technologies to determine whether or not a child has Down Syndrome. Kafer’s discussion of the Rockland Institute’s depredations serves to illustrate that even some of the most foundational work and well-respected researchers have been party to monstrous practices in order to make their discoveries. Even as Clynes and Kline’s ideal of the cyborg developed out of a concern for mental health and recognition that the human body was not developed to fit the niche of outer space, they did their work in a context built upon the degradation and predation of disabled and forcibly institutionalized persons. This understanding of marginalized persons as resources to be used or situated embodiments to be emulated has been unfortunately persistent, and it has changed the way we think about what a cyborg ought to be. Rather than being about recognizing that, as researcher of the intersection of philosophy, technology, and disability Dr. Ashley Shew has put it, we would all be disabled in space, and so would all need some form of cybernetic system of interventions to survive, a myth of the elite, perfectible human took root.14 There are number reasons why that is, and many implications for what it’s come to mean.

#### As humans attempt to transgress their limitations to survive futuristic cataclysms, they erase the public awareness of biotechnological ties to the cyber-eugenic project.

Williams 2 [Williams, Damien P., Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization (June 8, 2019). Available at SSRN: https://ssrn.com/abstract=3401342 or [http://dx.doi.org/10.2139/ssrn.3401342]//Lex](http://dx.doi.org/10.2139/ssrn.3401342%5d//Lex) VM

The history of biotechnological intervention on the human body has always been tied to conceptual frameworks of disability and mental health, but certain biases and assumptions have forcibly altered and erased the public awareness of that understanding. As humans move into a future of climate catastrophe, space travel, and constantly shifting understandings of our place in the world, we will be increasingly confronted with concerns over who will be used as research subjects, concerns over whose stakeholder positions will be acknowledged and preferenced, and concerns over the kinds of changes that human bodies will necessarily undergo as they adapt to their changing environments, be they terrestrial or interstellar. Who will be tested, and how, so that we can better understand what kinds of bodyminds will be “suitable” for our future modes of existence?[1] How will we test the effects of conditions like pregnancy and hormone replacement therapy (HRT) in space, and what will happen to our bodies and minds after extended exposure to low light, zero gravity, high-radiation environments, or the increasing warmth and wetness of our home planet? During the June 2018 “Decolonizing Mars” event at the Library of Congress in Washington, DC, several attendees discussed the fact that the bodyminds of disabled folx might be better suited to space life, already being oriented to pushing off of surfaces and orienting themselves to the world in different ways, and that the integration of body and technology wouldn’t be anything new for many people with disabilities. In that context, I submit that cyborgs and space travel are, always have been, and will continue to be about disability and marginalization, but that Western society’s relationship to disabled people has created a situation in which many people do everything they can to conceal that fact from the popular historical narratives about what it means for humans to live and explore. In order to survive and thrive, into the future, humanity will have to carefully and intentionally take this history up, again, and consider the present-day lived experience of those beings—human and otherwise—whose lives are and have been most impacted by the socioethical contexts in which we talk about technology and space.”

#### The role of the judge is to orient away from discursive forms of futurism that is grounded in transhumanism. The topic should be evaluated as just or unjust through a historical investigation rather than scenario analysis

#### The private sector is driving space exploration, government agencies innovate slowly, are stalled by processes, and can’t secure funding.

Houser 17 [Kristen Houser, 06-12-2017, "Private Companies, Not Governments, Are Shaping the Future of Space Exploration," Futurism, https://futurism.com/private-companies-not-governments-are-shaping-the-future-of-space-exploration, accessed 12-15-2021] //Lex VM

SPACE RACE 2.0 Sixty years ago, the Soviet Union launched the first artificial satellite into orbit. The event served as the starting pistol in what would come to be known as the Space Race, a competition between the U.S.S.R. and the United States for spaceflight supremacy. In the decades that followed, the first human reached space, a man walked on the Moon, and the first space stations were built. The U.S.S.R. and the U.S. were soon joined by other world powers in exploring the final frontier, and by the time the Soviet Union was dissolved in 1991, the contentious Space Race was something of a distant memory. A CROWDED FIELD SpaceX, Blue Origin, Bigelow Airspace, Virgin Galactic, Boeing, Lockheed Martin… Not only has the number of private companies engaged in space exploration grown remarkably in recent years, these companies are quickly besting their government-sponsored competitors. “We’re starting to see advances made by private entities that are more significant than any advances in the last three years that were made by the government,” Chris Lewicki, CEO and President of Planetary Resources, tells Futurism. Amazon CEO Jeff Bezos’s Blue Origin and Tesla CEO Elon Musk’s SpaceX are arguably the two companies that are setting the pace. In November 2015, the former completed the first successful vertical rocket landing after sending their New Shepard 100 kilometers (62 miles) into the air. SpaceX landed its own rocket a month later, only they did so with a craft twice as heavy as Blue Origin’s and traveled all the way into space first. A month after that, in January 2016, Bezos’s company became the first entity to re-launch and re-land a previously used rocket. SpaceX followed suit in 2017. “The government was never able to [build reusable rockets], but now, two private companies within the space of the same year have done that,” points out Lewicki. Not only are private companies already surpassing their government counterparts, several are poised to widen their lead in the coming months and years. If all goes according to plan, when SpaceX’s Falcon Heavy launches in September, it’ll take the title of the world’s most powerful rocket away from NASA’s Saturn V. Virgin Galactic is already selling tickets for what it expects to be the first private spaceflights, which will take place aboard the sleek VSS Unity. SpaceX plans to send space tourists to the Moon in 2018, and then in 2024, the company hopes to launch a system that will take people all the way to Mars…roughly 5-15 years before NASA expects to do the same. ALL ON THE SAME TEAM Private companies may be in the lead, but the finish line for this Space Race isn’t exactly clear. The first iteration was arguably “won” when Neil Armstrong took his first steps on the Moon, so does this sequel end when we establish the first Moon base? When a human walks on Mars? When we leave the solar system? Truthfully, the likelihood of humanity ever calling it a day on space exploration is slim to none. The universe is huge, with galaxy estimates in the trillions, so the goalpost will continue moving back (to bring another sport into the analogy). Rather than focusing on competing in what is ultimately an unwinnable race, private and government-backed space agencies can actually benefit from collaboration thanks to their inherent differences. “The way that SpaceX, Planetary Resources, or Virgin Galactic approaches space exploration is going to be very different from NASA or the Air Force,” explains Lewicki. Private companies aren’t beholden to the same slow processes that often stall government projects, and they can secure or reallocate funding much more swiftly if need be. However, unlike agencies like NASA, they do have shareholders to keep happy and a need to constantly pursue profitability.

### Experiment 2 is Space Genes

#### Thus, I affirm: Resolved: The appropriation of outer space by private entities is unjust.

#### Space appropriation offers a compelling argument for genetic modification of astronauts legitimizing a new cyber-eugenic era. Adapting the human for space will involve using technology to capacitate people beyond just “human”.

Regalado 17 [Antonio Regalado is the senior editor for biomedicine for MIT Technology Review. He looks for stories about how technology is changing medicine and biomedical research. Before joining MIT Technology Review in July 2011, He lived in São Paulo, Brazil, where I wrote about science, technology, and politics in Latin America for Science and other publications. From 2000 to 2009, was the science reporter at the Wall Street Journal and later a foreign correspondent., 4-15-2017, "Engineering the perfect astronaut," MIT Technology Review, https://www.technologyreview.com/2017/04/15/152545/engineering-the-perfect-astronaut/, accessed 12-11-2021] //Lex VM

At the International Astronautical Congress last September, in Guadalajara, Mexico, Elon Musk convinced many die-hard space engineers he could get a fleet of private rockets filled with thousands of people to Mars. Musk’s speech was long on orbits, flight plans, and fuel costs. But it was short on how any of those colonists would survive. In fact, the Mars journey would likely be a dead end. Bathed in radiation and with nothing growing on it, the Red Planet is basically a graveyard. Recently, a few scientists have started to explore whether we might be able to do a little better if we created new types of humans more fit for the travails of space travel. That’s right: genetically modified astronauts. Let’s be clear. No one is trying to grow an astronaut in a bubbling vat somewhere. But some far-out ideas once relegated to science fiction and TED Talks (here and here) have recently started to take concrete form. Experiments have begun to alter human cells in the lab. Can they be made radiation-proof? Can they be rejiggered to produce their own vitamins and amino acids? One person looking at the idea is Christopher Mason, a member of the Department of Physiology and Biophysics at Weill Cornell Medicine. In 2011, Mason came up with what he called a “500-year plan” to get humans off Earth. In it, genetic modification plays a big role. “I think we have to consider it for people that we send to other planets,” he says. “We don’t know if it’s a slight nudge to existing gene expression, or a whole new chromosome, or finally a complete rewriting of the genetic code.” Mason says there’s a decade or two of work left just to find out what effect space travel has on your genes, and which ones might be okay to change and which should be on a “do not disturb” list. His lab participates in NASA’s Twins Study, which is tracking physiological changes to an astronaut who was sent to the International Space Station for a year while his twin brother stayed on Earth. So far, that’s about as close as NASA has gotten to the subject of GM astronauts—one that still hasn’t been broached in any official agency document. Yet Mason says his lab is ready to take an initial step. Space is full of rays and fast-moving particles that damage DNA. So he’s working on radiation-proofing human cells. His students are taking cells and adding extra copies of p53, a gene involved in preventing cancer that’s known as the “protector of the genome.” Elephants have many extra copies of p53 and hardly ever get cancer, so maybe astronauts should have them too. Mason says he recently submitted a proposal to NASA to send the modified cells to the space station. “There is not a genetic engineering astronaut’s consortium or anything, but maybe we should start one,” he says. Gattaca All this has become easier to think about because it has become easier to do. In 2015 we published an article, “Engineering the Perfect Baby,” about the fact that gene editing, especially with a technology called CRISPR, had suddenly made it possible to easily change the genes in a human embryo. For the first time, we faced the real possibility of genetically modified people. Since then, scientists in China and Europe have begun editing embryos to see how it works. Would it be ethical to then actually make a gene-fixed baby? The U.S. National Academy of Sciences this year said yes, heritable genetic changes could be considered to avoid disease, but only in a few situations and under very strict supervision. The organization opined that under certain rare circumstances in which a couple could not otherwise have a healthy child, it would be acceptable to create a GM human being. Mason thinks that space travel will offer a second, very powerful argument in favor of genetically modifying people. “You can’t send someone to another planet without genetically protecting them if you are able to,” he says. “That would also be unethical.” But putting astronauts in the mix might also open the door to “enhancement.” For now, the experts remain dead set against using gene editing to make a child who is smarter or endowed with perfect eyesight. But let’s face it: NASA already “selects” people according to just such criteria, accepting only 14 of 18,300 applicants to its latest class of astronauts. Maybe you have seen the movie Gattaca? Only supermen with topped-off genomes are allowed to travel to Titan, while the genetic losers, called “in-valids,” stare up in envy as the rockets lift off. Like most good science fiction, the 1997 film is not so far from reality. Genetic wish list To think about surviving in space, a term from the science of genetics—“fitness”—will come in handy. It doesn’t mean that you’ve spent an hour on the treadmill at Equinox. In genetics, the fitness of an organism is how well it can thrive and reproduce in a given environment. The fitness of a human in space or on Mars is extremely low. Just picture an astronaut encased in a space suit with the right amount of oxygen, the right amount of nitrogen, and the right temperature. The purpose of that suit is to bring along the environment for which the astronaut’s genes make him or her fit. Some scientists have already prepared a catalogue of genes that might help. A Boston company called Veritas Genetics is offering to sequence anyone’s genome for $999. And one of the things that Veritas will give you is a report on your “space genes.” Do you have the specific variant of EPAS1, common to Tibetans, that lets you get by with less oxygen? How about the natural mutation that results in huge, extra-lean muscles, which might counter atrophy? Another DNA variant is associated with good problem-solving skills and low anxiety. That’s just the sort of temperament that made Matt Damon’s implausible survival heroics possible in The Martian. You’d be unusual if you had any one of these mutations. And the chances are billions to one that you have all of them. That’s why to get them all into one astronaut—the perfect astronaut—we might want to add them, probably before birth, and maybe using a technology like CRISPR. George Church, the big-bearded Harvard University genetics powerhouse and all-in futurist who founded Veritas, circulates a similar list of “rare protective gene variants relevant to an extraterrestrial environment.” Call it a wish list. What other kind of adaptations could we install into our race of astronauts? If you leave some large elephants on an island and come back 10,000 years later, what you’ll find is a bunch of small elephants. They’ll have adapted to the lack of surface area and shortage of food. The phenomenon is called “island dwarfism.” Under the Mars domes, smaller might be better too. There’s probably not that much space, and every pound of provisions NASA takes into Earth orbit costs $10,000. That means the perfect astronaut probably isn’t just twice as strong as the average person but half as big. (Church, who is 6'5", notes that he was once told by NASA not to bother applying because he was too tall.) Prototrophic humans Let’s take the modifications even further, as some scientists say we might need to. If you ate breakfast cereal this morning, you might have looked at the side of the box, where it says things like “Vitamin C—10% Daily Value.” The “essential” nutrients and vitamins listed on the box are so called because the human body can’t make them. Instead, we have to eat organisms that do, like plants, fungi, or bacteria. These organisms are classified as “prototrophs,” meaning they synthesize everything they need from minimal starting ingredients like simple sugars or what’s in the soil. Of course, eating rocks would be a pretty useful skill if you were living on Mars. And would you think I was kidding if I said scientists are looking into it? I am not kidding. In 2016, Harris Wang of Columbia University gave a talk titled “Synthesizing a Prototrophic Human” at a large off-the-record meeting of synthetic biologists organized by Church at Harvard Medical School. It could be pretty interesting for space travel, Wang told the group, if humans could subsist on sugar water. Despite the title of his talk, when I reached Wang by phone he wanted everyone to know he’s not actually synthesizing humans or astronauts and doesn't have plans to. That’s still many, many years away, if ever. “I don’t want it said that I am making green people, and I am not suggesting we do this any time soon. But I am suggesting that if you want to do intergalactic travel, you need to solve the problem of being totally self-sufficient,” he says. “We are putting humans in very extreme conditions, and from that perspective this seems to be one idea for a long-term plan.” Wang says it's not certain if the concept can even work. In his lab, researchers are trying to get human kidney cells to synthesize the nine amino acids our bodies don’t normally make, starting with the simplest one, methionine, manufactured by adding a single gene. If that works, he’ll move on to tryptophan, phenylalanine, and vitamins D, C, and B. Altogether, creating a prototrophic human cell would require around 250 new genes. Creating astronauts able to make their own essential nutrients would obviously be immensely complicated. Yet as complex as it is, it might be less challenging than the alternatives, such as terraforming a planet or bringing along a space ring complete with an atmosphere, plants, and livestock grazing overhead. Wang told me it would also be interesting if space travelers could perform their own photosynthesis, turning light into food. But any human able to do so would hardly be human, he admits. To produce enough energy, a person would need to be as flat as a leaf and about the size of a playground. The ability to alter the DNA of a human embryo has created a global debate over whether it would be right or wrong to genetically modify people here on Earth, to enhance their fitness for this planet. People have strong views. Some say the human species is not a laboratory rat. No to eugenics!! No to GM people!! Others say it might actually work—let’s check it out. I don’t have the solution to this moral question. But I do know we’ll probably have to answer it before we can get off the planet.

#### Elon Musk made a predictive claim about the seamless integration of human and cybernetics to keep up with AI advancements feeding the transformation of the word “cyborg”.

Kharpal 17 [Arjun Kharpal, 2-13-2017, “Elon Musk: Humans must merge with machines or become irrelevant in AI age,” CNBC, <https://www.cnbc.com/2017/02/13/elon-musk-humans-merge-machines-cyborg-artificial-intelligence-robots.html>] //Lex VM

Billionaire Elon Musk is known for his futuristic ideas and his latest suggestion might just save us from being irrelevant as artificial intelligence (AI) grows more prominent. The Tesla and SpaceX CEO said on Monday that humans need to merge with machines to become a sort of cyborg. “Over time I think we will probably see a closer merger of biological intelligence and digital intelligence,” Musk told an audience at the World Government Summit in Dubai, where he also launched Tesla in the United Arab Emirates (UAE). “It’s mostly about the bandwidth, the speed of the connection between your brain and the digital version of yourself, particularly output.” Musk explained what he meant by saying that computers can communicate at “a trillion bits per second”, while humans, whose main communication method is typing with their fingers via a mobile device, can do about 10 bits per second. In an age when AI threatens to become widespread, humans would be useless, so there’s a need to merge with machines, according to Musk. “Some high bandwidth interface to the brain will be something that helps achieve a symbiosis between human and machine intelligence and maybe solves the control problem and the usefulness problem,” Musk explained. The technologists proposal would see a new layer of a brain able to access information quickly and tap into artificial intelligence. It’s not the first time Musk has spoken about the need for humans to evolve, but it’s a constant theme of his talks on how society can deal with the disruptive threat of AI. ‘Very quick’ disruption During his talk, Musk touched upon his fear of “deep AI” which goes beyond driverless cars to what he called “artificial general intelligence”. This he described as AI that is “smarter than the smartest human on earth” and called it a “dangerous situation”. While this might be some way off, the Tesla boss said the more immediate threat is how AI, particularly autonomous cars, which his own firm is developing, will displace jobs. He said the disruption to people whose job it is to drive will take place over the next 20 years, after which 12 to 15 percent of the global workforce will be unemployed. “The most near term impact from a technology standpoint is autonomous cars … That is going to happen much faster than people realize and it’s going to be a great convenience,” Musk said. “But there are many people whose jobs are to drive. In fact I think it might be the single largest employer of people ... Driving in various forms. So we need to figure out new roles for what do those people do, but it will be very disruptive and very quick.”

### Experiment 3 is the Update

#### Social institutions shape public understanding of disability as a loss, ignoring the adaptability of the brain to new worlds and categorizing normality.

Williams 3 [Williams, Damien P., Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization (June 8, 2019). Available at SSRN: https://ssrn.com/abstract=3401342 or [http://dx.doi.org/10.2139/ssrn.3401342]//Lex](http://dx.doi.org/10.2139/ssrn.3401342%5d//Lex) VM

Shew’s paper “Up-Standing, Norms, Technology, and Disability” explores how ableism, expectations, and particularities of language serve to marginalize disabled bodies.[18] Shew takes her title from the fact that most technological “solutions” designed for people who don’t use their legs are intended to facilitate their engaging the world as if they did. Many if not most things in human societies are designed to be used within a certain range of height that assumes the user is standing; if your default mode is sitting, then your engagement with the vast majority of the world will be radically different. This is just one example of what is known as the social construction model of disability, which says that it’s not the physiological differences themselves which disable, but rather the ways that spaces, architectures, and simple basic societal assumptions limit how a person is expected to intersect with the world and what kind of bodymind they “should” have.[19] Shew notes that, while we tend to think of cyborgs as some seamless integration of technology and bodies, wheelchair and crutch users consider their chairs as fairly integral extensions and interventions, as a part of themselves. The problem is that the majority of societies assume different things about these different modes. Shew mentions a friend of hers: She’s an amputee who no longer uses a prosthetic leg, but she uses forearm crutches and a wheelchair. (She has a hemipelvectomy, so prosthetics are a real pain for her to get a good fit and there aren’t a lot of options.) She talks about how people have these different perceptions of devices. When she uses her chair people treat her differently than when she uses her crutches, but the determination of which she uses has more to do with the activities she expects for the day, rather than her physical wellbeing. But people tend to think she’s recovering from something when she moves from chair to sticks. She has been an [amputee] for 18 years. She has/is as recovered as she can get.[20] Shew is one of many researchers who have discussed that a large number of paraplegics and other wheelchair users do not want exoskeletons, and that those fancy stair-climbing wheelchairs aren’t covered by health insurance, because they’re classed not as assistive devices, but as vehicles. Shew says what most people who don’t have use of their legs want is to have access to the same things that people who do have the use of their legs have. Because ultimately, in around the time it takes for Apple to come out with a new iPhone—around about eighteen months—a person who has developed a disability—lost the use of their legs, the use of their sight, the use of their hearing, the use of their arms, whatever—will come to engage and to adapt to that new lived physical reality as normal. Many societies think about disability as a life-altering, worldchanging thing—something that lasts forever and nothing will ever be the same for you—but the fact the matter is that humans are plastic, adaptable, and malleable. We learn how to live around what we are, and we learn it very quickly. All of this comes back down and around to the idea of biases ingrained into social institutions. Our expectations of what a “normal functioning body” is gets imposed from the collective society, as a whole, a placed as restrictions and demands on the bodies of those whom we deem to be “malfunctioning.” As Shew says, “There’s such a pressure to get the prosthesis as if that solves all the problems of maintenance and body and infrastructure. And the pressure is for very expensive tech at that.” Humans became seen as those creatures which self-analyze and then alter and adapt themselves based upon said self-analysis. Many philosophers of technology have argued that we are always technologically mediated, and that that mediation shapes and is shaped by our physiological and sociocultural experiences, and elsewhere, I’ve explored the questions of identity that come along with Ship-of-Theseus-like questions of bodily integrity that do not quite fit into this work.[21] Suffice it to say that even as promises of becoming “more than” human have flooded the public imagination, they have been met with equally ardent cries of “but if you lose a part of your body, you’re not really you!” Either of these positions serves only to erase and marginalize the real lived experiences of disabled people, for the sake of some assumption about what the human bodymind “should” or even just might be. Even into the twenty-first century, cyborgologists such as Amber Case, a self-described “Cyborg Anthropologist,” have argued that, thanks to augmented reality, smart phone devices, and the generally ubiquitous integration of technology in to the daily life of the modern human being, “We Are All Cyborgs Now.”[22] But something crucial gets lost, here, when we obfuscate or elide the real experiences of people with disabilities from the conversation about cyborgs and cybernetics. In her pieces “Dawn of the Tryborg” and “Common Cyborg,” Jillian Weise specifically hones in on a great deal of the foundation for the modern mythology of cyborg experience, including that which comes out of perspectives like Haraway’s and Case’s.[23] The idea that anyone with a smartphone or with a particular conceptual relationship to the world is automatically a cyborg, Weise says, does violence to the very real lived experience of people with prosthetics or artificial organs or implants that keep them alive. Those latter interventions need maintenance to keep them functional in the face of damage, to prevent life-threatening infection, and to adjust them for day-to-day changes, and while they are not necessarily “sexy,” they are a truer example of what the term’s originators thought it would mean to be a cyborg. “Tryborgs,” on Weise’s view, are those people who want all the glitz and glory of being interconnected with technology, without any of the practical implications. They are the transhumanists who believe that we will all be able to upload our consciousnesses and change our shape, at will, with no muss and no fuss. They want to be the inspirational figures, without having to suffer any losses or do any of the messy upkeep and maintenance, to get there. And they exist in many cultures.

#### Hiding disability from the world as an attempt to fit in drives ableism. The use of tech for capacitation is vastly different than utilizing it for adaption.

Williams 5 [Williams, Damien P., Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization (June 8, 2019). Available at SSRN: https://ssrn.com/abstract=3401342 or [http://dx.doi.org/10.2139/ssrn.3401342]//Lex](http://dx.doi.org/10.2139/ssrn.3401342%5d//Lex) VM

In a cultural sense, the desires to either fit in or to use technology to become “more” and “better than” are what tend to drive cyborg-ableist concerns. Robertson discusses Tobin Siebers and the concept of able-bodied passing, comparing it to queer folx and “straight passing;” in each case there are transitive and intransitive forms of passing, where one is either actively effacing their difference/otherness, or merely benefitting from outside observers simply not recognizing said.[29] To that end, many may choose to make their disability (or their queerness, or both) unignorable by way of stylized prostheses; in fact, much in line with Shew’s assertions above, while people who’ve recently lose a limb may start off wanting a lifelike replacement, they tend to shift to wanting something that works and feels better, rather than just looking a particular way. [30] So are stylized prostheses better understood as empowering or distracting? On the one hand, there is something empowering about the use of a prosthetic to reshape and change the way the outside world can understand you; on the other hand, “prosthetics can divert attention from the disabled limb to its replacement.”[31] But this replacement, in itself, can be a source of discomfort for able-bodied folx. In the section “What is (and is not) the uncanny valley?” Robertson explores Masahiro Mori’s concept of Bunkimi no tani which Robertson translates as “the valley of eerie feeling,” rather than the more familiar “uncanny valley.”[32] Paired with shinwakan no tani or “familiar feeling valley,” Mori describes this as a kind of suddenly and shockingly frustrated expectation, when one is in the process of encountering and reinforcing increasingly familiar things. This concept depends heavily on Mori’s assumptions about what would constitute an “average, healthy, person” and what Robertson labels his “almost callous indifference toward disabled persons.”[33] In Mori’s graphs and descriptions of the Valley, he includes sick disabled people as on the upward curve of the “eerie,” moving away from corpses, zombies, and prosthetic hands.[34] While many people have taken the uncanny valley as some kind of gospel law, Robertson contends we should, rather, expect that the constituency or even presence of an uncanny valley would be a highly subjective thing, based on factors such as “physical and cognitive abilities, age, sex, gender, sexuality, ethnicity, education, religion, and cultural background;” and, indeed, Mori himself has said that it was meant only as an “impressionistic” guide.[35] Humans can adjust to and come to accept and embrace the unfamiliar and designers can avoid the uncanny valley, and many people on earth live in situations where injury illness and death are not “sudden and unfamiliar” or “eerie,” but rather are unfortunately everyday occurrences. But Mori’s response, and much of what is seen in the Japanese exoskeleton market, is just another example of Gotai, the traditional Japanese understanding that a “whole” or “normal” body is made of five constituent parts in combination: either the head, two arms, and two legs, or the head, neck, torso, arms, and legs.[36] This theory holds that anything that breaks this form breaks the person, a perspective which firmly binds these notions of “completeness” to notions of mental health. Hirotada Ototake’s book Gotai Fumanzoku or “incomplete/unsatisfactory body” (English title: “No One’s Perfect”) is an autobiography about his tetra-amelia syndrome which prevented his arms and legs from developing during his gestation; stressing his “Normality” and his desire to be treated equally.[37] But, Robertson notes, the kind of whole-body championed by the Japanese culture exoskeletons are not ways for people like Ototake to regain Gotai, and that there’s a difference between prosthetics that replace a limb and those that “enhance” an existing but disabled one.[38] Robertson, here, in a move similar to but not directly referential of Kafer, touches on Haraway’s use of cyborg as a metaphor for relationality and reflexivity, and, offers a critique of Haraway’s seeming to conceive of “disability” as a singular category rather than the multiform variable conditions that can be linked under this label.[39] This, along with transhumanists like Max More and Natasha Vita-More’s ableist notions of what the “perfect” body should be, feeds into narratives that comprise this vision of cyborgs as a somehow “perfected” humanity. But cyborgs were conceived as a means for humans to live in space, a situation which, again, would be a combination of constantly-dangerous processes of keeping close track of minute changes in the bodyminds of the astronauts and their relationship to their environment— processes that are already well-known to, e.g., diabetics or people with peripheral neuropathy. For a person within those lived experiences, always being aware of the state, position, and integrity of their body is always already a life-or-death scenario, in ways that have to be learned and mimicked by people who are otherwise able-bodied. Had we maintained disabled people’s stories as a part of the mythology of the cyborg, from the beginning, Western societies might now have a better relationship with concepts of disability and mental health. This relationship might have easily arisen from the recognition that most if not all disabled people are cyborgs, just as all spacefaring humans must become cyborgs, and that this, as Clynes and Kline understood, is precisely because all spacefaring humans will become disabled by the very act of existing in space. Which means that, in essence, spacefaring humans currently do and will continue to experience the social construction of disability. But since we have not, in fact, reinforced that chain of understanding, contemporary theorist would be well served to presently explore the situated and lived experiences of people with different configurations of bodyminds, and to listen to what they know about themselves. As Shew has noted, those people who have experience with orienting themselves to the world via pushing off of surfaces or using their arms as primary means of propulsion would be better positioned move in weightless environments and to teach others new strategies to do the same. Because, ultimately, people with disabilities are often already interwoven with their technologies, in ways idealized by technologists, but their lived experience is not recognized and appreciated for what it is. If we take these lived experiences and incorporate the people who embody them, in conjunction with the original intent of the notion of the cyborg, we might have the beginning of a system by which we can rehabilitate the notion of the cyborg—but overcoming the historical trends that have led us here will take a great deal of work.

#### Tracing the definition of the cyborg back to its original state requires creating a new system that recenters marginalized experiences and opens new relational modes with our world.

Williams 6 [Williams, Damien P., Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization (June 8, 2019). Available at SSRN: https://ssrn.com/abstract=3401342 or [http://dx.doi.org/10.2139/ssrn.3401342]//Lex](http://dx.doi.org/10.2139/ssrn.3401342%5d//Lex) VM

If humans do manage a future in which they travel into and live in space, they will need to change the kinds of embodiments and relations they have in order to survive; to do this, they will need to think in vastly different ways about the nature of technological and scientific projects they undertake. Our societal future imaginings are rife with assumptions about what kind of people are best suited to exist and these have been shaped by the historical positioning and treatment of many marginalized groups. Left unexamined, these assumptions and precedents will likely mutate and iterate into each new environment into which humans spread, and affect every engagement of human and nonhuman relationships. But, if we bring a careful, thorough, and intentional consideration to bear on the project of weaving together biomedical, interpersonal, sociopolitical, and technomoral concerns, then we might be better suited to both do right by those we’ve previously oppressed and agilely adapt to the kinds of concerns that will face us, in the future. As Haraway discusses in her (flawed but possibly still salvageable) “Cyborg Manifesto,” the language of the cybernetic feedback loop does not belong only to humanity as a way to describe its own processes—cybernetic theory and the myth of the cyborg are also frameworks which can be used to describe the cycles and processes of nature, as a whole.[44] Through this understanding, Haraway and others have argued that all of nature is involved in an integrated process of adaptation, augmentation, and implementation which, far from being a simple division between the biological and technological is, instead, a reflexive, co-productive process. Using the theorists and examples above, I’ve argued for an understanding of biotechnological intervention and integration as the truth of our existence with and within technology. Our bodies and minds are shaped by each other and exist as bodyminds, and those bodyminds dictate and are shaped by the technologies with which they interact. In order to carefully construct and live within vastly complex systems, it will be crucial to understanding the lived experiences of those whose embodiments and bodyminds have placed them at a higher likelihood of being marginalized by those who demand a “right kind” of lived experience. Only by allowing them to create a world out of the lessons of their lived experience will we be better able to intentionally craft what this system and its components will learn and how they will develop. What should characterize our understanding of the cyborg, then, is the reflexive, adaptive relationship between the sociotechnical, sociopolitical, ethical, individual, symbolic, and philosophical valences of our various lived experiences. The point in saying that “Cyborgs Have Always Been About Disability, Mental Health, and Marginalization” is not to say that the category of the cyborg should be Disclosed to cyborg anthropologists and philosophers who say “we have always been cyborgs.” Rather, it's about highlighting the fact that a category which was invented specifically to address the lived experiences of marginalized and oppressed people has been co-opted and transformed into a tool by which to erase the experiences of those very same people. We can, and indeed should, still make use of the Harawayan cyborg, the metaphor for entanglement and enmeshment, both as individuals and communities, but we must do so in a way that honours both the original meaning and the evolution of the concept. We must recognize that disabled people, the neurodivergent, trans folx, Black lives, women, queer individuals, and those who sit at the intersection of any number of those components comprise individual lives and communities of experience which are already attuned to changing and adapting to suddenly hostile environments, and it is these kinds of lives which should stand at the vanguard of how we understand what it means to be a cyborg, moving forward. Because the concept of the cyborg was never about a perfectible ideal, it was always about survivability, about coming into a new relational mode with ourselves, our society, and our world.

1. [Williams, Damien P., Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization (June 8, 2019). Available at SSRN: https://ssrn.com/abstract=3401342 or [http://dx.doi.org/10.2139/ssrn.3401342]//Lex](http://dx.doi.org/10.2139/ssrn.3401342%5d//Lex) VM [↑](#footnote-ref-1)