

Clacking Control Societies: Steampunk, History, and the Difference Engine of Escape

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Abstract:

Steampunk fiction uses strategic anachronism, counterfactual scenarios, and historical contingency in order to explore the interconnections between nineteenth-century and contemporary techno-scientific culture. William Gibson and Bruce Sterling's novel *The Difference Engine* (1990), a prominent exemplar of this contemporary genre, depicts a neo-Victorian setting in which the inventor Charles Babbage builds a proto-computer based on the "Analytical Engine" design that he proposed but never actually constructed in our own nineteenth century. The alternative chronology of the novel re-imagines Victorian texts and historical events, including Benjamin Disraeli's *Sybil* (1845) and the industrial revolution, in order to examine literary history and investigate historiography. This essay analyses *The Difference Engine's* commentary on the history of power relations. It contends that the novel's alternative genealogy helps us examine the evolution of control systems and think about the shape of history.

Keywords: biopolitics, control, *The Difference Engine*, William Gibson, historiography, power, self-reflexivity, steampunk, Bruce Sterling, technology.

Verily it was another world then.... Another world, truly: and this present poor distressed world might get some profit by looking wisely into it, instead of foolishly. (Thomas Carlyle, *Past and Present* [1843], 2009: 53-54)

"But then Stephen does not want to recall the past," said Sybil with a kind of sigh; "he wishes to create the future."

"The past is a dream," said Gerard.

"And what is the future?" inquired Sybil.

"Alack! I know not; but I often wish the battle of Hastings were to be fought over again, and I was going to have a hand in it." (Disraeli, *Sybil* [1845], 1981: 169)

Steampunk, which emerged as a fictional subgenre in the 1980s, is characterised by alternative histories that frequently explore the rise of new technologies in Victorian England and throughout its global empire. Steampunk fiction participates in the postmodern resurgence of interest in Victorian culture that has motivated what Sally Shuttleworth calls "the

retro-Victorian novel”, but steampunk ultimately enacts a far stranger speculative revision of nineteenth-century history (Shuttleworth 1998; Gutleben 2001; Krueger 2002; Joyce 2007).¹ Even as steampunk has expanded in numerous directions, weaving through weird interstices between techno-science and history, the majority of works belonging to this category have taken the conventions of fantasy and science fiction and relocated them in worlds that run on steam power. The most prominent novels that fall under this heading draw consistently from such disparate sources as nineteenth-century culture, the early science fiction of Jules Verne and H.G. Wells, and the late twentieth-century subgenre of cyberpunk fiction. Covering a diverse historical spectrum, many of these neo-Victorian futurist texts draw parallels between the Industrial Revolution of the nineteenth century and the Information Revolution of the late twentieth century. Major steampunk writers have included Tim Powers, Paul Di Filippo, and China Miéville.² Other literary authors who have employed certain elements of steampunk, without working entirely within the genre, include Neal Stephenson (in *The Diamond Age* [1995]) and Thomas Pynchon (in *Against the Day* [2006]).³ In addition to a host of prose fictions, visually oriented works such as Alan Moore and Kevin O’Neill’s comic book series *The League of Extraordinary Gentlemen* (1999-), Barry Sonnenfeld’s film *Wild, Wild West* (1999), and the Troika computer role-playing game *Arcanum* (2001) have been influenced by the steampunk subgenre. Through interventions that extend even into the realm of technological design, steampunk has penetrated virtually every major creative medium.⁴

In order to grapple with the historical, scientific, and aesthetic complexity of steampunk, this article focuses on what may be the closest text that steampunk has to a canonical novel: William Gibson and Bruce Sterling’s *The Difference Engine*. By the time this book was published in 1990, both Gibson and Sterling had made major contributions to the future-oriented cyberpunk subgenre, which they both helped to found.⁵ Throughout the 1980s and 1990s, cyberpunk texts captured the impact of the network era and its new computer technologies.⁶ The genre name combined the words ‘cybernetics’ and ‘punk’, gesturing toward a mix of high-tech settings and low life characters, as well as a clash between control systems and hackers who are driven by an oppositional impulse. Building on the aesthetic foundations of a literary movement they defined, Gibson and

Sterling took their interest in technology and control and pushed it back into the nineteenth century.

Like cyberpunk, steampunk explores the relationships – linked rather than bifurcated – among history and fiction; nostalgia and innovation; old cultures and new technologies. Unlike standard alternative or counterfactual historical fictions, steampunk texts are not content with playing the conditional game of ‘What if?’. Instead, these postmodern works fuse familiar convergences and strange divergences that invite a rethinking of potential historical paths and the composition of historiography. Through techniques such as hybridisation, pastiche, and strategic anachronism, steampunk texts defamiliarise both the Victorian past and the globalising present, isolating facets of both eras to make them more susceptible to analysis.⁷ This essay contends that steampunk fiction, however peripheral it may seem to literary studies, promises to make important contributions to the study of history and its social, political, and technological systems. Much like cyberpunk, steampunk enables a complex examination of the historical evolution of power structures and control systems. *The Difference Engine* represents a prime example of steampunk’s persistent and sophisticated attempt to trace history’s vast garden of forking paths. The novel undertakes a serious analysis of the relationship among past, present, and future, which is all the more remarkable for appearing in 1990, at a moment marked by the fall of the Soviet Union and the accompanying triumphal proclamations of the “end of history” (Fukuyama 1989).

In their first collaborative contribution to steampunk literature, Gibson and Sterling shift temporally from the future of computer technologies to its unrealised past. Set primarily in 1855, *The Difference Engine* imagines an alternative geopolitical order that both resembles and diverges from the historical record. The novel depicts a nineteenth century in which Great Britain, the primary world power, has managed to fragment America into countless zones, including the United States, the Confederate States, the Republic of Texas, French Mexico, and the Republic of California. In the midst of this division, the Marxist revolution takes place not in Russia and throughout Europe, but in America. In addition to this rearranged Western horizon, the novel imagines an Asian landscape in which Japan is a nation on the rise: a comparatively weak state that nonetheless seeks to become “the Britain of Asia” (Gibson and Sterling 1990: 169). Beginning with a political map of its imaginary steampunk

world, the novel repeatedly gestures toward a complex global order that diverges spatially and temporally from our own. Despite the expansive scope of this world, which the reader occasionally glimpses, the book focuses primarily on British technological, historical, and political development.

The difference between our actual historical record and the chronology of Gibson and Sterling's novel is attributed primarily to the figure of Charles Babbage, who perfects a general purpose proto-computer and ushers Britain into the information age a century in advance. Despite its title, *The Difference Engine* depicts a technology that is based not on Babbage's Difference Engine (a basic adding machine built in 1833 of our actual history), but on the more complex Analytical Engine design. Much like the groundbreaking automated Jacquard loom of the early nineteenth century, Babbage's Analytical Engine proposed to use punch cards to program a machine that could perform any arithmetical task. Gibson and Sterling's novel suggests that, technically speaking, Babbage's Engines could have been built in our own mid-nineteenth century, but remained in a merely theoretical form as a result of funding limitations, as well as the drastically different social and political priorities of the age. As such, the first programmable computer was not actually built until nearly a century later when, in the 1940s, it was used by the U.S. Navy Bureau of Ships during World War II.⁸ Nevertheless, the novel travels down an earlier path, available yet never traversed during the early nineteenth century, in order to examine the underlying contingency of history.⁹

In the early 1830s of Gibson and Sterling's novel, during what is called the "Time of Troubles", Britain undergoes a revolution by the Industrial Radicals: a capitalist party that facilitates a massive technological transformation fuelled by Babbage's Engines. According to the "Rad Lords" — leaders selected on the basis of their merit rather than birthright — the social focus on new technologies promises to eradicate poverty and create greater stability throughout England. This shift in power and in Britain's political dominance is attributed largely to the Engines, which are programmed by proto-hackers called "clackers" and controlled centrally by the state. The implicit suggestion in this fictional history is that technology, while not categorically determinative of socio-political reality, reflects social trends and enables political transformation. As the novel itself suggests, "the interests of science and manufacturing are inextricably mixed

with a nation's political philosophy" (Gibson and Sterling 1990: 398). In other words, technological machinery and the machinery of power are connected and co-productive.

Closely linked to the political and technological system of *The Difference Engine* is its intricate narrative structure. The majority of the narrative takes place in the mid-1850s over the course of five episodes, but there are also brief digressions that move into the early nineteenth and late twentieth century. Instead of being divided into 'chapters', the novel's major instalments are labelled "iterations", playing on the computer science concept of repetitions or recursions of a process that take place within a program. These narrative episodes are characterised by formal shifts between the present tense, which introduces and closes each textual segment, and the past tense, which makes up the bulk of each section. In effect, Gibson and Sterling use these iterations – units that are simultaneously synchronic and diachronic – less to tell a single linear story than to offer various perspectives on a fictionalised world and its history.

As a work of science fiction – a genre that it frequently complicates – *The Difference Engine* posits a world that derives from our own but is simultaneously and radically other. In fact, the novel's major protagonists, who hail from a variety of social classes, represent and constitute a number of different worlds. These central figures include Sybil Gerard (the daughter of a great Luddite agitator, who has been reduced to prostitution), Edward Mallory (a palaeontologist recently returned from scientific travels to America), Laurence Oliphant (a travel writer, diplomat, and spy), and Ada Byron (the brilliant daughter of the early innovator of the Analytical Engine who, unlike her historical counterpart Ada Lovelace, holds onto her maiden name). Most of the intersections among these characters, and others, concern the mystery of an enigmatic box of Engine punch cards that circulates through the narrative world. As the novel reveals, through a series of episodes that concern political intrigue, mob riots, and intense scientific debates, the mysterious punch cards prove to be the code for a hack with world-altering theoretical implications. While these cards transform the fictional time-space of the novel, they also reveal many of the links between techno-science and power in our own world. This essay analyses the history of power structures suggested by *The Difference Engine* in order to examine the way that counterfactual steampunk genealogies help us think about the evolution of control systems and the shape of history as such.

1. Power, Knowledge, and Techno-Science

The *Difference Engine* generates an extensive cross-historical literary program for the study of shifts among different systems of power. Through its iterations, the novel suggests a tripartite development of modes of power that closely resembles the genealogy posited by writers such as William Burroughs, Michel Foucault, and Gilles Deleuze. Numerous interviews with William Gibson and Bruce Sterling, not to mention their stylistic innovations, suggest that both writers were influenced by Burroughs's postmodern aesthetic and, beginning with their early cyberpunk work, were invested in understanding the structure of contemporary control systems.¹⁰ This theoretical and historical framework undergirding their work is worth dwelling upon briefly.

The narrative about power that underlies *The Difference Engine* most closely resembles the history elaborated by Foucault between the 1960s and 1980s. In his major works, Foucault describes a transition from a sovereign society to a disciplinary society that becomes visible over the course of the eighteenth and nineteenth centuries in the transformation of various institutions, including the school, the factory, the mental asylum, and the prison. In place of a sovereign society that maintained control by exerting force and the legal power of death over its subjects, the disciplinary society came to organise and order life. Given its focus on life, this form of power was achieved through a socially-oriented management technique that Foucault calls "biopolitics" –

the endeavour, begun in the eighteenth century, to rationalize the problems presented to governmental practice by the phenomena characteristic of a group of living human beings constituted as a population: health, sanitation, birthrate, longevity, race. (Foucault 1997: 73)

This epistemological approach employed such technologies as biometrics and statistical analysis in order to understand a new social object of study: the 'population'. Despite its claims to scientific neutrality, biopolitics gave rise to disciplinary processes that enabled centralised institutions of power to manage a newly defined human collective. From the inception of this fledgling form of liberalism, *knowledge about* and *power over* the population became mutually constitutive.

Building on Foucault's philosophical language as well as the conceptual framework developed by William Burroughs from the 1950s through the 1970s, the philosopher Gilles Deleuze came to describe the contemporary transition from disciplinary power to its next form: the "control society".¹¹ Unlike sovereign and disciplinary societies, control societies adopt a more flexible approach to colonising space and time. As disciplinary power is characterised by the establishment of an individual identity that is marked through "signatures" and "numbers", so for Deleuze, control societies depend on "codes" and "passwords" that give fragmented "dividuals" access to information (Deleuze 1990: 179-180, original emphasis).¹² Expanding upon Deleuze's theory of control societies, Alexander Galloway discusses the concept in the context of computer networks. Given the focus of *The Difference Engine* on computing and technology, Galloway's articulation of control is particularly relevant to a reading of the novel. Galloway draws from computing language to name the underlying program of contemporary power "protocol".¹³ On a macro-political level "protocol is a distributed management system that allows control to exist within a heterogeneous material milieu" (Galloway 2004: 8). Protocol does not impose rules from the outside (as is the case with systems such as bureaucracy or monopoly capitalism), but instead relies on a form of *internal* management (Galloway 2004: 121). Moreover, its organisation is horizontal, flexible, distributed, and productive of open systems of control.¹⁴

The Difference Engine stages the historical transformation from sovereign to disciplinary to control society that these thinkers examine. The novel's fascination with control is consistent with Gibson and Sterling's earlier interest in techno-science and the development of "cybernetics": a field that emerged in the late 1940s and 1950s and concerned the study of "communication and control" systems (Wiener 1954). Their co-written steampunk novel takes a wider historical view and marks the transitions between paradigms of socio-political control. It does so by tracking the feedback loops that run between technology and society, as well as the consequent transformations they undergo. In order to explore shifts in power, the text registers the changing attitudes of major characters regarding the nature of knowledge. Early in the novel, several characters repeatedly suggest an older top-down sovereign belief that knowledge unilaterally produces power. For example, the first phrase that Benjamin Disraeli dictates to Edward Mallory, on his newly acquired Engine-powered

typewriter, is Francis Bacon's sixteenth-century pronouncement that "Knowledge is power" (Gibson and Sterling 1990: 191). Cranking a needle along a perforated tape, Mallory misspells the antiquated slogan – "KNOWLEDGEE IS PPOWER" – on the new machine, marking the pronouncement's obsolescence. Even so, other characters also believe that knowledge, in the form of information, represents the surest route to power in this world built on Analytical Engines. The political aide Mick Radley makes this point to his mistress, in the opening pages of the book, when he explains, "It's what a cove *knows* that counts, ain't it, Sybil? More than land or money, more than birth. *Information*. Very flash" (Gibson and Sterling 1990: 8, original emphasis). Even with the persistent dominance of Victorian political and class hierarchies, an upwardly mobile Radley sees information as a levelling agent. For other characters, scientific knowledge and factual information point to a higher realm that remains untouched by the superficial influence of politics and power. In one passage, the "savant" Edward Mallory idealistically inquires, "Are we to let politics stand in the way of truth?" (Gibson and Sterling 1990: 125).

Despite Mallory's naïve belief that knowledge represents a unilateral source of power, the novel quickly overturns this earlier sovereign epistemological model. The pseudo-dystopian world of *The Difference Engine*, one in which Victorian science and information technologies intermingle, comes to suggest that knowledge cannot simply be exchanged for power. In a new disciplinary age, power and knowledge, as well as politics and truth, are mutually generative terms. This new model becomes instantiated by the British political powers at the heart of the narrative. These forces use emerging technologies and techniques, including a network of computational government-owned Engines, social scientific statistics, criminal anthropometrics, eugenics theories, and panoptic surveillance mechanisms, to maintain social control through the manipulation of information. In addition to upholding the dominance of the British Empire, the government's monopoly on information demonstrates an interest in managing historical knowledge. Instead of providing a new standard of objectivity, as Mallory believes, Engine technology facilitates the strategic production of histories that uphold an existing configuration of power. The text makes this point, early on, in a description of the powerful Engines that support the ominously named "Central Statistic Bureau": "Machines, whirring somewhere, spinning out history" (Gibson and Sterling 1990: 4).

Here, history becomes the product of a technological “spinning” mechanism that weaves together a thick narrative texture. Knowledge of the past operates as a construct of a state machine that puts its own biased spin on global events.

Some government Engines in this alternative Victorian society are devoted to theoretical science and pure mathematics, but most of their computing power is devoted to statistical analyses and police surveillance. One character, Prince Albert, articulates this biopolitical function, when he argues, “[S]tatistics is the key to the future. Statistics are everything in England” (Gibson and Sterling 1990: 369). Travel writer and diplomat Laurence Oliphant has an even more ambitious vision of computation that might give rise to a study of “social sciences”. In a conversation with Mallory, he fantasises about “statistical investigations” that could document the population in its overwhelming totality:

‘Mightn’t we then, sir,’ the man continued, with a slight shiver as of suppressed enthusiasm, ‘make utterly objective, entirely statistical investigations? Mightn’t we examine society, sir, with a wholly novel precision and intensity? Divining, thereby, new principles – from the myriad clusterings of population over time, sir; from the most obscure travels of currency from hand to hand; from the turbulent flows of traffic.... Topics we now vaguely call police matters, health matters, public services – but perceived, sir, as by an all-searching, an all-pervasive, a scientific eye!’ (Gibson and Sterling 1990: 104-105, original ellipses)

This fictional description of the rise of the social sciences closely resembles Foucault’s theoretical perspective on the rise of biopolitical endeavours and the panoptic forms of social control that accompanied them. For all of its ambition, Oliphant’s dream of total social knowledge passes too quickly over the darker modes of surveillance that such data enables. Nevertheless, this passage suggests that “a scientific eye” is also an intrusive “all-searching” and “all-pervasive” eye. Tobias, a minor character who works as a government clacker, elaborates this point in a later passage: “We have everyone in Britain in our records. Everyone who’s ever applied for work,

or paid taxes, or been arrested” (Gibson and Sterling 1990: 140). The pervasive paranoia that extends through the various iterations of *The Difference Engine* stems from precisely this systemic possibility of everyone being known. In a more terrifying sense, anyone who is recognised by the state can also be erased. Andrew Wakefield, the British government’s Undersecretary for Quantitative Criminology, channels this fear by referring to “the disappearances, the files gone missing, the name expunged, numbers lost, histories edited to suit specific ends” (Gibson and Sterling 1990: 380). As these examples demonstrate, knowledge may give rise to power, but power is equally adept at editing, shaping, and using knowledge to support its own survival.

In his essay on *The Difference Engine*, Herbert Sussman contends that the novel actually offers a way of thinking beyond the dystopian model of the disciplinary society. He argues that *The Difference Engine* “rejects the Foucauldian model of a seamless, invincible panoptical power as necessarily imbricated with information technology” and “imagines the sudden dissolution of a centralized information system” (Sussman 1994: 5). Sussman further contends that

Gibson and Sterling’s strategy in their alternative history of technology is to contest this deterministic disciplinary narrative of technoculture in several ways – by subverting one narrative, the anti-technological Victorian story of industry, and by substituting another, a liberationist, even utopian, story of technological revolution. (Sussman 1994: 7)¹⁵

While the novel certainly introduces a story beyond Foucault’s account of disciplinary power and the prominent Victorian anti-technological narrative, that story is far from “liberationist” or “utopian”. Indeed, the novel posits that surveillance and biopolitical management are not the most terrifying forms of power. There is still the more adaptable, ubiquitous, and systemic mode of power that drives control societies.

2. Consistency, Completion, and Control

While the majority of *The Difference Engine* operates within a regime of biopolitical management, the ending gestures toward another shift

in power, toward what Deleuze calls a system of “control” and Galloway describes as a network driven by “protocol”. The novel’s protocological future emerges, like the evils of the world escaping Pandora’s Box, from the container of Engine punch cards that serves as the novel’s central intrigue. While this box could easily be treated as a literary MacGuffin – an object or device that furthers the plot but is ultimately of little significance – I read this computer program as a primary component of the novel’s commentary on control systems. Throughout the book, most characters believe these punch cards to be a fabled gambling modus – the risk taker’s equivalent to the philosopher’s stone. Nevertheless, in the final pages, the object is revealed to be something much more complex and meaningful: the catalyst of a new system that introduces a different dynamic of control and opposition.

As the reader discovers, the coveted punch cards contain the code for a brilliant hack, through which British clackers have crashed the great French Engine (a kind of Victorian supercomputer known as the “Napoleon”). In a lecture that she delivers at the end of the novel, the savant Lady Ada Byron describes the theoretical mechanism behind this exploit. Speaking before a crowd that struggles to understand her paradigm-shifting insight, she explains:

Our lives would be greatly clarified if human discourse could be interpreted as the exfoliation of a deeper formal system [...]. And yet the execution of the so-called Modus Program demonstrated that any formal system must be both *incomplete* and *unable to establish its own consistency*. There is no finite mathematical way to express the property of ‘truth.’ The *transfinite* nature of the Byron Conjectures were the ruination of the Grand Napoleon; the Modus Program initiated a series of nested loops, which though difficult to establish, were yet more difficult to extinguish. The program ran, yet rendered its Engine useless! It was indeed a painful lesson in the halting abilities of even our finest *ordinateurs*. (Gibson and Sterling 1990: 421, original emphasis).

The significance of Ada’s revelation, which she makes in the 1850s of the novel, is that it proves to be a version of Kurt Gödel’s incompleteness

theorem that, in the chronology of our own history, would not be posited until 1931. As this theorem contends, “Any effectively generated theory capable of expressing elementary arithmetic cannot be both consistent and complete” (Kleene 1967: 250). A non-mathematical example of this claim is the famous philosophical liar paradox: the sentence that proclaims, “This sentence is false” and thus, logically, denies itself both the qualities of consistency and completeness.

As Ada’s theorem suggests, the search for a universal system of signification, which might reduce the complexity of human thought to a simpler mathematical notation, is theoretically unfeasible.¹⁶ In place of a rule-based system that accounts for all thought, Ada suggests a more open, adaptive, and emergent system. Initially, she describes her isolated exploit – the infiltration of the Napoleon Engine through the initiation of a logical crash – as a “painful lesson” to those clackers who cannot think beyond the existing generation of Engine technology. At the end of her lecture, however, this revelation is followed with a bolder prediction: “Yet I do believe, and must assert most strongly, that the Modus technique of *self-referentiality* will someday form the bedrock of a genuinely transcendent meta-system of calculatory mathematics” (Gibson and Sterling 1990: 421, original emphasis). Taking still another step forward, Ada uses Engine technology, as a metaphor, to illustrate her mathematical theory, noting:

If we envision the entire System of Mathematics as a great Engine for proving theorems, then we must say, through the agency of the Modus, that such an Engine *lives*, and could indeed *prove* its own life, should it develop the capacity to look upon itself. (Gibson and Sterling 1990: 421-2)

Ultimately, Ada suggests that a new system of mathematics could produce an innovative Engine and predicts that her own “[c]onjectures will transcend the limits of abstract concept and enter the living world” (Gibson and Sterling 1990: 422).

Given the centrality of Engines to Ada’s theoretical exploration, her theorem promises to transform Engine science in a similar way that concepts such as ‘self-referentiality’ and the ‘observer effect’ changed the course of computing in the 1960s of our own history.¹⁷ By revealing the

contradictions inherent in knowing a closed system, Ada gestures toward a more open type of operational protocol. She asks her audience:

Is it not strange that we mere mortals can talk about a concept – *truth* – that is infinitely complicated? And yet – is not a closed system the essence of the mechanical, the unthinking? And is not an open system the very definition of the organic, of life and thought? (Gibson and Sterling 1990: 421)

Ada, like Mallory earlier in the novel, holds on to a hope that science can lead to a resurgence of “life and thought.” For her, the study of open systems promises to extend beyond the interests of science and to challenge a world defined by “the mechanical” and “the unthinking”: a technological order that fosters paranoia throughout Britain and the world. Ada’s gesture toward an open system suggests a move from an age of closed computing Engines to an era of emergent media and distributed networks not unlike our own. Moreover, the technology that Ada envisions seems to extend into the realm of evolutionary algorithms and emergent artificial life aware of its own existence. Her insights have historical parallels in the theorisation of Turing Machines (programs that could simulate any computer algorithm and alter themselves) in the 1930s, the development of cybernetics (the study of control and communications systems with feedback loops) in the 1940s and 1950s, and the development of networks and distributed computing in the 1960s of our own history.¹⁸

Herbert Sussman’s utopian reading of *The Difference Engine*, which I previously mentioned, suggests that Ada’s hack into the Napoleon demonstrates that the disciplinary system is neither as ubiquitous as it seems in the novel nor as impregnable as Foucault would have it. Sussman contends that “Gibson and Sterling imagine the totalizing disciplinary system suddenly collapsing under internal stress” and “a fresh human/machine system emerging” in its place (Sussman 1994: 14). While this characterisation is consistent with Ada’s own hopeful suggestion about the organic social order enabled by her new techno-scientific paradigm, such a reading does not attend to a significant passage that directly follows the savant’s bright-eyed prophecy. Despite its ambitious optimism, Ada’s theory evokes a transformation of power from the biopolitical form depicted

throughout much of the novel to a control system founded on emergent protocol.

The Difference Engine ends with the suggestion that, through its flexibility and openness, Ada's mathematical discovery will complicate and alter rather than simply eliminate the human impulse toward power. In the final passage of the novel, Ada looks into a mirror and has a fleeting vision of a city: a metropolis in the year 1991 that exists over a century into the book's future. Ada's striking imagination of the long-term consequences of her theory is as darkly dystopian as it is poetic:

It is 1991. It is London. Ten thousand towers, the cyclonic hum of a trillion twisting gears, all air gone earthquake-dark in a mist of oil, in the fractioned heat of intermeshing wheels. Black seamless pavements, uncounted tributary rivulets for the frantic travels of the punched-out lace of date, the ghosts of history loosed in this hot shining necropolis. Paper-thin faces billow like sails, twisting, yawning, tumbling through the empty streets, human faces that are borrowed masks, and lenses for a peering Eye. And when a given face has served its purpose, it crumbles, frail as ash, bursting into a dry foam of data, its constituent bits and motes. (Gibson and Sterling 1990: 428)

The historical process that might give rise to this terrifying "necropolis" is never revealed, but the suggestion is that the "peering Eye" of power is capable of adapting to any new technological paradigm. Thus, it is not new technology as such that is the threat, but rather human power that co-emerges with such tools.¹⁹ In this future, the Eye operates through a dispersed capacity to move among a series of interchangeable and disposable "human faces". In contrast to a centralised sovereign power and a more decentralised disciplinary power, control represents a new form that is frighteningly distributed.

This final vision of a far-future world makes a predominantly utopian reading of the novel untenable. Ada's Modus hack does not cause the governing form of power to collapse, but merely to evolve.²⁰ As Gibson and Sterling's fictional version of Disraeli puts it in a passage of his book about the savant Mallory:

There are tumults of the mind, when, like the great convulsions of Nature, all seems anarchy and returning chaos; yet often, in those moments of vast disturbance, as in the strife of Nature itself, some new principle of order, or some new impulse of conduct, develops itself, and controls, and regulates, and brings to an harmonious consequence, passions and elements which seem only to threaten despair and subversion. (Gibson and Sterling 1990: 192)

In place of total subversion or disintegration, “the mind” and “Nature itself” develop new principles of order and organisation. Undue control certainly gives rise to new modes of opposition, but opposition, in turn, causes power to adapt to its tactical challenges. Instead of one pole absorbing the other, there is a constant evolution of these forms in relation to one another.²¹ According to the novel – and the same is true of Foucault’s theories – configurations of domination and control are neither absolutely impenetrable nor ultimately conquerable.²² In the end, all systems are subject to the rhythms of history, which do not conform to unidirectional narratives of progress or decline, but take on a chiral cyclicity. These socio-political structures take on the shape – the non-orientable curve – of a Möbius strip that introduces difference to the twirl of repetition. As *The Difference Engine* suggests, the choice between an impending dystopia and an imminent utopia is a false one. History is rarely so linear in its emergences.

Even so, substantive change does take place in the world. Historical differences can be imagined and enacted. Such transformations, however, do not conform to narratives driven by the fear of collapse or the fantasy of liberation.

3. Different Engines of Escape

Ada Byron’s vision of an inhuman cyber-hell tempers her initial utopian impulse, but it also suggests a broader commentary on the historical and analytical value of the steampunk subgenre. As the text explains about the setting of this unrecognisably horrific scene, “It is London.” Despite these clear spatial coordinates, a subsequent sentence produces a diametrically opposed assessment: “It is *not* London” (Gibson and Sterling 1990: 428, original emphasis). With such confusion regarding the location

of this future, the ontological status of the passage takes on an irresolvable instability. As a steampunk novel, *The Difference Engine* itself, of course, both *is* and *is not* a representation of nineteenth-century London and the empire that extends outwardly from it. It both is and is not an exploration of the effects of computing technologies on our own history. As this final vision simultaneously announces its reality (“It is London”) and its fabrication (“It is *not* London”), so steampunk juxtaposes actual and fictive histories, as well as separate genres, including fantasy, science fiction, historical literature, and detective fiction. *The Difference Engine*, in particular, participates in this type of paradoxical simultaneity by mapping Cold War era political paranoia, cybernetics research, and information warfare onto a Victorian Empire powered by Engine technology.²³

Even writing in the midst of early 1990s techno-utopianism, Gibson and Sterling do not suggest that technology necessarily can or will liberate us from systems of control. In place of transcendent escape, *The Difference Engine* gives rise to a messier alternative that emerges from Ada’s revelation of a future built on the mathematics of the self-referential paradox. In her final vision, “the Eye chases its own gaze through the labyrinth” (Gibson and Sterling 1990: 428). The principle of self-referentiality gives rise to new forms of surveillance and control. Nevertheless, the text complicates this grimly techno-deterministic prospect in its indented final sentences:

The Eye at last must see itself.
 Myself...
 I see:
 I see,
 I see
 I
 !

(Gibson and Sterling 1990: 429)

With this passage, which completes Ada’s reflective mirror vision, *The Difference Engine* does not proclaim a prophecy of either utopia or dystopia. It offers a vision of the shift from the romantic language of the liberated “I” and the paranoid discourse of a controlling “Eye” to a poetics of a different type of “I” that is capable of seeing itself. Through its complex

historical form, the novel demonstrates that a deeper understanding of history and a more critical stance toward emerging technologies can be achieved through the fostering of analytical self-reflexivity. *Self-reflexivity*, in my usage, differs significantly from the mathematical *self-referentiality* posited by Ada. Whereas self-referentiality is a logical property that culminates in a kind of inescapable infinite regress, self-reflexivity is a literary property that employs self-awareness and self-criticism to produce a dynamic feedback loop. While the aforementioned liar paradox, for example, offers no completely satisfying escape from its vicious cycle, *The Difference Engine*'s re-imagining of possible pasts and ethereal futures posits paths, however provisional, through (if never fully out of) the paradoxes of history.²⁴

The Difference Engine serves as a complex commentary on both history and aesthetics. At the level of organisation and structure, the novel encourages a historical self-reflexivity. In addition to its five central episodes, which take place in 1855, the periphery of the text moves among numerous other dates between 1830 and 1991. As I mentioned earlier, each episode is framed in a meta-historical present tense frame that reveals the main past-tense narration of the book to be an already-established history. Furthermore, in a sixth and final section of the book – an appendix that, like the punch card hack, is itself entitled “Modus” – a series of fragmented excerpts from letters, speeches, articles, and creative texts detail the past and future of the novel's alternative world. By offering a diverse and often contradictory collection of its own fictionalised historical source material, the book's appendix suggests that historiography is never an assemblage of raw information, but always a fabricated narrative account of past events. As steampunk more broadly suggests, the extensible, recombinant, and subjective nature of historical data makes it susceptible to the construction of numerous pasts and futures. This feature of the subgenre enables valuable observations about both literary history and historical theory.

As opposed to the realism of the historical novel, most steampunk fiction relies on a more fantastical approach to exploring literary representation and its history. *The Difference Engine*, for example, depicts versions of historical figures such as John Keats and Laurence Oliphant sharing their alternative Victorian setting with fictional characters. Even the writer Benjamin Disraeli is joined by characters from his own novel *Sybil*, including Sybil Gerard and Mick Radley. Another significant steampunk

text, Paul Di Filippo's *The Steampunk Trilogy* (1995), enables a playfully critical examination of history by inserting figures such as Queen Victoria and the British Prime Minister Lord Melbourne into counterfactual settings characterised by everything from the invention of nuclear power to a bio-engineered newt-human hybrid. Similarly, James Blaylock's steampunk novel *Homunculus* (1986) combines details from the history of science with fantasy elements such as re-animated zombies and a miniature space alien, thereby defamiliarising both the categories of historical fact and literary fiction.²⁵ Such juxtapositions produce an atmospheric weirdness and a sense of novelty, but they also animate history, enabling a fresh exploration of everything from Victorian class relations to the nineteenth-century politics of gender and race.

Steampunk represents a historical reboot, but its neo-Victorian manoeuvrings also blaze new paths into nineteenth-century literature, which is already teeming with alternative pasts and historical theories. Much as steampunk turns back to previous centuries to elucidate the present, Victorian essayist Thomas Carlyle uses the past as both a laboratory and model for thinking his present moment. In *Past and Present* (1843), he turns back to a medieval text, *The Chronicle of Jocelin of Brakelond* (1173-1202), in order to analyse labour relations in his own English society. He endeavours "from the Past, in a circuitous way, [to] illustrate the Present and the Future." As he adds, "The past is a dim indubitable fact: the Future too is one, only dimmer; nay properly it is the same fact in new dress and development" (Carlyle 2009: 44). This type of historical operation is common in numerous Victorian texts. Instead of an omniscient realism, books such as Carlyle's history *The French Revolution* (1837) and Charles Dickens's novel *A Tale of Two Cities* (1859) shift among various vantage points to represent a multifaceted past that informs the present. In place of histories with pretensions of scientific precision, novels such as Benjamin Disraeli's *Sybil* (one of the key nodes in Gibson and Sterling's intertextual network) produce creative reformulations of history. Even as Disraeli believes that "it is the past alone that can explain the present", he also acknowledges that the past is as much a product of imagination as of historical fact unearthed through careful research (Disraeli 1981: 421).

Steampunk fiction intervenes in literary history, but it also encourages readers to think more expansively about theories of history as such. Parallel to its contradictory space of "London" and "not London", *The*

Difference Engine marks a temporal paradox of inhabiting history and *not* history. This historical paradox does not derive merely from the novel's basis in actual and imagined elements of the past. More profoundly, the book theorises history as a mediation between poles of freedom and determinism; opposition and power; escape and belonging. In this way, the problem of control that I have been exploring in this essay is not merely expressed in historical terms (i.e., the movement from sovereign to the disciplinary to control societies), but is entirely co-extensive with the problem of history. In a recent essay, Alan Liu proposes a theory of history that suggests precisely this connection with control:

Think of it this way: we want to live in history, where our ancestors and all our brethren live and die in common. Those are the expanded parameters of our community (Burke's contract and chain). But, however expansive such parameters may be, we also desire to escape from history. No one, after all, actually wants to live in history if there is no escape from its chains. (Liu 2008: 258)

This simultaneous need to live within history and to escape it – as well as the parallel need to sustain and oppose systems of control – constitutes the sphere of human desire. That desire, in all of its bounded historicity and boundless imagination, is precisely what steampunk literature channels and explores.

Steampunk fiction's view of history gestures toward a corresponding approach to historiography that resembles a more expansive theory of historicism described by Liu. In his writing on "contingent postmodern historicism", Liu describes the need for a more imaginative engagement with history that recognises its radical contingency, both in the sense of its determined contiguousness and its un-necessitated chance. He contends that to study history and to complicate it does not represent an adequately critical stance:

Also necessary is a step that will only at first seem contradictory: the strenuous (rather than facile) act of *freeing* ourselves from the complicated history we are immersed in or, phrased another way, of choosing ethically to be

emancipated from historical context through the very act of allowing ourselves to be so fully and deeply absorbed in that context that we discern the alternative pathways between past and future emergent from its complexity. (Liu 2008: 20, original emphasis)

Steampunk's approach to counterfactual history seeks to free the reader from accepted histories and, in Liu's sense, forges "alternative pathways between past and future." These fictive worlds and their cartographically charted "pathways" enable what Liu calls "bubble universes at once contained *in* historical reality and admitting of freedom *from* that reality" (Liu 2008: 24).

Similarly to Liu, the literary critic Timothy Parrish contends that postmodern history – a critique of history that simultaneously binds a group to a particular narrative construction of the past – has found its primary practitioners not in historical scholars, but in some of the greatest American novelists of the twentieth century. While he cites such canonical writers as William Faulkner, Toni Morrison, and Thomas Pynchon, I would add Gibson, Sterling, and other steampunk writers to this list. Steampunk demonstrates, perhaps more effectively than any other literary genre, that history and imagination are not opposed terms. As Parrish puts it, "history is never only a story about the past but is also a groping toward the future – a search for an entryway to that which has not yet happened and therefore something that must be imagined" (Parrish 2008: 7-8). In response to the repetition of genre fiction and uniformity of globalisation itself, steampunk offers an alternative genealogy of fractal pasts and possible futures.

The complex creative motor of *The Difference Engine* aestheticises history and explores its many genres. Indeed, if technology influences the emergence of historical developments and systems of power, it also shapes literary and artistic forms. Through its self-reflexive poetics and critical aesthetics, *The Difference Engine* constitutes a meta-historical text that reveals history and fiction to be two sides of the same coin (White 1973). The past is a politically contestable term, and futurity – the vision of the future from a particular present – is always founded on deep-seated cultural fictions. While those in power can strategically adapt fictional conventions to maintain systems of control, this process is always reversible. Stories inevitably frame our relationship to time and space, to history and

knowledge, to control and freedom. Numerous stories – from monumental histories to governmental propaganda – invest the privileged with their power. Even so, there is no system of power that can completely eliminate other types of stories that imagine future forms of justice and project them speculatively into the past. As Liu puts it, in a structural sense, “constraint may even be the very ground of creativity” (Liu 2008: 262). If history is a temporal system, complete with subroutines of control and opposition, then steampunk is a mechanism for rendering and reprogramming that system. It is not so much a utopian vehicle of escape as an engine of difference that generates worlds and histories that are wholly other – and also our own.

Notes

1. A greater number of recent studies of neo-Victorianism have focused on contemporary novels that take up Victorian motifs than on speculative and steampunk literature that rethinks such tropes. Nevertheless, studies of retro-Victorian novels perform invaluable historical work in drawing connections between postmodern and Victorian culture. Christine L. Krueger observes this linkage when she writes, “In our every efforts at ‘revival’ and ‘restoration,’ we extend the Victorians’ own practices and manifest a markedly Victorian self-consciousness about our own place in time, as at once belated and a culmination, as agents of change and effects of infinitely complex processes” (Krueger 2002: xi).
2. The work of some of these writers has also been placed into other related categories, including ‘slipstream’ and ‘New Weird’ fiction. For example, China Miéville’s critically acclaimed novel *Perdido Street Station* combines Victorian technology, industrial capitalist urbanism, and the terrors of a police state with hybrid fantasy creatures and speculative scientific themes. The novel includes an extensive train network, steam-based technologies, and analytical engines that run on reprogrammable information cards, thereby drawing on (without relying exclusively) on the Victorian imaginary.
3. Neither Stephenson nor Pynchon has written a novel that belongs to the emerging steampunk canon. Nevertheless, it is a testament to the influence of this genre that Neo-Victorian values, technologies, and aesthetics figure prominently in both *The Diamond Age* and *Against the Day*.
4. In her analysis of steampunk design and fan culture, Onion observes that “steampunk culture is perhaps most defined by the object-based work of its fans” (Onion 2008: 139).

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5. William Gibson broke through with the success of his cyberpunk novel *Neuromancer* (1984) and the *Sprawl* trilogy (1984-1988). Bruce Sterling established himself as a key contemporary cyberpunk writer with the release of his novel *Schismatrix* (1985) and the anthology *Mirrorshades* (1986).
 6. The name 'cyberpunk' derives, originally, from a Bruce Bethke short story entitled 'Cyberpunk' (1980).
 7. Steffen Hantke describes this facet of steampunk's historical multiplicity as a "defamiliarization through hybridization." As he contends, these texts allow us to "recognize ourselves in a play of similarity and difference." He argues that "instead of submerging its readers in the historical past" steampunk "distances them from it" (Hantke 1999: 244). This distancing is achieved, in part, through the anachronistic juxtaposition of different histories. As Clayton explains, "Anachronism names the narrative consequences of hacking with history." He contends that, in steampunk texts such as *The Difference Engine*, this feature takes on a powerful analytic dimension: "The notion of alternative history raises anachronism, in the literal sense of something out of its proper time, into a methodological principle" (Clayton 2003: 113).
 8. As Sadie Plant explains, Charles Babbage was interested in creating a machine that not only stored memory, thereby making it programmable, but also processed data "from the future of its own functioning" (Plant 1995: 52). This intriguing interplay between past and future is a central component of a great deal of steampunk fiction.
 9. Clayton explains this feature of the novel's historical contribution when he writes, "Babbage's invention of the computer one hundred years before its time indicates the need for a conception of history that registers the untimely. Ways of responding to lost threads of the past, to forkings in history that seemed to have vanished with little trace, are crucial to the historical enterprise" (Clayton 2003: 116).
 10. Burroughs comes up in various interviews with Gibson and Sterling. See, for instance: Tom Nissley 'Across the Border to *Spook Country*: An Interview with William Gibson', www.amazon.com/gp/feature.html?ie=UTF8&docId=1000112701, and Thomas Myer, 'Chatting with Bruce Sterling at LoneStarCon 2', *SF Site*, 29 August 1997. Gibson, who dodged the Vietnam War draft, was perhaps more directly influenced by American counterculture and its theories of social control.
 11. Some of Burroughs' works most focused on the concept of "control" include his essay 'The Limits of Control' (1978) and the fictional piece 'The Mayan Caper' (in *The Soft Machine* [1961]). William Gibson, in particular,

repeatedly cites Burroughs' work as a key influence for his approach to science fiction.

12. Spatially, the disciplinary power of the panoptic gaze cedes to the control society's expansive network of interlinked nodes. Temporally, discrete phases of a subject's development (e.g., the move from the family to the school to the factory) give way to an incessant blur of modulations (e.g., continuing education and a breakdown between work and leisure time).
13. As Galloway explains, a "protocol is a set of recommendations and rules that outline specific technical standards" (Galloway 2004: 6). Moreover, "protocol is not merely confined to the digital world", but actually exerts control over bodies (Galloway 2004: 12).
14. For an extension of this theory of control, also see Alexander Galloway and Eugene Thacker's *The Exploit: A Theory of Networks* (2007).
15. In describing the utopian dimension of the novel, Sussman contends that the novel celebrates "the emergence of a reconfigured subjectivity and a valorized cyborg art" (Sussman 1994: 5).
16. This type of formal system was the dream of many mathematicians and scientists, including Gottfried Leibnitz, who pursued a *characteristica universalis* that would provide a basic alphabetic notation of human thought.
17. For more on the role of the 'observer effect' and 'reflexivity' in the history of cybernetics, see N. Katherine Hayles's *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (1999).
18. As Plant explains about the developments of the 1960s, "Parallel processing and neural nets succeed centralized conceptions of command and control; governing functions collapse into systems; and machine intelligence is no longer taught, top-down, but instead makes its own connections and learns to organize, and learn, for itself" (Plant 2000: 54).
19. For an extended version of this argument, see Manuel De Landa's *War in the Age of Intelligent Machines* (1991). De Landa argues that the threat of intelligent machines has less to do with sentient artificial life turning against human beings than with the way that human beings organise new technologies into a "war machine" and political infrastructure that exists in the service of destruction (De Landa 1991: 50).
20. The evolution of power that I have in mind is cumulative rather than merely stagial. In other words, even as *The Difference Engine*'s cross-historical scope registers a transition from epistemological techniques that exert biopolitical power over populations to control mechanisms that make up a ubiquitous socio-political infrastructure, it also suggests that these modes of power have the capacity to coexist.

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21. This theory of power, based on evolution and change rather than gradual dissolution, is also at the heart of Benjamin Disraeli's *Sybil* – one of *The Difference Engine's* key Victorian intertexts. In this 1845 novel, the character Walter Gerard observes, "Many circumstances of oppression have doubtless gradually disappeared but that has arisen from the change of manners, not from any political recognition of their injustice. The same course of time which has removed many enormities, more shocking, however, to our modern feelings than to those who devised and endured them, has simultaneously removed many alleviating circumstances. If the mere baron's grasp be not so ruthless, the champion we found in the church is no longer so ready. The spirit of Conquest has adapted itself to the changing circumstances of ages, and, however its results vary in form, in degree they are much the same" (Disraeli 1981: 171).
 22. For Foucault, resistance to power is frequently limited, but by means eliminated even in the tightest disciplinary societies. In *Discipline and Punish*, for instance, Foucault describes the network of modern power as characterised by a structural reversibility. Regarding the architecture of this system of power, he writes, "It was also organized as a multiple, automatic and anonymous power; for although surveillance rests on individuals, its functioning is that of a network of relations from top to bottom, but also to a certain extent from bottom to top and laterally; this network 'holds' the whole together and traverses it in its entirety with effects of power that derive from one another: supervisors perpetually supervised" (Foucault 1977: 177). While Foucault is perpetually skeptical about a liberationist perspective, he does not exclude opposition from his philosophical system. Even those in power, the supervisors, can in certain situations be supervised. Moreover, Foucault's larger body of work treats critique as a form of meaningful opposition of power.
 23. While *The Difference Engine* channels science fiction's techno-scientific fascination as well as cyberpunk's commitment to a politics of resistance, it also notably draws from the intrigue that drives Cold War spy fictions.
 24. In his reading of *The Difference Engine*, Clayton comments on the benefits of self-reflexivity in exploring the past. He suggests, "perhaps hacking with history, of the sort a historical cultural studies needs, can find its rationale in a history that often produced knowledge through hacking. This notion would suggest a justification beyond those usually offered by postmodern theorists – the loss of faith in scientific norms of objectivity, for example, or a belief in the inherent fictiveness of all writing – for considering self-reflexive and

literary approaches to the past as legitimate modes of knowledge” (Clayton 2003: 109).

25. *Homunculus* also experiments with intersections between several genres, including detective fiction, science fiction, and horror.

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