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The Ghostularity

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Figure 1 –the Ghostularity.

In 2013, futurist Ray Kurzweil predicted that Whole Brain Emulation (WBE) will be possible by 2045, a project endorsed by Russian investor Dmitry Itskov in creating the “2045 Initiative.” “This project aims to create technologies enabling the transfer of a (sic) individual’s personality to a more advanced non-biological carrier, and extending life, including to the point of immortality.”¹ Proponents foresee four stages in this path toward cybernetic eternity. Avatar A (2015-2020) would involve a brain able to remotely control a robot body via a Brain-Computer Interface (BCI). Avatar B (2020-2025) would realize the uncanny nightmare of innumerable pulp writers: transplantation of a human brain into a new vessel. Avatar C (2030-2035) would see “human personality” transferred into an artificial brain, the prelude to Avatar D (2040-2045) in which a “hologram-like avatar” becomes the ultimate repository of human consciousness. Such prognosticating

¹2045 Strategic Social Initiative, <http://2045.com/read-us/>

advances Kurzweil's earlier predictions in *The Age of Spiritual Machines* (1999), *The Singularity is Near* (2005), and *How to Create a Mind* (2012)—the destiny of the species is to augment and then exit the body through technology.²

But what if WBE is a trick? Not a figurative trick of some kind, but a literal one, an attempt (on the part of something or someone) to translate and trap all of humanity in digital code--*never to return*. After all, most reasonable experts on the paranormal agree that ghosts are analog creatures, specters of Being that are now *being-in-the-otherworld*. Access to the electromagnetic spectrum proved a fortuitous event for the dead--at last the secrets of eternity could be transmitted back onto the mortal plain to help those of us still on earth. But while psychic researchers have worked diligently over the past century to perfect this technology—the Psychophone, EVP, Spiricom, “Frank’s Box”—communication with the dead remains erratic, the reception poor.³ If Being and our tiny allotments of the *dasein-of-the-dead* are indeed analog phenomena, a product of continuous fields of energy, the recent advent of digital hyper-materialism and the looming “transcendence” of WBE portend nothing less than our collective purgatory, perhaps even the ultimate form of “soul murder.”⁴ Ghosts understand,

² Ray Kurzweil, *The age of spiritual machines: When computers exceed human intelligence*. New York: Penguin, 2000; *The singularity is near: When humans transcend biology*. New York: Penguin, 2005; *How to create a mind: The secret of human thought revealed*. New York: Penguin, 2012.

³ The “psychophone” was Thomas Edison’s device for contacting the dead. EVP stands for Electronic Voice Phenomena, the practice of listening for departed spirits using radios, tape/digital recorders, and other electronics. Attila von Szalay is thought to have made the first attempts to record the voices of the dead in 1941 using a 78rpm record player. Historians of paranormal research generally credit Friedrich Jürgenson with “discovering” EVP. In 1959, listening to birdcalls recorded through an open window in his house, Jürgenson heard the voices of his deceased father and wife during playback of the tape. After learning of Jürgenson’s experiments, Konstantin Raudive popularized EVP with the 1968 publication of *Breakthrough: An Amazing Experiment in Electronic Communication with the Dead*, a book detailing his own experiments in electronic contact with the dead. Utilizing plans transmitted from the spirit world by a deceased engineer, William O’Neill debuted “Spiricom” in 1980, a device that allowed for “real-time” two-way communications between the living and the dead. EVP research in recent years has centered on the construction of “boxes” specially designed to capture spirit voices by reducing the signal/noise ratio in earlier forms of electronic contact. Particularly influential in this respect is “Frank’s Box” (also known as a “Ghost Box”), created by Frank Sumption.

⁴ Confined to an asylum and under psychic attack by his physician (or, more accurately, by renegade factions of his physician’s soul), noted psychotic Daniel Paul Schreber

from their superior position of elsewhere-ness, that WBE is a blind alley, a dead-end, a glue-trap for the soul. We can only hope that the ghosts are redoubling their efforts to impart a simple lesson: existence depends on the unfathomable space between the integers, the gaps between “one and zero,” the occult spin of quark and charm. And if they (or we) do not truly “breakthrough” soon, clearly and unequivocally, they may be lost to us and we to them.⁵

Happily for those of analog faith, there remain a number of minor issues to resolve before WBE can proceed in earnest, time enough, perhaps, for ghosts to solve the problem of telecommunications with the mortal world. For example, the 2045 Initiative’s hierarchy of Avatars (A, B, C, D) describes a theoretical research program of inexorable progress toward the digital disincorporation of WBE. In practice, however, this quest to evacuate the meat puppetry of the pre-anthropocene may have a few detours in store for us. For example, the Initiative’s Avatar-system describes not only a linear progression of A to D, but also an implicit hierarchy of Avatars. Presumably, it is more desirable to exist as Avatar D (hologram-like) than as Avatar C (artificial brain), which in turn is more desirable than Avatar B (meat brain implanted into a new vessel, perhaps a vat or bubbling aquarium of some kind).⁶ Given the generally unavoidable factors of

described the plot against him as an attempt at “soul murder,” a complicated (and shifting) scheme to destroy his soul through a constant excitation of his nervous energy. For a more complete account, see Daniel Paul Schreber, *Memoirs of my nervous illness*. New York: New York Review of Books, 1955.

⁵ Many whom have been diagnosed as “paranoid” or “schizophrenic” believe it is already too late, that the computer-transfer has already occurred. One such individual is Diane Napolis, a former social worker in San Diego who attracted press attention in 2003 after her conviction for stalking actress Jennifer Love Hewitt. A blog post from 2011 details our current dilemma: “*We are in a Simulated Augmented Reality We are no longer located in the space time we once were but it appears that the planet has been teleported by Quantum Computer Technology by an alien race Details are available in a future document There is a Pseudo light source which passes for the Sun and the Moon but it is not our Sun or Moon We are not located in the same space and time that we were in 2008 Instead it appears that we are in an artificial greenhouse with in an astral field Various alien groups are playing Gods in this program and want the power of life and death over their victims The perpetrators are brutal animals with various degrees of intelligence and some speak English Their physical forms vary based for several reasons*” See <http://diananapolis.wordpress.com/> (11 October 2011)

⁶ Avatar A—a human brain controlling a remote robot through a Brain-Computer Interface (BCI)—is presumably an intermediate step necessary to achieve Avatars B, C, and D, given that Avatar A does nothing to rescue the ego from its fate as a captive to organic matter.

economic stratification, uneven technological access, and lingering attachment to the world of flesh, one has to assume there will be no simultaneous mass exodus into Avatars C and D. How, then, will this migration be managed? How will an ego “trade-up” from existing as a brain-in-a-vat to a full-fledged holographic Avatar (keeping in mind that a brain in a vat, though perhaps capable of a much longer life, nevertheless remains vulnerable to the hazards of the physical world--from continuing organic deterioration to the Pepsi Syndrome).⁷ If the current political economy of modern technocracy is any indication, access to the Avatar system and its upgrades will no doubt be market-driven. There is a good chance our first digital immortals will be the aging industrialists, professional athletes, and A-list celebrities who have sufficient capital to enter into the Avatar “rat-race” of advancing from floating brain to pure hologram.⁸ Perhaps as a gesture of goodwill, these same market forces might subsidize the uploading of another highly desirable community (Mensa members and MacArthur Genius grant recipients come to mind, for example). For everyone else, however, finding the necessary resources to break the Avatar ceiling will no doubt prove arduous, leading to a future where families may very well celebrate the first child to live as an artificial brain much as today they celebrate the first child to attend college.

With Avatar D status theoretically available but extremely competitive, the question also arises as to how those suspended in Avatars B and C will work their way up to the superior models. There are two possibilities: 1). The original meat-person possesses such immense wealth that his or her migration to higher Avatars can be “pre-paid” in perpetuity; or 2). The “lower” Avatars will need to engage in some form of productive labor to earn the necessary capital to make the migration to a higher level. What kind of work can a brain-in-a-vat perform? In science-fiction, such entities have been capable of nothing less than conquering the world through their enhanced abilities in telepathy and telekinesis. But that is science-fiction. In the real world of WBE, a brain-in-a-vat (as well as Avatar C, the artificial brain) will need to perform some manner of “brain work” appropriate to

⁷ “The Pepsi Syndrome” derives from a comedy sketch that appeared on *Saturday Night Live* in 1975. Parodying *The China Syndrome* (1975)—a hit movie about a catastrophic accident at a nuclear power facility--the sketch depicted nuclear technicians causing a core meltdown by accidentally knocking over an open can of Pepsi on the plant’s control board. “The Pepsi Syndrome” has since become a vernacular term describing the unpredictable collision of complex technologies and human error.

⁸ Before the catastrophic crash of Virgin Galactic Spaceship 2 during a test flight on October 31, 2014, billionaire Richard Branson had hoped the first commercial tourist flights into space would begin in the spring of 2015. Among those who had pre-paid the \$250,000 price for a ticket to space were Lady Gaga, Tom Hanks, and Justin Bieber.

its new circumstances. Data-processing comes to mind, or perhaps some form of disembodied global surveillance (assuming of course that the ego-data will have the ability to migrate through the Net). Moreover, market-driven brain suspension will require continuing investments of capital, so Avatars at every level will need to be encouraged to acquire various upgrades and accessories to keep the money flowing. The Apple corporation has demonstrated great success in this regard, so perhaps they can take the lead in orchestrating desire among Avatars for new hardware designs and “brain-packs” that expand the affordances of Avatar consciousness. There are also whole new horizons in lost dongles and obsolescent fire-wire interfaces to consider, not to mention the inevitable upgrades to Avatars E, F, G, and beyond.

Who will remain behind to service the vast technical infrastructure necessary to maintain Avatars B, C, and D? Brain-tanks need to be cleaned. Software needs to be updated. Back-up generators must be maintained.⁹ The most obvious candidates for such work are those who are unable to achieve even the lowly status of Avatar B, either from lack of funds or intelligence. If we leave them behind to service our surgically scooped brains and mainframe emulation programs, however, will they do this work willingly? Can we trust them? After all, once the more elite egos become digital information, they sacrifice any individual ability to respond to the various threats and indignities perpetrated by burly infrastructure workers. They might simply unplug us. Short of this existential threat, unsupervised meat workers could easily engage in the pranks so often seen among alienated labor. Clearly, Avatars B, C, and D will require some form of collective disciplinary interface with the meat world to insure a proper maintenance program and to deter random acts of sabotage. Much of this discipline might be maintained by awarding the infrastructure workers some form of monetary unit that, when accumulated in sufficient amounts, would allow for their own Avatar conversion. This would be a complicated and delicate system, however, in that it must ensure that earning the necessary units would take many, many years, thus assuring long-term continuity in infrastructure maintenance while also preventing massive waves of sudden immigration into the Avatar vats, simulacra, and holograms. This system would necessarily be hierarchal, much like the Avatars themselves, so that the “management classes” closer to achieving Avatar status would remain invested in extracting the necessary labor power from the rank-and-file meat workers. At the same time, however, this system must not

⁹ These questions are central to the plot of William Hjortsberg’s *Gray Matters* (London: Sphere Books, 1973). Written in the pre-digital era of brain preservation, the novel imagines harvested brains stored in contraptions that resemble rolling file cabinets. An army of mobile robots services the brains as they await implantation in newly cloned bodies.

appear “rigged” or impossibly unfair--there will need to be occasional success stories of infrastructure workers who do in fact make the successful quick conversion to Avatar status (even if it is only the entry-level brain vat of Avatar B). Perhaps a limited number of Avatar conversions could be awarded more or less randomly through the purchase of lottery scratch-offs, purchased at the various convenience stores habituated by the infrastructure workers as they commute from their meat domiciles to work.

There is also the issue of power. Can Whole Brain Emulation occur before ensuring an infinitely renewable power source is in place to maintain the various brain-tanks, artificial brains, and WBEs? What is needed is nothing less than a perpetual energy machine of some kind, one that ensures our digital immortality by arresting the forces of entropy that would otherwise allow WBEs to become diminished and disorganized, not only through the neglect of careless or insolent maintenance workers, but also according to the Second Law of Thermodynamics. If this problem is not solved, WBE will represent little more than “kicking the can” down the road of immortality. Given the relativity of phenomenological time, 20,000 years of WBE may well become akin to 82 years of meat-life, the digitized ego still quivering in terror at what awaits it in a mere three to five thousand years. And what is to be done about rogue asteroids? It would be both catastrophic and highly embarrassing for the world of WBE to be extinguished by the very forces that destroyed the dinosaurs--our exquisite architectures of networked consciousness laid low by a big, stupid rock. And then, at the final horizon, there is the seemingly intractable obstacle of a collapsing universe. Suppose by some miracle our WBEs survive the various threats that remain in the material world for centuries, millennia, even until the final articulation of cosmic space-time. What will we do when we realize the universe is collapsing back into self? Where will we go when our Singularity confronts the final horizon of the ultimate Other Singularity--the implosive bookend to the “Big Bang?”

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For many these questions will seem absurd given that science appears nowhere near capable of WBE. And yet, even now, brain digitizers are making preliminary plans for our eventual migration into Avatar receptacles. In his 2013 article “Electron Imaging Technology for Whole Brain Neural Circuit Mapping,” K.J. Hayworth argues that current models of “human cognitive architecture” suggest that “successful mind uploading could be accomplished based only on a static map of all neural connections in the brain,” what neuroscientists and

transhumanists call “the Connectome.”¹⁰ For Hayworth, associated with the Lichtman Lab in Neuroscience at Harvard, the task exceeds the capacities of current science in scope but not necessarily in technique, arguing that Focused Ion Beam Electron Scanning Microscopy (FIBESM) already provides the ability to capture the “finest axonal and dendritic process” in the brain. Hayworth’s scheme involves slicing a willing brain into extremely thin (10 micron) strips that in turn will be affixed to a reel-to-reel tape for orderly review beneath the exhaustive gaze of the FIBESM. The static “map” produced by this scanning can then be converted into a digital 3-D “brain” replicating the organ’s architecture down to the level of the synaptic gap. Once this 3-D digital receptacle is ready, presumably, all that would remain is the ego’s “crossing over” from tissue to emulation.

Hayworth acknowledges some might find WBE unlikely. “There are many levels at which one could disagree with this thesis,” he notes, “so I will briefly cover the logic behind it before moving on to the technical discussion of how to obtain such a high-resolution volume image of an entire brain.”¹¹ Hayworth’s plan requires us to stipulate that the “human mind and its conscious experiences” are “purely computational phenomenon.” Writes Hayworth:

We are broadly similar to an intelligent robot. Our body is analogous to the robot's mechanical body. Our brain is analogous to the robot's computer hardware including the physical hard drives which contain its control software. Our mind is analogous to the computational processes that result by the running of this control software on the robot. Our first-person conscious experiences are analogous to the particular stream of tokened data structures that the robot uses to model its own perceptions, goals, and actions as part of its self-model (used as a higher-order guide for reasoning about and planning its future behaviors). What would ‘mind uploading’ mean for such a robot? It would simply mean that the robot's software is copied to another computer (possibly of different design) controlling another robot body. This of course would result in a similar behaving robot with a similar tokening of internal data structures.¹²

¹⁰ Kenneth J. Hayworth, "Electron imaging technology for whole brain neural circuit mapping," *International Journal of Machine Consciousness* 4.01 (2012): 87-108.

¹¹ Hayworth, "Electron imaging technology for whole brain neural circuit mapping." 89.

¹² Hayworth, "Electron imaging technology for whole brain neural circuit mapping." 89.

This cybernetic model has become so ubiquitous that many “posthumanists,” “transhumanists,” and brain emulators no longer feel the need to cite Norbert Wiener as its source, much in the same way that “humanists” no longer find it necessary to cite Freud at each mention of the unconscious.¹³ Elsewhere, Jeff Lichtman and fellow researcher J.L. Morgan write, “ We think the computer analogy gives us a lead. The computer can be turned off and on without losing much data because the instructions that make it work are embedded in its ‘static’ physicality. A deep understanding of how information is stably stored in the structure of hard discs, the input and output wires of each chip, the physical structures that explain the working of those chips and so on would be enormously helpful in making sense of a computer. Might the same be said of nervous systems?”¹⁴ Yes, the same *can* be said of nervous systems given that western science has been training for some four hundred years to think of men and machines as analogous devices bound by the logic of electrical circulation. These electro-Cartesian cybernetics have been the foundation of innumerable man-machine fantasies that imagine mind/consciousness/ego existing in a state of pure energy that can then manifest across multiple platforms (in the brain, in a computer, in the afterlife), what I have termed elsewhere “the logic transmutable flow.”¹⁵ As N. Katherine Hayles has argued, this assumption that information can exist independently of its material embodiment (indeed, of *any* material embodiment) is the foundational doctrine of “posthumanism.”¹⁶ Hayworth concedes likening consciousness to “computational phenomena” is an analogy, one that is perhaps “deeply flawed.” Nevertheless, he argues, “it is an analogy that rests at the core of all of our research in cognitive science, neuroscience, and even biology itself.”¹⁷ Flawed or not, in other words, *we all believe it*.

¹³See Norbert Wiener. *The human use of human beings: Cybernetics and society*. New York: Da Capo Press, 1954.

¹⁴ Joshua L. Morgan and Jeff W. Lichtman, "Why not connectomics?," *Nature methods* 10.6 (2013): 494-500.

¹⁵ See Jeffrey Sconce. *Haunted Media: Electronic Presence from Telegraphy to Television*. Durham: Duke University Press, 2000.

¹⁶ N. Katherine Hayles. *How we became posthuman: Virtual bodies in cybernetics, literature, and informatics*. Chicago: University of Chicago Press, 2008.

¹⁷ Hayworth is correct in this assumption—much of neuroscience does indeed believe that human beings are “intelligent robots,” a symptom—it should be noted—also commonly encountered among those diagnosed with schizophrenia, an illness frequently distinguished by a tendency to literalize metaphors.

As citizens of a wholly Other world, ghosts are uniquely positioned to see this cybernetic analogy for the trap that it is, a fantasy of the ego grounded in late 18th century models of electrical conduction and magnetic induction. Conceptually installed in the body via Galvani's "animal electricity," nervous conduction remains central to the cybernetic imagination of self-regulation, a practice that—in theory at least—involves the ego supervising its energetic reserves and willpower. To "will" is to master the instrumental "power" of the body in the rational, controllable conduction of energy. Conduction thus posits a visible and ultimately channeled path connecting point A and point B. Lightning connects heaven and earth, a wire connects outlet and appliance, a nerve connects finger and brain, a message connects sender and receiver. As 19th century physiology understood all too well, too much nerve power can lead to over-excitement, hysteria, mania, a burning-out, or short-circuiting, while too little results in neurasthenia and melancholy. But the rational, instrumental conductivity of electricity has always been haunted by its own ghost, that of magnetism and irrational induction. As any child who has played with a magnet knows, magnetism's invisible field can only be witnessed indexically--iron filings made to move across a table, metals irresistibly drawn to a magnet through the open air, two magnets that palpably resist making contact despite the apparent "nothingness" that divides them. Also dating to the close of the 18th century is the conceptual and energetic counter-force of Mesmer's "animal magnetism." Equally prominent in theories of will and power, magnetism is in almost every aspect the uncanny shadow of electricity. Whereas Galvanism emphasized the internal, individual regulation of will, mesmerism imagined a field occupied by multiple wills and diffuse powers impinging on the body from the outside. If galvanic power "courses" though body via a regulated network of direct, conductive control, mesmeristic power surrounds and suffuses the body as an amorphous, inductive cloud of occult influence. Lobotomies and brain chips are galvanic interventions in the brain. The frequently conflated phenomena of hypnosis, broadcasting, and ideology, on the other hand, are all variations of an abstract power in the air that can control the mind. It is also, most likely, the domain of the ghost--a continuous field that resists any and all efforts to stuff it in a wire or convert it into digital code for isomorphic transfers and compliant regulation. Though there is a rich lore in "trapping" ghosts, typically in a box or a bottle, there is no evidence at present to support the idea that ghosts might be "channeled" through material media platforms.¹⁸

¹⁸ A recent neurological study has attempted to explain why certain individuals feel "haunted" or a sense a "presence" in the room, even designing a robot that can produce this sensation among test subjects. See Ed Yong, "It's Behind You! Robot Creates

Ghosts are elusive because they occupy the synapse, and it is the synaptic gap that they will mount their final resistance to our ongoing digitization. The history of neuroscience itself provides a useful contrast in this respect. In the late 19th century, Ramon y Cajal and Camillo Golgi advanced rival theories as to the interconnectivity of the brain's neural pathways, what one writer has evocatively distinguished as "the soup and the spark."¹⁹ Golgi's "spark" model was essentially conductive, believing there was a physical connection between neurons that allowed information to continue flowing along "the wire." Cajal, meanwhile, eventually prevailed in demonstrating the more inductive "soup" model of the synapse, identifying a gap between neurons where the energetic pathway was—for a fleeting moment—suspended among potentialities, adrift in the psychochemical space of the neurotransmitter.²⁰ The synaptic action of the gap was a central concern for Wiener in proposing his theory of cybernetics. Wiener notes that physiology has generally favored a digital model of the brain as a primarily conductive network of "open" and "closed" nerves. Inevitably, however, a nervous impulse encounters the more analog "gap" of the synapse where it may or may not continue in its journey. Temperature and blood chemistry can affect this transfer through the gap, notes Wiener, as well as other variables perhaps still unknown. Here we enter the mysterious domain that is home to what Wiener calls a "change of taping," a type of no-man's land where a nervous impulse, altered in the act of processing new information, breaks free of its typical conductive pathway to become "an undirected message spreading out until it finds a receiver" (seeking, in the synapse, a new pattern of conductive links). Wiener calls this momentary suspension of the impulse within the synapse

Feeling of Ghostly Presence," <http://phenomena.nationalgeographic.com/2014/11/06/its-behind-you-robot-creates-feeling-of-ghostly-presence/>

¹⁹ Elliot S. Valenstein, *The war of the soups and the sparks: the discovery of neurotransmitters and the dispute over how nerves communicate*. New York: Columbia University Press, 2005.

²⁰ Both men were awarded the Nobel Prize in 1906. See Richard Rapport, *Nerve Endings: The Discovery of the Synapse*. New York: W.W. Norton & Co., 2005. As early as 1874, meanwhile, Dr. Edward Tylor Richardson proposed a "theory of nervous ether" to explain the capacity of nervous tissue to respond to the stimuli of pressure, hypothesizing that the transmission of nervous impulses was not a conductive function of "electrical fluid," but rather an inductive function of this internal ether thought to suffuse the spaces between all nerve molecules. See Dr. Richardson, "Theory of the Nervous Ether," *Recreations in Popular Science*: pp. 362-374.

a “to-whom-it-may-concern” message.²¹ Learning, thinking, and being thus proceed from a combination of predictable “channeling” via conduction and these more indeterminate moments of inductive “spreading” as these “to-whom-it-may-concern” messages forge new pathways at the synaptic transfer. An early advocate that the “mind” might be stored and transferred to other media, Wiener concludes, “It ought not to be too difficult to devise electrical methods of performing this task.”²²

It is only fitting that WBE, in taking up this challenge, would remain “haunted” by the synaptic gap, that infinitesimal infinity separating neuron from neuron that privileges the messy logic of analog soup over the rational digital pathways of conduction. Like those Victorians who addressed the divide between the orderly conductive flows of galvanism and the mysterious inductive presence of mesmerism, WBE appears similarly uncertain as to how the static circuitry of the “Connectome” will produce, as a type of energetic secretion, the amorphous presence of mind. Just what is “digitized” in the digital self of WBE often remains unclear, necessarily so perhaps. At times, the language suggests that a 3-D digital replication of the brain, detailed down to the cellular level, will also reproduce the exact consciousness of the brain so digitized (leading to the possible dilemma of the same ego existing in two places at the same time).²³ In “downloading” iterations, the digitized brain—as a uniform Connectome built of evolutionary Fordism—becomes the platform for hosting an energetic ego extracted from the organic brain and transferred to its new digital home. Paradoxically, however, both of these models require a faith that the ego residing within the Connectomes’ pathways, now rationally mapped and digitized, will retain the ability to behave *irrationally* and *unpredictably* while suspended in the synaptic gap. Posthumanist faith in the ego machine is so profound, in fact, that it demands nothing less than the absolute destruction of the Enlightenment subject that proceeded it (even as the posthuman rarefies and extends that subject’s Cartesian premise). For example, another team involved in WBE research asserts

²¹ Norbert Wiener, *The human use of human beings: Cybernetics and society*. New York: Da Capo Press, 1954. 70-71.

²² Wiener. 71.

²³ This appears to be the model endorsed by Hayworth, who writes, “it is hypothesized that a computer simulation could be constructed that when turned on would behave so similarly to the original that close friends and relatives would be hard pressed to distinguish (from behavior alone) this simulation from the original. Finally, and crucially, it is hypothesized that this simulation would exhibit first-person conscious experiences very similar to those experienced by the original person.” See Hayworth, “Electron imaging technology for whole brain neural circuit mapping.” 89.

“the human brain is the only body organ that cannot, even in principle, be transplanted from a donor without fundamentally altering the individual persona of the recipient.”²⁴ This is a rather extraordinary statement for two reasons: 1). there is, presumably, no test case on which to make this claim; and 2). It defies the intuitive logic of innumerable “brain transplant” stories appearing over the past 200 years. Given this (unsubstantiated) claim that the brain cannot be moved without fundamental alteration of the person, the team’s proposed solution (to move the “person”) is a form of brain emulation involving the use of neuronanorobotics. These tiny brain robots, they argue, present the most promising technique for “non-destructively acquiring, transmitting, validating, and archiving comprehensive brain-related structural and functional information.”²⁵

Given the current state of practical science, only cybernetic faith could believe that the transmitting and archiving of “brain-related structural and functional information” is intrinsically more plausible than simply attaching a carefully severed head onto a new body—assuming, of course, that said head remained fueled by properly oxygenated blood. Even scooping a brain out of the cranium and reconnecting it to the nervous system of another body (one that, presumably, had suffered irreversible “brain death”) would appear more imminently feasible as an ego preservation fantasy than the existential leap from tissue to avatar posited by WBE. The proposition that the brain cannot be transplanted, even “in principle,” without fundamentally “changing the persona of the individual recipient” actually serves to reaffirm the futility of WBE. Implicit in this statement is the idea that the “mind” (or persona) is such a unique property of materially embodied information that it is, in principle, inconceivable that this organ and its resident ego could be transplanted without alteration. But for WBE, that which cannot be *transplanted* can apparently be *translated*. Posthumanist faith in WBE thus requires that the info-ego be so absolutely pure as data that it actually has a better chance of surviving in tact as an electronic simulation than within the embodied organ that first gave it shape. The current desire to believe in WBE, both in neuroscience and popular culture, appears to be an attempt to restore faith in the Cartesian subject that operated, more or less unimpeded by

²⁴ Nuno Martins, Wolfram Erlhagen, and Robert A. Freitas, Jr., “Non-destructive whole-brain monitoring using nanorobots: Neural electrical data rate requirements.” *International Journal of Machine Consciousness* 4.01 (2012): 109-140.

²⁵ Nuno Martins, Wolfram Erlhagen, and Robert A. Freitas, Jr., “Non-destructive whole-brain monitoring using nanorobots: Neural electrical data rate requirements.” 109-140.

scientific self-knowledge, in the era before galvanism made that impossible by forcing a confrontation with the material foundations and finitude of the ego. A mind that is of the brain that is of the body is a frequently abject reminder that the ego exists, not as a clean data stream, but as a secretion inextricably bound to the viscera of the physical body. For the posthumanist fantasy to work, WBE *must* be intrinsically more plausible than a brain transplant. Otherwise, we come face to face with the same enigma posed by the numerous heads decapitated in the name of Enlightenment science: *just what is or was going on in there, and where did it go?*

* * * * *

In *The Future of an Illusion*, Freud helpfully reminded his readers of a basic truth: nature wants us dead. The ego, as a fiction of neurochemistry and semiotics, does whatever it can to avoid this troubling fact. For Freud, religion and civilization began as solutions for blunting the capricious hostility of the universe. Imaginary sky beings, modeled on the infant's relationship to his parents, may well be vengeful, aloof, and highly unpredictable, but at least they allowed humanity a comprehensible strategy for negotiating the otherwise baffling terrors of self-awareness. "The Gods retain their threefold task," writes Freud, "they must exorcize the terrors of nature, they must reconcile men to the cruelty of Fate, particularly as it is shown in death, and they must compensate them for the sufferings and privations which a civilized life in common has imposed on them."²⁶ For many moderns (and especially scientists), the utility of these sky beings lost this compensatory function long ago. But this does not mean that the ego, in its fundamental narcissism, has lost the underlying need for exorcism, reconciliation, and compensation, especially in relation to cruel fate and the privations of civilization.

At present, Whole Brain Emulation certainly masquerades as the best bet for continuing our collective fiction that the fiction of the ego will endure, safe at last from the insulting vicissitudes that might befall the mortal body. But as ego-defensive fantasies go, WBE is ultimately unsatisfying, a materialism so panicked in its positivism as to become parodic. In 1874, Fredric Rowland Marvin identified a similar impulse within the American Spiritualist movement, calling it "mediomania." "Spiritualism is the heart of Materialism--it is materialism of

²⁶ Freud, Sigmund. "The future of an illusion," *The Standard Edition of the complete Psychological Works of Sigmund Freud*, vol. XXI. New York: W.W. Norton and Company, 1961: 32.

Materialism--the worst kind of Materialism," he advised. "Its ghosts are material and appeal to the five senses--they have shape, color, and density; they walk and talk like men and women. Never did any form of Materialism attack the soul so effectually as Spiritualism."²⁷ Marvin located Spiritualism within a larger crisis of civilization, noting, "The periods in history specially marked by mental disorders are those called transitional. They are the intercivilized periods--that is, they lie between great civilizations. In these, old civilizations disintegrate and new ones form. They are the skeptical periods, in which men, having lost faith in the old, have not yet learned to believe in the new."²⁸ In the 1850s, as the "old" transitioned into the Industrial, many supporters of Spiritualism argued that contact with the dead, recently facilitated through the "Spiritual Telegraph," was the work of Benjamin Franklin. In death, as in life, Franklin tinkered with electricity and magnetism, creating a technology that could transmit messages to a "medium" channeling these transmissions through the "spirit battery" of the séance. Thus did the world of spirit, so long suspected, become real, tangible, and eventually ambulatory through the rational application of technical knowledge. It would only be fitting, then, if the ghost of Norbert Wiener would now step forward during our current moment of "intercivilization" to contest the "man as intelligent robot" conceit that he was so instrumental in escorting into the 20th (and now 21st) century. Much like the techno-anatomy of the Spiritualists, Wiener's cybernetic model of the organism as a vector of signals, feedback, control, and communication is at heart a fantasy of conductive energy, a phantom equally indebted to the circuitry of Luigi Galvani, the metaphysics of Mary Shelley, and the positivism of the Shannon-Weaver model. Eliminate noise, defeat entropy, live forever as energized data.

Other models exist, however, that are much friendlier to the synaptic ghost and thus provide a better future for the illusion. In his controversial tract of 1845, *Anastasis*, theologian George Bush sought to reframe the Christian doctrine of bodily resurrection for those increasingly disenchanted by the materialist revelations of galvanic physiology. As traditionally promulgated by the church, Bush argued, resurrection was not supported by reason or revelation.²⁹ The dead rot, Bush reminded his readers. But, as galvanism demonstrated so powerfully,

²⁷ Frederic Rowland Marvin, *The Philosophy of Spiritualism and the Pathology and Treatment of Mediomania: Two Lectures*. New York, 1874. p. 5

²⁸ Marvin, *The Philosophy of Spiritualism and the Pathology and Treatment of Mediomania: Two Lectures*. p. 36.

²⁹ George Bush. *Anastasis: or, The doctrine of the resurrection of the body, rationally and scripturally considered*. New York: Wiley and Putnam, 1845. 73

there might be a covert energy within the body that lives on, perhaps dormant until revived at the point of death. “The precise boundaries between the *physical* and the *psychical* parts of our nature have never yet been determined,” he argued. “In many points they seem to run into each other, and the progress of physiological science is continually multiplying the proofs of a most intimate relation between our sensations and the subtler physical agencies of nature.”³⁰ Resurrection should thus be understood in terms of a “spirit body,” argued Bush, a wholly immaterial and presumably energetic essence that evacuated the corpse at the moment of death. Bush thus presumed a type of galvanic reanimation, not in this world, but in the next—the electrical body rising from death to occupy a higher plane of energetic existence. Crucially, resurrection of the “spirit body” did not mean capturing consciousness as pure energy, but instead involved a “crossing over” of the mind-body relationship into the spiritual plain. Once on the “other side,” the dead could play croquet with Socrates and Shakespeare, not as bottled brains hallucinating their balls and wickets, but as flesh-and-blood bodies composed of “spirit nerves” and “spirit atoms.”

William Fishbough, a prominent Spiritualist and secretary to the “Poughkeepsie Seer” Andrew Jackson Davis, provided an even more detailed schematic of the “spirit body.”

It is easy to conceive, then, that the magnetic essence of *all* the particles and compounds of the body, associated together, must necessarily form *an interior, magnetic and invisible body*. At death the particles of the visible body collapse, and this interior, vitalizing and magnetic body, exhales forth in its united form, its various parts maintaining their mutual affinities as before; and could we then see it as it is, we would find it to possess spiritual bones, muscles, heart, lungs, nerves, brain, &c., and that it still preserved all the *general* features of its original mould, though in a vastly improved state.³¹

As an ego-defense fantasy, the spirit body holds distinct advantages. Whereas WBE aspires to a digital transcription of the Connectome that is as detailed as possible (and yet necessarily incomplete), the spirit body loses no information in the process of the ego’s “crossing over” into its new home. The ego’s analog integrity, like the fine subharmonics of a piano, loses nothing in the jump to

³⁰ Bush. *Anastasis*, 73-74.

³¹ William Fishbough, “Laws and Phenomena of the Soul. Number One,” *Spirit Messenger and Harmonial Advocate*, Vol. I, No. 6 (November 20, 1852): 1.

immortality, thereby ensuring the full *me-ness of me* survives without any degradation, compression, or decay. Even more appealing, the “spirit body” model allows for the ego’s transfer between mediums without any actual *mediation*. Realization of the spirit body is instantaneous in that the “spirit atoms” are already latent within the material being—there is no need for a “transfer” as such, given that the spiritual architecture already occupies the same time and space as the meat body. It is worth remembering that the cybernetic transmutation of the ego into digital data presents unpredictable hazards of noise and lost (or extraneous) information, and thus a potential alteration of the *me-ness of me*. For the analog ego to survive in its full spectrum of me-ness, it must “go ghost” immediately and instantaneously—any time squandered within a temporary conduit of some kind (firewire, datachip, iCloud) only invites disaster.

A case study published in 1868 anticipates the hazards of mediation in making this material-spiritual transfer: A Reverend Jennings finds himself tormented by a ghostly monkey. At first he only sees the creature fleetingly out of the corner of his eye, but gradually the monkey becomes more visible and aggressive. In desperation he seeks the counsel of Dr. Hessalius, a “metaphysical physician” dedicated to integrating body and spirit in his treatments. Visiting the Reverend’s home, Hessalius finds his patient has for some time been writing a book on ancient religious practices, a project that has led him deep into mysticism and the occult. Discussing his symptoms, the Reverend confesses that the “spectral illusion” of the otherworldly monkey first appeared as he began working long into the night on his book, often under the influence of powerful stimulants. Of late, he adds, the monkey has begun to speak. “Speak! How do you mean--speak as a man does, do you mean?” interjects the disbelieving Hessalius. “Yes; speaks in words and consecutive sentences, with perfect coherence and articulation,” responds Jennings. “But there is a peculiarity. It is not like the tone of a human voice. It is not by my ears it reaches me--it comes like a singing through my head.” Though no one else in the congregation can see him, Jennings continues, the monkey often dances atop the open bible during his sermons, taunting the Reverend and interrupting his thoughts with “dreadful blasphemies.” Hessalius asks if the creature is now in the room with them as they speak. No, responds the Reverend, but he is certain the creature will return, as he always does, to torment him, “urging me to crimes, to injure others, or myself.” Intrigued, Hessalius agrees to take the case and, as he leaves, asks Jennings to inform him the moment the monkey returns. Later, when a note does arrive from the Reverend, apparently once again at the mercy of the evil monkey, Hessalius rushes back to the house. But it is too late. The Reverend Jennings has slit his own throat.

What has happened here? Before taking his own life, Jennings provides his own assessment: "They talk of the optic nerves, and of spectral illusions, as if the organ of sight was the only point assailable by the influences that have fastened upon me--I know better. For two years in my direful case that limitation prevailed. But as food is taken in softly at the lips, and then brought under the teeth, as the tip of the little finger caught in a mill crank will draw in the hand, and the arm, and the whole body, so the miserable mortal who has been once caught firmly by the end of the finest fibre of his nerve, is drawn in and in, by the enormous machinery of hell, until he is as I am."³² In this evocative image, Jennings imagines his nervous system drawn out of his body sense by sense, organ by organ, into "the machinery of hell," a single nerve pulling the rest of this variegated network into another world. Hessalius, in summarizing the Reverend's unfortunate fate, converts this poetry into proper Victorian science, locating the demon monkey as the side-effect of a faulty interface. "It is the story of the process of a poison," Hessalius opines, "a poison which excites the reciprocal action of spirit and nerve, and paralyses the tissue that separates those cognate functions of the senses, the external and the interior. Thus we find strange bed-fellows, and the mortal and immortal prematurely make acquaintance."³³ The doctor continues his post-mortem assessment, describing the normal conduction of nervous and spiritual fluid. "Of this system, thus considered, the brain is the heart. The fluid, which is propagated hence through one class of nerves, returns in an altered state through another, and the nature of that fluid is spiritual, though not immaterial, any more than, as I before remarked, light or electricity are so."³⁴ Normally, this spiritual fluid coursing through the nervous system is insulated and in balance. But, Hessalius continues, "By various abuses, among which the habitual use of such agents as green tea is one, this fluid may be affected as to its quality, but it is more frequently disturbed as to equilibrium. This fluid being that which we have in common with spirits, a congestion found upon the masses of brain or nerve, connected with the interior sense, forms a surface unduly exposed, on which disembodied spirits may operate: communication is thus more or less effectually established." To review: excessive consumption of green tea > disequilibrium of spiritual "fluid" > irritation of nervous tissue > lesion > portal for otherworldly contact > phantom, homicidal monkey. The lesion thus serves as a faulty connection between two autonomous circuits, the monkey demon

³² Joseph Sheridan Le Fanu. *Green tea. The familiar. Mr. Justice Harbottle* (Vol. 1). London: R. Bentley, 1872. 71.

³³ Le Fanu, *Green tea. The familiar. Mr. Justice Harbottle* (Vol. 1). R. Bentley, 1872. 89.

³⁴ Le Fanu, *Green tea. The familiar. Mr. Justice Harbottle* (Vol. 1). R. Bentley, 1872. 93.

accredited in the end, not as a hallucination, but as a genuinely otherworldly phenomenon sparked by the crossed wires of two incompatible media systems. Rather than evacuate the body in full analog transcendence, the Reverend stupidly opens a premature “patch” between the two circuits. Had the Reverend lived, Hessalius argues, his cure would be found, not in the asylum, but in “dimming” and “sealing” the “inner eye” that the unfortunate Reverend had “inadvertently opened.” No doubt the first step in the Reverend’s recovery would have been strict avoidance of all caffeine.

* * * * *

If the ghost of Norbert Wiener will not step up to re-enchant the cybernetic occult, perhaps we can summon the more recently minted ghost of Jean Baudrillard. In *The Intelligence of Evil*, Baudrillard names the future that WBE would actually secure: Integral Reality. “What I call Integral Reality is the perpetrating on the world of an unlimited operational project whereby everything becomes real, everything becomes visible and transparent, everything is ‘liberated,’ everything comes to fruition and has a meaning (whereas it is in the nature of meaning that not everything has it).”³⁵ It is a reality “whereby there is no longer anything on which there is nothing to say.”³⁶ Integral Reality, in other words, is a positivist utopia wherein the entirety of the known world has been realized as information—visible, accessible, programmable, interchangeable. WBE would signal the very apotheosis of Integral Reality wherein the ego would itself become digital data existing within a larger universe of digital information. Crucially, Baudrillard’s Integral Reality does not refer to the Enlightenment fantasy that all objective truth will one day be known; rather, it is a world where a particular system of truth, fully realized within a system of simulation, concretizes as a closed universe of manifest data. “This time it is not nature that lays the trap of objective reality for us,” writes Baudrillard, “but the digital universe which sets us the trap of a hyperobjectivity, of an integral calculus in which the very play of the mirror and its objects is abolished—the last avatar of philosophical idealism.” With Integral Reality, the historical dialectic of subject and object at last finds its ultimate resolution as everything collapses into a closed circuit of Absolute Infospirit—brain, mind, and world all surviving as Big (but not necessarily Infinite) Data.

But the most crucially important of all possible questions remains unanswered: *what will be the fate of ME in the realm of digital ME-ness?* “Brain-

³⁵Baudrillard, Jean. *The Intelligence of Evil: Or, The Lucidity Pact*. London: A&C Black, 2013. 13

³⁶Baudrillard. *The Intelligence of Evil: Or, The Lucidity Pact*. 32.

in-a-vat” fantasies, thoroughly explored over a century of science-fiction, frequently emphasized an ego still invested in sustained illusions of embodied desire. Though confined to a brain in a bubbling tub, the residing ego nevertheless retained its “will to power.” If the brain knew it was merely a brain, it typically sought a body so that it might once again conquer, seduce, and consume.³⁷ If the brain was fed an illusion of embodiment, knowingly or unknowingly, this Avatar then sought pleasure and power in the realm of the virtual.³⁸ But what, if anything, would the positivist ego of WBE seek? Existing as digital data in a world where all has been realized and rendered as digital information, the ego risks suffocation in a system where gaps, fissures, and even basic difference no longer exist. With a digital ego “jacked” into a universe of the fully present, not only does the diabolical binary of subject and object evaporate, so too does the divide of ego and Other that has historically produced the motivating energies of libidinal attachment. Ghosts have traditionally functioned as an index of “things” (beings, sentiments, forces, etc) that are not fully present, interstitial residents of a world that can only be glimpsed “through a glass darkly.” By channeling the mind into a medium among media, “here,” “there,” and the glass in between merge into a fused flow of digits.

Ghosts cannot survive in a world without bodies, leaving only three possibilities for the digitized ego:

1. The most optimistic scenario is the *Milles Plateaux* position. Here the digi-ego realizes the utopian dream of Gilles Deleuze and Felix Guattari in *Capitalism and Schizophrenia*, becoming a relentless “desiring-machine” that pinballs through Integral Reality in a never-ending exploration of desire.³⁹ Of course, hazards remain. If the goal of WBE is to translate the *me-ness of me* into Avatar form, at what point does the radical pursuit of aleatory desire become so transformative that the *me-ness of me* becomes something else entirely, the ego so thoroughly deterritorialized by its peregrinations as a desiring-machine as to have no way back to its original state of *me-ness*? And what is the good of desire if there can be no return to a static state of *me-ness* from which to contemplate and anticipate

³⁷ Such is the plan of the evil space brain, Gor, in the 1957 film *The Brain from Planet Arous*. Having arrived on earth and taken possession of John Agar’s body, Gor the evil space brain immediately sets his sights on Agar’s fiancée, Sally.

³⁸ Such was the fate of those witless beings caught in *The Matrix*.

³⁹ See, randomly, Gilles Deleuze and Félix Guattari. *A thousand plateaus: Capitalism and schizophrenia*. New York: Bloomsbury Publishing, 1988.

jouissance past and future? If my ego transforms into something unrecognizable from me, what do “I” care if this other desiring-machine experiences *jouissance* when “I” am now merely little more than a lost operating system? Future desiring-machine versions of “me” might even have the temerity to store “classic me” on an external hard-drive, lamenting that I am now too boring or take up valuable Avatar space in *jouissance-me*’s quest for century-long cyber-tantric orgasms. Also, how desirable is desire? If desire is, by definition, fleeting, how onerous must it be to spend centuries constantly working to renew and reinvest this desire in new objects and linkages? Once an emulated brain has plotted every single trajectory and permutation of its egocentric desire, what is left other than torpor and boredom (followed by the inevitability of entropic decline)?

2. The first scenario assumes my *me-ness* will have access to the sensory array of something approximating a body. The 2045 Initiative is less than forthcoming on this point. The vaunted status of “Avatar D” is described as the mind residing within a mobile holographic avatar, but it is unclear if this means 1). a customized “game piece” within a shared digital reality; 2). a holographic ghost-body that somehow maintains the digital integrity of “me” as I navigate physical reality; 3). “Me” safe in the mainframe, but able to interface with my holographic body from afar as it goes to Paris, the moon, Planet Pandora, and so on. Affixed in some manner to a holographic body, perhaps my “me-ness” is simply carried around the physical world in an Avatar-litter to accumulate more audio and visual data. Or, more likely, my *me-ness* resides in a mainframe where it can access multiple streams of data from anywhere that other media exist. In this case, there is the distinct possibility of an instantaneous evaporation of the *me-ness of me*, leading us to a scenario that might be called *poisson solubles*. What happens if my ego, now transferred into a digital Avatar that will exist in the digitally realized aquarium of Integral Reality, simply dissolves into its own medium of information? Holding the illusion of one’s ego together in the blood-and-tissue venue of the brain is difficult enough—so what happens when brain, mind, and reality are all composed of the same binary bits? Science-fiction depictions of this process frequently portray this experience as an oceanic imperialism, the digitized ego now lording over all the information and information systems of the world. But this presumes that a digital ego attached to the entirety of the “grid” retains a centered agency that can willfully navigate its way through this information (and given that any computational question of qualitative interest necessarily carries the possibility of infinite calculation, how does this ego resist the temptation of endless distraction?) Perhaps in the digital afterlife, the newly minted digi-ego has the opportunity for a single coherent thought or question (Where am I? What should I do now? Is it cold in here?) that then initiates centuries of Derridean processing (see the *Milles Plateaux* position, above). Perhaps the digi-ego emerges after these calculations, somehow still miraculously

in tact, with some sort of answer. Then again, perhaps this first question is the thread that unravels the sweater, the immersion that dissolves the fish, until the thinking “I” drowns in the information pool. Given the primary narcissism of the ego, “I” assume “I” will master whatever matrix “I” enter, but in this scenario adding one’s ego to the digital universe is not unlike pissing in the ocean. And what happens if my thinker/thinking/thought corner of Integral Reality is colonized by a superior cybernetic entity, one with a long computing history and more calculating power, that then enslaves me to become a subroutine in managing its attempt to solve for Pi or stockpile *World of WBE Warcraft* points? Welcome to eternity!

3. A third possibility of ego digitization might be called *inertie catatonic* (to maintain the French parallelism), a type of paralysis wherein the theoretically liberated ego remains wholly frozen in data time and space. This catatonic inertia could be the result of the digi-ego’s reluctance to engage in either of the dissociative or disintegrative scenarios described above. Faced with the schizophrenic possibilities of radically transformative desire and/or the annihilating possibilities of dissolving within the shared data pool, the ego defends its integrity by withdrawing from all external attachments, hunkering down in a type of “sleep mode.” Then again, this catatonia could also be the inevitable endpoint of Integral Reality itself. In a world that has been made wholly visible as data, wherein positivist truth is both ubiquitous and absolute, there is no trajectory, no calculation, no reverie, not already predetermined in its outcome. As Baudrillard notes of the Internet (the infant home of WBE), it “merely simulates a free mental space, a space of freedom and discovery. In fact, it merely offers a multiple but conventional space, in which the operator interacts with known elements, pre-existent sites, established codes. Nothing exists beyond its search parameters.”⁴⁰ With brain, ego, and world all operating as (or through) digital code, subject and Other become nothing more than a finite dialog of possible exchanges. When every trajectory in a positivist universe of absolute information is foretold and predictable, the momentary suspension of the analog gap vanishes, difference dissolves, the desiring-machine stalls, the ghost goes dark. This is why ghosts speak to us from the air, in the radio signal, and not through the digi-perfect architecture of the computer and Internet. Contacting the other side through the ether remains eminently plausible whereas encountering a computer ghost is laughably impossible. In digital culture, the “ghost in the machine” is never an honest-to-God ghost, but is instead some other rational operation of numbers that has heretofore remained hidden (but not occult). And this is why WBE is ultimately such a poor fantasy for the ego that dreams of

⁴⁰ Baudrillard. 81.

immortality. Gods, ghosts, and angels, as creatures born in the occult mysteries of the analog, promise the terrified ego absolute deliverance and transcendence, an evacuation to an immortal plain beyond all material comprehension. WBE, on the other hand, offers merely deliverance into continuing banality, an evacuation into a positivist terrain of materialized and thus material information where the ego has little or nothing to do other than await its inevitable moment of absolute extinction. And what then? Noted psychotic Daniel Schreber observed, at the beginning of the 20th century, that God already had occasional difficulties extracting the soul from the nervous system—how much more difficult will it be for Him to extract my me-ness from a data chip?⁴¹

Even if Whole Brain Emulation is possible, its realization as a *practical* technology is clearly decades if not centuries away. In the meantime, if mechanist neuroscience wants to do something truly useful for the fortification of ego narcissism, why not work on some intermediate, palliative projects that will better enhance or delude my current ego's horizon of being? The living head transplant, for example, seems a much wiser investment at the moment. With proper care, a head (and thus "me") might survive two or three centuries jumping from neck to neck. Or, perhaps science could engineer an injection port that allows me to dose my synapses directly with more interesting neurotransmitters, thus producing new experimental modes of ego experience. An extra set of eyeballs on the back of the head might be nice, either as a switchable option for backwards vision or to introduce the glory of a 360 degree sight horizon. How about a libidinal kill switch for those consistently led astray by their genitals? Or, best of all, why not develop a brain chip that induces a powerful hallucination that the *me-ness of me* is truly immortal, a type of faith switch that can never be defeated? That way, when we come to an end, as we most surely will do one day, our ghost brothers and sisters are there ready to receive us in our full analog integrity (now minus the brain chip, presumably). After all, a chip in the brain could very well accomplish the same goal as a brain translated into chips, offering the *me-ness of me* an effective but much more cost-efficient fantasy that I will somehow survive the universe's inexorable progress of entropic annihilation.

⁴¹ Daniel Paul Schreber, *Memoirs of my nervous illness*. New York: New York Review of Books, 1955.

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Figure 1: « The Ghostularity » Supplied by author.