VIRTUAL EMBODIMENT, OR: WHEN I ENTER CYBERSPACE, WHAT BODY WILL I INHABIT?

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ABSTRACT: The following paper attempts to look at virtual reality technologies—and the (dis)embodiment affected by them—through a phenomenological lens. Specifically, augmenting traditional discussions of virtual reality as a purely technical problem, this paper seeks to bring Maurice Merleau-Ponty's embodied phenomenology into the discussion to try to make sense of both what body we leave behind and what body we gain as we enter virtual worlds. To do this, I look both at historical examples of virtual reality technologies and their methods of (dis)integrating the body and speculative future examples of virtual reality where the corporeal body is fully sidelined through the lens of Merleau-Ponty's account of the body schema, noting that habituation is an ever present factor that must be considered in virtual environments. Ultimately, I conclude that even in a scenario of one-to-one mind-computer transference, the virtual world will, like the physical world we currently inhabit, solicit a 'phantom body' thus forcing us to act and live in accordance with a mutual interplay between self and virtual world.

KEYWORDS: Merleau-Ponty; Phenomenology; Virtual reality; Body scheme; Science fiction

INTRODUCTION

The question of "virtual embodiment"—that is to say, embodiment in the world of virtual reality technology, mind-uploading, and whole-brain emulation—has,

very often, been approached through the lenses of technological feasibility,[1] robotics,[2] and cognitive science.[3] While these approaches no doubt have merit—indeed, Linssen and Lemmens' account is, if correct, of profound import to how we understand human finitude in relation to technological advancement—it is my contention that any approach to virtual embodiment which does not find its roots in phenomenology (specifically, the phenomenology of Maurice Merleau-Ponty) will inevitably miss some crucial aspect of what it means to Be-in-the-World. Given that, the following paper aims to begin the process of filling the phenomenological lack in otherwise practical discussions of virtual embodiment. Specifically, in what follows I will attempt to see if Merleau-Ponty's analysis of the body and its schema laid out in the *Phenomenology of Perception* can be successfully applied to various instances of virtual reality.[4] To do this, I will give a phenomenological analysis of *recent* (and to some extent, still currently existent) virtual reality technologies as a starting point while attempting to expand Merleau-Ponty's understanding of embodiment to future virtual technologies. Given the scope of such a paper, a few caveats are necessary.

First, given the speculative nature of future virtual technologies, a number of different varieties exist. For example, the virtual reality of David Cronenberg's 1999 film *eXistenZ* differs in small but important ways from the Wachowski sisters' film of the same year, *The Matrix*. While 'consciousness uploading' occurs in both films, the mind-body problem is made explicit in *The Matrix* where corporeal existence—*i.e.*, the body's existence in the 'real' world—maps one-to-one with virtual existence ("if you die in the Matrix, you die in real life"), physical harm done to the virtual body in the world of *eXistenZ* does not affect the 'real' body. Given the speculative, and therefore incongruous, instantiations of future virtual technologies, we must find common ground to begin our discussion. Due to that, it seems fitting that we 'return to the source' and work off the conception of

[1] Anders Sandberg and Nick Bostrom, *Whole Brain Emulation: A Roadmap*, Technical Report #2008-3 (Oxford: Future of Humanity Institute, 2008); Anders Sandberg, "Feasibility of Whole Brain Emulation," in *Philosophy and Theory of Artificial Intelligence*, ed. Vincent Müller (New York: Springer, 2013): 251–264.

[2] Murray Shanahan, "Whole Brain Emulation," in *The Technological Singularity* (Cambridge: MIT Press, 2015): 15–50.

[3] Charl Linssen and Pieter Lemmens, "Embodiment in Whole-Brain Emulation and its Implications for Death Anxiety," *Journal of Evolution & Technology* 26, No. 1 (July 2016): 1–15.

[4] Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Donald Landes (London: Routledge, 2014).

cyberspace in William Gibson's landmark 1984 cyberpunk novel, *Neuromancer.*[5]

Second, given Merleau-Ponty's extraordinary ***oeuvre*** and intense examination of bodily existence from every angle, various analyses must necessarily be bracketed. While questions about lived vs. geometrical space in relation to virtual realities, for example, are profoundly interesting in their own right, the ***structure*** of the virtual space we enter will largely be bracketed and thus Merleau-Ponty's discussion of the world must be put on hold. Indeed, what I intend to do is look strictly at ***virtual embodiment*** and interrogate the role of ***le corps*** in cyberspace. Given that, the brunt of my analysis will draw on Merleau-Ponty's direct discussion of the body in Part One of the *Phenomenology of Perception.*[6] While Parts Two and Three would no doubt provide valuable insight into this project, they must be held in reserve.

MAINLINING THE VIRTUAL

> "The matrix has its roots in primitive arcade games," said the voice-over, "in early graphics programs and military experimentation with cranial jacks."
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> […]
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> "Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts ... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding…."[7]

This is the description of cyberspace that Henry Case overhears in Gibson's *Neuromancer;* "a consensual hallucination." While not inaccurate, it is, as Case notes a description given on a "[k]id's show" and thus oversimplifies the reality of cyberspace; there is so much more.[8] The cyberspace that Case longs for as an escape from "the prison of his own flesh" is described as a projection of "*dis*embodied consciousness" into a wholly virtual world.[9] Once jacked in, corporeal demands are sidelined and consciousness engages with the constructed world in novel ways.

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[5] William Gibson, *Neuromancer* (New York: Ace Books, 1984).

[6] Merleau-Ponty, *Phenomenology of Perception,* 69–209.

[7] Gibson, *Neuromancer,* 51.

[8] Ibid., 52.

[9] Ibid., 6, 5 (emphasis my own).

As Case begins to journey through the ether with the rouge AI, Wintermute, he finds that cyberspace is more than just swarms of light, it is a space where non-virtual places can be simulated and moved about while former friends take on a new life; things certainly aren't what they appear. Threatening the 'ghost' of his 'dead' friend Julius Dean with a .357 magnum, Case finds out that Wintermute can inhabit and 're-animate' bodies from Case's memory in the virtual, while Case can, in turn, destroy them. "If you use [the .357], you'll see a lot of brains and blood, and it would take me several hours—your subjective-time—to effect another spokesperson."[10] Recognizing futility when he sees it, Case lowers the weapon and talks to the AI inhabiting the virtual body of a dead friend ported directly into his brain via the simulated stimulation device attached to Case's console.

This is the type of future virtual technology that we are dealing with—direct mind-computer transference with no loss of information with the guiding question of our interrogation being 'is Gibson correct in describing this phenomenon as an instantiation of "disembodied consciousness," or is it, rather, a *different type* of embodiment?'

"WHEN I ENTER VIRTUAL REALITY, WHAT BODY WILL I LEAVE BEHIND?"[11]

We must step back, however. Before attempting to answer the question posed at the end of the previous section, we must first look at some of the existent literature on virtual embodiment. With the question, 'what is left behind?' Karen Franck undertakes a post-Merleau-Pontian analysis of virtual embodiment in her 1995 essay, "When I Enter Virtual Reality, What Body Will I Leave Behind?" For Franck, this question is intimately rooted in the technology of her day—crude virtual reality set-ups involving "[a] head-mounted displaying [containing] video monitors" that display the constructed world, a "head tracker" to measure movement, gloves to provide haptic feedback while allowing the user to "manipulate items," "a body suit" allowing for physical representation, and, in

[10] Ibid., 119.

[11] Karen Franck, "When I Enter Virtual Reality, What Body Will I Leave Behind?" in *Architectural Design* No 118: "Architects in Cyberspace," ed. Martin Pearce and Neil Spiller (London: Academy Group, 1995): 20–23.

other systems, "a treadmill and bicycle handlebars" to aid in virtual movement.[12] A far cry from the elegant, direct transference in *Neuromancer,* this crude technology provides us with a place to start as we push Merleau-Ponty to his limits.

For Franck, this crude amalgamation of human and artifact is very clearly physical as, per her comments, "I will have the feeling of occupying those [virtually presented] images with my entire body." Indeed, following Merleau-Ponty's discussion of habit, we can get a clearer picture of *how* the technologies we use to engage with virtual reality, at least in the 1990s, made such realities "very physical."[13] (To head off criticism that we're almost 30 years beyond Franck's essay, only the software of virtual reality technologies have drastically advanced; the hardware has simply been compressed into smaller, more integrated packages. We needn't leave the 1990s to understand Oculus Rift, for example. Indeed, going to a VR 'salon,' one finds small headsets dangling from ceiling mounted wires augmented by small, wireless hand controllers. We have not left Franck's world.)

For Merleau-Ponty, as embodied beings, we have a "body schema." While being a term that dates back to classical psychology, Merleau-Ponty argues that the body schema needs phenomenological updating to place it in contradistinction with classical and mechanistic views of the body. Where classical views of the body would assert that different 'parts' are quasi-independent from one another—that is to say, my left and right hands are in separate, unique 'worlds,' in contrast to the individual with allochiria who experiences cross-body stimulation, for example—Merleau-Ponty argues that the body as a whole is situated in a very particular way and can't simply be reduced down to different parts operating in different worlds. As opposed to merely being "an assemblage of organs juxtaposed in space," we are instead enveloped by our organs in such a way that not only does the body become whole via the progressive and continuous association of parts, but acts done to one part of the

[12] Franck, "When I Enter Virtual Reality, What Body Will I Leave Behind?" 20. Allucquére Rosanne "Sandy" Stone, "Will the Real Body Please Stand Up?: Boundary Stories about Virtual Cultures," in *Cyberspace: First Steps,* ed. Michael Benedikt (Cambridge: The MIT Press, 1992), 81–118: 96.
[13] Franck, "When I Enter Virtual Reality, What Body Will I Leave Behind?" 20.

body resonate throughout its entirety in a field.[14]

This understanding, however, is too simplistic as it implies that the body schema is merely a "*summary* of our bodily experience," taking specific points of movement and giving us the option to synthesize them later in a world of abstraction.[15] For Merleau-Ponty, we must work through another understanding before arriving at a phenomenologically acceptable definition of the body schema.

Gestalt psychology, Merleau-Ponty notes, views the body schema not as "the mere result of associations established in the course of experience, but rather the global awareness of [one's] posture in the inter-sensory world."[16] Indeed, such a conception begins to push back against both the intellectualists and the empiricists who, to recapitulate all too briefly, view Being-in-the-world in terms of the world as a collection of thoughts and judgements about external phenomena, and direct sensory experience of phenomena respectively. That being said, the gestalt conception made "*dynamic*" and postured "toward a certain task" is too physicalistic for Merleau-Ponty as it makes the spatiality of the body positional—oriented towards a given end—as opposed to situational—always related to the world as a whole.[17] In a word, the distinction between positionality and situationality is that where the former posits a given end to start with, the latter remains open to the potentialities of the world.

Thus, for Merleau-Ponty, the phenomenologically apt description of the body schema is one that views the body as always-already involved in the world *without our thinking about it.* Specifically, the spatiality of the body is not a static spatiality of existence of given points laid "side by side," but rather is an opening up of the body onto the world as a whole. Given that, the body schema is best seen phenomenologically not as a manner of *understanding* and *rationalizing* the positionality of the body, as was emphasized by classical psychology, but rather ought to be seen as "*a manner of expressing*" the body "in and toward the world."[18] The body is thus considered a zone of Becoming, always opening on to the

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[14] Merleau-Ponty, *Phenomenology of Perception*, 100–101.
[15] Ibid., 101.
[16] Ibid., 102.
[17] Ibid.
[18] Ibid., 103 (emphasis my own).

horizon of a world filled with objects. For example, the hands that type this are not only enmeshed in a whole body that they are a part of and which gives itself to me to use while remaining pre-conscious as I intuitively know the spatiality of the rest of my body, but they are also engaged directly with objects in the world to varying degrees. My hands are most directly engaged with the keyboard, functioning as an extension of my body, but they are also engaged with my entire mental attitude as various quasi-indeterminate items—for example, the can of soda next to me—can solicit action and thus change what I focus on.

Further, physical objects that I engage with don't just become tools in the stereotypically Heideggerian sense, rather they become incorporated into my body schema.[19] For Merleau-Ponty, however, what this actually means is very different from classic or cyborgian views of technology seen as a literal extension of the body *as such*. As opposed to a Cronenberg-esque body-horror vision where a gun melts into me as my hand devours the cold steel *à la Videodrome* (1983), Merleau-Ponty argues that the usage of tools is tantamount to a new bodily "habit" wherein the entire body schema becomes morphed.[20] While it's important to note that habituation, for Merleau-Ponty, stands in sharp contradistinction to traditional views of the psychology of the body insofar as habituation is "systematic" and involves a process of "motor consecration" wherein our body takes up various acts 'unconsciously' as opposed to habit as cognition where we decompose and analyze certain acts and then "recompose" them to churn out a new activity, our discussion must focus not on the *acquisition* of habits, but rather the *expression* of such habits.[21]

The feather in a woman's hat or the car I drive, for example, become, quite unconsciously, integrated into our respective modes of Being-in-the-world such that as the woman walks down the street, "she senses where the feather is" and makes bodily adjustments so as to avoid bumping it into things. Likewise, as I drive down a narrow street, I have an 'intuitive' sense of how wide my new, mechanical body is, and thus I recognize spaces that I can fit into. The important point for Merleau-Ponty, however, is that both of these actions cease to be

[19] Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson (New York: Harper and Row, 1962), 97–98, 102–103.
[20] Merleau-Ponty, *Phenomenology of Perception*, 143–148, 103.
[21] Ibid., 143–144.

instances of cognization where the woman would recall the length of her feather and compare it to her distance from a pole, for example, or where I would compare "the width of [a] lane to that of [my] fender." Instead, the objects are incorporated into our respective body schemas in such a way that "just as we sense where our hand is," we 'sense' where our objects end.[22]

Furthermore, there is a dual sense in which extra-bodily objects become incorporated into our body schema. Unlike the cyborgian/Cronenbergian view whereby objects are strictly assimilated into my body schema, there is an interplay harkening back to Merleau-Ponty's 'subject-object dialogue' whereby both the subject and the object engage in a mutual solicitation of each other by the object gathering "the subject's intentions" and the subject taking "up the sense [possible modes of Being] scattered across the object."[23] Specifically, the objects I utilize become co-constitutive of me in such a way that as I become acquainted with them—that is to say, begin to intuitively know their limits—I not only "take up residence in them" by imposing myself onto them and assimilating them, but they become fully ensconced within my world by participating "within the volumionosity" of my body. As Merleau-Ponty notes, habituation of this sort—a reciprocal engagement with objects—is a way of expanding our body schema by either "dilating our being in the world, or of altering our existence through incorporating new instruments."[24]

Such an understanding of the body schema and habituation can help us understand Franck's usage of crude virtual reality technology. As she notes, to enter virtual reality she must fully engage with technology by placing "different kinds of equipment on or around [her] body." The introduction of headsets, gloves, motion trackers, etc., become fully incorporated into her bodily field such that even when her perceptual field is augmented (or fully changed), her "experience of virtual reality *depends upon [her] physical body's movement*."[25] After being in dialogue with the technological artifacts which allow for virtual interaction, the body becomes acquainted with them and, in the case of virtual reality, not only is the 'real' world "dilated" by the addition of bodily

[22] Ibid., 144.
[23] Ibid., 134.
[24] Ibid., 145.
[25] Franck, "When I Enter Virtual Reality, What Body Will I Leave Behind?" 20 (emphasis my own).

augmentations, but "the video monitors which will form stereoscopic images before [one's] eyes" engulf the self and open up a massive virtual horizon where our perceptual field is radically changed.[26]

For Franck, however, this change is not disembodiment, as crude virtual reality technology still relies upon the body as an indispensable substrate. Mirroring Merleau-Ponty's analysis of the subject-world relationship where, as Taylor Carmen notes, having a body "in turn means *inhabiting* a world," Franck points out that when entering virtual reality, one is not leaving behind their body—as without my physical body, "I am in no world at all"—but instead one is leaving "behind a particular kind of 'being in the world,'" a Being-in-the-world that is constrained by various physical limitations.[27] Indeed, Franck notes that in virtual reality, the rules of the construct govern how one experiences the virtual world as "[t]he objects we see or create have very different visual and kinesthetic qualities from those in the physical world" and that this radically different relationship to the world around us solicits "another kind [of Being-in-the-world] instead."[28] Although Franck, when she enters virtual reality, will "be the same physical body," her feeling of herself is changed as she "is constituted by [her] relationships to all that is not [her]."[29] While typically seen as "an *escape* from physical reality," such new modes of Being-in-the-world might, in fact, force us to have a "greater appreciation of flesh and matter" as, at least in Franck's time, the "[v]irtual and physical can be seen and made to be interdependent and complimentary."[30]

OUT OF (MEAT)SPACE

> Downing a handful of beta-phenethylamine tabs, chased only with the warm whisky from the night before, we rush for the console and jack-in. Electricity shoots through our body and makes the hairs on our neck stand up like so many arms reaching out for food. One minute we're 'here,' the next, we're 'there.' Taut skin giving way to free-flowing electrons, we have a new body, a new Being-in-the-

[26] Ibid.

[27] Taylor Carmen, "Forward," in *Phenomenology of Perception*, trans. Donald Landes (London: Routledge, 2014), vii–xvi: x. Franck, "When I Enter Virtual Reality, What Body Will I Leave Behind?" 20.

[28] Ibid., 20.

[29] Ibid., 21.

[30] Ibid., 22-23.

world.

The world of cyberspace that Case longs for is a leap ahead of Franck's virtual reality. While still trapped by the body insofar as he was reliant on its continual existence for his Being-in-*any*-world to exist, in the world of *Neuromancer,* movement of the virtual body does not depend upon movement of the physical body.[31] With his basic needs taken care of, Case could physically remain completely sedentary while exploring the "curve of [a] beach" which concealed a far-off city. Despite being bundled in his clothes and watched over by Maelcum, the Zionite guarding him with a Remington shotgun, Case's bodily experience took a sharp turn after he jacked in as "[c]yberspace, as the deck presented it, had no particular relationship with the deck's physical whereabouts."[32] While physically in the rustically decorated and book filled hallway of Tessier-Ashpool's Villa Straylight, Case was *also* listening to gulls cry as "[s]and stung his cheek."[33] Indeed, "crouched on his haunches on the damp sand, his arms wrapped tight across his knees," Case shook.[34] Classically corporeal needs taken care of, Case now had to contend with a different, but equally powerful world—one where he was stranded and cold, "tucking his fingers beneath his arms for warmth" and eventually throwing driftwood on a small fire. "None of this was real, but cold was cold" and a world was a world.[35]

The question that now arises is 'can we use Merleau-Ponty to make sense of such a differently embodied situation; a situation where "everything, including bodies, exists as something close to a metaphor"'?[36] It is here that we must turn to Merleau-Ponty's analysis of the phantom limb phenomenon as a starting point to draw an analogy between amputee and limb, and Case and virtual body.

For Merleau-Ponty, the phantom limb phenomenon is an interesting test case to examine the interrelatedness of the physiological and the psychological, as the phantom limb appears to be related both to physical and psychical health. Indeed, the phantom limb is clearly somewhat physical insofar as it "disappears when the sensory conductors that run to the brain are severed," but it must also

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[31] Gibson, *Neuromancer,* 59.
[32] Ibid., 106.
[33] Ibid., 233.
[34] Ibid., 233.
[35] Ibid., 234-235.
[36] Stone, "Will the Real Body Please Stand Up?" 104.

be psychical insofar as the emergence of a phantom limb seems to arise when an individual experiences "an emotion or a situation [which] evokes [memories] of [an] injury" sustained to the initial limb. This dual nature is further affirmed when Merleau-Ponty notes that a pure psychological description makes it "inconceivable how [the phantom limb] can *also* result from the personal history of the patient."[37] There must then be a blending between the two. That being said, it is insufficient to say that the phenomenon of the phantom limb is merely a combination of physiological symptoms and psychical anomalies insofar as the phantom limb engages in action, in some instances doing so pre-consciously.[38] Therefore, the individual's pre-thetic and intrinsic *orientation toward the world* must be considered.

Noting the behavior of insects that lose a leg vs. those that have two legs tied together, Merleau-Ponty explains that in the case of the former, the insect "instinctively substitutes a healthy leg for the leg that has been removed" not out of a 'conscious' desire to achieve its aims or via a built-in "safety mechanism." Indeed, if the latter were the case, then the tied leg would be substituted as well as when the insect would have n-1 usable legs. This, however, is not what happens; "[t]he tied limb is not replaced […] because the tied one continues to count in the animal's being." Given that, we can infer that something else is going on. For Merleau-Ponty, the explanation for this phenomenon lies in the insect's orientation toward, and mutual envelopment with, the world.[39] Specifically, the insect lives in a world that solicits it in different ways while its body schema enters into a mutual interplay with the world such that an "'open' situation" is created where the insect's movements are called for on an instinctual or pre-thetic level. Further, this mutual interplay situates the insect in a specific milieu, its "being in the world," that reflexively draws out certain actions as the world "calls for the animal's movement—just as the first notes of the melody call for a certain mode of resolution—without thereby being known for itself." For Merleau-Ponty, it is this determination by the subject-world relationship that explains the aforementioned phenomenon and "allows the limbs to be interchangeable."[40]

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[37] Merleau-Ponty, *Phenomenology of Perception*, 79.
[38] Ibid., 80.
[39] Ibid.
[40] Ibid., 81.

What's vital for Merleau-Ponty is that all the aforementioned actions occur "pre-objective[ly]" and thus operate on a similar level as habits described above. This "pre-objective perspective" is what is characteristic of "being in the world" and is able to "establish the junction of the [quasi-thetic] 'psychical' and the [biologically objective] 'physiological.'" Our blending (note: not a "mixed" and therefore muddied explanation) between the psychical and the physical thus manifests in a form incorporating both and results in a Being-in-the-world where we are always-already oriented toward the world, and vice versa.[41]

The above discussion of the alternative to the strict dichotomy between the psychical and the physical is of vital importance for Merleau-Ponty's understanding of the phantom limb phenomenon as it is something he doesn't think can be reduced to either side. The classical physiological explanation of the phantom limb would interpret the phenomenon "as the mere supersession […] of interoceptive stimulations" such that the 'limb' is "a part of the body's representation that should not be given, since the corresponding limb is in fact absent." The psychological understanding would posit that "the phantom limb becomes a memory, a positive judgement, or a perception" and thus, in the mind of the individual in question, becomes a "representation of an actual presence." For Merleau-Ponty, while the former is too physically reductive, the latter is too psychically reductive. Specifically, both understandings of the phantom limb firmly place us in a specific relation with the "objective world" where "presence and absence" are the only two legitimate categories.[42] Indeed, such a binarism, without recourse to phenomenological analysis, cannot explain why, "[i]n the case of the phantom limb, the subject certainly seems to be unaware of the mutilation and counts on [their] phantom limb as if on a real limb" to the point that *failures are not discouraging*.[43]

Thus, to apply a phenomenological understanding to the phantom limb, Merleau-Ponty expands upon the analysis above. Specifically, he argues that despite the physical lack of a limb, the orientation of the body schema toward the world is such that the limb is *assumed*—the body is "'available' as an indivisible

[41] Ibid., 82.
[42] Ibid.
[43] Ibid., 83.

power and that the phantom leg is sensed as vaguely implicated in it"—and "allow[ed] for" in the individual's body-world relationship.[44] In other words, not only does the world make necessary the 'existence' of the limb by calling for certain actions from the individual which can only be accomplished by the limb, but the individual's existence in a world that requires mobility implicates a limb that may not physically be there. In a word, the world *creates the limb.*[45] As Merleau-Ponty neatly sums up, the phantom limb phenomenon, when stripped of reductive explanations, can "be understood from the perspective of being in the world. What refuses the mutilation or the deficiency in us is an I that is engaged in a certain physical and inter-human world, an I that *continues to tend toward its world despite deficiencies or amputations.*"[46]

Dixie Flatline, a ROM construct of McCoy Pauly, captures this spirit in a morbidly humorous way:

> Had me this buddy in the Russian camp, Siberia, his thumb was frostbit. Medics came by and they cut it off. Month later he's tossin' all night. Elroy, I said, what's eatin' you? Goddam thumb's itchin', he says. So I told him, scratch it. McCoy, he says, it's the other goddam thumb.[47]

We can understand the position of attempting to use an arm that's no longer there or itching an amputated thumb, in part, through reference back to habituation and the body schema. Were my right arm to suddenly disappear, I would, as per Merleau-Ponty's view, not cognize the absence, but, in some ways, intuitively sense the absence by way of, for example, tacitly recognizing that I can fit through slightly smaller spaces. Further, and of more relevance to our current discussion, when engaged in an activity, the world would solicit me pre-consciously and create the phantom limb as the world I occupy right now—that is to say, my desk where I can do multiple things at once with different limbs—is one that requires a right arm. The can to my right would beckon for me to pick it up and even though I couldn't pick it up with my right arm as there would be no such physical thing, a phantom arm would be projected, thus allowing me to

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[44] Ibid.

[45] Obviously, Merleau-Ponty's examples are contentious within the realm of disabilities studies, and I leave his work as an artifact to the be dealt with by others more well versed in such literature.

[46] Merleau-Ponty, *Phenomenology of Perception*, 83 (emphasis my own).

[47] Gibson, *Neuromancer, 106*.

'engage' with my world. As Merleau-Ponty says, my "body is the vehicle of being in the world and, for a living being, having a body means being united with a definite milieu." This relationship creates a "complete world" wherein "the impulse of movement that goes toward it […] still figures." While the body may be the "unperceived term" in the human-world relationship, it is also the term that is created by the mobile and manipulatable structure of the world.[48]

Thus, our Being-in-the-world situates us in a myriad of specific relations that draw forth action from us, even if we are physically incapable of performing the action. Such a solicitation and situation create the conditions whereby two types of bodies arise: habitual and actual. The solicitation of the world onto us by a stone calling for our grasp, for example, creates a two-fold transformation. First, the object soliciting us changes from an object-for-us—that is to say, "something that I [can] currently manipulate"—into an object-in-itself—that is to say, "something *one* can [theoretically] manipulate"; the object becomes *the type of thing* that can call forth certain actions. Additionally, this transformation is concurrent with a transformation in the body from an "actual body" that has various limitations based on amputation, for example, into a "habitual body" that is in synergy with the world via an intentionality toward objects that are given to us. Ultimately, "[b]y carrying myself toward a world, I throw my perceptual intentions and my practical intentions against objects that appear to me" thus creating a new body.[49]

Such a view of the phantom limb, not as a strict lack but rather as a partial void that can be filled by the world, can help us make sense of Case's 're-embodied' experience in cyberspace where his physical body is entirely absent but a very real virtual one takes its place. As Case lies prone, unaware of his physical surroundings and jacked into one of Villa Straylight's terminals, he exits his physical body and enters cyberspace. As he is 'walking' along the beach where Wintermute stranded him, we are left to ask, 'what body is Case inhabiting?' Indeed, he appears to be in two places at once. Following our understanding of the phantom limb as a limb that is, in large part, created by the world and exists as part of a habitual body, we can begin to take Merleau-Ponty to his limits by

[48] Merleau-Ponty, *Phenomenology of Perception*, 84.
[49] Ibid., 84–85.

looking not just at a phantom limb, but at a *phantom body.* When Case is fully immersed in cyberspace and his physical body becomes merely one substratum upon which his existence relies, his Being-in-the-world is radically changed. He is no longer oriented toward the physical world, but rather toward the virtual world. Thus, even with the removal of the physical body in complete virtual reality, there is a virtual world that opens on to us and solicits us, actuating a continuation of Being-in-the-world. Where Merleau-Ponty says that "[t]he body is the vehicle of being in the world," we can just as easily say, with recourse to his analysis of the phantom limb being "implicated" and created by the world, that Being-in-the-world is the generative state of a body. Thus, when fully immersed in virtual reality where our virtual body is guided by our mental movements, we can still make sense of embodiment by virtue of our orientation toward the constructed world. Since the body is in a constant state of flux with respect to the world, a radically different world such as that of virtual reality will solicit whatever type of body is appropriate. In a word: the virtual world draws out and establishes a virtual body.[50]

Furthermore, even if we are unwilling to make the leap and invert Merleau-Ponty's body-Being-in-the-world relationship above, we can note that a virtual body can still be created under a rigid and non-revisionist reading. Indeed, if we take the claim that "[t]he body is the vehicle of being in the world" seriously and bracket any inversion such as was done above, we can rephrase Merleau-Ponty's maxim to state that 'the body is a precondition for Being-in-the-world.'[51] Given this, if there is Being-in-the-world, then there must necessarily be a body *of some sort;* all that is left for us to do is determine what type of body that is. Thus, the simple absence of a physical body need not be a concern, as the world solicits whatever type of body it needs from us. In a digital environment, therefore, a digital body will be established and, just as the patient with the phantom limb has a "preconscious knowledge" of the limb's existence while relying upon it in certain scenarios that require its movement (as it still "tend[s] toward its world"), the 'disembodied' subject becomes 'phantomized' as the whole body, not just a limb, is created. "[Case, therefore,] has not lost his [body] because he continues to

[50] Ibid., 84, 83.
[51] Ibid., 84.

allow for it"—it is on the "horizon of his life" and is called forth by the world.[52] While the virtual world, and thus the body it solicits, will depend upon a myriad of different factors—*e.g.*, design concerns, attempts to mitigate power relationships, etc.—its existence as a world that we can inhabit and Be-in, and indeed, can manipulate, means that *some form of embodiment* will occur.

FURTHER AND FUTURE CONSIDERATIONS

Pushing the bounds of what we can know, a further question must be asked: what happens when we remove the body entirely? All instances of virtual reality technology that we have looked at thus far—from crude virtual reality interfaces that "shackle the body with goggles, gloves, and datasuits," to "disembodied consciousness[es]" to now prevalent Oculus Rift technology which is merely an integration of "goggles, gloves, and datasuits" into one head unit—still rely on a fleshy substrate for basic existence and are, in some sense, still physically situated.[53] Case's romps through cyberspace may seem utterly foreign, but as noted above, the physical body *as such* still has primacy. Indeed, in both Franck's analysis and Case's experience, without the body there can be no virtual existence. Or can there? What are we to make of so-called whole-brain emulation? While a rigorous analysis of whole-brain emulation and all of its phenomenological implications is far beyond the scope of this paper, we can start by stating the speculative problems, isolating the philosophical assumptions, and see what a 21st century Merleau-Ponty might say.

Whole-brain emulation, as per Sandberg and Bostrom, is the idea that we can map a brain and "construct a software model of it that is so faithful to the original that, when run on appropriate hardware, it will behave in essentially the same way as the original brain." Indeed, for Sandberg and Bostrom, this is the *true* one-to-one virtual experience, as an emulation "mimics the internal causal dynamics" of a system and produces, in theory, the same output as the physical original. Thus, if whole-brain emulation were to be possible, the physical body could be done away with entirely with brain data stored indefinitely while

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[52] Ibid., 83.

[53] Michael Heim, *The Metaphysics of Virtual Reality* (Oxford: Oxford University Press, 1993), 80. Gibson, *Neuromancer*, 5.

'consciousness' could exist virtually.[54] It is important to note that while numerous methodological questions arise—that is to say, 'how are we mapping the brain?' 'Is memory of having had a body retained?' 'Is there a meta-awareness of the constructed nature of the simulation?' Etc.—we will bracket those and focus instead on the phenomena that arise *after* the emulation, thereby ignoring any prior questions about the type of body the brain was emulated from, memories of the prior body, etc. Indeed, we will simply consider the emulation in a vacuum.

Apart from the obvious technical hurdles which Sandberg and Bostrom attempt to address (and are themselves the subject of entirely different debates), there are larger philosophical issues that need to be answered.[55] Where virtual embodiment in the form of Case in *Neuromancer* already implicitly flirted with this issue, the mind-body problem becomes foregrounded in whole-brain emulation. Indeed, for whole brain emulation to make sense, or at least *"mind"* and *"person emulation"*—with the former being an emulation able to "produce the phenomenological effects of a mind" and the latter being an emulation able to recreate "a particular mind"—to make sense, there has to be a strict dualism between anything physical and the mind as such.[56] Further, not only is the computational theory of the mind at work at here, but the largest philosophical assumptions that Sandberg and Bostrom make—and they recognize this—are the assumptions of physicalism and pure materialism. While they note that physicalism "is a convenient but not necessary assumption," I'm unsure of the latter half of the claim and thus suspect that, at the very least, physicalism is an assumption that is technically required, and, at the most, is an assumption that will always loom in the background. Regardless, we can accept physicalism without too much of a fuss and leave any conceptual roadblocks aside.[57]

Linssen and Lemmens, in their discussion whole-brain emulation as a response to death anxiety, seem to provide one explanation of how such embodiment might work. Linssen and Lemmens begin by drawing upon the interrelated nature of embodiment and material substrate inasmuch as there seems to be an inexorable link between the brain, with all its activity, and some

[54] Sandberg and Bostrom, *Whole Brain Emulation*, 7.
[55] Ibid., 16–28, 40–72.
[56] Ibid., 7–8.
[57] Ibid., 15.

physical substrate. Indeed, where an emulated brain would be run on a computer, the human body can be seen as a form of "wetware" whereby the brain is running on the body. Thus, whole-brain emulation merely is a change "from a biological substrate to the substrate of a computer."[58]

Further, for them embodiment is a term of art referring to the linkage between the world we interact with (our "embeddedness") and the physical substrate in which our brain-data are housed. As they note, embodiment "constitutes a necessary bridge between the objects and phenomena that exist in the environment and the spike in signals of the nervous system." Thus, in whole-brain emulation, embodiment is distinct from the material substrate holding the brain-data insofar as embodiment is bound up with the act of perception: "Embodiment in WBE [whole-brain emulation] should thus refer to the body and environment that we perceive to be physically real, even though it may not actually exist in the real world."[59]

Might we expand upon this account, however? For Merleau-Ponty writing in 1945, the body clearly meant the physical substrate of meat upon which we rely. With advancements in cybernetic technologies, however, that definition of the body may be outdated. Performance artist Stelarc, who views the strictly physical body as obsolete, is a perfect example of this. For him, not only does "[t]he body [need] to be repositioned from the psycho realm of the biological to the cyber zone of interface and extension," but "[t]he information explosion" and "[i]nvading technology eliminates skin as a significant site, an adequate barrier between public space and physiological tract." Thus, for him the body becomes not a static entity, but rather "an object for designing."[60] If we're to understand the body in the late-20th-early-21st century as an amalgamation of human and machine, why not extend that further and apply the status of 'body' to the hardware that the whole-brain emulations run on? Indeed, if whole-brain emulation serves to recreate, one-to-one, the phenomenological experiences of

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[58] Linssen and Lemmens, "Embodiment in Whole-Brain Emulation and its Implications for Death Anxiety," 4.

[59] Ibid.

[60] Stelarc, "Towards the Post Human: From Psycho-body to Cyber-system," in *Architectural Design* No 118: "Architects in Cyberspace," ed. Martin Pearce and Neil Spiller (London: Academy Group, 1995), 91–96: 91, 93 (formatting removed).

subjects and, as noted above, subjects are embodied, what else but a new body could the computational hardware be?

Furthermore, such constructs in which the emulated brain exist would themselves serve as a definite world for the emulated brain and thus, if we are to take Merleau-Ponty seriously, would themselves solicit a new Being-in-the-World, and subsequently a virtual body, that would be appropriate for the cyberspace. Where Linssen and Lemmens limit their discussion to substrates as traditionally understood, the pace of technology doesn't rule out using the universe itself as a substrate, as is the case in Isaac Asimov's short-story "The Last Question" (1956).[61] In the story, told in exponentially increasing periods of time, humans begin to merge with machines that begin to merge with each other to make up the "Cosmic AC," a computer "in hyperspace and made of something that was neither matter nor energy," a truly independent and yet materially transcendent substrate which housed trillions of minds that "freely melted one into the other."[62] Such a form of existence where there are still conscious beings (albeit existing at a highly abstract level) would thus raise the question of 'what would embodiment then look like?' It seems as if this level of abstracted embodiment is no longer reliant upon any substrate in any traditional sense of the word. Here we truly have "disembodied consciousness." What such an existence would look like is, of course, not only open to speculation, but is contingent upon the design of the construct itself. One thing is for sure, however: If "having a body [merely] means being united with a definite milieu," then the world of the virtual construct would itself act as a quasi-substrate, soliciting a certain kind of behavior from the minds within it.[63] In a manner similar to how the world solicited the physical body of Merleau-Ponty in the 1940s, such a radical future world would solicit the very consciousness of a future intelligence in such a way that a body would be co-constitutive with Being-in-the-Construct.

If we are willing to bring Merleau-Ponty into the future with us and not cling to our flesh *as if it were the body*, then perhaps we can develop a fully virtual phenomenology.

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[61] Isaac Asimov, "The Last Question," in *The Complete Stories, Vol. 1* (New York: Foundation Books, 1990): 290–300.

[62] Asimov, "The Last Question," 299, 298.

[63] Merleau-Ponty, *Phenomenology of Perception*, 84.