



### The Freudian Robot: Digital Media and the Future of the Unconscious

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## Introduction

### the Psychic Life of Digital Media

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### [–] Abstract and Keywords

This book examines the birth of the Freudian robot in the postwar Euro-American world order by looking at how information theory and digital media reframe the problem of the unconscious in human-machine simulacra. Digital writing is central to its analysis because the manipulation of (written) symbols in the computing machine is what makes digital media tick at the most basic level. The discovery of the Freudian robot promises a firmer and more critical grasp of the precarious nature of the networked society than can reasonably be accommodated by the human-machine competition theory of what computers can or cannot do. A great deal going on—politically, socially, and psychologically—than the perceived need to overcome human physiological deficiencies with technological prosthesis.

**Keywords:** Freudian robot, human-machine simulacra, information theory, digital media, technology

The distinction between us and robots is going to disappear.

Rodney A. Brooks, *Flesh and Machines*

What is a Freudian robot? Is it an intelligent automaton or a fundamentally different creature? Writers of science fiction, robot engineers, and pundits and critics of artificial intelligence have written a great deal about humanoids, androids, cyborgs, and all kinds of robots that have been either built or conceived for future development. They point to some basic differences between robots and traditional automata. A robot is digital and is based upon the idea of communication networks of finite-state machines. An automaton, on the other hand, is widely understood to rely on the mechanical principles of clockwork and is usually limited to one special skill.<sup>1</sup> This elementary distinction explains why a robot, even without the benefit of consciousness, is capable of greater (p.2) intelligence and of more dazzling performances than any specialized automaton.<sup>2</sup>

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Although the technical distinction between robots and automata is helpful in some respects, it still leaves an old puzzle untouched: Fundamentally, why should a machine be made to resemble or duplicate a human being? Is narcissism a necessary (psychic) condition for the development of technological prosthesis, as Marshall McLuhan once suggested? Furthermore, does the logic of reciprocity compel human beings to imitate their machines just as much as the machines are built to resemble them, keeping an infinite feedback loop of simulacra or doppelgänger in place? If so, is there a psychic force that drives the feedback loop of human-machine interchange even before the reverse engineering of the human brain becomes possible? Finally, does this feedback loop obey a set of laws once speculated by Freud as the compulsion to repeat, the unconscious, the death drive, and so on?

These questions have guided the main thrust of my inquiry and research in this book, leading toward a number of specific discoveries concerning, for example, the ideographic writing (strictly speaking, not “language”) of digital media and its fundamental connections with the Freudian and Lacanian hypotheses about the unconscious. One discovery worth highlighting at the outset is the emergence of Freudian robots in the postwar Euro-American world order. Who is a Freudian robot? My preliminary answer is that any networked being that embodies the feedback loop of human-machine simulacra and cannot free her/him/itself from the cybernetic unconscious is a Freudian robot. This definition should have no trouble accommodating cyborgs, androids, and all robots of the present and the future. But does it also apply to human beings who prefer not to associate themselves with cyborgs or machines?

It seems that whenever we take prototype robots from industrial laboratories or science fiction too literally, we forget to ask what has become of the psyche of the people who make them and use them—a psyche that has evolved along with their intelligent machines. Essentially, one does not need to encounter a HAL 9000 or an actual robot manufactured in the (p.3) U.S. or Japan to recognize a Freudian robot amongst us, nor does a living body (and head) need to hook up with some cutting-edge prosthetic devices to become a Freudian robot.<sup>3</sup> The Freudian robot need not be made of plastic, metal, or silicon, since the redoubled simulacra of flesh-and-blood humans and their thinking machines are fluid and dynamic, never ceasing to traverse the physical and sensorial boundaries we try to maintain for our phenomenal world. In that sense, a cyborg with her/his/its psychic states is already a kind of Freudian robot, and all cyber-literate humans have the potential of simulating intelligent machines simulating human beings ad infinitum before they turn into Freudian robots themselves, unless something else comes along and intervenes ...

Exactly what that something else is and how it will come about remains an open question. Insofar as modern philosophers and self-reflexive scientists are concerned, an alternative and more imaginative notion of humanity, technology, and their capability for change and evolution—as opposed to what we can glimpse in the terrible truths of the Freudian robot I discuss in this book—must begin by acknowledging that scientific knowledge is limited and limiting, and that our truths are always conditioned and our future uncertain. This, of course, is not news. Quantum physicist Werner Heisenberg already saw the scientific endeavors of his own time in that light.

What concerned Heisenberg in the mid-twentieth century was the future of modern civilization and how the fateful entanglement of humans and their machines was foretold by ancient philosophers. In his 1953 lecture “The Picture of Nature in Contemporary Physics” (“Das Naturbild der heutigen Physik”), Heisenberg shows how a familiar ancient parable by philosopher Zhuangzi (c. 369–286 BCE) staged a powerful confrontation between one of

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Confucius's disciples who argued for the good of technology to save labor and achieve efficiency and his opponent—an old Daoist gardener—who took an uncompromising ethical and philosophical stance to reject that argument.<sup>4</sup> In that confrontation, Heisenberg discovered that philosophical reflections upon the existential and moral entanglement between human beings and their machines did not begin with the modern age but went back several millennia to at least the beginning of recorded history.

**(p.4)** Within a few years of the publication of Heisenberg's lecture, the same Zhuangzi text reemerged verbatim in McLuhan's *Understanding Media*. Here the ancient parable is quoted once again as a tribute to the quantum physicist for teaching us that technological change alters not only our habits of life, but our patterns of thought and valuation.<sup>5</sup> Here is the twice quoted text from the third century BCE:

Zigong [Tzu-Gung] traveled south, and on his way back through Jin, as he passed along the south bank of the river Han, he saw an old man working in his vegetable garden. The man had hollowed out an opening by which he entered the well and from which he emerged, lugging a pitcher, which he carried out to water the fields. Grunting and puffing, he used up a great deal of energy and produced very little result. "There is a machine for this sort of thing," said Zigong. "In one day it can water a hundred fields, demanding very little effort and producing excellent results. Wouldn't you like one?" The gardener raised his head and looked at Zigong. "How would it work?"

"It's a contraption called *gao* and is made of a piece of wood. The wood is shaped so that the back end is heavy and the front end light and it raises the water as though it were pouring it out, so fast that it seems to boil right over! It's called a well sweep." A scornful smile appeared in the old man's face, and he said, "I have heard my teacher say that whoever uses machines [*jixie*] does all his work in the manner of a machine [*jishi*]. He who does his work in the manner of a machine lets his mind run like a machine [*jixin*], and he who carries his machine-like mind around loses his pure innocence. Without the pure innocence, the life of the spirit knows no rest. Where the life of the spirit knows no rest, the Way will cease to buoy you up. It's not that I don't know about your machine. I would be ashamed to use it!"

Zigong blushed with chagrin, looked down, and made no reply. After a while, the gardener said, "Who are you, anyway?"

"A disciple of Kung Qiu [alias Confucius]."<sup>6</sup>

**(p.5)** Wearing the mask of the old gardener, Zhuangzi attacks Zigong and his rationalizing of machine to demonstrate where and how Confucius's teaching has erred. Machine, efficiency, and technical skill are each scorned by him in a fierce celebration of the unfettered spirit and the Way or *Dao*. And it is not for nothing that water management happens to be the focal point of Zhuangzi's parable, which, incidentally, would have some bearing upon Martin Heidegger's discussion of the hydroelectric plant in the river Rhine and his notion of the "standing reserve" (*Bestand*).<sup>7</sup> I am alluding to possible intertextual connections here because Heidegger's well-known essay "The Question Concerning Technology" ("Die Frage nach der Technik"), in which the above discussion occurs, is based on a public lecture he prepared in response to Heisenberg's own lecture, "The Picture of Nature in Contemporary Physics." Both lecture events

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took place in a symposium hosted by the Bavarian Academy of Fine Arts in Munich in November 1953.<sup>8</sup>

Being lifted out of its context, Zhuangzi's diatribe against Confucian teaching would have remained utterly foreign to Heisenberg or McLuhan and mostly likely would have escaped their notice. This should not matter much because they did not turn to the ancient parable to appreciate the old gardener's opposition to machine but used it to articulate their own conflicted views about modern science and technology. Nevertheless, there is something in Zhuangzi that resonates deeply with their understanding of how humans relate to their machines at some fundamental psychic levels. Heisenberg writes: "[T]he far-reaching changes in our environment and in our way of life wrought by this technical age have also changed dangerously our ways of thinking."<sup>9</sup> More than two thousand years ago, Zhuangzi taught us that our machines were not just tools or prosthetic devices that could perform wonderful tasks for humans; they were also agents of psychic (and social) transformation. On the basis of that understanding, the old gardener takes up a philosophical position against Zigong's prosthetic view of machines, which is being dismissed as flawed and ethically unacceptable. The point of this parable, however, can easily be misconstrued. **(p.6)** The tension Zhuangzi asks us to contemplate is not a facile opposition between some irrational human love and hate of machines but rather a carefully stated antithesis of two different conceptions of human-machine relationship, one being the prosthetic/instrumental view and the other interactive/transformational view. And this is what brought the ancient parable closer to the time of Heisenberg and McLuhan, making it speak to an often reiterated questioning in the discussion of technology: Do human beings become masters of their machines, or their slaves?

Relevant to our discussion is the etymology of the word "robot," which originally denotes "slave" through its association with the Czech word *robota*, meaning "compulsory labor." Some robot engineers such as Rodney Brooks try to distance themselves from the idea that humans use robots as their new slaves; Brooks asks, "Is there, or will there ever be, enough similarity to us in our humanoid robots that we will decide to treat them in the same moral ways we treat other people and, in varying degrees, animals?"<sup>10</sup> This curious moral stance is complicated by an observation Brooks makes elsewhere in *Flesh and Machines*. Recalling his childhood experience of watching the Stanley Kubrick film *2001: A Space Odyssey* (1968) and in particular the robot character HAL, Brooks writes: "HAL turns out to be a murdering psychopath, but for me there was little to regret in that."<sup>11</sup> Not only is HAL a murdering psychopath, but he murders astronauts and engineers whom he is supposed to serve. It appears that something or someone is missing in this parade of robot-slaves and robot-psychopaths ... Recognizing a similarly missing figure in a different context, Jacques Lacan observes: "[W]hen people had become acquainted with thermodynamics, and asked themselves how their machine was going to pay for itself, they left themselves out. They regarded the machine as the master regards the slave—the machine is there, somewhere else, and it works. They were forgetting one thing, that it was they who had signed the order form."<sup>12</sup> And what are they?

"It's unfortunate that we've become slaves to these damned things [computers]."<sup>13</sup> Admiral Thomas H. Moorer's reply to the investigation by the U.S. Senate Armed Services Committee on the secret bombing of Cambodia in 1969–70 is well worth recalling here. When President Richard **(p.7)** Nixon decided to bomb Cambodia and hide that decision from Congress, the computers in the Pentagon were "fixed" to create a double system of accounting—"one to keep the truth from the people, the other to tell the truth to the computer" ("... Admiral and Computer," *New York Times*, August 14, 1973). The computers transformed the genuine strike

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reports about the 3630 recorded B-52 sorties in Cambodia and their bombing of a neutral nation into false reports about strikes in South Vietnam.<sup>14</sup> The US government officials who had access to the secret reports had to believe them because they came directly from the Pentagon's computers. Commenting on this war crime, MIT computer scientist Joseph Weizenbaum wrote: "George Orwell's Ministry of Information had become mechanized. History was not merely destroyed, it was recreated."<sup>15</sup> Those officials "did not realize that they had become their computer's 'slaves,' to use Admiral Moorer's own word, until the lies they instructed their computers to tell others ensnared them, the instructors, themselves" (Weizenbaum, *Computer Power and Human Reason*, 239). Gilles Deleuze and Félix Guattari would insist on a distinction here: "One is not enslaved by the technical machine but rather subjected to it." Subjection to the machine in a Foucauldian sense.<sup>16</sup> We will elaborate on the dangerous implications of this subjection and the human-machine entanglement later in the book.

In *Understanding Media*, McLuhan has suggested that "by continuously embracing technologies, we relate ourselves to them as servomechanisms. That is why we must, to use them at all, serve these objects, these extensions of ourselves, as gods or minor religions. An Indian is the servo-mechanism of his canoe, as the cowboy of his horse or the executive of his clock."<sup>17</sup> McLuhan's inversion of the master-slave relationship is provocative and contains some truths in it, but it nevertheless asserts a cybernetic (machine) view of human-machine relationship that puts his momentary nod to Zhuangzi and Heisenberg in a double bind.<sup>18</sup> For it is well known that cyberneticians have conceived of the central nervous system itself as a cybernetic machine like all other servomechanisms capable of maintaining equilibrium or homeostasis. Norbert Wiener, for example, would have (p.8) agreed with McLuhan, while Zhuangzi and Heisenberg would have found his mere inversion of a prosthetic view of human-machine relationship just as problematic as the straightforward instrumental view of machine. Clearly, McLuhan's critique of the technocratic civilization is contradicted by his enthusiastic endorsement of the cybernetics that has been the hallmark of that same civilization.

In that sense, McLuhan and many of his followers are still toeing the line of Confucius's disciple Zigong when they repeat ad nauseam that the physiological deficiencies of the human species are in need of prosthetic extension through technology. It is one thing to argue that the memory capacity of the human brain can be greatly extended by the increased power of a microchip computer and quite another to argue that the logic of the computer—and communication networks in general—is the same as the logic of the human psyche itself. In fact, the argument of technological prosthesis never works well in the latter case, especially in regard to cybernetic research. The prosthetic argument is actually an alibi for something more fundamental that has been going on since the mid-twentieth century, and this is the cybernetic conception of the human psyche as a computing machine.

In 1920, Raoul Hausmann—one of the foremost Dadaists of the twentieth century—made a curious sculpture and named it *The Mechanical Head: The Spirit of Our Age*. In the twenty-first century, this remarkable work could be renamed *The Freudian Robot* because it does seem to embody the spirit of our new millennium in all its essential aspects. Adorning the cover of my book, Hausmann's image of a mechanical head allows the reader to visualize and grasp some of the salient attributes of the Freudian robot discussed in the chapters that follow. The artist appears to have had an unusual premonition of what would happen to the human psyche under the technocratic regime of capitalist production when the mind grows increasingly attached to

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objects or prosthetic devices: a ruler, typewriter and camera segments, pocket watch mechanism, a crocodile wallet, and so on to fashion a machine head.

By the 1940s, we began to witness the first generation of cyberneticians arriving upon the scene when Warren McCulloch and Walter Pitts sought to demonstrate that psychic events follow the “all-or-none” law of communication circuits and constructed their formal neural nets isomorphic to the relations of propositional logic. In the early 1960s, AI scientists such as Kenneth Mark Colby and Robert P. Abelson began to develop their cognitive computer programs to simulate neurosis and paranoia. Marvin Minsky, founder of the MIT Artificial Intelligence Laboratory, attempted to derive **(p.9)** cognitive models from computation; he calls himself a neo-Freudian. And there is also the untold story of Lacan, who closely followed the work of Norbert Wiener, Claude Shannon, and the cyberneticians of the Macy Conferences as he tried to rethink Freud and advance his own theory of the symbolic order. Where do all these developments add up? Can they tell us something new about the development of digital media that we do not already know? This book will show that there is a great deal more going on—politically, socially, and psychologically—than the perceived need to overcome human physiological deficiencies with technological prosthesis.

From the standpoint of Heisenberg, people and their machines are always mutually entangled in the pursuit of scientific knowledge. Quantum physics forces upon us the realization that “there are situations which no longer permit an objective understanding of natural processes, and yet use this realization to order our relationships with nature. When we speak of the picture of nature in the exact science of our age, we do not mean a *picture of nature so much as a picture of our relationships with nature*.”<sup>19</sup> Heisenberg further states that the previous division of the world into objective processes in space and time and the subjective mind in which these processes are mirrored—the Cartesian difference between *res extensa* and *res cogitans*—is no longer a valid starting point for understanding modern science. “The scientific method of analyzing, explaining, and classifying,” says he, “has become conscious of its own limitations, which arise out of the fact that by its intervention science alters and refashions the object of investigation.”<sup>20</sup> In other words, with quantum physics, method and object are no longer separated. With the coming of the Freudian robot upon the scene—where “the distinction between us and robots is going to disappear” or has already begun to disappear<sup>21</sup>—the redoubled simulacra of human-machine entanglement are bound to complicate Heisenberg's observation by bringing the extremely fraught neurophysiological and psychoanalytical dimension of that relationship into play.

These days, the public are bombarded with the prophecies of engineers and science fiction pundits who try to persuade us that we are on our way to becoming immortals through the implants and prosthetic extensions they will invent. Minsky, Hans Moravec, Ray Kurzweil, and others have **(p.10)** announced that human beings will transcend biology in the near future. Kurzweil puts it symptomatically: “[A]s we move toward a nonbiological existence, we will gain the means of ‘backing ourselves’ up (storing the key patterns underlying our knowledge, skills, and personality), thereby eliminating most causes of death as we know it.”<sup>22</sup> The familiar psychic defense mechanisms against the death drive that Freud identified long ago bring us face to face with the looming figure of the Freudian robot in Kurzweil and his colleagues. The return of the repressed may well lurk in the shadows of their updated myth of human transcendence in the manner of a pseudoreligion.

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For this reason, I am convinced that the discovery of the Freudian robot promises a firmer and more critical grasp of the precarious nature of our networked society than can reasonably be accommodated by the human-machine competition theory (Hubert Dreyfus, John Searle, et al.) of what computers can or cannot do, or Donna Haraway's celebration of the cyborg, or the transhuman variety predicted by others. It seems to me that the idea of the cyborg or transhuman often obfuscates the political and psychic foundations of human-machine entanglement in the digital age more than it clarifies it. For Haraway, the cyborg is "a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction."<sup>23</sup> And she is right to point out further that writing is preeminently the technology of cyborgs. But she goes on to assert that "[c]yborg politics is the struggle for language and the struggle against perfect communication, against the one code that translates all meaning perfectly, the central dogma of phallogocentrism. That is why cyborg politics insists on noise and advocate pollution, rejoicing in the illegitimate fusions of animal and machine" (176). This may sound empowering as far as the rhetoric goes, but as soon as we begin to reflect on the argument itself, it seems fraught with confusion and contradiction. What exactly is the discourse against which Haraway's cyborg politics is pitted? How does the cybernetic code which has always insisted on the fusion of animal and machine differ from the writing of cyborgs she advocates here? And from where does the political will of cyborgs issue forth? Until we figure out what kinds of psychic and political transformation remain open and available to cybernetics and **(p.11)** digital media, it is unlikely that Haraway's cyborg can do any better than become a Freudian robot and submit to the compulsion to repeat in the feedback loop of human-machine simulacra.

But ultimately, we ought to be concerned with the political consequences of an emerging society of Freudian robots, which is where American society is headed and attempts to lead the world. It is not for nothing that the sciences of robotics, artificial intelligence, and neurophysiology have served the defense and naval research programs so well and been generously rewarded with grants and taxpayer's money. In fact, many of their pundits do not feel any qualms about their participation in the imperial domination of the world and the universe.<sup>24</sup> Would democracy still have a substantial meaning for a society of Freudian robots who are consumed by the desire to control, militarily or otherwise, and are ultimately driven by the cybernetic unconscious?

This book examines the birth of the Freudian robot in the postwar Euro-American world order by looking at how information theory and digital media reframe the problem of the unconscious (sometimes dubbed "subconscious" by cyberneticians) between what I call human-machine simulacra. Digital writing is central to my analysis because the manipulation of (written) symbols in the computing machine is what makes digital media tick at the most basic level. For example, the introduction of the twenty-seventh letter into the English alphabet in 1948 was a significant event in the invention of digital media; inexplicably, this event has heretofore gone unnoticed in the studies of so-called New Media. Nor have we learned much about how Basic English and James Joyce's *Finnegans Wake* got into the experimental work of communication theory. As I try to bring Shannon back into conversation with James Joyce, Lacan with von Neumann, Freud with Minsky, and so on, the reader will learn a very different story about the making of digital media and those who made them happen.

This book is organized in six chapters that begin with an examination of the technology of writing. Chapter 1 begins by asking what constitutes the writing of digital media and where we are mostly likely to encounter **(p.12)** it. These questions lead me to a systematic scrutiny of many of our presuppositions about the mind, machine, language, writing, symbol processing,

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and inscription technologies. My research reveals a number of significant conceptual lacunae in new media studies and modern literary theory; these lacunae have been responsible for what we do not see and what we have not been able to conceptualize in regard to digital media, namely, what I call the *techne* of the unconscious. The idea here is not to make psychoanalytical theory speak to the study of digital media but to explain how the *techne* of the unconscious got into the invention of digital media in the first place.

Chapter 2 provides a detailed historical analysis and technical explication of the twenty-seven-letter English alphabet to explain and analyze Shannon's invention of Printed English. Briefly put, Printed English is a mathematical refiguring of alphabetical writing as an ideographic system; it lies at the theoretical foundation of information theory. For this reason, our discussion of textuality, subjectivity, technology, and ideology in new media must proceed from an informed understanding of how Printed English has been the unacknowledged figure of the universal writing of imperial technoscience in the postwar decades. Under the mantra of digital media, all coding systems—in machine, language, neural networks, and genetic inscription—have been subsumed under a single unified and universal system unprecedented in the history of world civilization. This development prompts us to ask what is a universal symbol and how the universal symbol operates in digital media or, for that matter, in the book of life. The historical relationship between Basic English and Printed English is explored next to help explain how the Anglo-American empires of the mind came to be grounded increasingly in the politics of writing and communication technologies. The mind-testing games of Jung on the one hand and the cybernetic games adopted by information theorists and scientists at the Macy Conferences on the other are analyzed and compared to bring the nature of the psychic machine of postwar technoscience to light.

Chapter 3 reconsiders literary modernism by focusing on some of the most radical theories of language and writing that have emerged at the threshold of sense and nonsense. One of these views is grounded primarily in a mathematical figuring of alphabetical writing and a speculative treatment of the unconscious mechanism of language that is taken to function automatically like a psychic machine. James Joyce is among the first to intuit the statistical and psychic structure of alphabetical writing by pushing his experiment with “nonsense” word sequences to the extreme in *Finnegans Wake*, a work that Derrida has dubbed “a hypermnesiac (p.13) machine.” Joyce's work anticipated the stochastic properties of Printed English and helped Shannon set the limits of the entropy and redundancy rate of English prose. My reading seeks to reestablish some of the forgotten linkages among the radical theories and experiments across the disciplines, especially those bordering on nonsense and schizophrenia. Even as the modernist fervor subsided in the postwar years, the Bell Labs scientists continued to carry the surrealist experiments forward to generate automatic writing with an eye to producing computable verse and music and speculate about schizophrenia.

Chapter 4 focuses on the work of Jacques Lacan and his 1954–55 seminars. It proposes a new interpretation of Lacan's theory of language and the symbolic chain and his notion of the unconscious by investigating the intellectual provenance of French theory typically associated with this central figure. Lacan's reinterpretation of Freud must be significantly rethought in tandem with what he had learned about game theory, cybernetics, and information theory when these theories were systematically imported to France from the United States. The specific textual sources for Lacan's close reading of Poe's “The Purloined Letter” remind us that the general reception of Lacanian psychoanalytic criticism in the U.S. has been misguided due to our lack of familiarity with the scientific discourse of the time to which the French theorist was



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thoroughly exposed. This explains the popular misunderstanding of the Lacanian notion of language, his relationship to Saussure, and what Lacan means by the symbolic order. For instance, the ruse of writing espoused by John von Neumann and Oskar Morgenstern to generate strategic moves in game theory was taken up by Lacan to think about the function of the psychic machine of the unconscious. This psychoanalytical work provides us with some unusual insights about the cybernetic unconscious of the postwar Euro-American world order.

Chapter 5 examines the role of automata in psychoanalytic discourse by focusing on the problem of the Freudian uncanny. The accelerated advances in the technologies of animated pictures and automata have led many critics to return to Freud's original formulation. More importantly, robot engineers and computer game designers have begun to incorporate various ideas associated with the Freudian uncanny in their research programs as they investigate the emotional and cognitive impact of human-oid robots, automata, and social robots upon human beings. To grasp the full implications of automata for our understanding of the uncanny, we must reexamine the original point of contention between Freud and Ernst Jentsch and their contested readings of Hoffmann's "The Sandman." This **(p.14)** work of reinterpretation aims to resituate the uncanny as the problem of human-automata relationship, whereby I hope to clarify the conceptual origins of the Freudian robot.

Chapter 6 suggests that the Freudian robot embodies the unconscious of our posthuman social structure. Raoul Hausmann's sculpture *Mechanical Head* is a sobering anticipation of the Freudian robot. Along with Shannon's *Ultimate Machine*, this work of art offers unparalleled philosophical insights on the death drive of the digital civilization. If the last stand of ideology lies in the engineering of the unconscious in the posthuman, it is important to raise the next question: Do we stand any chance to defend or counter-engineer against the new ruses of digital writing in the years to come?

### Notes:

(1.) The moment of conceptual shift from the automaton to the robot in this sense is marked by Warren McCulloch and Walter Pitts's work on neural networks in 1943 and by John von Neumann's proposition of "cellular automata" in 1948. See McCulloch and Pitts, "A Logical Calculus of the Ideas Immanent in Nervous Activity," and von Neumann, "The General and Logical Theory of Automata."

(2.) A robot needs to be embodied as well as situated, which means that it should have the ability to react to the changing environment and adopt a new course of action accordingly. Such a feedback loop does not exist between an automaton and its environment. See Brooks, *Flesh and Machines*, 51–55. Jacques Vaucanson's Defecating Duck and the Jaquet-Droz family's the Musician, the Drawer, or the Writer are some of the best-known eighteenth-century automata based on the mechanical simulations of animal or human life. For recent studies of mechanical automata, see Jessica Riskin, "The Defecating Duck, or, the Ambiguous Origins of Artificial Life."

(3.) For the making of Cog and other robots at the MIT Artificial Intelligence Laboratory, see Rodney A. Brooks, *Flesh and Machines: How Robots Will Change Us*, 69–91.

(4.) Werner Heisenberg, *The Physicist's Conception of Nature*, 7–31.

(5.) This was, of course, McLuhan's free interpretation of Heisenberg's reworking of the subject-object relationship for quantum mechanics.

(6.) The English translation by Heisenberg's translator contains numerous errors and inaccuracies. Here I have adopted Burton Watson's translation and modified his text slightly according to my reading of the original. See Zhuangzi. *The Complete works of Chuang Tzu*, translated by Burton Watson, 134-35. For Heisenberg's own quote of the Zhuangzi in translation, see *The Physicist's Conception of Nature*, 20-21; for McLuhan's quote of the same, see *Understanding Media: The Extensions of Man*, 63.

(7.) "What the river is now, namely, a water-power supplier, derives from the essence of the power station." Heidegger, *The Question Concerning Technology*, 16. This point is presumably related to his reaction to Heisenberg's essay.

(8.) This is not the place to evaluate the exchange between Heisenberg and Heidegger on the question of technology. For a discussion of the Heisenberg-Heidegger exchange, see Cathryn Carson, "Science as Instrumental Reason: Heidegger, Habermas, Heisenberg," *Continental Philosophy Review*, December 5, 2009, <http://www.springerlink.com/content/e5772880g7750031/>.

(9.) Heisenberg, *The Physicist's Conception of Nature*, 20.

(10.) Brooks, *Flesh and Machines*, 154. For an extended treatment of this and other issues relating to machine and morality, see Wendell Wallach and Colin Allen, *Moral Machines: Teaching Robots Right from Wrong*.

(11.) Brooks, *Flesh and Machines*, 64

(12.) Jacques Lacan, *The Ego in Freud's Theory and in the Technique of Psychoanalysis*, 83

(13.) "... Admiral and Computer," *New York Times*, August 14, 1973.

(14.) Seymour M. Hersh, "Wheeler Asserts Bombing Secrecy Was Nixon's Wish," *New York Times*, July 31, 1973; and Seymour M. Hersh, "Laird Approved False Reporting on Secret Raids," *New York Times*, August 10, 1973. For some of the key testimonies to the Senate Armed Services Committee, see Hersh's other reports in *New York Times* in the months of July and August 1973.

(15.) Weizenbaum, *Computer Power and Human Reason*, 239.

(16.) Deleuze and Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, 457.

(17.) McLuhan, *Understanding Media*, 46.

(18.) Even the notion of double bind derives from the cybernetic theory of Gregory Bateson.

(19.) Heisenberg, *The Physicist's Conception of Nature*, 28-29.

(20.) Heisenberg, *The Physicist's Conception of Nature*, 29.

(21.) Rodney A. Brooks, *Flesh and Machines*, 236. My interpretation of the disappearance of the human-machine distinction is very different from Brooks's affirmative conception because he does not recognize the Freudian robot in this relationship.

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(22.) Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, 323. Brooks refuses to accept the techno-utopian myth of immortality. He points out that Kurzweil and Hans Moravec “have succumbed to the temptation of immortality in exchange for their intellectual souls.” See Brooks, *Flesh and Machines*, 205.

(23.) Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late 20th Century,” in *Simians, Cyborgs and Women: The Reinvention of Nature*, 151.

(24.) The majority of the AI researchers and cyberneticians who appear in this book have participated in such programs and benefited from such grants. Kurzweil has mentioned his own role in the five-member Army Science Advisory Group (ASAG) while discussing smart weapons in *The Singularity Is Near*, 330–35. One courageous dissenter I have come across is the late exiled German-Jewish scientist Joseph Weizenbaum at MIT, the famed inventor of the first mind simulation program, ELIZA. For Weizenbaum's scathing criticism of his MIT colleagues and technological messiahs whose work merely justifies military spending and masks real political conflicts, see Weizenbaum, *Computer Power and Human Reason*, 241–57.

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