

Mirror Mirror on the Wall
- Reflecting Surveillance Studies -

by

Christopher S. Hankin

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Certificate of Approval

This is to certify that the accompanying thesis by Christopher S. Hankin has been accepted in partial fulfillment of the requirements for graduation with Honors in Politics.

Eleni Zeleke

Whitman College
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Abstract

In this thesis I employ Greg Egan's Science Fiction novel *Permutation City* in order to help make sense of how the "data double" from surveillance studies relates to the flesh from which it was captured. In this effort, I turn to N. Katherine Hayles and Donna Haraway to think about the flesh and the "data double" through the language of the human and the posthuman, language and code, print text and digital text. I argue that rather than terrified paralysis over the prospect of digital primacy, scholars in surveillance studies ought to mobilize that terror to generate space for deliberation.

Introduction – Enter the “Data Double”

Ela Darling, 31, is a pornographic actress. She has been in the industry since she was 22 and has always taken her work very seriously. Recently, however, the nature of that work has changed. In 2014 Darling filmed her first virtual reality scene. She sat in a college dorm room wearing an R2-D2 swimsuit and knee-high athletic socks.¹ Typically separated from her viewers by their respective screens, Darling was excited by the prospect of appearing as a three-dimensional figure. With the help of 142 cameras, viewers could consume her image as a dynamic and malleable hallucination from inside a virtual reality headset. That this remarkable technology is being used to produce high-quality porn is hardly surprising; the visual sex industry is one of many using similar technologies for a diverse array of purposes. From military equipment to therapeutic treatment, technologies which produce images of people abound. So prolific is our contemporary capacity to photograph, videotape, and otherwise capture, that app developers have designed routes through major cities that citizens can use to walk without being surveilled.² Spoiler alert: they are few and far between. Most curious about this arsenal of lenses is how many are not operated by any centralized authority, but instead by everyday consumers. Through smartphones, nanny cams, and virtual reality pornography, western urbanites have constructed a grass-roots Orwellian state. In this sense, surveillance in the 21st century is up and down and side to side, never ending or beginning. This complexity and diversity of

¹Krueger, Alyson. “Virtual Reality Gets Naughty,” *The New York Times*.

²Baard, Erik. “Routes of Least Surveillance,” *WIRED*.

actors and subjects has lead theorists within surveillance studies – a field of academic inquiry dedicated to understanding contemporary surveillance – to adopt the notion of the “surveillant assemblage.”

The “surveillant assemblage” can be loosely defined as the lateral conglomeration of previously discrete methods of surveillance into an unavoidable and all-encompassing process.³ The phrase can be directly attributed to Kevin Haggerty and Richard Ericson, two theorists in surveillance studies, though they appropriated the concept of the “assemblage” from Gilles Deleuze and Felix Guattari’s *A Thousand Plateaus*. Aside from its laterally expansive nature, the “surveillant assemblage” is also enormously concerned with the body. Fingerprints, retinal scans, facial recognition software, and many more technologies harvest data from flesh through “biometric surveillance”. This data serves a wide variety of functions; from suggesting products on Amazon to placing minorities on no-fly lists. Haggerty and Ericson intervene at the nexus of “biometric surveillance” and the “surveillant assemblage” in order to theorize the productive capacity of contemporary surveillance through what they term the “data double”.

“Data doubles” are composed of vast banks of biometric data harvested from the flesh to which they correspond; heart rate, fingerprint, voice print, retinal scan, height, weight, etc.⁴ The surveillance and subsequent storage of countless metrics monitoring the bodies of 21st century citizens has created vast banks of data representing the flesh it purports to watch. In the case of Ela Darling, this data

³Haggerty & Ericson, “The Surveillant Assemblage”.

⁴Ibid., 7.

manifests in an eerily realistic digital rendering. Not only do every pore and hair follicle appear in 1080p, enthusiastic viewers can purchase headset add ons which allow them to smell and even taste their virtual partner. Darling describes sharing an emotional intimacy with the people who interact with her “data double,” “they feel like they know me and are in the bedroom with me... there is literally a mind-body connection.”⁵ Through the additional inclusion of less body-specific information such as internet browsing patterns, financial interactions, voting history, and countless other data points, these doubles are themselves becoming a primary target of surveillance. As these surveillant technologies continue to improve, ethical issues abound. Darling’s fear is of a future in which viewers can interact with her “data double” without recourse to her flesh. In this way, the regime of lenses which characterizes western urban life jeopardizes the flesh’s ability to control the “data double.” This potentiality holds true outside of a pornographic context; the “data double,” it seems, threatens to come unhinged.

This relationship between the flesh and the “data double” in contemporary surveillance studies generates a paradox. As the flesh is the subject of ever increasing scrutiny through biometric surveillance, it becomes increasingly abstract because the data it produces is more accessible and flexible. In other words, though viewers may feel as though they have a relationship with Ela Darling, the entirety of that relationship may be spent interacting with her “data double.” I am not alone in noticing this paradox; it is well documented within surveillance studies.⁶ What is lacking thus

⁵Darling does not herself use the phrase “data double”. I have applied it to her to make the point clear.

⁶These specific attempts will be discussed further in my literature review.

far is a method through which this relationship can be theorized and understood, and it is my assertion that taken alone, surveillance studies is ill-equipped to fill this gap.

In my reading of the existing scholarship, the problem lies in the discipline's inability to take seriously the flesh and the "data double". Scholars trying to make sense of the pairing are approaching it from too formal a perspective, and this severity has left them paralyzed. Without a productive method for understanding the relationship between "data doubles" and the flesh to which they correspond, theorists forfeit the tools necessary to understand, let alone advocate, for those victimized by the "surveillant assemblage". What remains is impotent theory which accepts the logic of technological determinism and cedes primacy to the "data double" as inevitability.

In my thesis I hope to make an intervention in surveillance studies using posthumanist theory in order to provide a method through which theorists in surveillance studies can better understand the relationship between flesh and "data double". I contend that posthumanist theory is also thinking through the question of how flesh relates to data, but through far more creative avenues. The relationship between the human and the posthuman central to posthumanist theory mirrors the relationship between flesh and data present in surveillance studies. While Ela Darling stands on the side of the human, her "data double" represents one articulation of the posthuman. Because of this similar focus, the theoretical jump is natural. I take as my primary theoretical backing the work of N. Katherine Hayles, a feminist literary critic and posthumanist scholar. Hayles is similarly concerned with the dichotomy between human and posthuman, and through engagement with literature she argues for a process driven understanding of how the two interact.

Through a series of works on posthumanist theory, Hayles sets out to mobilize the terror generated by the “post” in posthuman to create space for critical intervention into the two categories, and what lies hidden in between.⁷ She seeks to create space for deliberation, pushing back against technological determinism in order to avoid reinscribing the faults of the human onto whatever comes next. My goal is to use the theoretical framework that Hayles applies to the human and the posthuman in order to better understand how the flesh and “data double” relate to one another and what that relationship brings to light. In applying Hayles’ theory to surveillance studies, I also intend to mimic her methodology and use literature, science fiction in particular, as my object of analysis.

Literature is central for Hayles because it encapsulates her theory about the human and the posthuman. In the same way that the dichotomy between flesh and the “data double” is stretched to encompass the human and the posthuman, Hayles uses literature to further this laundry-line of dichotomous pairings. She sees the relationship between language and code, as well as print text and digital text, as further dichotomies which can be used to better understand the human and the posthuman. In my thesis I intend to read theory from Hayles as well as others through science fiction in order to interrogate the problematic with which I began.

Science fiction is particularly useful for me because it holds no air of pretense. The genre is often derisively described as escapist, books relegated to the children’s section. What this allows for is an alternative severity, and therefore a lens through

⁷Hayles is not directly concerned with surveillance studies. Her critiques of the pursuit of primacy and the focus on terror relate to posthumanist theory, though I contend it is a productive framework through which to consider my problematic in surveillance studies.

which it can theorize problematics such as the relationship between the flesh and the “data double”. Science fiction equips me with a toolkit altogether absent from that provided me by surveillance studies. In pursuing an efficacious framework through which subsequent thinkers can better advocate for those lost in between the flesh and the “data double”, I intend to apply the theory provided me by Hayles and others to Greg Egan’s *Permutation City*.⁸

Egan’s novel is valuable to my thesis for many reasons. He is concerned with both posthumanism and surveillance, which makes *Permutation City* especially apt for my purposes. Egan is also interested in the same critiques and questions as Hayles. Compressing, stretching, and abusing the dichotomy between material and information is seminal to Egan’s project. In this way, I read *Permutation City* as a 310 page narrative exploration of Hayles’ theory. The flesh and “data double” pair are considered from a variety of perspectives, each sympathetically provided by his characters.

Permutation City is set 50 years into an alternate future which oscillates between utopia and dystopia. The manipulated variables which make the novel science fiction are a technology which allows consumers to scan their brains to create “Copies” of themselves, and vastly accelerated climate disaster. We can productively read Ela Darling into the novel, with her “data double” filling the role of Copy. The animating conflict in *Permutation City* is over access to scarce computing power which is publicly traded on a marketplace called the QIPS Exchange. The Copies are primarily created by the extravagantly rich and the terminally ill; customers run datafied versions

⁸Though Hayles has considered *Permutation City*, my application of her arguments to the novel is a unique contribution.

of themselves on closed programs and can achieve effective immortality on a hard drive. However, they require enormous amounts of computing power to run, which becomes an issue under conditions of scarcity. Challenging for that scarce computing power is a computer program called “Butterfly Effect”. This program models and nullifies natural disasters through a complex algorithm. Though it saves countless lives in this enviro-dystopia, it also threatens the computing power needed for the technoutopia. The material and information dichotomy is phrased as a conflict.

In the problematic that I began with, part of the failure of the existing theory is the focus on primacy in the future between the flesh and the “data double”. In *Permutation City*, Egan allows that fascination to play out, asking what a victory of information might look like. Ultimately, Egan demonstrates the fiction of that notion. As his characters try time and again to transcend materiality, they are constantly rebuffed, unable to separate the pair. The relationship between material and information - the way that they are co-constituted and the material present in both - cannot so easily be forgotten.

By applying Hayles theory to *Permutation City*, I argue that a framework through which theorists in surveillance studies can consider the flesh and the “data double” becomes clear. The search for primacy is motivated by a terror that just as the “post” in posthuman suggests the end of the human, the “data double” jeopardizes the flesh. Hayles demonstrates that this terror can be generative and not paralyzing; it creates space which theorists in surveillance studies can fill with deliberation. The flesh and the “data double” are fundamentally interpenetrated, and rather than working to understand which side of the pairing will have primacy in the future, this terror

provides fertile terrain for critical intervention in the present. Through the application of science fiction, previously unseen political possibilities become manifest. The process-driven method that Hayles employs in her study of the human and posthuman, when applied to the flesh and the "data double", generates space for deliberation. Technological determinism is insufficient, and the terror Ela Darling experiences over the prospect of her "data double" acting without her knowledge presents an opportunity to challenge that future in the present.

Literature Review

Though I ground myself in surveillance studies and hope to make clear the stakes in that field, my contribution lies in the connection I draw between surveillance studies, posthumanist theory, and science fiction. For this reason, my literature review proceeds in three parts. The first deals with surveillance studies, expanding upon the problematic that I am puzzling over and showing how it connects to larger debates in the field. The second section situates N. Katherine Hayles in the terrain of posthumanist theory and explicates some of her scholarship. In the third I complete the bridge between the first two by expanding on their shared use of science fiction, as well as my own application of the genre.

Surveillance Studies -- “Data Doubles” & Deleuze

Theorists within surveillance studies have been pondering the best ways to understand the problematic of data and flesh for nearly two decades - largely without luck. I locate my attempt among scholars such as Kirstie Ball, Charlotte Epstein, Martin French, and Gavin JD Smith, among others.⁹¹⁰¹¹ French and Smith’s 2016 article “Surveillance and Embodiment: Dispositifs of Capture” uses an example from the UK border to understand the problematic at the heart of my thesis. Foreign nationals in the United Kingdom are required to hold biometric visas, so when they reenter the country, their

⁹French & Smith, “Surveillance and Embodiment”.

¹⁰Ball et al., “Big Data Surveillance and the Body Subject”.

¹¹Epstein, “Surveillance, Privacy, and the Making of the Modern Subject”.

faces are not compared to a picture. Instead, their fingerprints are taken and cross referenced with the existing database. French and Smith demonstrate that “trust is placed in the apparently stable and measurable materialities of the body, rather than in the perceived fallibility of a human border agent trying to match a face with a passport picture.”¹² This notion of the primacy of data over flesh has been furthered by countless scholars in surveillance studies. David Lyon argues that the rise of surveillance society “has everything to do with the disappearance of bodies.”¹³ French and Smith characterize this as “the paradoxical manner in which bodies under surveillance appear to disappear, before reappearing as aggregated binary codes in digital enclosures.”¹⁴

In other words, it may appear as though the data becomes more important than the flesh from which it was harvested. Smith and French resolve this paradox as such: “...these observations might seem to lead to the conclusion that surveillance does away with bodies. However, nothing could be further from the truth. A better way to understand the sum of these observations is that surveillance is *generative* of bodies... with surveillance technologies and surveillance bodies locked in a relationship of *mutual interdependence*.”¹⁵ Ela Darling’s digital rendering would constitute such a body. Herein lies the problematic animating my thesis: through the scrutiny of the flesh-bound body and the subsequent production of the data-liberated body, one becomes two. They are firm in asserting that this process is productive rather than

¹²French & Smith, “Surveillance and Embodiment”, 5.

¹³Lyon, “Surveillance society”, 15.

¹⁴French & Smith, “Surveillance and Embodiment”, 15.

it should also be noted that Smith and French borrow the phrase “digital enclosures” from Andrejevic.

¹⁵ibid., my emphases

destructive, but stop short when it comes to providing much in the way of a framework for how to critically assess this junction. In theorizing the productivity of surveillance they also harken back to one of the most influential articles in the field of surveillance studies, Kevin Haggerty and Richard Ericson's *The Surveillant Assemblage*.

Through the notion of the “data double”, Haggerty and Ericson provide the groundwork for my thesis and the problematic which animates it. They separate the process into two parts. “First,” they say, “[the body] is broken down by being abstracted from its territorial setting. It is then reassembled in different settings through a series of data flows. The result is a decorporealized body, a data double of pure virtuality.”¹⁶ By combining technologies which directly target flesh with more habitual surveillance targeting the “trails of information which has become the detritus of contemporary life”, the “surveillant assemblage” is creating “a new type of body, a form of becoming which transcends human corporeality and reduces flesh to pure information.”¹⁷ This is the “data double”, and the basis of the problematic that I will try to make an intervention into. The notion is embedded in what they call the “surveillant assemblage”, appropriating the term from Gilles Deleuze and Felix Guattari.

Since its first utterance, the “surveillant assemblage” has become integral in articulating contemporary surveillance. The phrase is taken from Deleuze and Guattari, who have seldom written directly about surveillance. Nonetheless, the notion of an “assemblage” is useful in the context of surveillance studies to describe the “radical multiplicity” that characterizes contemporary surveillance.¹⁸ An assemblage for

¹⁶Haggerty & Ericson, “The Surveillant assemblage”, 611. They explicitly reference Donna Haraway.

¹⁷Haggerty & Ericson, “The Surveillant Assemblage”, 611-613.

¹⁸Ibid., 608

Haggerty and Ericson takes heterogenous and previously discrete institutions and conglomerates them into one functioning mechanism. They say it is “multiple, unstable and [it] lacks discernable boundaries or responsible governmental departments, the surveillant assemblage cannot be dismantled by prohibiting a particularly unpalatable technology” or any similarly narrow critique.¹⁹ Rather than existing in a vertical hierarchy in which watching is concentrated in one entity, the “surveillant assemblage” exists horizontally as a rhizomatic root structure. The “surveillant assemblage” is driven by the desire to bring things together, “to combine practices and technologies and integrate them into a larger whole.”²⁰ David Lyon alternatively terms this “liquid surveillance.”²¹ The “data double” is culled from these tentacles which have penetrated every aspect of modern life. The double is not merely produced by CCTV cameras in cities or airport scanners, but by the assemblage which constantly incorporates new modalities of surveillance. This includes a physical likeness, but also incorporates an entire profile complete with measurable data about the body and less body-specific information such as consumption habits and voting history. In mobilizing not only the language of assemblages and rhizomes, but also other concepts from Deleuze and Guattari, Haggerty and Ericson place their article in the landscape of the debate between the application of Foucault’s discipline society and Deleuze’s society of control.

This debate is one of the most generative in surveillance studies, though neither theorist addresses surveillance directly. Michel Foucault’s disciplinary society has

¹⁹Ibid., 609.

²⁰Ibid., 601.

²¹Lyon, “Liquid Surveillance”.

animated much of the conversation about architectural surveillance. The central image in this conception is Bentham's "Panopticon". Surveillance here is located in discrete institutions such as the prison, the school, or the hospital.²² Gilles Deleuze's control society declares the end of the disciplinary society, arguing that the factory has been replaced by the corporation. This also entails a different version of surveillance that is not architecturally oriented, and no longer confined to discrete institutions. In an essay titled *Postscript on the Societies of Control*, Deleuze proclaims that the institutions which characterized the disciplinary societies "are finished."²³ What takes their place in the context of surveillance is the "surveillant assemblage". This truncated overview of the society of discipline as it relates to the society of control is only intended to show that Haggerty and Ericson's "surveillant assemblage" and the subsequent "data double", tend towards Deleuze's vision. In this way the problematic between data and flesh has significant theoretical stakes, which is why I hope to make an intervention and propose an alternative avenue for more expansive thinking. It is towards this goal that I turn to posthumanist theory and N. Katherine Hayles to stretch and further understanding the dichotomy between flesh and "data double".

²²This is clearly a gross oversimplification of the dispersal of power that Foucault describes. It is certainly true that through the process of subject formation, surveillance in these discrete institutions transcends their physical boundaries. That said, in its application in surveillance studies, what characterizes the society of discipline is its centralized nature, as opposed to the control society where subjects are often both the surveyor and the surveyed.

²³Deleuze, "Postscript on the Societies of Control", 4.

Posthumanist Theory

What I hope is clear from this section is that the turn from surveillance studies to posthumanist theory is natural due to their shared fascination with the problematic of flesh and data. The “data double” can be read as a digital iteration of the posthuman; the flesh from which it was culled parallels the human. It is my assertion that though both fields are studying this dichotomy, scholars in posthumanist theory are doing so through more expansive avenues, and therefore reaching more provocative conclusions. These conclusions provide me with a framework through which I can interrogate the dichotomy that animates my thesis. In pursuing this end I have become especially fascinated by N. Katherine Hayles, a literary critic and posthumanist theorist who provides the backbone for the theoretical work I do.

Posthumanist theory doesn't have any fixed genesis story. It was popularized around the mid-1990s, but its origin can be dated anywhere from the 1940s to the 1960s.²⁴ In broad strokes, the field is concerned with exploring what the possibility of life after humans might mean. This expansive focus allows for contribution from a wide variety of disciplines. Though I explore posthuman theory only tangentially, it provides me with an invaluable framework for interrogating my problematic. Donna Haraway's *A Cyborg Manifesto* is especially valuable in this regard. In it, Haraway sets out to complicate the distinctions traditionally drawn between human and animal, animal/human and machine, physical and nonphysical; in other words, between human and posthuman.²⁵ She argues that removing this fictitious distinction does not however

²⁴Wolfe, “What is Posthumanism?”, xii.

²⁵Haraway, *A Cyborg Manifesto* 6.

collapse the two into one, but rather allows it to form a complex dichotomous pairing. Theorizing these pairs, she writes, “one is too few, but two are too many.”²⁶ This is the tradition in which N. Katherine Hayles is located, and the theory that she builds upon. Through the application of literature, Hayles furthers Haraway’s conclusions, arguing that not only can the pairs be neither separated nor collapsed, but that by reveling in this fraught relationship they can be better understood. It is only through consideration of the posthuman that previously obscured elements of the human come into sharp focus, and vice versa.

In *How We Became Posthuman*, Hayles lays out her vision of how the posthuman might relate to its predecessor. Her goal is not to formulate any utopian or dystopian prophecy of life after humans. Instead, she hopes to use the space generated by the terror of the “post” in posthuman to better understand both categories, and to call for deliberation. In this pursuing this end, she turns to literature. In *Writing Machines*, Hayles explores the process of writing in the computer age to better understand the human and the posthuman.²⁷ She expands her understanding of how the human and posthuman relate by stretching the framework to encapsulate two more dichotomous pairs: language and code, as well as print text and digital text. With all of these, there is a terror that the latter may destroy the former. Her intent is the subsume that battle for primacy and place in its stead a more process driven attempt to understand what the two reveal about one another. In *My Mother Was a Computer*:

²⁶Ibid., 60.

²⁷Hayles, *Writing Machines*.

Digital Subjects and Literary Texts, Hayles continues to explore literature as an embodiment of the human and posthuman dichotomy.²⁸

Through these three books as well as her other work, Hayles calls for a process-driven understanding of the human and the posthuman. She argues that the terror which the “post” in posthuman elicits can be used to generate space for critical theory. Rather than focusing on any struggle for primacy between the human and the posthuman, Hayles seeks to make an intervention into the dichotomous pairing and use the relationship between the two to better understand them both. This is an understanding grounded in process and material, and one that she complicates and expands throughout her scholarship. In my thesis I intend to apply her argument to the problematic in surveillance studies with which I began; stretching further this line of dichotomous pairings to encompass the flesh and the “data double”. I contend that her conclusions are applicable, and that rather than trying to understand which of the two will have primacy in the future, a more process-driven approach which focuses on what the two explain about one another in the contemporary moment yields more interesting answers. Further, her fascination with science fiction completes the bridge between surveillance studies and posthumanist theory, making the jump all the easier. Greg Egan’s *Permutation City* has allowed me to wrestle with the flesh and the “data double” equipped with the tools of narrative and metaphor instead of those typical to surveillance studies.

²⁸Hayles, *My Mother was a Computer*.

Science Fiction & the Broken Mirror

My use of science fiction as the object of analysis is by no means original. There is a long tradition of scholars employing science fiction to understand and theorize surveillance, and given science fiction's prominence in Hayles work, the genre represents another bridge connecting surveillance studies and posthumanist theory. George Orwell's *1984* is exemplary of this genealogy.²⁹ Though in subsequent decades theorists in surveillance studies have largely dismissed Orwell's vision as too simplistic, the dramatic impact that the book has had on the field is irrefutable. Along with Bentham's image of the Panopticon, *1984* is one of the foundational texts within surveillance studies. More contemporary theorists like William Bogard have also employed science fiction to understand surveillance.³⁰ My use of science fiction is not, however, defined exclusively by its presence in surveillance studies and posthumanist theory.

I was initially pushed towards posthumanist theory and subsequently science fiction because of what I see as a shortcoming in surveillance studies. Though countless articles engage with Haggerty and Ericson's "surveillant assemblage", they typically avoid altogether the datafied bodies later in the text.³¹ Those few who dare have found their attempts largely fruitless.³² I cannot help but feel that this theoretical impotence is a byproduct of bashfulness, scholarly embarrassment over the prospect of

²⁹Orwell, "1984".

³⁰Bogard, "The Simulation of Surveillance", 8.

³¹An exhaustive list to this point would be impossible, as citing scholars not citing other scholars is difficult.

³²Here I am referring to Ball, Smith, French, and Epstein. As mentioned in the previous section, their attempts have largely been mere calls for further attempts, or a meditation on the possibility of the primacy of the "data double".

stooping to the level of the “data double”. I hold that surveillance studies has applied too formal a lens to this problematic, and this severity has lead to inadequate theorization.

It is in addressing this crisis of imagination that I turn to science fiction, a genre often dismissed as escapist. For my purposes, the flip side of this escapism is that science fiction is uniquely capable of addressing the seemingly ludicrous. The genre basks in what more formal approaches to surveillance studies can only speak of in hushed tones, which is useful when thinking seriously about the notion of digital bodies. In my reading of science fiction as theory, two elements stand out as especially useful. The first is that science fiction allows me to interrogate the problematic that I began with, but equipped with a set of tools different from those provided by more formal political theory. The second is that by reading Hayles theory through Egan, I am able to continue to extend the laundry line of dichotomous pairings with which I have been working thus far.

One uniquely valuable element of this toolkit is the way science fiction mobilizes the future for analysis of the present. Science fiction writers don’t aspire to prescience; they apply a broken mirror to trends in the contemporary moment in order to see them differently. Ursula Le Guin, a prolific writer both in and about the genre argues that “science fiction is not predictive; it is descriptive.”³³ The genre is not a break from older forms of fiction which attempt to shed light on some perplexity of contemporary life. Rather, it invokes that tradition by an alternative means. Le Guin continues, “all fiction is metaphor. Science fiction is metaphor. What sets it apart from

³³Le Guin, “Left Hand of Darkness”, xiv.

older forms of fiction seems to be its use of new metaphors, drawn from certain aspects of our contemporary life... The future, in [science] fiction, is a metaphor.”³⁴ But of course, the picture it paints of the present is not entirely accurate. It elongates and deforms, fractures and fidgets, thereby reflecting things not previously seen.

In reflecting the contemporary moment, science fiction also crucially distorts elements so as to render them hypervisible. It allows readers to look at the world they inhabit from a totally different perspective, bringing to light things that might otherwise remain shrouded in darkness. Le Guin describes the genre as “a crazy, protean, left-handed monkey-wrench.” She continues, writing that science fiction is “an infinitely expandable metaphor exactly suited to our expanding universe, a broken mirror, broken into numberless fragments, any one of which is capable of reflecting, for a moment, the left eye and nose of the reader, and also the farthest stars shining in the depths of the remotest galaxy [sic].”³⁵ This is its unique value, and how I intend to use it. What I intend to do through Greg Egan is sit the flesh and the “data double” in front of this mirror and then allow Egan to apply blunt force to the reflective pane. As Le Guin says, perhaps a nose and an eye will be reflected, but the misdirection of the mirror will also elucidate things far beyond what is sitting in front of it.

³⁴Le Guin, “Left Hand of Darkness”, xix.

³⁵Le Guin, “Science Fiction and Mrs. Brown”, 29.

Chapter 1 – One is Too Few, Two are Too Many

My broken mirror is provided by Greg Egan and his hard science fiction classic *Permutation City*. Egan helps me creatively rethink the dichotomy between the flesh and the “data double” through three parallel dichotomies: material and information, language and code, and print text and digital text. He is especially concerned with the relationship between the first, placing the two in competition over access to scarce computing power. By applying Hayles’ theory to my reading of *Permutation City*, I explicate further the framework that I intend to apply to the flesh and the “data double”. Language and code and print text and digital text concern the way that *Permutation City* is written and read, while the relationship between material and information becomes clear through narrative. In all three cases, what is clear is that the two sides of each pairing can only be understood if read and theorized in tandem; material is constantly implicated in information and vice versa. The same goes for the pairs concerned with form. These pairs are interpenetrated - inseparable but also not prone to collapse. Though I consider them through the specific tools provided to me by Egan and Hayles, Donna Haraway gives what is my overarching philosophy in their consideration. “One is too few, two are too many” is the name of this section because in it I hope to make clear that in all of the pairs that I consider, they can only be understood if viewed as process-driven and mutually explanatory.³⁶ While Hayles

³⁶Haraway, “A Cyborg Manifesto”, 60.

provides the theory through which I can see that in her argument, Egan allows that theory to come alive through narrative.

Characters & Plot Synopsis

Permutation City follows a small cast of characters and their Copies.³⁷ Paul Durham, an Australian man who fades in and out of sanity throughout the novel, is the protagonist. A techno-savvy smooth talking salesman, he offers a service to wealthy Copies interested in achieving effective immortality. His claim is that as environmental disasters increase in frequency, conflict over access to scarce computing power will become unavoidable and Copies will lose out. Paul Durham offers to generate a fully separate digital world where the virtual megarich can enjoy eternity without threat from the material. Maria DeLuca, his co conspirator and eventual lover, is a scientist obsessed with a computer program called the Autoverse. The Autoverse is an artificial life simulator constructed on a set of abstracted and simplified natural laws. The collection of enthusiasts who experiment in this world are set on creating an organism capable of genuine evolution in the Autoverse. Maria DeLuca is the first to be successful, which is why Paul Durham reaches out to her. The offer to megarich Copies is not only eternity, but an eternity which also promises the quasi-organic development of a new life-form. The rest of the characters are variously implicated in this scheme; colleagues, patrons, or tagalongs. Of note is Thomas Reimann, an eccentric millionaire unable even in virtuality to escape the guilt of his material creator

³⁷As mentioned earlier, “Copies” are virtual brain scans which live in a software program and require significant computing power to run.

murdering his fiance; and Malcolm Carter, a software architect who built the city in which the rich Copies will live.

The book is split into two parts. In the opening passage the reader learns that our protagonist, Paul Durham, is split in twain. Paul is a Copy carrying out a complex set of experiments for Durham, his flesh and blood creator. Paul is trying to learn what it would take to make digital life tolerable so that Durham can better market that life to other Copies.³⁸ In his quest to sell this world to mega-rich electronic millionaires, Durham recruits Maria to construct a naturally developing species in the Autoverse as well, and Malcolm Carter to design a city for the immortal Copies to inhabit. With a population to inhabit Permutation City, Durham and Maria prepare to launch their Garden of Eden with the Copies onboard. From there, the simulation will continue to persist even after Durham deletes the program, thus granting the Copies effective immortality. In this way, Egan both introduces the characters and conflicts, and then prepares to put to the test the notion of informational primacy to the test.

In the second section, Egan allows this victory of information to play out. As the novel progresses, the information and material dichotomy at the book's heart separate further and further, and the stakes change with that shifting relationship. The computer program Permutation City is running on begins to crash, and the characters find that they are perpetually tailed by the material and that the relationship cannot be so easily divided.³⁹ Through this narrative, Egan provides a story through which material and information can be theorized.

³⁸My usage mirrors Egan's; I refer to him as "Paul" when he is a Copy and "Durham" when he is flesh-bound.

³⁹"Permutation City" is both the name of the book and the name of the fictionalized city. I will distinguish between the two through my use of italics.

Information & Material in *Permutation City*; Content

The dichotomy at the heart of *Permutation City* is best theorized through Egan's protagonist: Paul Durham. The prologue opens with eyelids; Paul Durham awakes. The reader soon learns, however, that it was actually only Paul, the Copy, who opened his eyes. Durham, the flesh from which Paul was copied, is absent.⁴⁰ For the entirety of the prologue the two are kept distinct, locked in an adversarial relationship. Paul resents Durham for creating him, at one point even considering digital suicide to end the horror of pixelated immortality. This is significant because it demonstrates Paul's ability to act entirely on his own volition, even when that places him at odds with his flesh creator. However, it is complicated further because Paul is unable to go through with it.

“This body didn't want to evaporate. This body didn't want to bail out. It didn't much care that there was another – “more real” – version of itself, elsewhere. It wanted to retain its wholeness. It wanted to endure.”⁴¹

Not only can Paul act independently of Durham, but he also possesses an intense will to live, even if that life is lonely and pixelated. There is no sense that Durham is more important due to his fleshy disposition. In this way, Egan begins with material and information miles apart. And yet, he has already articulated the counterpoint. Though Paul and Durham are entirely separate, they collectively make up the protagonist: Paul Durham. They are two sides of the same person, and in this sense are one. As the plot progresses, the pairing is complicated further. We learn that we have been tricked by a

⁴⁰Here we can see the relationship between Ela Darling and her “data double” play out narratively.

⁴¹Egan, “Permutation City”, loc. 263.

faulty narrator, that Paul is actually Durham and that Paul Durham is the product of 23 Copies, all of whom share a continuous consciousness.⁴² We then learn that Paul Durham was recently released from a mental institution. This is all to say that the eyes through which the reader sees Egan's world are equipped with distorted glasses; the dichotomy between material and information, flesh and data, is muddled and constantly contorting.

In this way, through the content of *Permutation City* I can begin to think through the dichotomy that I am concerned with: that of flesh and the "data double". At times, Egan holds Paul and Durham so far apart that they seem utterly distinct, and at times they exist as Paul Durham. This is a valuable start, and by reading Hayles through Egan I can begin to consider the novel's form as well as its content.

Textual Interpenetration; Form

In the same way that Paul and Durham can never be separated nor collapsed, Hayles makes a parallel argument about language and code as well as print text and digital text. She opens *My Mother Was a Computer* with a discussion of the "new languages [that] are springing into existence, proliferating across the globe."⁴³ These languages are designed by humans, but used to communicate with computers, and they almost always exist in tandem with languages like English. So quickly and thoroughly have they interpenetrated previous forms of human communication, that today the two are often indistinguishable. Take for example my experience with *Permutation City*.

⁴²Here meaning neither the Copy nor the original but both; the product of this shared consciousness.

⁴³Hayles, "My Mother was a Computer", 15.

Read on the digital screen of a Kindle, what began as a story in English in the mind of Greg Egan was translated to binary code and stored on a computer, printed back into English for publication, returned to binary code for transportation onto my electronic reader, before finally appearing in English for my consumption. In this way Hayles explicates the way that contemporary writing and reading disguises the 1s and 0s which dwell just below the surface. But for Hayles, even that surface is deceptive.

Stretching the laundry line of dichotomous pairings one step further, Hayles moves from language and code to print text and digital text. This pair functions similarly in her argument to language and code, in the same way that the latter pair now often occupy the same communicative space, print and digital text are similarly interpenetrated. Take my thesis as an example. The crisp white paper on which it is read hides the fact that most of its life was spent flickering on the electronic screen of my laptop. Print text and digital text cannot be collapsed nor separated, as with language and code, Paul and Durham, material and information, and for my purposes, flesh and “data double”. The sides exist often in the same space, harkening back to Haraway’s quote. But what both Hayles and Egan demonstrate is that this is not a peaceful cohabitation. There is a terror latent in the pairing, a worry that one may destroy the other embedded in the “post” central to posthumanist theory.

Chapter 2 – Will This Destroy That?

Even as these pairs exist so often in tandem, there is a lingering sense that one may come at the expense of the other. The posthuman places the human in jeopardy, much like code threatens language, digital text threatens print, and the “data double” threatens the flesh. This latent terror is central to Hayles theoretical work, and in *Permutation City* Greg Egan allows this possibility to run roughshod narratively. In both Egan and Hayles, the conclusion is that this terror can be generative, but their different tools and methods of approach allow for productive degrees of nuance. By studying the terror not only in the relationship between Paul and Durham but also the ways in which the words are written, Hayles and Egan help me better understand the terror latent in the pairing with which I began.

Text @ Risk; Form

In the opening pages of *Writing Machines*, Hayles describes a famous scene in Victor Hugo’s *Notre-Dame de Paris* in which the Archdeacon is shown contemplating the end of the primacy of spoken communication at the hands of the printing press. Looking out the window at the Cathedral of Notre Dame, he then points to the printed book lying on his side table. “Casting a mournful glance from the book to the church: “Alas!” he said. “This will destroy that.”⁴⁴ Looking back upon the transition between

⁴⁴Hugo, “Notre Dame de Paris”, 197.

oral and written communicative primacy, Hayles argues that the place of writing is now in a similar scenario, once again imperiled by a new technology. As the typewriter begins to fade into obsolescence, this terror becomes manifest between language and code as well as print text and digital text. That same terror comes to the fore in the close of the first section of *Permutation City*. But while Hayles stops short at describing this terror before making her theoretical intervention, Egan embraces it narratively and dives into it headlong, considering what an informational victory at the expense of the material might mean for his characters.

Paul @ the Expense of Durham; Content

Having twisted and turned and terrorized the dichotomy between information and material through the relationship between Paul and Durham, Egan ends the first section with what seems like a victory of the information. The section concludes with Durham and Maria launching *Permutation City* into digital eternity, populated with Copies of themselves as well as the rest of the cast of eccentric millionaires. Their task is complete, and the information has been set free. They watch Paul furiously experimenting in his new world, preparing for launch.

The Copy took on the air of a deranged sect leader driving a bus full of frozen billionaires straight toward the edge of a cliff -- accelerating euphorically in the sure and certain knowledge that the thing *would* fly, carrying them all off into a land beyond the sunset.⁴⁵

They share a somber celebration colored by Durham's intermittent weeping. Toasting champagne, they grow drunk before awkwardly coming together to make love. The

⁴⁵Egan, "Permutation City", loc. 3946.

scene is evocative, as sex typically precedes the exchange of information necessary to produce life. Here Egan switches the order; creation seizing primacy from physical intimacy, information from material.

Maria is woken from an uneasy sleep by a dream. In it she finds herself in labor, enduring tremendous pain as she strains; “Keep pushing! Keep pushing!”⁴⁶ The dream concludes with birth, but instead of a child she is left with a blood stained statue carved from dark wood. She gives birth to permanence in statue form, mirroring the creation of Permutation City. She soon realizes, however, that her dream was triggered by Durham. Upon opening her eyes, she smells something foul and realizes that she is alone in his oversized bed. Assuming Durham was sick from the drink, she raps gently on the bathroom door. Hearing no response, she opens it, finding him sprawled in the bathtub, soaked in blood. He had taken a kitchen knife to his belly, expelling his entrails into the porcelain tub. “Keep pushing! Keep pushing!” His cries had animated her dream. In a twisted vision of hypermasculine birth, Durham had carried out some deformed reverse C-Section and then cut the umbilical cord, played by his lower intestine. The scene demonstrates the final and sheer sacrifice of the material, the flesh, for the information and the data. Egan allows the latter to take utter primacy, and Maria is left stunned as the first part concludes.

In this way, Egan takes the terror latent in the material and information dichotomy and makes it manifest. He allows the latter to take primacy as Paul blasts off into techno-utopia, leaving Durham to bleed out in a bathtub reeking of feces. But what he shows in the concluding chapters is the ultimate fiction of this notion. By

⁴⁶Ibid., loc. 4072.

simultaneously reading this as instructive for my own work also and also applying
Hayles consideration of the terror latent in the language and code and print text and
digital text pairings, a method for intervention becomes clear.

Chapter 3 – Revel in the Stench

In the final section of *Permutation City* Egan makes manifest the terror latent in the material and information dichotomy. Following Durham's suicide for the primacy of Paul, Egan lets that vision play out. What he shows is that try as it may, information cannot break free. The material has a niggling proclivity to return time and again, and in this way Egan helps me think through the notion of the "data double" in surveillance studies. By reading Hayles through his prose, I gain a framework through which to understand that terror. Hayles sees it as generative, rather than petrifying. She aims to occupy that space with theoretical intervention to understand both sides of the complex pairing.

Concluding in the Material; Content

Thousands of years after the genesis of the Garden of Eden simulation, Paul wakes up Maria's Copy to enlist her help in making contact with the artificial life, the Lambertians, that she designed. His hope is that Maria can convince them that they were created through an algorithm. The physical laws governing Permutation City are abstractions; designed as a cheap simulation of nature that, if scrutinized too closely, are not internally consistent. The artificial life, which at the outset of the simulation was rudimentary and unthreatening, has evolved into intelligent life. The laws of the Lambertians form a new materialism with a whole different set of materials, but ones with a consistent logic. The juxtaposition between the informationally abstract world

with that of the internally consistent Lambertians places material and information in conflict yet again. The meeting ends disastrously, as the Lambertians are unwilling to accept the hypothesis. This refusal spells disaster for the inhabitants of Permutation City. In the scenes that follow, the new material that constitutes the Lambertians civilization begins to corrode the simulated laws of Permutation City, allowing Egan to show a victory of a sort of new material. The answer to his puzzle about the material and the information at the end of the first part becomes clear, and the world of information begins to crumble.

As Permutation City begins to come apart at the seams, Paul and Maria frantically scramble to ensure the safety of their digitized millionaire customers. Though they manage to upload newly scanned Copies of most of their millionaire patrons, there is one straggler: Thomas Reimann. Reimann has been unable even after seven thousand years of simulation to shake the guilt from his life of flesh in which he murdered his lover. he lives entirely detached from the rest of the Copies, in a simulated home which he has programmed to obey the natural laws of earth. While the other Copies were rescanned and downloaded into the new Garden of Eden simulation, Reimann altered the software to prevent external extraction of his data. He can only be accessed through physical interaction from within the program in which he lives. Upon arrival, Paul and Maria find him despondent. He is unable to go with them to preserve his information as the software around him comes undone. They have only minutes to save him, and they realize that it can only be done by physically carrying him out. His weight is crushing, their struggle is fruitless. This grim reminder of material is

incontrovertible. They are ultimately unable to rescue Reimann, and leave to save their own data.

Unable to shake the material, they jump further into information. The initial Garden of Eden simulation was carried out by two flesh bodies, this time two Copies carry out the simulation, preparing to jump further into the void. Egan leaves the fate of this second simulation unclear; the book ends as they make the leap. But even though it is left unwritten, the reader gets a conclusion of sorts in the epilogue.

Though the entire second part takes place in Permutation City, the flesh-bound Maria lives on in the material world. She is reintroduced in the epilogue. The last pages show her grieving at a digital wreath placed in Durham's honor. While staring at the screen simulating corinthian columns and an olive grove, an acquaintance walks by. "It's beautiful, isn't it? Don't you wish you could step right through?" Maria doesn't reply. It is unclear whether this flesh and blood Maria has access to the memories that her Copy made in Permutation City, but it is clear that she has made a choice to keep the information and the material connected. As she walks away, Egan remarks that a sewer has burst, releasing a stench bad enough to make her eyes water. The stench is a motif repeated from Durham's death as well as the first page, and Egan's inclusion of it on the last page returns the book's structure to a circle. The stench signals material: both in the sense of excreting physical waste, but also in that it is such a sensory image. It demonstrates Egan's utter rebuke of the primacy of information, even as the fate of the second Garden of Eden simulation is left untold. Reading Hayles through this final passage provides me a productive framework through which I can intervene into the terror latent in my own pairing.

Reading the Typewriter's Headstone; Form

Building on the conclusion of *Permutation City*, Hayles pushes to generate space for critical intervention into the terror latent in the “post” in posthuman. Instead of succumbing to paralysis, Hales argues that as the typewriter fades into obsolescence, critical intervention becomes possible. Her assertion is that language and code are not merely neutral purveyors of information, but that they actively shape what information can be expressed and that therefore studying the way they interact with one another may yield provocative conclusions.

Digital media ha[s] given us an opportunity we have not had for the last several hundred years: the chance to see print with new eyes, and with it, the possibility of understanding how deeply literary theory and criticism have been imbued with assumptions specific to print. As we work toward critical practices and theories appropriate for electronic literature, we may come to a renewed appreciation for the specificity of print... Books are not going the way of the dinosaur but the way of the human, changing as we change, mutating and evolving in ways that will continue, as a book lover said long ago, to teach and delight.⁴⁷

By embracing terror rather than cowering from it, crucial elements of the processes inherent to both become clear.

Hayles rejects the tendency to view the computer as the end all be all of media and literature, rejects the notion that code will destroy language. She regards the relationship between the pairs as process-driven and mutually explanatory, engaging both the technology and the humans designing and consuming them. When looked at from this perspective, what becomes clear is not merely a competition for primacy, but

⁴⁷Hayles, “Writing Machines”, 96.

also how the two interact and transform one another. The broken mirror provided by Greg Egan reveals not the material in the sense of a material primacy, but rather the material inherent to the process behind each dichotomous pair. In the case of language and code or print text and digital texts, this means the literal physicality of books and computers. By considering not only the words on the page, but the page itself, the process of wood production, ink production, software engineers writing code, and so many more components, it becomes clear that there will not be any simple replacement of language by code or print text by digital text.

This method is parallel to her examination of human and posthuman, and my examination of flesh and “data double”. In the same way that in the moment of questioning what the “post” in posthuman might mean for the human presents her an opportunity to challenge assumptions about the human taken for granted, print and digital textuality present a similar opportunity “to break out of assumptions that have congealed around the technology of print, rendered transparent by centuries of continuing development, refinement, and use. This opportunity is powerfully present in the implicit juxtaposition of print and digital textuality.”⁴⁸ The peril which seems suddenly to plague the writing of books allows for the foregrounding of their material, of their process. What remains is the conclusion which I hope to apply to the dichotomy between flesh and the “data double”, though it is certainly reworded. Hayles argues that “by adopting a double vision that looks simultaneously at the power of simulation and at the materialities that produce it, we can better understand the implications of articulating posthuman constructions together with embodied

⁴⁸Hayles, “How We Became Posthuman”, 45.

actualities.”⁴⁹ My argument is that rather than focusing on which has primacy in the relationship between the flesh and the “data double”, surveillance studies is better served by making an intervention into the space generated by the terror latent in that pairing. It is only by embracing terror and recognizing how the relationship is process-driven that theory can shed light on those elements of the pair that are otherwise obscured. In doing so I have argued further that serious consultation of science fiction provides theorists with a useful avenue for critical thought; a broken mirror in which to sit the flesh and the “data double”.

⁴⁹Ibid., 47.

Conclusion – Towards the Future Present

This all began with a problematic in surveillance studies. Building on the work of Kevin Haggerty and Richard Ericson and their notion of the “surveillant assemblage”, I followed them to the “data double”. From there I turned to other theorists in the field trying to understand what that double might mean for the flesh from which it was culled; the simultaneous scrutiny and abstraction which has animated my writing. Finding no help in surveillance studies, I followed N. Katherine Hayles and began reading seriously about posthumanist theory and science fiction. From flesh and “data double”, to human and posthuman, to print text and digital text, to language and code, and back again.

But it would be disingenuous to treat these all as discrete pairs; there is a larger dichotomy under which they all fall. It can be articulated a number of ways, perhaps most clearly as between past and future. On the one side lie code, digital text, “data doubles”, the posthuman, Deleuze’s society of control. On the other lie their opposites. Though I hardly dare write the list because it would place humans as an element of the past, many others have no such trepidation. If Ela Darling were to go the way of the typewriter, it would only come as a shock to those who haven’t been paying attention. Illustrations of a posthuman future are myriad, and come from a wide variety of disciplines.

One which seems especially prescient is from Michel Foucault, writing at the end of *The Order of Things*. In what can only be read as the harbinger of death for his society of discipline, Foucault writes that:

As the archaeology of our thought easily shows, man is an invention of a recent date. And one perhaps nearing its end. If those arrangements were to disappear as they appeared, if some event of which we can at the moment do no more than sense the possibility - without knowing either what its form will be or what it promises - were to cause them to crumble, as the ground of Classical thought did, at the end of the eighteenth century, then one can certainly wager that man would be erased, like a face drawn in sand at the edge of the sea.⁵⁰

The prospect is terrifying, and it feels everyday as though humans rush ever faster into an unknown and frankly unknowable posthuman future. It is often easy to feel like Maria DeLuca, watching Durham frantically prepare the Garden of Eden to blast off into informational utopia.

Making sense of this terror is seminal to Hayles' project. Terror is inherent to the very notion of "post", a warning that "the days of the human may be numbered."⁵¹ And yet, Hayles does not despair. Into that terror she carves space for deliberation, shining a light on that which lies between the human and posthuman, ensuring that we don't rush into the future with our eyes closed. In the case of past and future this brings forth is the present. The present exists as a relationship between what came and what comes; a process driven creation much like what emerges for Hayles in her analysis of human and posthuman. The future can never wrest primacy from the past in the same way that Egan refuses to allow information to reign supreme. And yet, there does seem to be a plodding progression from past into future, though the latter is never gone.

It seems to me entirely conceivable that 50 years from now Ela Darling will have been made redundant. It seems equally conceivable that she will not. I claim no insight into the future of surveillance, let alone that of pornography. Predicting or

⁵⁰Foucault, "Order of Things", 387.

⁵¹Hayles, "How We Became Posthuman", 283.

preventing the future has never been my intention, and it is similarly irrelevant to Hayles' work. Instead, my project has always been one of creative comprehension. To take seriously the ethos of science fiction is to recognize that the future only exists as an abstraction or deformation of the present. Orwell was a keener observer of 1949 than 1984. His hope, that shared by all great authors of science fiction, was to give their readers pause. What if...? The future, then, is defined by malleability in the present. Ela Darling's apprehension over what abuses the future might hold ought to give us such pause, ought to spur deliberation. What if...? If that is a future which is worthy of our terror, it is also certainly one which we can alter. The gravest danger is and never has been a dystopian future. The gravest danger is that we collective future makers forfeit our power and abandon deliberation, tricked into the belief that the future is set in stone.

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