

**"Genuine Made-in-Americans": Living Machines and the Technological Body in the  
Postwar Science Fiction Imaginary, 1944-1968**

**Kimberly Lynn Mann**

**Minneapolis, Minnesota**

**Master of Arts, The College of William and Mary, 2009  
Bachelor of Arts, University of Minnesota-Twin Cities, 2004**

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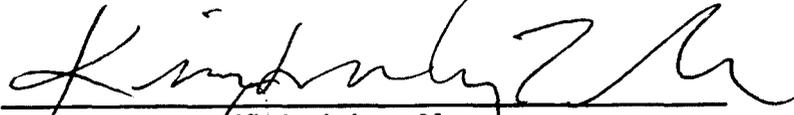
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\_\_\_\_\_  
Kimberly Lynn Mann

Approved by the Committee, May 2014

  
\_\_\_\_\_  
Committee Chair  
Associate Professor Arthur Knight, American Studies and English  
The College of William & Mary

  
\_\_\_\_\_  
Associate Professor Leisa Meyer, American Studies and History  
The College of William & Mary

  
\_\_\_\_\_  
Assistant Professor Kara Thompson, American Studies and English  
The College of William & Mary

  
\_\_\_\_\_  
Professor Scott Bukatman, Art and Art History  
Stanford University

## ABSTRACT

The science fiction imaginary of mid-twentieth century America often takes as its subjects all manner of animate objects — living machines like robots, cyborgs, automata, androids, and intelligent “thinking” computers. These living machines embody early cold war anxieties about the relationship between humans and their machines, as well as about human “identity” in a world perceived as increasingly technological and fragmented. Built with text and still or moving images, these figures’ bodies are formed by metal and plastic, circuits and electronics, at times fused with organic parts — at the same time that they are also represented as built from the innovation and imagination of cutting-edge American industry and science. These diverse machined bodies are sometimes straightforwardly humanoid in form, and at other times, they are less so, while still others may appear to share little in common with humans at all. As bearers of built bodies, living machines inhabit the interface between human and machine, exposing the ruptures and contradictions of the conception of the modern, technological body: the material and the immaterial, the animate and the inanimate, the subject and the object. While this study analyzes fiction by canonical science fiction writers like Isaac Asimov, Ray Bradbury, and Arthur C. Clarke, its focus is on government documents and images regarding NASA’s Projects Mercury (1959-1963) and Gemini (1962-1966), popular journalism articles and images, Stanley Kubrick’s 1968 film *2001: A Space Odyssey*, and less well-known pulp science fiction stories from the 1930s through the 1950s.

## TABLE OF CONTENTS

Acknowledgements	ii
Dedications	iii
Introduction	1
Chapter 1. With the Flexibility of Flesh: Machining the Feminine Body	28
Chapter 2. The Citizen Machine: Robot Oppression Narratives in Pulp Science Fiction, 1939-1959	84
Chapter 3. Man or Computer, Which Is the Best Machine?: NASA's Project Mercury and the Mechanization of Thought	153
Chapter 4. Looking into the (Inter)Face of Hal: The Screen and the Computer Body in <i>2001: A Space Odyssey</i>	211
Epilogue	263
Appendix	276
Bibliography	279

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## Introduction

The title of this study, "Genuine Made-in-Americans," refers to a claim made by a robot character in the 1952 pulp science fiction story "Robots of the World! Arise!" by Mari Wolf. The robot asserts his entitlement to wages for his factory labor by invoking the nativist argument that he is a "genuine 'made-in-American.'" The fear of human-built technological "bodies" and the beings that inhabit them reflect American anxieties over uncannily active machines. While some of the living machines taken up in this study are robots, like the "genuine 'made-in-Americans,'" others are cyborgs, automata, and computers. One such living machine is the "sixth crew member" of the middle portion of Stanley Kubrick's 1968 film *2001: A Space Odyssey*. It is an artificially intelligent computer, and probably the most famous fictional computer in American popular culture, the Hal 9000. Although in the film Hal is represented most frequently as an ubiquitous red camera lens that watches over the humans on board, according to screenplay co-writer (and well-known science fiction author) Arthur C. Clarke, Hal's character began as a robot. This robot was "roughly the size and shape of a man," and named Socrates (or Athena, depending on the version).<sup>1</sup> In a 1972 collection of short stories and essays Clarke wrote as background information in the course of the film's development, Clarke writes about Socrates and includes a short story featuring this early version of Hal.

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<sup>1</sup> Arthur C. Clarke, *The Lost Worlds of 2001* (New York: Signet, 1972), 81.

In this collection, Clarke says little about Hal's "evolution" from Socrates the robot into the sentient computer Hal from the film, but he does say that "it will be seen that in the course of writing, Hal lost mobility but gained enormously in intelligence," since the character that became Hal started out "no more intelligent than a bright monkey."<sup>2</sup> In this exchange of physical mobility for intelligence, Hal became the computer onboard the *Discovery* when Clarke ultimately decided against a humanoid form.<sup>3</sup> The humanoid form of Socrates the robot begets physical mobility, but Hal's more ambiguous form as a computer comes with a boost of intelligence and self-awareness. Socrates/Hal, indeed, becomes an elegant mechanical figure with its own kind of beauty in the film, but via a minimalistic "body" almost completely devoid of humanoid referents. Hal's only identifiable body part is a red camera lens within a matte black rectangle. The only short story from this collection is "Man and Robot," in which NASA administrators and politicians visit a test run of Socrates watching over hibernating astronauts. The men visiting the laboratory observe:

The robot walked into the airlock, and a moment later appeared on the TV monitors that showed the inside of the capsule. He moved slowly down the central aisle, plugging a test probe into various instrument panels as he walked past them. His movements were swift and certain, like a trained human who knew his job perfectly. He came to the sleeping men, leaned over them, and very gently checked the adjustment of their helmets and the location of their biosensors. There was something at once sinister and touching about this encounter between quasi-conscious machine and wholly unconscious humans; all the spectators showed their involuntary tenseness.<sup>4</sup>

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<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid., 83.

Hal's lack of a humanoid robot body transforms Hal from one kind of living machine into another, and this transformation encapsulates one of the major concerns of this study — while humanoid living machines, like robots and cyborgs, exist in great numbers in the 1940s and 1950s, the development of “space age” technologies, including the computer, both demonstrate and help create a growing idea that the notion of the “body” itself is a flexible one.

With an encounter that is both sinister and touching between the sleeping humans and the semi-sentient robot Socrates, this example reflects the contractions inherent in the representations of living machines and the feelings they evoke, be they robots like Socrates, computers like Hal, or cyborgs, androids, automata, or others. Socrates, with its robotic body that changes into Hal, who, as the “central nervous system” of the spaceship *Discovery* ostensibly has a highly non-normative body, reveals both the variation of the living machine “body” and the way that, over the course of the mid-twentieth century, it becomes a site of ambiguity.

Furthermore, Hal is an infamous fictional machine in an already saturated cast of living machines in American science fiction and popular culture in the mid-twentieth century.

The subjects of this study are “animate objects” — machines that move and think and exist by their own volition. Whether living machine bodies seem to be completely “artificial” as with a robot, or whether they are a blend of organic and artificial parts as with a cyborg; whether or not they take on human characteristics

through resembling humans, “passing” for human, or if they only have some or few or no physical human characteristics at all; they all suggest a dialectical relationship between the “inert” machine and the “active” human. The animation of these “objects” grants them potential for becoming or being “subjects,” representations of self-aware beings with agency. Hal is only one example of living machines that straddle the gap between active and inert, animate and inanimate, subject and object, human and non-human. This study analyzes representations of living machine subjects along with Hal: cyborgs, robots, NASA’s seemingly autonomous computers and other “thinking” machines, and suggests that living machines, in occupying an imaginary space between subject and object, disrupt and reinforce existing meanings of bodies as raced, classed, gendered, and dis/abled.

The living machine “body,” whether it is that of a cyborg, robot, automaton, or computer, is the site of the interface between human and machine. The negotiations of such a “body” of the living machine, in its different forms, glues the subject/object together, as well as illuminates and interrupts the boundaries between enslavement and freedom, the material and immaterial, and the real and virtual. In Minsoo Kang’s study of representations of automata in Europe up to the interwar period, he suggests that the automaton, a precursor to the robot of the twentieth century, is an “inherently captivating and disturbing object at the same time...it can arouse such widely ranging emotions as fascination and awe, contempt and horror,” and its “capacity to cross the boundaries between the antithetical categories of the natural and the artificial, the animate and the inanimate, the living

and the dead” require a historical investigation.<sup>5</sup> Kang further suggests that “for a full understanding of the automaton motif in the Western imagination as a whole, one must take into account both aspects of the mechanical entity, to see how the object functioned in different historical contexts as the representation of both human empowerment and oppression, liberation and subjugation, transcendence and debasement.”<sup>6</sup> The living machines addressed in this study similarly inhabit contradictions, and as animate machines, they are both subject and object — existing in that ambiguous state makes them particularly fertile ground for other contradictions that are important for understanding mid-twentieth century American technological culture. While his study ends at World War II, he suggests that a postwar study of the symbolic power of the robot would need to shift geographically from Europe to the United States, and take into consideration the context of the cold war and of technological developments “from the atomic bomb to the digital computer.”<sup>7</sup> This study covers the period from near the end of World War II (1944) to near the end of the space race (1968), a particularly fruitful quarter-century during which the American technological landscape changed drastically.

The unease and excitement over technological development during this time period centers around technologies that include the atomic bomb, the satellite, the

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<sup>5</sup> Minsoo Kang, *Sublime Dreams of Living Machines: The Automaton in the European Imagination* (Cambridge, MA: Harvard University Press, 2011), 304.

<sup>6</sup> *Ibid.*, 305.

<sup>7</sup> *Ibid.*, 298.

space capsule, the television broadcast infrastructure, and the digital computer.

The notion of an engineered body also becomes popular in the postwar period, and with that notion – that technology can be used to manipulate the boundaries of the material body itself – along with the idea that machines are taking on more and more human qualities, Americans begin to wonder what their purpose is in this unsettling period when they are perhaps becoming less unique in their humanness.<sup>8</sup> The cyborg had become popular in academe via Donna Haraway's cyborg theory in the mid-1980s, but what was happening before this? There are bodies of living machines that do not have a merging of organic and machine parts but still hold the significance of the machined cyborg body. The moment was ripe for mechanical life to spring up from the imaginations of Americans, and this study seeks to explain this moment, and some of its inhabitants -- human, machine, and those figures in-between.

### **The Body and the Living Machine**

The narratives about living machines circulating in the mid-twentieth century often reveal anxiety over the perceived blurring of the boundary between humans and machines. Similarly, it is the permeability and flexibility of the boundaries of the body that are also undergoing a shift at this moment in American culture. While ever more visible technologies of the space age threaten to make humans more like

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<sup>8</sup> See David Serlin's *Replaceable You: Engineering the Body in Postwar America* (Chicago: University Of Chicago Press, 2004) for more on how biotechnological developments affected ideas of conformity, identity, and the body in the 1950s.

machines as well as make machines more like humans, the idea of the body also is a shifting and often contradictory conception, between object and subject.

Elizabeth Grosz provides a compelling description of the difficulties in pinning down the body as either object or subject. She suggests that “the body is a most peculiar ‘thing’ for it is never quite reducible to being merely a thing; nor does it ever quite manage to rise above the status of thing. Thus it is both a thing and a nonthing, an object, but an object which somehow contains or coexists with an interiority, an object able to take itself and others as subjects, a unique kind of object not reducible to other objects.”<sup>9</sup> Living machine bodies emphasize this characteristic of bodies, that, much like the living machine itself, are not quite “objects” but also not fully “subjects.” Indeed, scholarship that attempts to define the “body” usually faces one of two critiques: either of not considering the material realities of the body enough — the body “disappears” — or crediting the materiality of the body too much and not accounting for its symbolic existence. Bodies are material sites of information, and the immaterial consumption and interpretation of that information. Like living machines, bodies are sites where object and subject coexist.

Although the living machines of this study exist in an imaginary space as representations, rather than a “real” or material space, they are not unimportant, but in fact critical to understanding the ways that the “imaginary,” the “representation,” and the discursively constructed all have material effects and

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<sup>9</sup> Elizabeth Grosz, *Volatile Bodies: Toward a Corporeal Feminism* (Bloomington, IN: University of Indiana Press, 1994), xi.

cannot be separated from the “real,” the “material,” and the “natural.”

Representations of living machines are also representations of bodies, as well as expressing the relationship between racialized, gendered, and classed bodies. Most of the living machines considered herein have non-normative bodies: not only do they not have “normal” human bodies, but they raise questions about what constitutes a “body.” For example, the aforementioned Hal 9000 from *2001: A Space Odyssey* has a “body” that calls into question the boundaries between the body and the environment, between bodies and “objects.” Is Hal a computer “mind” which has no body? Or is its body the ship that it controls, with human astronauts within it? Is it its voice, which is so important in the construction of Hal’s character? Or the red camera lens which is suggestive of an unblinking eye? Hal is just one example of the way that the living machines have bodies that defy normative definitions of bodies, and call into question the bodies that may appear “normal.” Those living machines that resemble or even pass for human also are non-normative, because as machines, what they “should” look like is not human. Their resemblance to what they are not — human subjects — reinforces their strangeness, their otherness. This study concerns itself with the construction of the boundaries of the body and the “subject,” and the ways that those boundaries are maintained and upheld. Living machines erode the idea of the subject as they are “objects” come to life, uncannily animate and in some ways more “human” than their human counterparts.

Understanding embodiment in this way asserts a relationship between ideology or information, usually thought of as “immaterial,” and bodies, usually

thought of as “material.” Fusing immaterial and material and understanding them as inseparable refuses to allow a framework that privileges body over mind or identity over body. While living machines occupy the realm of representations and, other than cyborgs, are not humans, this study will show the ways that representations of the subjectivity of machines can also participate in a discourse about the relationship between bodies and technology. Part of the central project of this study is to reveal the way that the mechanized, non-normative bodies of living machines question the ways that institutions, culture, and people mark certain bodies as “deviant.” The marking of bodies also produces meanings for those bodies. To return to the example of Hal: He is without a normative body, and at the same time, he also happens to be murderous and manipulative; and this is no coincidence.

The bodies of living machines like Hal’s may be read as participating in and reproducing the idea of the “normal” human body, while also disrupting it through their occupation of the space between subject and object, their status as “animate objects.” Sharon Snyder and David Mitchell suggest that the “goal in disability studies is to leave a permanent mark on ‘normative’ modes of embodiment; to mar the sleek surface of normativity.”<sup>10</sup> Living machines do just that. Being animate objects, there is no way for living machines to ever have “normal” forms of embodiment -- but it is also in their mobility, their animation, their interruption of

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<sup>10</sup> David T. Mitchell and Sharon L. Snyder, *Narrative Prosthesis: Disability and the Dependencies of Discourse* (Ann Arbor, MI: University of Michigan Press, 2001), 169.

the invisibility of what makes up a “normal” body that they find representation. Through their representations, living machines expose the artifices of categories of gender, sexuality and race; of the notion of the proletariat “classed” body made for “manual” labor; of the role of the normative American white male astronaut body; and of the boundaries of the body itself thrown into question by the bodiless subject that is the computer.

Discussions of “identity” and “subjects” and “objects” imply something about objects and “inhumanity” that is critical to understanding oppression, power, and the privileges of subjectivity itself. The subject/object dialectic is both a key trope for understanding many different forms of oppression and power, and also one that is fallible in its ability to reveal the nuance of systems of power. Explaining oppression through the idea of people becoming either “objects” or “subjects” is complicated by living machines that are “objects” with subjectivity and animacy. These “animate objects” assert agency in many ways, and defy categorization as objects, even as they are positioned as “subhuman,” laborers built for the purpose of unpaid factory or domestic work, computer systems that threaten the agency of human astronauts, and the “artificially” intelligent computer that can be shut off despite its consciousness. Representing people as without agency, as victims and less-than-human, as “objects,” are all ways that marginalize and disempower. The subject as oppressed “object” can be illuminated by looking at how living machines reverse the direction of this configuration. In chapter 1 of this study, discussed in the chapter summaries section below, a cyborg character from 1944 opens up an

investigation of the meaning of “objectification” and what it means to be an “object” through being an object that is unaffected by the live television broadcast technology of the camera lens, which reduces human figures in its eye to animated objects.

### **Science Fiction and the Speculative Science Imaginary**

The focus of attention for this study is living machines of mid-century science fiction and, in chapter 3, speculative science writing. The blending of a science fiction imaginary and the futuristic visions of writers, filmmakers, and NASA administrators help to produce a culture in the United States enamored with notions of “progress” and the technologies that will carry Americans into the future. In chapter 1, the technological “future” of television and telecommunications, envisioned in a 1944 science fiction short story set in the future, helps to forge an envisioned “future” that is firmly anchored in the story’s historical context of a world on the brink of becoming “global.”<sup>11</sup> Several prominent science fiction writers of the mid-twentieth century, including Isaac Asimov had, in the late 1930s, formed a radical group called the Futurians who met to discuss their progressive vision for the United States; their political ideology was based in socialist thought buttressed by a faith in the potentially utopian rationalism of technology and science. As the genre of science fiction bloomed into its “Golden Age” in the 1940s (and as some

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<sup>11</sup> In chapter 1 also considers the work of the members of the Frankfurt School, which often had particularly dystopian overtones.

argue, into the 1950s) the Futurians became the writers and editors of science fiction magazines of the 1940s and 1950s, letting their visions for the future of the United States come to life in the pages of the literature that they wrote and facilitated. Later on, in the 1950s and into the 1960s, American politicians and NASA administrators were similarly invested in visions for a technologically advanced future — one where Americans colonized Mars, lived aboard space stations, and, at home on planet Earth, lived in smart houses that could cater to their whims.<sup>12</sup>

Although the above examples reveal the diversity of visions for America's future, their blending of science fiction imaginary with "plausible" visions for America's future (based in science, of course), demonstrates the importance of interrogating science fictive texts in order to understand contemporary cultural concerns with technology. Not all futuristic visions are utopian or even desirable; many are fraught with tension between seemingly contradictory visions. NASA imaginations for the future were colored by the imperative that if the United States was not the first nation to colonize space, the Soviet Union would be, and they would use it for nefarious purposes. With the technology of the rockets that launched American satellites, and later astronauts, into space also came the

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<sup>12</sup> See the discussion in chapter 3 of the *Collier's* 1952-1954 series "Man Will Conquer Space Soon!," in which space scientists and writers borrowed from popular imagery of science fiction to help produce their plausible vision of a futuristic space-faring America based in "science fact." Kennedy's New Frontier ideology, which relied on utopian visions of the future by drawing on nostalgia for the United States' frontier past, also comes to mind.

technology to put a nuclear missile into orbit, a missile that had the potential to unleash mass destruction almost anywhere in the world with the push of a button. Science fiction writer and academic Joanna Russ suggests that “science fiction is also the only modern literary form (with the possible exception of the detective puzzle) which embodies in its basic assumptions the conviction that finding out, or knowing about something—however impractical the knowledge—is itself a crucial good. Science fiction is a positive response to the post-industrial world, not always in its content (there is plenty of nostalgia for the past and dislike of change in science fiction) but in its very assumptions, its very form.”<sup>13</sup>

Science fiction narratives elucidate the ways that Americans sought to make sense of a rapidly modernizing world, a world whose cultural landscape was heavily influenced by the visibility of technological and scientific “innovations.” Stories about living machines are a way to connect with technology and grapple with the anxieties stemming from modern life in mid-twentieth-century America – they are about dealing with “newness” and rapid change. Technology is a measure of “progress,” an idea closely tied to an idea of a unique American character, and it is also intertwined with many of the cultural and social changes in the United States over the course of the past century. That is to say, technological developments in twentieth-century America have been used as markers of modernity, as “advancement,” as “progress,” and as engines for socio-cultural change.

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<sup>13</sup> Joanna Russ, “Toward an Aesthetic of Science Fiction” in *Science Fiction Studies*, Number 6, Volume 2 (July 1975).

### **Technology and the Body: Facilitating and Critiquing the Posthuman Subject**

Technology and the way that people imagine its relation to bodies and subjectivity are also important. The idea of the “posthuman” is particularly important because it is a critical way that Americans understand and relate technology -- especially the technology of the postmodern age -- to identities that blur the boundaries between what is human and what is machine. Scott Bukatman identifies the idea of the posthuman as a radical break from old ways of understanding identity, and that American culture’s interactions with technology have produced a new kind of subjectivity.<sup>14</sup> N. Katherine Hayles connects this new kind of subjectivity to the idea of narrative, suggesting that culture “understand[s] and process[es] new modes of subjectivity...through the stories it tells, or more precisely, through narratives that count as stories in a given cultural context.”<sup>15</sup>

While the posthuman produces a new subjectivity between the fusion of human and machine (though as Hayles suggests, machine parts are not required), that subjectivity is not without its critics.<sup>16</sup> The posthuman assumes a problematic relationship between identity and the body, in assuming a universal (white, male) human identity.<sup>17</sup> Sherryl Vint also criticizes the idea of the posthuman because it

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<sup>14</sup> Scott Bukatman, *Terminal Identity: The Virtual Subject in Postmodern Science Fiction* (Durham, NC: Duke University Press, 1993), 33.

<sup>15</sup> N. Katherine Hayles, “The Life Cycle of Cyborgs: Writing the Posthuman” in *The Cyborg Handbook* edited by Chris Hables Gray (New York: Routledge, 1995), 322.

<sup>16</sup> N. Katherine Hayles, *How We Became Posthuman*, 4. Hayles suggests that to be posthuman is about a certain subjectivity rather than a literal cyborg body.

<sup>17</sup> *Ibid.*

“is a position available only to those privileged to think of their (white, male, straight, non-working-class) bodies as the norm. This option does not exist for those who still need to rely on the work of their bodies to produce the means of survival, for those who lack access to technologies that can erase the effects of illness, and for those whose lives continue to be structured by racist, sexist, homophobic, and other body-based discourses of discrimination.”<sup>18</sup> The posthuman also potentially normalizes the human/machine interface, in the ways that it imagines a universal identity. In doing so it also imagines a non-identity, erasing differences across bodies even as it constructs them. The living machines of this study disrupt this trend towards normalizing nascent posthuman figures, they emphatically do not exist without racialized, sexualized, gendered, classed identities projected onto them. Thus, their machine bodies are not free of the markings, valuation, and meanings that bodies signify. While I see the varying ways that people of marginalized groups become “objects” and seek to reassert themselves as “subjects,” this project reverses the dynamic, taking the perspective from that which “should” be an object, but can become a subject. If the boundary between subject and object is a permeable and tenuous one, then readings of the object-becoming-subject are important to this discussion. The living machines considered here all point towards ways of re-inserting the materiality -- the “objectness” of the body -- into discussions of technology, as they are representations of machines with non-

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<sup>18</sup> Sherryl Vint, *Bodies of Tomorrow: Technology, Subjectivity, Science Fiction* (Toronto: University of Toronto Press, 2006), 9.

normative bodies; and it is through the representations of the material “facts” of their bodies that their identities, uses, and subjectivities come into focus.

### **The Chapters of this Study**

Each chapter takes up a different kind of living machine-influenced “body,” and the chapters are organized in a rough chronological order, beginning with a WWII-era cyborg from a pulp science fiction story, moving to oppressed robots of 1950s stories. The first two chapters feature more familiar living machine bodies, that of the cyborg and the robot, and the work that their bodies do to establish a relation between the “marked” machine body and the marginalized subject. The second two chapters take up the invention of the computer and its influence on the “liveliness” of machines — as “thinking machines” they create a novel kind of machine-subject that does not need the human form to construct its liveliness. As antecedents to the “virtual subject” and the “posthuman” of the 1980s and 1990s, the nascent lively computers speak to the way that computers become more crucial than humanoid “robots” to imagining automation in relation to the human body. The period that this study spans, roughly from the end of WWII to the end of the space race in the late 1960s, covers a critical moment in American technological “progress.” In this span of more than two decades, anxiety over “progress” is manifested through representations of and narratives about machine-bodies — and therefore comes through via technology that is both embodied (via cyborgs, robots, automatons) and problematically disembodied (via computers). The invention of computers, and

their representation as being able to perform tasks much like human cognition, results in a shift from living machines that are humanoid in body to living machines that do not need the human form in order to reproduce human-ness. The mind becomes more important in determining a human essence than the body, although as will be demonstrated, the material body is still of great importance.

Chapter 1, "With the Flexibility of Flesh: Machining the Feminine Body," opens with an analysis of a story from 1944 that anticipates feminist film theory of the 1970s and 1980s through a (formerly) female cyborg television star with a humanoid (but distinctly not human) body. As mentioned above, science fiction can often have the effect of both seeming ahead of its time and firmly of its time, and this story is no different. Written by female speculative fiction author C. L. Moore (1911-1987), and published in the pulp magazine *Astounding Science Fiction*, "No Woman Born" tells of dancer and television performer Deirdre, whose flesh body is replaced by a metal one after it is destroyed in a theater fire. Deirdre finds her new body superior to her old one, despite its "taint" of metal on her human brain, her only remaining "original" body part. Much of the story focuses on Deirdre's performances, both for a live television audience and off-camera for her former agent and the scientist who created her metal body. Her new body, "with the flexibility almost of flesh," has the ability to not only allow her to move in a way that makes fleshly human bodies seem "jointed and mechanical," but also to allow her to withstand the fragmentation and dehumanization of the technologies of broadcast entertainment. As a former flesh-bodied person become object via her

transformation into a cyborg, Deirdre changes the meaning of what it is to become an “object” and to be “objectified” as a formerly female-bodied person. The ordinary humans of the story, two men, have a difficult time grappling with Deirdre’s new powers as a “sexless” being who still wields and wears femininity and “humanity” as a mask for the manipulation of her audiences, both on- and off-stage.

“No Woman Born” reveals a living machine figure that allows for an examination of culture industry technologies of replication and broadcasting, and at several moments, Moore seems to connect with critiques of the culture industry, intersecting in particular with Siegfried Kracauer’s “Mass Ornament” essay with a scene reminiscent of the Tiller Girls and Busby Berkeley choreography replete with a “dancing” television camera. The machines and objects of this story, at many points, appear more alive than their human counterparts, emphasizing the anxieties over automated and lively technologies just beginning to become widespread across the country. Published in December of 1944, this story appears just months before the end of World War II and the dropping of the atomic bomb, which usher in a new technological cultural landscape for Americans hand-in-hand with the beginning of the cold war.

An altered version of Moore’s phrase “with the flexibility almost of flesh” serves as the title of this chapter, as it is the flexibility of her machined body that allows Deirdre to dance in her paradoxical way – both inhumanly jointed yet also more human-like than an organic human body. This idea of flexibility also draws attention to the ambiguity that Deirdre’s cyborg body inhabits, and the blurred

boundaries between seeming contradictions that she embodies: she is a feminine yet not female, markedly golden-skinned, a human subject and mechanical object, and both “sub-human” and “super-human.” A nascent cyborg, so early as to exist before the term “cyborg” itself, Deirdre’s character anticipates the living machine figures that populate science fiction and question the boundaries of the human subject considered in subsequent chapters.

Chapter 1 covers the early cyborg figure from pulp science fiction that existed before the word “cyborg” was in use, but chapter 2, “The Citizen Machine,” takes up a far more familiar figure from the pulps for mid-century Americans: the robot. While chapter 1, with its WWII-era cyborg character, sets the stage, so to speak, for the early cold war period and its living machines, chapter 2 establishes the figure of the 1950s “oppressed robot” that has its roots in the radical politics of the 1920s and 1930s and the origins and genealogy of the “robot” itself. The chapter begins with a brief overview of pulp science fiction, anchoring its origins in progressive visions for the future with Hugo Gernsback’s 1926 publication *Astounding Stories*. Not coincidentally, the word “robot” first appeared in Czech writer Karel Čapek’s 1920 play *R.U.R.*, which was, among other things, a critique of industrial capitalism’s tendency to treat human workers like machines. The idea of the robot and the pulps’ progressive visions gelled, and, combined with the United States’ pro-machine culture, robot stories abounded in American pulp publications. The chapter focuses on two early sets of robot stories before considering the “proletariat robots” of the 1950s, Eando Binder’s Adam Link series (1939-1942), an

enormously popular set of stories that feature the first sympathetic robot character, and Isaac Asimov's robot stories containing the "Three Laws of Robotics" (the first of which was "Runaround" from 1942). Both Binder's and Asimov's robot stories helped establish conventions for robot stories that become important for later robot pulp stories: Binder establishes the notion of a robot protagonist meant for readers to empathize with, and Asimov codifies robot behavior that demands obedience and binds it in the service of human beings. These two ideas, along with cultural concerns in pro-proletarian writings of industrial capitalism making human workers into machines and treating them as objects, yield robots as literary figures ripe for attending issues of oppression.

Robot stories usually fall into two categories during the "Golden Age" of science fiction: those gladly subservient to humans (often represented as not-quite-sentient), and those who resent their human oppressors and seek retribution through a violent rebellion. The stories in the second half of chapter 2 fall in between these two categories, with nonviolent robot protest as a mechanism for obtaining civil rights, whether that be via citizenship and voting rights, a voice in workplace conditions, or equal status to human beings. Specific examples include Mari Wolf's "Robots of the World! Arise!" (1952),<sup>19</sup> R. R. Merliss's "The Stutterer" (1955),<sup>20</sup> Harry Harrison's "The Velvet Glove" (1956)<sup>21</sup> and "The Robots Strike"

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<sup>19</sup> Mari Wolf, "Robots of the World! Arise!" *If Worlds of Science Fiction* (July 1952), 74-89.

<sup>20</sup> R. R. Merliss, "The Stutterer" in *Astounding Science Fiction* (April 1955), 47-69.

<sup>21</sup> Harry Harrison, "The Velvet Glove" in *Fantastic Universe* (November 1956), 59-76.

(1959),<sup>22</sup> and David C. Knight's "The Love of Frank Nineteen" (1957).<sup>23</sup> These stories harken back to radical politics of the 1920s and 1930s invested in workers' rights, but they also borrow from language and arguments of civil rights activism of the 1950s, some of them positioning robots as a racialized underclass. Anxieties over difference in the conformist era of the 1950s reveals a set of stories that negotiate that anxiety through the obviously fictional character of the robot, which, while an apt character for exploring the idea of bodily difference, is also one easy to dismiss with its obvious existence in the realm of science fiction. While the body of Deirdre the cyborg in chapter 1 represented a site for re-imagining the fragmentation of the female body within the technological apparatus of the culture industry, a figure subject to oppression via her once-female body, the body of the robot in these stories becomes a site for uneasy identification with the "other," an other whose bodily difference is intractable, but that ultimately finds resolution in cultural similarity. The living machine body, then, in chapter 2 represents anxiety over the perceived blurring of the boundaries of human and machine, subject and object, in the early cold war period.

Chapter 3, "Man or Computer, Which Is the Best Machine?," shifts attention from the humanoid machine bodies of the first two chapters to the abstraction of the "thinking machine," which reconfigures the boundaries of the human subject not through bodily means, but through not necessarily having a "body" at all. The

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<sup>22</sup> Harry Harrison, "The Robots Strike" in *Fantastic Universe* (January 1959), 58-65.

<sup>23</sup> David C. Knight, "The Love of Frank Nineteen" in *Fantastic Universe* (December 1957), 49-64.

bodies under consideration in this chapter are those of the white male bodies of the astronauts of the Mercury program (1957-1962), the United States' first "manned" space exploration mission. While the other "bodies" of this study are the fictional machine-bodies of cyborgs, robots, and computers — "non-normative" bodies — this chapter looks at the ways that the technology of the lively machine of NASA flight system computers projects meaning onto the highly normative astronaut bodies. Indeed, the astronaut bodies themselves are already machine-like in the way that they were produced via an almost assembly-line selection process that required certain physical characteristics — both specified (like height, weight, and age) and implied (like race and sex). The first astronauts were required to be Air Force test pilots, products of the U.S. military system, which in many ways sought to make machines from men for the purposes of national defense. Along with the implications for astronaut's bodies from the selection process, this chapter suggests that the use of ever more sophisticated computers that could do the work of the Mercury capsule "pilot" led to a need to re-define the role of the human. Ergonomics experts sought to design a "human-machine system" when developing the Mercury capsule, in which the human being fit in as part of an integrated circuit.

In order to examine the tension between the rapidly developing technology of the automation of the "thinking machine" and the human astronauts and NASA officials, this chapter also includes analyses of NASA documents, including speeches, press kits, and press releases, uncovering discourse about computers and representations of their role, and their influence on human pilots. The popular

press covering the Mercury project, mostly *Life* magazine articles (since *Life* had an exclusive contract with the “Mercury 7”), also tell their stories. While these sources are within the realm of “nonfiction,” during the space race the edges between “nonfiction” and “science fiction” tended to bleed together as science writers and NASA administrators borrowed from a popular science fiction imaginary in order to craft their vision for human-machine relations of the near future. Several stories from the 1950s by science fiction writer Ray Bradbury, as well as the speculative science eight-part series from issues of *Collier's* from 1952-1954, “Man Will Conquer Space Soon!” help illuminate that vision. Imagining a near-future where Americans lived and worked in space and had colonized other planets demonstrated a quite different character for the human-machine relationship than subsequent NASA documentation outlined, because of NASA’s eventual development and dependence on “thinking machines” for tasks that the human brain was just not capable of. The writers and contributors to this series were scientists who went on to work for NASA, including several Operation Paperclip scientists — like rocket scientist Wernher von Braun.

At the same time, Bradbury’s stories, “The Velt” (1951), “There Will Come Soft Rains” (1950), and “The City” (1951) paint a darker picture for human-machine relations. In these stories, humans existing within automated spaces, instead of integrating smoothly with the human-machine system, become less human and the machines themselves become troublingly more alive. This dystopian vision of the erosion of the boundaries between human and machine feed into the anxiety over

space-age technologies used during Project Mercury, making it even more important that the role of the hero-astronaut remain anchored in older notions of American conquest and exploration. Without the figure of the “active” American astronaut, which the overly-“active” computers threatened, the space race could not be “won,” as American ingenuity, inventiveness, and individuality resided at the heart of the technological “progress” celebrated by the American cold war propaganda machine.

The final chapter of this study, chapter 4, “Looking into the (Inter)Face of Hal” looks to the technologies of television and the computer as “space age” constructions of the 1960s that shape the boundaries of how Americans at this time understood bodies and minds. The technology of the “screen” brings together the material and immaterial, and its inclusion with the representation of the Hal 9000 computer in *2001: A Space Odyssey* forges a new way of imagining the bodiless subject. Like the body and the living machine, the screen, too, exists between the immaterial and the material, but it additionally helps to organize the human body within the viewing experience. As an “interface” between human and technology, the screen provides a site for the encounter between human and machine. Hal, as mentioned in the beginning of this introduction, started out as a humanoid robot, but changed to an intelligent computer that is the “central nervous system” of the *Discovery* ship inhabited by astronauts on their way to Jupiter.

Computers contemporary to the film were not the familiar desktop devices that became popular in the 1980s — they were mainframes, which were difficult to

represent visually and describe. Most often, they were described by the function that they performed, i.e. a mechanical process analogous to "thinking," called "electronic brains" or "thinking machines." These 1960s computers usually did not come with monitors as output devices, and the screen was not part of the visual lexicon of the computer. Aboard the futuristic ship *Discovery*, however, screens abound, and Hal uses them for any number of purposes. It is the inclusion of the screen into Hal's interfaces, along with his camera lens "eye," that lend him a certain kind of virtual embodiment. Ultimately, Hal obtains a material body by taking control of a small mobile space capsule, a "pod," when he kills astronaut Frank Poole. With the help of the screens aboard the *Discovery*, which lend visual representations to his thinking -- his humanoid attribute -- Hal becomes the *Discovery* ship. The notion of what makes up a "body" becomes a crucial issue for this film, as the subject of the (apparently) self-aware computer demands a material form, and makes a decidedly non-humanoid form, the ship, into a material mechanical body.

This final chapter also addresses the role of the spacesuit and spaceship within the frame of space age technologies, as the spacesuit, when worn by humans, produces a cyborg of the astronaut, just as the screen and the spaceship help to produce a body for Hal. Comparing images of the first American extra-vehicular activity (EVA, also known as a "spacewalk") performed during the Gemini IV mission in 1964 with scenes of spacewalks in *2001*, suggests that the embodiment of Hal via the screen and the spaceship and the mechanizing of the astronaut illuminate the

tension of technologies that have inherent contradictions. The spacesuit during a spacewalk is both freeing, from the confines of the ship and the pull of Earth's gravity, but it also emphasizes the vulnerability of the human body to the vacuum of space. Dependent on the technology of the spacesuit, without it, the human inside would be dead, but with it he is able to experience a feeling of weightlessness, of freedom. Through the figure of the mid-century living machine in the science fiction imagination, the anxiety produced over the development of new technologies that enable Americans to continue exploration, a cornerstone of the American "character," is one that is echoed and returned to in all of the chapters.

### **Conclusion**

The end of the last chapter considers the way that *2001: A Space Odyssey* rearticulates the permanence of the human body through the representation of the human fetus-like "star child," a being evolved from astronaut David Bowman. The star child, instead of needing a spacesuit, spacecraft, and onboard computer, has integrated space-age technologies into its body, traveling through space via powers imbued by its physical body. To shake off the fetters of machine-technology, perhaps, is a dream of assuaging the anxieties produced through a growing technological dependence. The return to a "natural" state, without any technological device between star child and the image of the planet earth again (except for, perhaps, the star child's white halo), emphasizes the power and permanence of the human body, but it also emphasizes the gap between normative human beings and

the potential “natural” state of the star child. Chapter 4’s conclusion presents the image of a machine-less human body, rather than a living machine, highlighting both the ambiguous nature of the living machine, as well as the inflections that these machine representations have on the meanings of the human body itself. American technology as a whole is also ambiguous and contradictory. Technological “progress” and its accouterments (and also late industrial capitalism) demand our acquiescence that technology makes our lives better, at the same time that it is also suspect in the perceived dependence that it encourages.

### With the Flexibility of Flesh: Machining the Feminine Body

*By the time she reached the stage floor she was dancing. But it was no dance that any human creature could ever have performed. The long, slow, languorous rhythms of her body would have been impossible to a figure hinged at its joints as human figures hinge. (Harris remembered incredulously that he had feared once to find her jointed like a mechanical robot. But it was humanity that seemed, by contrast, jointed and mechanical now.)*

-- Moore, "No Woman Born"<sup>1</sup>

*"The hands were more nearly human than any other feature about her, though they, too, were fitted together in delicate, small sections that slid upon one another with the flexibility almost of flesh."*

-- Moore, "No Woman Born"<sup>2</sup>

"The flexibility of flesh" refers to the hands of Deirdre,<sup>3</sup> a dancer whose body has been rebuilt by science in "No Woman Born,"<sup>4</sup> a 1944 short story by writer C. L. (Catherine Lucille) Moore (1911-1987).<sup>5</sup> In this story, which takes place generations

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<sup>1</sup> C. L. Moore, "No Woman Born," *Astounding Science Fiction* (December 1944), 156.

<sup>2</sup> *Ibid.*, 141.

<sup>3</sup> While the story reads that Deirdre's hands have "the flexibility almost of flesh," it is this idea of "almost" that emphasizes the importance of the notion of "flesh" versus "metal" that comes up repeatedly in the story and in this chapter.

<sup>4</sup> See the Appendix for a synopsis of "No Woman Born."

<sup>5</sup> Moore, "No Woman Born," 134-176. *Astounding Science Fiction*, a pulp magazine, was originally titled *Astounding Stories* and began in 1930. C. L. Moore was a science fiction writer who also wrote science fiction stories under the name Lewis Padgett with her husband, Henry Kuttner, also a science fiction writer under his own name, and while they wrote as Padgett, "at times neither knew which of them had written what" (see "Kuttner, 43, Wrote Science-Fiction" in the *New York Times* (February 7, 1958); although the headline suggests otherwise, Kuttner was actually 42 at the time of his death of a heart attack). She co-wrote the majority of her stories with Kuttner, but "No Woman Born" was written and published under only her name. After Kuttner's untimely death in 1958, Moore stopped publishing stories, passing away in 1987 from Alzheimer's. For a brief history of C. L. Moore's life, see Andrew Liptak's "The Many Names of Catherine Lucille Moore" from *Kirkus Reviews*

after the 1926 death of “the fabulous [Rudolph] Valentino,” a theater fire has destroyed Deirdre’s body.<sup>6</sup> At the beginning of the story, a scientist has built Deirdre a mechanical body made of golden interlocking metal rings to replace her destroyed human body. The only surviving body part, her brain, is embedded in the featureless head of the machine — her brain controls the metal rings and keeps them assembled as a body. Her body, literally consisting of pieces held together by the power of her brain and personality, is the site for an exploration of what it means to be female and feminine in a world of mass-produced and-disseminated images of the female form. The flexibility of flesh, though it describes Deirdre’s nearly human hands, is an idea that runs throughout the story. This chapter shows the flexibility of flesh as a phrase fraught with the ironies of flesh made into metal; it is a flexibility of both bodily movement and performances enacted via a metal body so like flesh and so unlike it that it could not ever be mistaken for human.

The story and this analysis of it plays on this “flexibility,” the many possible interpretations of Deirdre’s body — the masquerades she enacts, her televised performance, indeed, her identity as a woman — a female-bodied person, a (dis)abled person, a “golden”-skinned person, a human being or inhuman object. Deirdre dances amongst these identifiers, remaining ambiguous, and always seen through the eyes of her agent, audience, and the scientist who built her. Her character offers insight into representations of human-machine interactions from

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(February 7, 2013), available online  
<https://www.kirkusreviews.com/features/many-names-catherine-lucille-moore/>.

<sup>6</sup> Ibid., 158.

the 1930s and 1940s that suggest that the circulation of mass-produced and -consumed images make people more like machines. The physical body and the broadcast image of the body are intimately entwined in Moore's work, with technology binding them together. The "flexibility of flesh" relates to a flexibility not only in Deirdre's "fleshly," physical body, but also in its representational analogue — the more nebulous concept of "identity," the shifting "self" and subject-hood that defines an individual based on performance as well as via the audiences for those performances. Deirdre's "flexibility of flesh" is more than her ability to dance in a way that makes humans "[seem], by contrast, jointed and mechanical" — it is a vision for a modernizing of the body that raises questions about body-based patriarchal control, even as it simultaneously works in service to it.

Much like the other living machines of this study, Deirdre's story is one of the many narratives circulating in the mid-twentieth century about the boundary between humans and machines that many Americans view as ever more permeable. Deirdre's story is one that also elucidates the ways that Americans sought to make sense of a rapidly modernizing world, a world whose cultural landscape was heavily influenced by the visibility of technological and scientific innovations. The development and use of the atomic bomb is an example one such technology that fundamentally changed how Americans thought about science and modernity.

Fiction about living machines is a way to connect with technology and grapple with the anxieties stemming from modern life in mid-twentieth-century America. "No Woman Born" is a story published at a moment in U.S. history that witnessed a

number of cultural and technological changes -- a rapidly expanding telecommunications industry by the end of World War II, a world newly shrunk by the intercontinental reach of nation-states and on the eve of the atomic bomb and the cold war, and technologies that allow for imagining the human body itself as something to be engineered. The story of Deirdre takes up these techno-cultural crises – the repercussions of broadcast television, engineered bodies, and life lived through images projected on a “global” screen. As an early cyborg character, Deirdre and her existence as a television and stage performer take up questions about the thriving culture industry as well as anticipate investigations into the relationship between “subject” and “object” as theorized by feminists in the 1970s and 1980s. As with the other chapters of this study, “With the Flexibility of Flesh” marks out the ways that stories about “living machines” help people make sense of both the promises and threats of “modern” America and its technological change.

This chapter seeks to make a connection between Deirdre’s story and concerns over technologies that threaten to destroy or fragment the individual in the “eye” of the camera lens – both concerns of the Frankfurt school in the 1920s and 1930s and concerns of feminist theorists in the 1970s. Siegfried Kracauer and other members of the Frankfurt School in the late 1920s through the 1930s interpreted telecommunications technologies of radio, film, and television as mechanisms put to work by the state to mobilize a willing and thoughtless “mass” of citizens. While these technologies as part of the “culture industry” upend the relationship between people and machines, treating people like machines, they also wreak the female-

bodied individual, reconstituting individual women into geometric patterns and figurative machinery. The notion of the female body as “object” did not gain popularity until feminist theorists began writing about it in the 1970s, gaining traction as a mode of analysis with Laura Mulvey’s influential 1975 “Visual Pleasure and Narrative Cinema.”<sup>7</sup> This story anticipates the work of feminist theorists like Mulvey, but at the same time questions and interrogates the idea of the female body as “object.”

As well as anticipating feminist film and media criticism that interrogates female bodies as objects, Moore also explores the notion of femininity as performance.<sup>8</sup> She reveals that femininity is always a masquerade, but it is through inhabiting her re-built body that Deirdre is able to expose femininity as such.

However, even as Moore reveals both femininity and gender as constructs, no

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<sup>7</sup> Laura Mulvey, “Visual Pleasure and Narrative Cinema” in *Screen* 16.3 (Autumn 1975), 6-18. Although Mulvey’s work was one of the earliest works of feminist theory that considered the idea of women as “objects” for the gaze of the camera and audience, this was not the first time feminist writers talked about female bodies as objects. Simone de Beauvoir, the French feminist and author of *The Second Sex*, also used the concept of women’s bodies as “objects” (published in France in 1949 and published in English in 1953). *The Second Sex* is text often cited, along with Betty Friedan’s *The Feminine Mystique* in 1963 as setting the foundation for the women’s movement of the 1960s and 1970s. For more on Beauvoir’s influence on American feminism during the 1960 and 1970s, see Ruth Rosen’s history of the women’s movement *The World Split Open: How the Modern Women’s Movement Changed America* (New York: Penguin, 2000), 56-58.

<sup>8</sup> While Judith Butler published the major theoretical work on gender as performance in *Gender Trouble* in 1991, in her article “Sex and Gender in Simone de Beauvoir’s *Second Sex*” (in *Yale French Studies*, No. 72, 1986, 35-49) she explores Beauvoir’s 1949 work as anticipating the notion of gender as a process of “becoming” or performance. See also Joan Riviere’s 1929 essay “Womanliness as a Masquerade” (originally published in *The International Journal of Psychoanalysis*, Vol 10, 1929, 303-313), another earlier work on gender as performative.

different in a female-bodied individual or in Deirdre's "sexless" body, she also marks Deirdre's skin as "golden" – a racialized yet racially ambiguous marking. Moore's frequent references to Deirdre's golden skin and her dancing performance are reminiscent of those describing African American performer Josephine Baker, whose "golden" skin provides a discursive site for interrogation of modern notions of identity and the body.<sup>9</sup> Despite her suggestions of femininity as artifice, Moore's racializing of Deirdre's mechanical body raises questions about a residual "essential" self based in constructs of race and ethnicity.

Moore summons the figure of the cyborg to reveal the fragmentation and performance aspect of body-based identities. Assembled from organic and machined parts, the cyborg exists as a fusion between contradictory ideas, and it has served as a meeting place for any number of oppositions — the unnatural and natural, mechanical and biological, active and inert. The cyborg character of Deirdre reveals femininity as artifice as she exists along the boundaries of human and machine. The "flexibility of flesh," then, serves as a construct in this chapter not only for understanding the difference between the machined body and the fleshly one, but also as a construct for understanding the concept of the living machine as a flexible one, able to extend between both ends of seemingly intractable binaries — binaries of subject and object, animate and inanimate, female and male, machine and human. Deirdre's body has "the flexibility almost of flesh," even though her

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<sup>9</sup> See Anne Anlin Cheng's *Second Surface: Josephine Baker and the Modern Surface* (New York: Oxford University Press, 2013).

body is no longer fleshly, but metal.<sup>10</sup> It is her ability to control her metal body in a way that is both more and less than human that makes her exceptional. Her new body, with flexible metal “flesh,” is the site of Deirdre’s power over the machinery of mass-produced images that had once fashioned her into a multitude of images cast across space on a global scale.

In this story, Moore constructs an elaborate masquerade of objects as people and people becoming objects, all through the “eye” and gaze of the camera lens. Deirdre’s representation as a living machine allows for a discussion of the relationship between the body and self that various theories of identity — queer theory, feminist theory, and disability theory — seek to explain. It is the disassembly and reassembly of the body that results in the perfect merging of body and image, of subject and object. It also reveals a feminine identity that was never “whole,” “original,” or “natural” to begin with, but that becomes obviously artifice when reflected by the surface of Deirdre’s golden metal body.<sup>11</sup>

### **Deirdre’s Body as “Modern” Machinery**

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<sup>10</sup> Moore, “No Woman Born,” 141.

<sup>11</sup> One of the most compelling descriptions of the difficulties with pinning down the body as object/subject can be found in the introduction to Elizabeth Grosz’s *Volatile Bodies: Toward a Corporeal Feminism* (Bloomington, IN: University of Indiana Press, 1994). For Grosz, “the body is a most peculiar ‘thing’ for it is never quite reducible to being merely a thing; nor does it ever quite manage to rise above the status of thing. Thus it is both a thing and a nonthing, an object, but an object which somehow contains or coexists with an interiority, an object able to take itself and others as subjects, a unique kind of object not reducible to other objects” (see page xi). Deirdre’s cyborg body emphasizes this unique existence of a body that is not quite an “object” but also not fully a “subject.”

"No Woman Born" raises questions about the trauma visited upon women when transformed into images for consumption and objects of the "mass's" gaze. Through this story, Moore offers an alternative to the dismemberment and fragmentation exacted upon female bodies by the culture industry. Instead of focusing on the trauma of the fragmented feminine identity of the female star, Moore imagines a different kind of transformation via the rebuilding and machining of a new, mechanical body. Through this transformation, taking place because of the burns suffered by the "original" organic female body, the female star can shed not only the "original" female-ness of the body that oppresses her, but also forge a new relationship with the machinery of the mass-produced image. In becoming potentially disabled due to her body's destruction, Deirdre is reborn into a body with new signifiers, an abstraction that is the "feminine."

The technologies of the moving image, the broadcast and the televised image, are a critical part of understanding the ways in which the story represents Deirdre's character. The technologies at work in this story are technologies of machining bodies and the technologies of mass communication that construct Deirdre's image. Before her injury, Deirdre's character is one that already pushes the boundaries of humanity because of the mediation and transmission of her image "along the airwaves."<sup>12</sup> She has inhabited a high-tech form before her body itself is machined by science, because she has been using technology (or technology has used her) to alter her body in order to broadcast its image into places she could not reach

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<sup>12</sup> Ibid., 134.

physically, i.e. beyond time into an “uncivilized” or “primitive” space otherwise inaccessible to her.<sup>13</sup> Paradoxically, it is broadcast technology, along with Maltzer’s body-building technology that make Deirdre herself again. Unlike other characters broadcast by the television cameras in the story, Deirdre remains in control of her image, herself, and the television camera as she appears on screens across the world in her comeback debut. As a living machine, she becomes the perfect subject for being the object of the “mass” audience’s gaze. Rather than producing a body that is alienated from the person who Deirdre was, machining her body produces a body more in line with her sense of self which, at times, signifies humanness more powerfully than that of the human bodies around her. Instead of resisting modernization and its anxieties, through her very body, Deirdre embraces modernization by becoming the very thing that is feared — the machine.

Moore writes Deirdre’s story from the perspective of John Harris, her former agent. It starts with Harris’s recollections of Deirdre’s fame and tragic body-destroying accident as he waits to see Deirdre for the first time in the year since the fire. Since the fire, Deirdre has been kept in scientist Maltzer’s secret laboratory where he and a team of “artists, sculptors, designers, scientists” had worked to give

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<sup>13</sup> At the beginning of the story, Moore emphasizes Deirdre’s access to audiences via broadcast technology that previous film and stage stars had not had. The story reads, “In times before her, other actresses had been lovely and adulated, but never before Deirdre’s day had the entire world been able to take one woman so wholly to its heart...But Deirdre’s image had once moved glowingly across the television screens of every home in the civilized world. And in many outside the bounds of civilization.” (See Moore, “No Woman Born,” page 135.)

Deirdre's brain, the only part of her that had survived, a body.<sup>14</sup> At the very beginning of the story, Harris has not seen or spoken to Deirdre since the fire, constructing Deirdre for the reader from his memories, seeing her and describing her as he remembers her before the fire. Since the theater fire, Harris has "never been quite able to let himself remember her beauty clearly, except when some old poster, half in tatters, flaunted her face at him, or a maudlin memorial program flashed her image unexpectedly across the television screen."<sup>15</sup> His memories are based largely in the images of Deirdre that had circulated in print media and via the television screen. Even without a body, Deirdre's disseminated image still commands attention, even against Harris's will. The emphasis on Deirdre's control and the control of her projected image continues throughout the story. From the beginning, Deirdre herself is mediated, through Harris's memories, and through the images of her that remain after her body burned.

Awaiting his first encounter with Deirdre after her accident Harris frets about what Deirdre's new body might look like:

He had envisioned many shapes. Great, lurching robot forms, cylindrical, with hinged arms and legs. A glass case with the brain floating in it and appendages to serve its needs. Grotesque visions, like nightmares come nearly true. And each more inadequate than the last, for what metal shape could possibly do more than house ungraciously the mind and brain that had once enchanted a whole world?<sup>16</sup>

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<sup>14</sup> Moore, "No Woman Born," 136.

<sup>15</sup> *Ibid.*, 134.

<sup>16</sup> *Ibid.*, 138-39.

Harris cannot imagine a possibility that involves Deirdre's body returned to a "normal" or human state. Although this is not what happens, Deirdre's new body becomes something more than human and more Deirdre than her original body had been. Indeed, after seeing her new body dance for the first time, "Harris remember[s] incredulously that he had feared once to find her jointed like a mechanical robot. But it was humanity that seemed, by contrast, jointed and mechanical now."<sup>17</sup> Moore spends many passages focusing on movement and the ways that Deirdre is mobile through a technologically constructed body, as well as the way that her image and voice are "mobile" and "had once moved glowingly across the television screens of every home in the civilized world."<sup>18</sup>

Descriptions of Deirdre's body, even — *especially* — her new machined body, are expressed in racialized, sexualized, and gendered terms. As a character with a prosthetic body that signifies a "disability" and a body permanently altered by the trauma of the fire, Deirdre and her body are sites for the discussion of layered markers of identity. Even as her new body reflects and alters the perceptions of her "old" organic self, the televising and mediation of her image also provides the lens through which to examine the complex signifiers of her cyborg identity. Deirdre's stardom stems from her image's movement and her audience's access to her image via the television. Throughout the story – and this passage is no different – Deirdre's image and Deirdre as an individual are collapsed. The continuity between

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<sup>17</sup> Ibid., 156.

<sup>18</sup> Ibid., 134.

her moving, televised image, and her 'self' seems uninterrupted due to the conflation of her identity and her identity as a star. However, Moore also draws attention to this through Deirdre's machined body. Her "new" body provides a site for discussion of the undifferentiated boundary between her star image and her "self."

When Harris first sees Deirdre, Moore explores, over the course of several pages, Harris's thought processes during a single moment of horror when he recognizes how unlike the old Deirdre this new metal thing is. To say the least, Harris has trouble reconciling the image of Deirdre that he remembers with this new body: "His brain was called upon now to perform a very elaborate series of shifting impressions" trying to make sense of what he sees:

First, incongruously, he remembered a curious inhuman figure he had once glimpsed leaning over the fence rail outside a farmhouse. For an instant the shape had stood up integrated, ungainly, impossibly human, before the glancing eye resolved it into an arrangement of brooms and buckets. What the eye had found only roughly humanoid, the suggestible brain had accepted, fully formed. It was thus now, with Deirdre.

The first impression that his eyes and mind took from sight of her was shocked and incredulous, for his brain said to him unbelievably, *'This is Deirdre' She hasn't changed at all!*

Then the shift of perspective took over, and even more shockingly, eye and brain said, 'No, not Deirdre — not human. Nothing but metal coils. Not Deirdre at all—' And that was the worst. It was like waking from a dream of someone beloved and lost, and facing anew, after that heartbreaking reassurance of sleep, the inflexible fact that nothing can bring the lost to life again. Deirdre was gone, and this was only machinery heaped in a flowered chair.

Then the machinery moved, exquisitely, smoothly, with a grace as familiar as the swaying poise he remembered. The sweet, husky voice of Deirdre said, 'It's me, John darling. It really is, you know.' And it was.<sup>19</sup>

Harris's brain, as "suggestible" as it is, has difficulty making sense of both the image of Deirdre of his memories and the sight of Deirdre standing before him. That along with the "shifting impressions" that the sight of the new Deirdre requires of Harris points to the idea that Deirdre's body is difficult for the normal, meat-bodied human to comprehend. With her new image beyond immediate understanding for Harris, it is Deirdre's movement and voice that finally reconciles the image of the human Deirdre in Harris's head with the "machinery" of Deirdre's metal body. Moore does not yet give the reader the details of Deirdre's appearance, only the description of Harris's reaction to her appearance, filtering Deirdre's image and sight through Harris's perspective, which describes his thoughts and feelings about what he sees rather than the visual details of what he sees. Harris's first impression plays upon the idea that the eyes and the brain can be tricked by an illusion, and that he at first remembers a moment when he mistook inanimate objects for a person. His realization works in reverse, first seeing a person, then a thing, then a person again. Within these shifting perspectives, Harris processes Deirdre from human to object to something not quite either. The mediation of Deirdre's image through Harris's emotional impressions of her reinforces the notion of an identity stemming from mediated images and constructed from the perspectives of others. The mediation of Deirdre's image in this story emerges not only through expected routes, like a

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<sup>19</sup> Ibid., 139.

television camera, but also through the characters themselves — Deirdre’s image and Deirdre herself are routed through another’s eyes even when she is not engaged in a formal performance onstage or on camera. More succinctly, Deirdre, a woman (or formerly a woman), is mediated and constructed through the gaze of a male character. After this first impression, Harris then “sat down bonelessly. He had no muscles. He looked at her speechless and unthinking, letting his senses take in the sight of her without trying to rationalize what he saw,” as this is the only way for his brain and eyes to be able to make sense of Deirdre’s new body, which defies his ability to think and to “rationalize.”<sup>20</sup>

Then Moore at last gives us a description of Deirdre’s new body, in bits and pieces, over the next few pages. The first thing that Moore chooses to describe about Deirdre is, oddly, her color and the shape of her head:

She was golden still. They had kept that much of her, the first impression of warmth and color which had once belonged to her sleek hair and the apricot tints of her skin. But they had had the good sense to go no farther. They had not tried to make a wax image of the lost Deirdre. *(No woman born who was so beautiful -- Not one so beautiful, of all the women born --)*

And so she had no face. She had only a smooth, delicately modeled ovoid for her head, with a ... a sort of crescent-shaped mask across the frontal area where her eyes would have been if she had needed eyes. A narrow, curved quarter-moon, with the horns turned upward. It was filled with something translucent, like cloudy crystal, and tinted the aquamarine of the eyes Deirdre used to have. Through that, then, she saw the world. Through that she looked without eyes, and behind it, as behind the eyes of a human — she was.

Except for that, she had no features. And it had been wise of those who designed her, he realized now. Subconsciously he had been dreading some

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<sup>20</sup> Ibid.

clumsy attempt at human features that might creak like a marionette's in parodies of animation. The eyes, perhaps, had had to open in the same place upon her head, and at the same distance apart, to make easy for her an adjustment to the stereoscopic vision she used to have. But he was glad they had not given her two eye-shaped openings with glass marbles inside them. The mask was better.<sup>21</sup>

Deirdre appears to be defined by her color, which is in some way exactly the same as what her human body was. Her skin is "golden" and her eyes aquamarine, but the shape of her face and eyes, and the shape of her body are not the same, but capture Deirdre in a more symbolic and abstract manner. Assigning her the color that directly reflects that of her old, human body, while making other aspects of her form more symbolically representative of Deirdre's identity, makes skin color an intractable and nonnegotiable part of who Deirdre is.

Her body has been sculpted and built up from images of her old self, and in that process, Maltzer and his team have translated her into what makes her who she is or was. They made a copy of a copy, as it were, since all they have had to work from in the wake of the fire was the images and representations of Deirdre that existed in people's minds and in print and on film. Her new body is, in many ways, more in tune with her identity as a female TV and performance star, aligning her with the person whom others thought she was and should be.

This works out well for Deirdre, and she takes to her body with enthusiasm, reveling in its power, and her absolute control over its every motion. Instead of feeling out of sorts in a body designed by others based on mediated copies of herself, she appears to Harris to feel more at home in it than she did in her old

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<sup>21</sup> Ibid., 139-140.

body.<sup>22</sup> Harris notices this as well, in his continued comparison between the old Deirdre and the new Deirdre, “and every gesture, every attitude, every flowing of motion into motion was so utterly Deirdre that the overwhelming illusion swept his mind again and this was the flesh-and-blood woman as clearly as if he saw her standing there whole once more, like Phoenix from the fire.”<sup>23</sup> The dexterity of her new body makes its movements seem eerie in its ability to replicate Deirdre. While Harris “had expected and feared mechanical rigidity, nothing had prepared him for this more than human suppleness.”<sup>24</sup> The mechanical aspects of Deirdre’s body, combined with its locomotor aspects make her appear “more than human,” and this theme is repeated over and over again throughout the story. Her mechanical body, instead of making her less human, makes her more so – able to move and to dance, and to behave in a way that is more human than the humans around her.

Throughout the story Deirdre’s image and Deirdre as an individual are so entangled as to be indistinguishable. The continuity between her moving, televised image, and her ‘self’ appears uninterrupted, due to her representation as a star. However, Moore also draws attention to this continuity through Deirdre’s machined body. Her “new” body provides a site for discussion of the non-differentiation between her star image and her “self.” Her identity is constructed out of a hybrid

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<sup>22</sup> Deirdre also finds herself at home in her new body, and considers it “my house and the machine my life depends on.” She thinks that one day “metal against metal” will feel so much the same as “flesh against flesh” that she will not remember or notice the difference (see “No Woman Born,” 145).

<sup>23</sup> *Ibid.*, 142-143.

<sup>24</sup> *Ibid.*, 142.

mediated self, consisting of her broadcast image as well as her organic human body/self. With her new body, that hybridity becomes embodied, with the technological apparatus now part of the boundaries of her material self. As a hybrid having both mechanized and organic parts, Deirdre's existence as a cyborg becomes realized through the machining of her body. As the story progresses, we see that she is more at home in and able to control her new body than her former one. The control and power she exerts through her new body suggests that by becoming the embodied "mediated" self, she has become the ultimate performance. While the images and the physical bodies of other characters appear split apart and made into objects by the cameras later in the story, Deirdre merges perfectly with her mediated image, and it becomes her.

It is through Deirdre's merging with her mediated image as well as her metal body that she becomes a cyborg figure, even before the word "cyborg" existed.<sup>25</sup> As Donna Haraway suggests in her "Cyborg Manifesto," "the cyborg is a condensed image of both imagination and material reality, the two joined centers structuring

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<sup>25</sup> Although this story predates the word "cyborg" (which first appeared in the popular press in a 1960 article in the *New York Times* ("Spaceman is Seen as Man-Machine," May 22, 1960)), cyborg theory rooted in feminism (see Donna Haraway's seminal "Cyborg Manifesto," originally published in *Socialist Review* no. 80 (1985), 65-108), and the popularization of the notion of the cyborg (which traces its origins back to Norbert Wiener's 1948 book *Cybernetics: Or Control and Communication in the Animal and the Machine*), the concept of a human-machine or technologically enhanced human body was anticipated and represented well before the coining of a specific term. For examples of the retroactive use of the idea of the cyborg, see Klaus Benesh's *Romantic Cyborgs: Authorship and Technology in the American Renaissance* (Amherst, MA: University of Massachusetts Press, 2002).

any possibility of historical transformation.”<sup>26</sup> Like Haraway’s cyborg, Deirdre is a character that is an intersection of both the image and the material. The cyborg as a feminist construct serves as a figure that exposes the artifice of categories that often appear as “natural” or “original” or “universal.”<sup>27</sup> In becoming a cyborg, Deirdre consolidates her existence as a “mediated image,” resolving the fragmentation threatened by being broadcast across global airwaves. Through representations of the technology of broadcast television, Moore suggests a cyborg identity as a means to withstand both the fragmentation of the self as mediated image, as well as the inherent fragmentation of feminine identity and femininity. The fragmentation of mediated identity is of course represented as gendered, pointing to questions of feminine identity and femininity — as a fragmented and fractured identity that is never really “whole” to begin with, the cyborg serves as a way to be feminine in part by simultaneously revealing the feminine as artifice or masquerade.<sup>28</sup> Deirdre’s constructed and “abstracted” body works to undermine essential notions of the body that undergird systems of power invested in bodily difference.

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<sup>26</sup> Donna Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1990), 150.

<sup>27</sup> See Haraway’s “Cyborg Manifesto.” Haraway’s assertion that the cyborg is free of innocence and has no origin resonates with Beauvoir’s *The Second Sex*, in which she famously writes, “one is not born, but rather becomes a woman” (New York: Vintage Books, 1973), 301. Both suggest that gender is a social process, an intersection between the social and the biological.

<sup>28</sup> See Veronica Hollinger’s “(Re)reading Queerly: Science Fiction, Feminism, and the Defamiliarization of Gender” Veronica Hollinger, *Science Fiction Studies*, Vol. 26, No. 1 (March 1999), 23-40, for a discussion of the idea of the “masquerade” in feminist science fiction.

There are two moments in "No Woman Born" that seem to contradict the issues that Moore raises about body-based identities as performative – Deirdre's sexuality and Moore's racializing of Deirdre's mechanical body. When looking at Deirdre's new body, Harris takes note that he "could not see its shape. A garment hid her" because "without garments, he realized, she would have looked oddly naked, since her new body was humanoid, not angular machinery."<sup>29</sup> Although Deirdre is now a machine, she still wears clothing, because her humanoid body would appear "naked," and therefore, suggestive or indecent should she be without clothes. Harris notes the ability of a machine to appear "naked" as odd, but the shape and form of her body (which he cannot actually see) retains enough of a semblance of an idealized female form as to make it somehow inappropriate for her to be without clothes. Although her new body, as Maltzer claims, is sexless, its form suggests female sexuality as something in need of regulation with clothing. Although Deirdre is apparently without sexual desire due to her new body, this does not remove her from the social conditions of being a potential female object of male desire.

Along with her "feminine" shape, Deirdre also retains her eye and skin color from her original body. The project of building Deirdre a body in her own image produces a body that is golden, with aquamarine eyes. The colors of the surface of her body are non-negotiable in producing something that captures the essence of Deirdre. The idea of the surface and of corporeality is critical to understanding

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<sup>29</sup> Moore, "No Woman Born," 140-141.

Deirdre's new body, as well as its relationship to the technologies of the "mass" media. Film and television are both mediums of surface — they exist on surfaces, and it is through producing surfaces out of "real," physical people and things that they function. Deirdre's body is the most modern of surfaces, made up of smooth hammered metal. Regarding her shape, Harris notices that "Brâncuși himself had never made anything more simple or more subtle than the modeling of Deirdre's head."<sup>30</sup> Quite literally, Deirdre's head is a piece of Modernist sculpture, its aesthetic likened to a work of art by the Modernist sculptor Constantin Brâncuși. Deirdre's body, its colors, its shape all suggest that it is a modern surface like no other. And like her body, the film and the television screen, which feature so prominently in this story, also suggest interiors that are no longer there, but were ostensibly once there at some time.<sup>31</sup> Her body references back to a "self" that other characters fear is no longer there, just as the surfaces of the television screen and film present images of people and objects that were once before the camera lens.

Deirdre's existence as a modern surface connects with the importance of the coloration of her skin as it reflects Moore's racialized markings of Deirdre. Her body is golden, and Moore comments on Deirdre's former body having "golden" skin and "apricot tints" throughout the story. As previously mentioned, the only aspect of Deirdre's body that Maltzer and his team have retained from her organic body was

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<sup>30</sup> Ibid., 139.

<sup>31</sup> See Roland Barthes' *Camera Lucida: Reflections on Photography* (translated by Richard Howard, (New York: Hill and Wang, 1981), 76-78), for his notion of the "that-has-been" quality of photography – that photographs have a "referent" that cannot be denied, and that something that was once before the camera.

Deirdre's skin and eye color, matching them exactly to her metal body and her eye mask. None of the other physical characteristics of her body are matched to her metal body, but are somehow symbolically representative of who Deirdre is – the abstracted characteristics are able to represent her better than her meat body was ever able to signify. The retention of Deirdre's color is an interesting burr on the smooth surface of this narrative. For such a modernist project, with a body abstracted to an extreme degree, it is curious that Deirdre's skin and eye color do not undergo a similar abstraction. Does her coloration suggest that these things are already symbolic to a point of not needing to be made more abstract? Or is skin and eye color so crucial to who a person is that to change those aspects of a body is to change who that person is? The retention of Deirdre's eye and skin colors suggest a troubling essentializing of racial signifiers that the story invokes, but does not question.

As important signifiers of race and ethnicity, the colors of Deirdre's skin and eyes mark her racially, though somewhat ambiguously. Moore makes a point to mark Deirdre with her particular skin and eye color, but in a way that situates Deirdre somewhere between the typical binary of white and black in American culture. The color "golden" (and sometimes "pale gold") as a skin tone is ambiguous – though, I would argue, not unmarked. First, had Moore so chosen, she could have marked Deirdre's body surface as white through words that tend to signify white female bodies, "ivory" or "porcelain" or even "silver." Instead, her body color is compellingly both not white, and not dark either. Second and more importantly,

however, her golden skin recalls the contemporary-to-this story and famous African American dancer and performer Josephine Baker, whose skin was also frequently described as “golden.”<sup>32</sup> In modernist terms, Baker was also often described as “sculptural.”<sup>33</sup> Deirdre’s body is modern through its surface as well — its color, and its minimalist Modernist form.

Anne Anlin Cheng’s analysis of the “surface” of Josephine Baker’s body is relevant to a discussion of Deirdre’s body, not only due to their striking similarities, but also because both bodies have skin surfaces that suggest interactions between the machines of the twentieth century and the repercussions of the use of these machines. Cheng’s idea of the meanings placed on “human skin” in the early twentieth century helps to understand how Deirdre’s machined body, too, engages with the ideology surrounding skin at this time. She suggests that:

The very substance and contours of the human body were undergoing renovations [at the dawn of the twentieth century], a process precipitated by the Industrial Revolution and intensified by the age of mechanical reproduction. Medical advancement, visual technological innovations such as film and photography, industrial-philosophical discourses such as Taylorism, among other developments, converge to forge a fantasy about a modern, renewed, and disciplined body. At the same time, through discourses such as psychoanalysis, the boundary of the human body is simultaneously multiplied and restricted; the mind/body split gets both liberalized and distorted.<sup>34</sup>

What makes Deidre’s character distinct is her inhabitation of an actual sculptured, modern body, unlike Baker, who existed as a person whose representations in

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<sup>32</sup> Cheng, *Second Surface*, 102.

<sup>33</sup> *Ibid.*

<sup>34</sup> *Ibid.*, 8.

discourse produced her as “sculptural,” among other things. With Baker and Deirdre, however, both reveal that, as Cheng suggests, skin and its visibility are not as available and transparent as critics have suggested.<sup>35</sup> Perhaps – as is the case with Baker – with Deidre, early viewers were not always seeing they thought they were. Moore presents readers with a character multiply represented from different perspectives, leaving the visible and skin itself as not all that legible. Unlike the questions raised about the artificial nature of gender performances, Moore leaves the artifices of race and ethnicity relatively unquestioned. Like film technologies, and the way they caused people to doubt what it was that they saw, the character of Deirdre plays on what we see, and what we think that we’re seeing, revealing the shifting perspectives and perceptions that constitute our interpretation of the world.<sup>36</sup>

In addition to her skin being marked as golden both before and after her accident, a discussion of her “primitive” and “intellectual” senses also invokes notions of racialized hierarchies. Maltzer worries that Deirdre has become too “civilized,” due to her contact with metal and the modern technology that exists in and as her very body. She is the machine, not just inhabiting a body affected by the machine. Modern technology in this story exists in tandem with a continuum of the civilized/primitive, relating back to the lived experience of the body. Deirdre has the

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<sup>35</sup> Ibid., 7.

<sup>36</sup> Mary Ann Doane, “Technology’s Body: Cinematic Vision in Modernity,” in *A Feminist Reader in Early Cinema*, eds. Jennifer M. Beam and Diane Negra, (Durham, NC: Duke University Press, 2002), 532.

senses of sight and hearing, but not of smell, taste, or touch, and the characters of the story identify those latter three senses as “primitive” and therefore anti-intellectual. Deirdre, in a way, is “overcivilized” in her inhabitation of her machined body, and the male characters of the story fear that she will be too coldly calculating and intellectual, cut off from her fellow human beings due to her lack of “primitive” senses. Technology, aligned with “civilization,” is also problematic — with a machined body created by a genius scientist, Deirdre can’t help but be improperly aligned with her “primitive” side. This “handicap,” as scientist Maltzer refers to it — represented as a lack of the “primitive” senses – marks human beings as needing a particular balance of civilized and primitive, in order to best interact with their environments and cultures. It is only white Americans, of course, that have access to being “overcivilized” and in need of that balance, according to this trope. Possession of a machined body grants a privilege of being too civilized rather than too primitive. As the story continues, Maltzer is not finished listing Deirdre’s “shortcomings.” He identifies her lack of three senses as critical in her being “pitifully handicapped,” but also he projects the senses into a hierarchy of civilization that no characters challenge throughout the story.<sup>37</sup> The senses of smell, taste, and touch, though allegedly less “civilized” than vision and hearing, are necessary for making connections to other people. Maltzer explains that “we need

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<sup>37</sup> Moore, “No Woman Born,” 153.

those primitive senses to tie us in with nature and the race” while “sight is a cold, intellectual thing compared with the other senses.”<sup>38</sup>

Among Deirdre’s “handicaps,” which make Deirdre “subhuman” in Maltzer’s eyes, is the fact that “she hasn’t any sex. She isn’t female any more.”<sup>39</sup> He claims that “she’s an abstraction now” who cannot respond as she once had “when a man came into the room.”<sup>40</sup> Sex and sexuality, for Maltzer, are critical parts of Deirdre’s former humanity. Without her sexual desire for men and her female physical traits, Deirdre has lost her abilities to function as a human being. As an abstraction, her body engineered by science, she no longer has some of things that Maltzer thinks makes someone human — a physical sex and sexual desire. This vision of humanity, however, is gendered and sexualized, seemingly specific to women and therefore a female-bodied person. Deirdre’s prosthetic body, according to Maltzer’s character, renders her sexless and asexual, privileging a body-sourced conception of human identity. Maltzer continues, “She doesn’t realize how delicately poised her very sanity is. We gave her what we could - the artists and the designers and I all gave our very best - but she’s so pitifully handicapped even with all we could do. She’ll always be an abstraction and a...a freak. Cut off from the world by handicaps worse in their way than anything any human being ever suffered before. Sooner or later she’ll realize it. And then—”<sup>41</sup> Typical of interactions steeped in traditional notions

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<sup>38</sup> Ibid.

<sup>39</sup> Ibid., 152.

<sup>40</sup> Ibid.

<sup>41</sup> Ibid., 153.

of femininity, Maltzer sees Deirdre as mentally weak and unable to handle the stresses and power of her new body. Despite the fact that she no longer possesses the organic female body that would have been identified as the source of “hysteria” and other womanly ailments, Maltzer expects Deirdre’s delicate mental constitution to erode.

What Maltzer sees as “handicaps,” however, Deirdre sees as qualities that make her superior to her former self. She grows to inhabit her artificial body with a zeal that frightens Maltzer, and she seems more at home in an engineered body than she did in her “born” one. Instead of having a female body that hinders Deirdre’s ability to control the world around her, Deirdre still has her own brain – only controlling a body she sees as far superior to her meat one.<sup>42</sup>

Deirdre’s prosthetic body is routed through a language of disability, and her new body’s capabilities link the idea of disability to “humanity” and inhumanity, as well as gender and race. Maltzer, when discussing the topic of Deirdre’s humanity with Harris, identifies her lack of abilities and characteristics as Deirdre’s “handicaps,” making her “subhuman,” while later in the story Deirdre herself identifies the positive, additional abilities her body affords as justification for “superhuman” status. This story presents a hierarchy of human traits and qualities that can either make someone “subhuman” or “superhuman,” and these traits of

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<sup>42</sup> One of the things that makes Deirdre feel at home in her body is its superior flexibility and strength that allows her to dance as she has never been able to before. She tells Harris that she does not “work on hinges now” and so “every motion [can be] a long curve,” and that she can also “turn a hundred *fouettés* now without a flaw” and could “go right on and turn a thousand, if I wanted” (see Moore, page 148).

difference are funneled through a framework of disability. In the story, it is Maltzer who has difficulty adjusting to Deirdre's new state, and both male characters, Maltzer and Harris, are uneasy about how powerful and commanding Deirdre has become since her transformation. As a person who has existed "across the airwaves" for longer than she has had a machined body, she is able to inhabit her projected image and identity more fully than before with her organic brain housed in her metal body. Deirdre sees herself as something more than humanity, and while her human friends continue to define humanness in this story through the bodily signifiers of identity like sex and gender. The mediation of Deirdre's image further accords with the notion of telecommunications technologies and the body: "the innocuousness of photographic technology (and this applies to any technology), its instrumentality, and hence its rationality are in a sense predicated on its separability from the human body which it strives to represent in all its contingency. Nevertheless, alongside this doubt, this assertion of a non relation between photography and the body, there continues to exist a certain fascination with the possibility of an imbrication of technology and the body."<sup>43</sup> Instead, Deirdre becomes the mediated surface itself, the technology that paradoxically seeks to represent the human body and be separate from it at the same time. She meets the utopian ideal of combining the body and the mediation of the body within her machined form. Her new, modern body is far more suited for broadcast and in control of the cameras and screens that threaten to make machines out of us all.

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<sup>43</sup> Doane, "Technology's Body," 531.

### **The “Mass Ornament” and the Machined Body**

Perhaps one of the most fascinating aspects of this story is the period in which it was written. The representation of a cyborg, one that is a posthuman figure that embraces the technological imperatives of modern life in the 1940s, is unusual. Moore’s story predates the genre of cyberpunk by decades,<sup>44</sup> as well as predating popular representations of cyborgs, including television shows the *Six Million Dollar Man* and the *Bionic Woman* from the 1970s, not to mention Donna Haraway’s seminal essay on cyborg theory from the mid-1980s.<sup>45</sup> Moore’s character moves against the representations of people as machines in the 1920s and 1930s leading up to World War II, and counter to those who find alienation and anxiety in technologies of “modern” life in the 1930s and 1940s. This section of the chapter bridges the representation of Deirdre’s body and her subsequent performance, and

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<sup>44</sup> Cyberpunk is a subgenre of science fiction that flourished in the 1980s. It is characterized by its abundant examples of conspicuous technologies: it is “slick, colloquial, and science-based [and] represented a concerted return to the (originary) purity of hard SF, apparently purged of the influence of other-worldly fantasy, and embracing technology with new fervor” (Nicola Nixon, “Cyberpunk: Preparing the Ground for Revolution or Keeping the Boys Satisfied?” in *Science Fiction Studies* 57 (July 1992), 220). Nixon argues that cyberpunk is a backlash against the increasing popularity of feminist science fiction writers of the 1960s and 1970s, which who had allegedly “softened” the genre. Cyberpunk’s affinity to conspicuous technology allowed an imagining of the “posthuman,” which some feminist scholars critique as privileging a universal humanity, eliding and erasing body differences. Interestingly, however, arguably the first cyberpunk text published was by female science fiction writer James Tiptree, Jr.’s (Alice Sheldon). Her novella, “The Girl Who Was Plugged In” (in *New Dimensions 3* edited by Robert Silverberg (New York: Doubleday, 1974)), suggests that the body is indeed important despite the ability to inhabit a different body via technology.

<sup>45</sup> Haraway, “A Cyborg Manifesto,” 149-182.

addresses the peculiar context of Deirdre within the frame of reference of people as machines via telecommunications and film technologies. Kracauer's work "The Mass Ornament" serves as a useful example of how mass-produced and -consumed images contribute to anxieties over machined bodies in the 1920s and 1930s. In the context Kracauer's work, "No Woman Born" illuminates both anxiety over people treated as machinery in the 1930s as well as a feminist embracing of a person housed in a machined body. Technology is represented as both something that can destroy the body, yet also as something that serves to reassemble the female self.

During the 1930s, the effects of technology and machines on bodies concerned many American intellectuals and the Frankfurt School of cultural critics. American intellectuals concerned with the effects of American capitalism on its workers found the United State's socio-economic system as one that transformed people into machines, exploited for their labor. At the same time, cultural critics of the Frankfurt School, concerned with the rise of fascism in Europe and of industrial capitalism in the US and Europe, wrote about the effects that the machinery of mass-production and -consumption of images had on individuals and culture. Concerns of both Marxist American intellectuals and the members of the Frankfurt School were ultimately attentive to the idea of bodies coming into contact with "modern" technologies. Thus the body becomes a site for anxieties over machine-human interactions, as well as anxiety over the exertion of state powers in a newly "global" setting.

The Frankfurt School theorist Siegfried Kracauer and his contemporaries were concerned with the effects of mass-produced entertainment (especially that controlled by the state) on bodies during the late 1920s and 1930s. Individuals become objects and subject to violence and control through their interactions with machines. Kracauer's work suggests and predicts an engineering of people through the machinations of state powers via a technologized system of mass-produced and -consumed images. The work of Kracauer and other members of the Frankfurt School anticipates the violence created in part by passive "masses" of German fascism during World War II. The trauma exacted on literal bodies during WWII echoes the trauma visited upon the figurative "body" by the machinery of the film industry as suggested by Kracauer. The link between this figurative body and the physical body sets the stage (so to speak) for an analysis of the machining of Deirdre's body, an analysis that works through this period's politics of machine-body interactions. Deirdre's destroyed and rebuilt body's performances on a global stage reckons with both the dehumanizing effects but also the possibilities that such a constructed body can bestow upon a body fragmented by existing as female within the cogs of the film and television industry's machinations.

Kracauer's 1927 essay "The Mass Ornament" is of particular relevance to this study due to his use of female performers as his example.<sup>46</sup> Kracauer comments on the processing of women's bodies into visual objects in "The Mass Ornament," and

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<sup>46</sup> Siegfried Kracauer, "The Mass Ornament," in *The Mass Ornament: Weimar Essays*, trans. Thomas Y. Levin (Cambridge, MA: Harvard University Press, 1995), 75-86.

suggests that “mass” entertainments, like the Tiller Girls<sup>47</sup> are “products of American distraction factories” that feature “no longer individual girls, but indissoluble girl clusters whose movements are demonstrations of mathematics.”<sup>48</sup> Through the technologies of producing and re-producing the images of the Tiller Girls and other mass entertainments, Kracauer points out that “as they condense into figures in the revues, performances of the same geometric precision are taking place in what is always the same packed stadium, be it in Australia or India, not to mention America. The tiniest village, which they have not yet reached, learns about them through the weekly newsreels.”<sup>49</sup> The production of such performances means that individual people have been asked to become uniform within the structure of their performances, and in the geometric patterns that they create. The audiences at different venues and on different nights then can all view the “same” performance, even as they are “themselves arranged by the stands in tier upon ordered tier.”<sup>50</sup> It is both the performers and the audiences that are driven to becoming ordered patterns through their consumption of mass-produced entertainment. Film, and subsequently television technologies, encourage a need for large numbers of people to be able to watch the same performance and consume the same, uniform product made up of what was once individual human beings.

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<sup>47</sup> The Tiller Girls were a traveling chorus-girl-like dance troop.

<sup>48</sup> *Ibid.*, 75-76.

<sup>49</sup> *Ibid.*, 76.

<sup>50</sup> *Ibid.*

Kracauer's impression of these types of mass-produced entertainment engagements is a dystopian one, and this is no surprise, given that at the time of the writing of the essay, he was living as a dissident in Germany in the interwar period, before moving to Paris in 1933.<sup>51</sup> His dark vision for the transformation of people into objects via both their performing and watching mass-produced performances brings to the fore the importance at this time (and into the 1930s and 1940s) of anxiety over modernization: through the process of modernization, technologies machine people into objects. Although Kracauer does not address the fact that his main example of the Tiller Girls is a gendered one, the use of female bodies and images as the example of "mass ornament" is crucial for understanding Deirdre's existence as a cyborg suited for the system of the mass circulation of visual cultural texts like that of the television broadcast and the film. In becoming "objects" for visual consumption, women are fragmented -- the bodies of individuals become patterns of arms, legs, and other component parts.<sup>52</sup> The Tiller Girls as an example lend themselves too well to being objects for producing geometrically appealing

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<sup>51</sup> The concept of human-machine interaction as a negative one was not, of course, the only way to imagine human-machine relations in Germany in the 1930s. At the same time as much of the writings of the members of the Frankfurt School, the interwar period, Dada artists in Berlin used the cyborg as important and idealized, even "utopian" figure that could resist bourgeois capitalist society. See Matthew Biro's *The Dada Cyborg: Visions of the New Human in Weimar Berlin* (Minneapolis: University of Minnesota Press, 2009).

<sup>52</sup> Haraway suggests that "to be a subject in the Western sense meant reconstituting women outside the relations of objectification (as gift, commodity, object of desire) and appropriation (of babies, sex, services)," (*Simians, Cyborgs, and Women*, 138). She identifies the idea of "objectification" as a fundamental mode of patriarchal oppression, a mechanism for making women into non-subjects.

images because of the broader history of women's bodies subjected to being looked at in particular ways. Women's bodies, through this process of becoming spectacles of "mass ornamentation," are dismembered and recombined into images of machined geometric beauty that exist solely for their own mathematical beauty. Kracauer suggests that female bodies – ordinarily sites of erotic attention – are drained of the erotic, their "mass movements" becoming part of "a linear system that no longer has any erotic meaning but at best points to the locus of the erotic."<sup>53</sup>

The machined body, represented as able to move in a way superior to and even "more human" than an organic body, idealizes a rebuilding of bodies through technologies. This rebuilding constructs a mass-consumed body that increases the mobility of the image as well as increases the mobility of an individual body. When that mobility of an image is of the movements of the individual body's performance, the two collude to produce a human experience inextricably steeped in modern technologies, paradoxically more fully "human" than before. Multiply-referenced identities produced out of lived bodily experiences and the mediation of the self come together in the cyborg body, fragments reassembled into something that is not "whole," but in resistance to wholeness.<sup>54</sup> Kracauer laments the prevalence of

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<sup>53</sup> Kracauer, "The Mass Ornament," 77. It is interesting that Kracauer uses this wording, as he assumes that women are properly "erotic" objects, and that it is somehow unnatural for them to be "drained" of it. The notion of women as "objects" in this system of the mass production and consumption of entertainment images is something that feminists theorists take up in particular in the 1970s.

<sup>54</sup> See Haraway's "Cyborg Manifesto," for her description of the cyborg as a figure without an origin story, as "an origin story in the 'Western', humanist sense depends on the myth of original unity, fullness, bliss and terror, represented by the phallic mother from whom all humans must separate," 151.

abstraction, which separates from the “natural.” The idea of the “natural” and the “natural body” privileges people who have bodies that allow them to avoid body-based discrimination. The naturalness of the bodies of female-bodied persons, for example, has been used to oppress women. Female bodies represent the seat of the oppression of women, and in “No Woman Born,” the female body is rebuilt into an object of bodily power, though still caught as an object of the gaze. As a machined body, though, Deirdre exists as an animate object, but one with the flexibility of flesh.

Kracauer’s “indissoluble girl clusters” are bodies of individual women fragmented into arms, legs, and other “component parts,” while at the same time producing a mass that is inorganic in its appearance and structure.<sup>55</sup> Women’s bodies, through this process of becoming spectacles of “mass ornamentation,” are dismembered and recombined into images of geometric precision and machined linear beauty. The elision between organic surfaces of human bodies and inorganic visual patterns is echoed in the representation of Deirdre’s body as both organic and inorganic, both human and machined. Deirdre also remains an individual instead of part of a multiple. Rebuilding the body ultimately becomes necessary in order to resist the dismemberment and reassembly that the camera exacts upon female bodies in this story. Through the engineering of her body, Deirdre becomes the broadcast image, and dances along the edges of being subject and object. The trauma experienced by Deirdre (both through the fire and through being a televised

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<sup>55</sup> Ibid., 76.

image) is reconciled in the new form of her machined body -- she is both fragmented and whole. Machining her body makes Deirdre's assembly and artifice visible, and that visibility of her artifice (as opposed to its seamless illusion and masquerade before her accident) is what gives her power over her audiences.

### **"A Line of Tiny Dancers"**

One of the most astonishing aspects of this story is the time period in which it was published, and the feminist questions that it raises. While it raises questions of gender as performance and the fragmentation of the female body in front of the camera, it does so nearly thirty years before feminist theory takes up these questions in earnest.<sup>56</sup> Although theorists like Mulvey did not write about women's bodies as objects and objectified by narrative cinema until the 1970s, Mulvey was not the first feminist writer to explore the mechanisms of patriarchy through using a metaphor of women's bodies as objects. As footnoted earlier in this chapter, it was as early as 1948 that Simone de Beauvoir, author of *The Second Sex*, a seminal text in the modern women's movement, wrote about women's bodies as objects under

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<sup>56</sup> The body as "object" and the idea of being "objectified" is one of concern to many feminists, but often these words are not as thoroughly investigated as they should be. What does it mean to be an "object," in a culture where objects so often can take on a semblance of life and aliveness? While the boundary between "subject" and "object" becomes ever more permeable, questioning the notion of being "objectified" can help in unpacking the notion of body-based oppressions. Feminist criticism of pornography is one of the sites where the notion of objectification becomes most salient. For an overview of the debate between sex-positive feminists and antipornography feminists (namely Andrea Dworkin and Catharine MacKinnon), see Lisa Duggan and Nan D. Hunter's *Sex Wars: Sexual Dissident and Political Culture* (New York: Routledge, 1995).

patriarchy. While it is unusual that “No Woman Born” takes up this idea in 1944, it was not a new concept. What is perhaps most intriguing about Moore’s story is that through her story’s futuristic setting she anticipates a critique of the circulation of images of women’s bodies for entertainment.<sup>57</sup> Moore wrote and published this story in between what are referred to as the first and second “waves” of American feminism, it appears to anticipate many of the questions and issues taken up by feminists of the 1960s and 1970s, there are several reasons why this is not all that unusual. One of the modes of feminist theoretical work of the 1960s and 1970s took place was through fiction writing. Science fiction (and the broader umbrella category of “speculative fiction”) that explored gender and sex differences was an important subset of this body of writing.<sup>58</sup> Many of the first well-known writers of

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<sup>57</sup> Although the criticism of film, television, advertisements, and other “mass media” cultural texts as representing women’s bodies as objects for consumption is often noted as an issue of the “second wave” of U.S. feminism, it is partially the “wave” metaphor itself that erases feminist work that happens between the “waves” (i.e. from the 1920s to the 1950s), as well as hinders feminist work that deals with topics outside of the time period that the wave metaphor expects. For a more thorough criticism of the wave metaphor in the women’s movement, see Jo Reger’s *Everywhere and Nowhere: Contemporary Feminism in the United States* (New York: Oxford University Press, 2012), especially pages 7-9. Benita Roth and Becky Thompson suggest that one of the theoretical threads that the wave metaphor erases is an analysis of race and class, and the usage of the concept of “second wave” feminism obscures the writings of women of color and antiracist white women involved in the feminist movement of the latter part of the twentieth century (see “Multiracial Feminism: Recasting the Chronology of Second Wave Feminism” in *Feminist Studies*, Vol. 28, No. 2, (Summer, 2002), 336-360).

<sup>58</sup> See my M.A. thesis, “The First Thing out the Window: Race, Radical Feminism, and Marge Piercy’s *Woman on the Edge of Time*,” for more on science fiction as a mode for feminist thought of the 1960s and 1970s. See also science fiction writer Joanna Russ’s essay collection *To Write Like a Woman: Essays in Feminism and Science Fiction* (Bloomington, IN: Indiana University Press, 1995) and Patricia Meltzer’s

feminist science fiction cite reading the science fiction pulp magazines while growing up as a major influence on their writings as adults.<sup>59</sup> Moore's story fits within an earlier generation of women writing science fiction for the pulps, science fiction that does theoretical work investigating sex and gender oppression.<sup>60</sup>

Miriam Hansen, among others, connects Kracauer's "The Mass Ornament" with the films of choreographer and director Busby Berkeley, famous for his cinematography featuring geometric arrangements of female bodies and body parts.<sup>61</sup> In "No Woman Born" a Busby Berkeley and Tiller Girls-like performance calls to mind Kracauer's essay and the effects that mass visual technologies have on women's bodies and the concept of objectification. Before Deirdre takes the stage for her comeback performance (a live performance at a theater that is also a live broadcast), Harris and Maltzer watch a number of stage performances broadcast on their television screen. This section offers a reading of these performances,

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*Alien Constructions: Science Fiction and Feminist Thought* (Austin: University of Texas Press, 2010), especially pages 7-9 on feminist science fiction.

<sup>59</sup> This is true by and large of almost all science fiction writers of the 1960s and 1970s. Feminist writers, however, often cite a love-hate relationship with the pulps – both having devoured them but also finding their gender politics for the most part problematic. Ursula K. LeGuin is one example. She had read the pulps as a kid, then stopped reading them when she got "was tired of bureaucratic heroes" (see pages 28 and 54 of *Conversations with Ursula K. Le Guin* (Jackson, MS: University Press of Mississippi, 2008)).

<sup>60</sup> See Eric Leif Davin's *Partners in Wonder: Women And the Birth of Science Fiction, 1926-1965* (Lanham, MD: Lexington Books, 2006) for more on female pulp authors. See especially page 225, where he suggests that the tradition of American "socialist and feminist utopias...appeared in the pulps – and nowhere else – between 1920 and 1950."

<sup>61</sup> Miriam Bratu Hansen, *Cinema and Experience: Siegfried Kracauer, Walter Benjamin, and Theodor W. Adorno* (Berkeley, CA: University of California Press, 2012), 52.

suggesting that the similarities to Busby Berkeley choreography and camerawork make explicit an anxiety-provoking relationship between humans and objects.

After the first performance, a dramatization of the execution of Mary, Queen of Scots, a number of women enter the stage to perform a dance number. Moore describes the performance through the eye of the camera lens: "Now a line of tiny dancers under the tremendous arch of the stage kicked and pranced with the precision of little mechanical dolls too small and perfect to be real. Vision rushed down upon them and swept along the row, face after stiffly smiling face racketing by like fence pickets. Then the sight rose into the rafters and looked down upon them from a great height, the grotesquely foreshortened figures still prancing in perfect rhythm even from this inhuman angle."<sup>62</sup> The description of the dancers and the representation of them on Harris and Maltzer's screen are reminiscent of the choreography envisioned by filmmaker Busby Berkeley, famous for his high-budget musicals with elaborately-shot dance sequences. These dancers, through the eye of the camera lens, appear to move with "mechanical precision." The abstraction of people into objects through the gaze of the camera lens not only makes the dancers seem inhuman, but the camera itself also seems to move and capture the dancers' movements apart from any human interaction, swooping and moving on its own. The "top shot" made famous by Berkeley (with the camera positioned high above the actors), appears in this passage as well, showing the images of the dancers as "grotesquely foreshortened figures" from an "inhuman angle." Moore calls attention

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<sup>62</sup> Moore, "No Woman Born," 154.

to the movement and action of the camera as a character in and of itself — it becomes more than an object, while it reconstructs the human dancers and their movements as object-like.

Berkeley's musicals also featured close-ups on the faces of rows of women, as either the camera moved down a row of performers, or the women moved up to the camera themselves. This technique also features in "No Woman Born," as "vision rushed down upon them and swept along the row, face after stiffly smiling face racketing by like fence pickets."<sup>63</sup> While the top shot angle of the camera produces "grotesquely foreshortened figures" that appear mechanical, the shot that sweeps across their faces shows them "stiffly smiling," and Moore compares them to "fence pickets"— identical pieces of wood all linked together. Both instances show the television camera transforming these performing women into objects. The resemblance to Berkeley's cinematography and choreography in his films is undeniable. Moore draws a direct comparison to these kinds of filmed performances and the televised performances of this futuristic media-steeped world that Deirdre inhabits.

As Mary Ann Doane has expressed, "Berkeley's spectacular regimentation of female bodies and his deployment of them as ornaments in a larger design have been extensively discussed. Berkeley himself situates 'girls' as the pure content of spectacle."<sup>64</sup> Women as "pure spectacle" is a crucial element of Berkeley's films, as

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<sup>63</sup> Ibid.

<sup>64</sup> Doane, "Technology's Body," 544.

well as Moore's story. Juxtaposed with the line of tiny dancers, themselves the product of being "pure spectacle," Deirdre's performance becomes that much more a response and answer to the mechanization of women's bodies for the purpose of "mass" entertainment. Doane further suggests that the technological prowess of the execution of the cinematography of Berkeley's films helps to support the transformation of women's bodies into spectacle: "The spectacular presentation of the female body is buttressed in his films by the sheer technological prowess of elaborate crane shots and his famous (or infamous) through-the-legs tracking shots."<sup>65</sup> The technological apparatus of filming these kinds of dance sequences is critical to the transformation of women's bodies into spectacle, and into non-human objects and illusions. As in "No Woman Born," the camera, and its ability to move through space and subsequently transform women into images, is itself part of the process of "objectification." It is of that much more significance, then, that when Deirdre comes onstage, "the screen did not swoop to a close-up upon her. Her enigma remained inviolate and the television watchers saw her no more clearly than the audience in the theater."<sup>66</sup> For Deirdre, as discussed below, the camera does not control her image, and it does not have an effect on how remote viewers see her.

Busby Berkeley made many of his films in the period when sound film technology was new, and according to Martin Rubin, instead of just filming a Broadway musical onstage, he made use of film technology in a way that "made the

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<sup>65</sup> Ibid.

<sup>66</sup> Moore, "No Woman Born," 155.

camera dance.”<sup>67</sup> The camera itself in Berkeley’s films takes an “active” role in the production of moving image versions of stage performances. In “No Woman Born,” the camera seems to dance, and moves more autonomously than the dancers, who are performing a rote sequence of movements that makes them appear mechanical. One thing that stands out as being different from Berkeley’s films and the performances in Moore’s story, however, is that while Berkeley’s dance sequences are filmed — recorded and edited for future viewing — Moore’s performers are doing so for a live broadcast, and so the camera’s antics are translated instantly to the viewers’ television screens. In a way this is the ultimate form of consumption of stage performances in front of a camera — they are “live,” the way that stage performances are live, but they also allow for a cinematic type of viewing due to the autonomous nature of the camera that swoops and dives and dances around the performers to accord a privileged, “cinematic” viewpoint to the audiences. The at-home audience of the line of tiny dancers gain viewing angles that they would not have had if they had been in the theater, though they give up control over their gaze, since if they were in the theater, they could direct their eyes toward whatever they wanted, but only from the viewpoint of their own seats. As Doane comments regarding Berkeley’s films, they “could also be said to constitute a veritable celebration of the disembodied spectator or, in the words of Michel de Certeau, ‘the lust to be a viewpoint and nothing more.’”<sup>68</sup> The spectators of Moore’s story are

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<sup>67</sup> Martin Rubin, *Showstoppers: Busby Berkeley and the Tradition of Spectacle* (New York: Columbia University Press, 1993), 2.

<sup>68</sup> Doane, “Technology’s Body,” 544.

viewpoints, but ones that also have the ability to watch something live, one of the aspects of television broadcast technology that makes early television viewing a distinct experience from film viewing.

As Busby Berkeley scholar Rubin says, “even when the results are not as dramatic as a giant picture or a kaleidoscopic pattern, virtually any precision chorus number involves a certain degree of objectification of the feminine — a loss of individuality as a result of being made part of a mass, synchronized unit.”<sup>69</sup> Positioning these women as objects, and transforming them into patterns and images prepares them for becoming objects for destruction. In the title sequence from the 1934 *Dames*, for example, women frequently transform from images of women into patterns of light and dark. At the end of the song, by editing the filmed image of women onstage into a paper image of the same, the male protagonist is able to burst his head through the paper image of the women. Ultimately, the “dames” that are the objects of desire for the musical audience, both within the film and the audience watching the film, become a literal object that is ruptured and torn. This moment could never have happened during a normal stage performance, but it can happen with the technology of cinema.<sup>70</sup> The big-budget Busby Berkeley

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<sup>69</sup> Martin Rubin, *Showstoppers: Busby Berkeley and the Tradition of Spectacle* (New York: Columbia University Press, 1993), 74.

<sup>70</sup> Robert Rydell’s “Future Perfect” chapter in *World of Fairs: The Century-of-Progress Expositions* (Chicago: University of Chicago Press, 1993, pages 115-156) has a fascinating analysis about performances that combined a vision of the future with visual access to women’s bodies. In particular, the 1939 New York World’s Fair had the “Crystal Gazing Palace” which consisted of women doing a striptease on a “platform surrounded with mirrors” so that a viewer could see women’s bodies from a multitude of angles at once (see page 139). Rydell quotes a draft of the

musical is perhaps one of the clearest examples of the way that women are transformed into spectacular objects for consumption on a large scale. The example from *Dames* highlights the process of gendered "objectification" through telecommunications technology that Moore probes in "No Woman Born."

Through the eye of the camera lens, the line of tiny dancers appears to move with "mechanical precision," and we see how the anxiety over the dangers of television and other technologies of the "mass" audience resonates with this passage. However, while Kracauer seems wholly pessimistic about the mass audience, Moore seems, in *Deirdre*, to imagine a subject/object that can both look and be looked at, exist as an abstraction and a person at the same time. The human dancers on stage are transformed through their images' transmission through the camera to the screen and into mechanical figures. The camera itself, however, moves and captures the dancers' movements apart from any human interaction. It has "sight" and "vision," suggesting that it has some odd control and subjectivity of its own, and Moore does not mention a camera operator. The camera acts uncannily

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proposed exhibit, saying that "the effect would be 'that of a ballet of several hundred girls dancing with inhuman precision'" (see page 139). Although this is different from using film technology to view women's bodies in ways that transform them into objects to look at, it is part of a broader notion at the time of visually accessing women's bodies through technology. Rydell compares the logic behind this technological striptease as "a machine-age dance that made a woman's body seem infinitely replicable like the interchangeable parts on the assembly line" to Catherine A. MacKinnon's analysis of pornography as a "technologically sophisticated traffic in women" (see page 139). Also on page 139, see the tangentially related image of a person in a robot costume amongst a group of naked women in the Zorro Garden in San Diego in 1935. Another striptease-style exhibit at a World's Fair, the robot figure interrupts (both figuratively and literally) an edenic scene of nude women bathing in a pastoral setting.

of its own accord, swooping and transmitting the images of people for Maltzer and Harris (and the other millions watching their television screens) to consume. Maltzer and Harris also seem absent as viewers, suggesting a passive reception of what the camera captures and transmits. Moore calls attention to the movement and action of the camera as a character — it becomes more than an object, while it reconstructs the human dancers as object-like images. It becomes more alive, while the dancers themselves become automatons.

### **Deirdre Onstage Performing Her (In)Humanity**

After two more performers, the “performing dolls” return to the stage, then are followed by the last performance of the night, Deirdre’s comeback number. Deirdre performs after the camera-mechanized dancers, but for her, the camera does not dominate her performance, and readers, as well as Maltzer and Harris, view it quite differently. If Moore’s line of tiny dancers is a hyperbolic example of the fate of women onscreen, then Deirdre is Moore’s answer that complicates the idea of being a subject or an object, and the gendered dangers of being mechanized by modern technology. While the tiny dancers became mechanical, their performance provides a contrast to Deirdre’s, in which her body becomes more human than humans are able to be. Instead of being beholden to the camera as the tiny dancers were, Deirdre’s experience of being televised demonstrates her machined body as far more suited to withstanding the powers of “mass” telecommunications technologies.

While Deirdre does not escape the fate of being made into an object through her inorganic metal body, as well as an object for the camera and audience's gaze, her comeback performance reveals a play on the very idea of what constitutes an object:

The last curtain of golden gauze withdrew. The stage was empty. Or it seemed empty. But even through the aerial distances between the screen and the place it mirrored, Harris thought that the audience was not waiting for the performer to come on from the wings. There was no rustling, no coughing, no sense of impatience. A presence upon the stage was in command from the first drawing of the curtains; it filled the theater with its calm domination. It gauged its timing, holding the audience as a conductor with lifted baton gathers and holds the eyes of his orchestra.

For a moment everything was motionless upon the stage. Then, at the head of the stairs, where the two curves of the pillared balustrade swept together, a figure stirred.

Until that moment she had seemed another shining column in the row. Now she swayed deliberately, light catching and winking and running molten along her limbs and her robe of metal mesh. She swayed just enough to show that she was there.

Then, with every eye upon her, she stood quietly to let them look their fill. The screen did not swoop to a close-up upon her. Her enigma remained inviolate and the television watchers saw her no more clearly than the audience in the theater.<sup>71</sup>

Unlike their experiences with the dancers, Maltzer and Harris appear as active viewers of her performance, and we read much of Deirdre's performance through Harris's perspective and critiques. Moore presents Deirdre, in some ways, as a perfect "subject" for the camera. As a cyborg, she cannot be reduced to an object by the camera – in many ways, she already is one. But at the same time, she commands

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<sup>71</sup> Moore, "No Woman Born," 155.

and dominates the camera, the stage, and the audience, even before anyone “sees” her. Before the audience (either the audience in the theater watching the stage, or the television viewing audience) sees her, the stage appears empty, but “a presence upon the stage was in command from the first drawing of the curtains; it filled the theater with its calm domination.”<sup>72</sup> Of course, Deirdre *is* on stage, but no one “sees” her because of her metal body and her lack of movement — she appears as part of the background of the stage even as she commands her audience’s gaze without their seeing her.<sup>73</sup> Moore writes that “for a moment everything was motionless upon the stage. Then, at the head of the stairs, where the two curves of the pillared balustrade swept together, a figure stirred. Until that moment she had seemed another shining column in the row.”<sup>74</sup> Fraught with the tension of anticipated movement, when Deirdre finally does move, her stirring reveals her to be the animate object that the audience is there to see. Deirdre’s subjectivity in this passage comes from her command and “domination” of the audience’s attention; but she also exists as an object of the gaze, an object that is in control of its viewers’ sight. Her shift from stillness to motion and back to stillness punctuates her transition from a stationary part of the stage to a figure to gaze upon. After she “swayed just enough to show that she was there...with every eye upon her, she

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<sup>72</sup> Ibid.

<sup>73</sup> A common convention of Berkeley’s choreography and staging of dance numbers used women as architecture, like women serving as columns in the “Petting in the Park” sequence of *Golddiggers of 1933*. See Rubin’s *Showstoppers*, 58, for more on the “living architecture” of Berkeley’s choreography.

<sup>74</sup> Ibid.

stood quietly to let them look their fill. The screen did not swoop to a close-up upon her. Her enigma remained inviolate and the television watchers saw her no more clearly than the audience in the theater."<sup>75</sup> The camera, which had swooped and moved to produce the abstracted, distorted images of the dancers before Deirdre, does not do the same for her. The image of her, the same as for the television audience and the theater audience, is unmediated and unchanged by the camera's gaze.

Deirdre's performance after her dramatic entrance further shows her as an ideal feminine figure for the representation on screen, more so than the human dancers. Deirdre's machined body refuses to be made an object by the camera's gaze, because she is already between object and subject. Her machined body's camaraderie with the camera allows her to have control over the image that appears the television screen. Deirdre's control over her own mediated image suggests an interpretation of the role of the camera in the "objectification" of the female star alongside the work of feminist film scholars of the male gaze of the camera.

Although Laura Mulvey did not publish her seminal feminist film studies article "Visual Pleasure and Narrative Cinema" until 1975, "No Woman Born" provides an alternative reading of the role of the camera in the production of women into images and objects.<sup>76</sup> Deirdre has already undergone violence that resulted in her becoming a literal object: The fire that destroyed her body and the reconstruction of herself in

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<sup>75</sup> Moore, "No Woman Born," 155.

<sup>76</sup> Laura Mulvey, "Visual Pleasure and Narrative Cinema," in *Screen*, 16 (3) (1975), 6-18.

the image of what the male gaze saw in combination with the images of her on printed posters and recorded television specials. Her very body is a product of the male gaze, of what Maltzer saw as the epitome of feminine grace and beauty, but recast as an abstract metal object that has none of the body parts that distinguish the sexes, but all of the hinting at the abstraction that is femininity. Deirdre has gender, but not sex, and inhabits a body that suggests femininity, but without the “weaknesses” of female flesh. With this interpretation in mind, we can see how Maltzer’s fears take shape as a gendered crisis of male control and female subservience. Ironically, through being a product of Maltzer’s male gaze, Deirdre has complete control over her image, her body, and her self.

Her movements during her performance further emphasize the way that she confounds previous categories of what is human and what is not. Built of interlocking metal rings, her body has joints that move differently than a “normal” human body, but somehow behave in ways more human than the movements that a human body could produce. “By the time she reached the stage floor she was dancing. But it was no dance that any human creature could ever have performed. The long, slow, languorous rhythms of her body would have been impossible to a figure hinged at its joints as human figures hinge...it was humanity that seemed, by contrast, jointed and mechanical now.”<sup>77</sup> It is the motions that Deirdre is capable of that renders her both non-human and human at once. Her dancing makes humans themselves appear “jointed and mechanical,” while her own movements — while

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<sup>77</sup> Moore, “No Woman Born,” 156.

not explicitly “human” — suggest something other than mechanical. “Many must have thought her at first some wonderfully animate robot, hung perhaps from wires invisible against the velvet, for certainly she was no woman dressed in metal — her proportions were too thin and fine for that. And perhaps the impression of robotism was what she meant to convey at first.”<sup>78</sup> Deirdre performs and plays on her audience’s expectations for a metal body, performing object-ness and a certain “robotism.” Yet, as her performance continues, it remains inhuman, but not robotic either, but something *more* than human. “Nothing she had done yet had been human. The dance was no dance a human being could have performed. The music she hummed came from a throat without vocal chords. But now the long, slow rhythms were drawing to their close, the pattern tightening in to a finale. And she ended as inhumanly as she had danced, willing them not to interrupt her with applause, dominating them now as she had always done. For her implication here was that a machine might have performed the dance, and a machined expects no applause.”<sup>79</sup> After her dance ends, she returns to the top of the stairs where she had begun and laughs, her laughter making her “a woman now. Humanity had dropped over her like a tangible garment.” The applause her performance elicits causes the television to vibrate: “The television screen trembled and blurred a little to the volume of that transmitted applause.”<sup>80</sup> She is the star of this performance, not the television screen nor the camera.

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<sup>78</sup> Ibid., 155.

<sup>79</sup> Ibid., 155-156.

<sup>80</sup> Ibid., 158.

Moore offers a solution to Berkeley's distillation of female bodies into "pure" spectacle, and imagines a future world where the female performer, her body engineered by modern science, is the author and creator of her own objectification.<sup>81</sup> "Objectification," also takes on a different, empowered subject position in itself — and the object becomes capable of being a subject.<sup>82</sup> It is the transition from subject to object, that allows for this type of active, "subjective objectivity." Without her machined body — her inanimate rings of metal become animate through the power of her brain alone, she would not be able to be the kind of performer that is in control of the camera and of her processing into an image for the world to see. Unlike the dancers, who seem abstracted and mechanized into inhuman images by the camera, Deirdre is an abstraction in "the flesh." She cannot be reduced to an abstract figure, image, or object because she already is one. A

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<sup>81</sup> The concept of "objectification" and the female body as "object" is a cornerstone to feminist theory, and as such it would be impossible to list all of the many feminist writers who have theorized on this concept.

<sup>82</sup> In Ann Cahill's *Overcoming Objectification: A Carnal Ethics* (New York: Routledge, 2012), she suggests that the "objectification" concept of feminist theory is widely used but infrequently attended to (see page 1). Cahill suggests that Simone de Beauvoir's *The Second Sex*, a seminal text in twentieth century feminist theory, relies on "objectification" as "the primary means by which women become defined as an inessential other" (see page 3). I do not go as far as Cahill to suggest dismissing the notion of "objectification," but instead argue that the notion of the "object" is a complicated one, especially against the backdrop of machines that move and act like humans and vice versa, and that it is a useful construct for feminist thinkers. Problems arise when discussion the notion of the "subject" versus the "object" because the subject is a construct that too easily removes embodiedness from the notion of identity. When the role of the body is minimized, then the experiences of people who face body-based discrimination are more easily erased. Posthumanism is an excellent example of the dreams of the pure subject, removed from the frame of the human body and lived-in bodily experience which defines the lives of many who do not experience life as white males.

figure undifferentiated by becoming an image broadcast across the airwaves, Deirdre's body and image remain consistent regardless of whether or not she is "in the flesh" or on television. In fact, being "in the flesh" no longer applies to Deirdre: not only does she no longer have flesh, so to speak, but she also inhabits both the live stage and screen equally — she has become an abstraction.

The concept of "objectification" takes on new meaning with Deirdre's performance. The machined bodies and Deirdre's body are significant in that she is (or was) a woman and that it is a female body that is rebuilt in "No Woman Born." Mulvey suggests that the camera and the gaze of the audience makes women's bodies into objects to be looked at. However, one could further suggest that Deirdre herself is offered up as an alternative to the oppression that the camera and the other machinery of the mass-production of images deliver. Deirdre's body is already an object, being a machine made of metal. She refuses the camera's acrobatics that transform other women into distorted images and objects (the line of tiny dancers). Deirdre is still consumed by an audience and its gaze, but her audience is in thrall, and under her control. Deirdre gains power through being televised and being looked at, rather than being "reduced" to an object of the gaze. Deirdre's power is in the global reach of the futuristic broadcast technology of the story, and the violation of space and time and physical distance that she is capable of. Deirdre is a creature of this broadcast technology, and she exists in many places at once — it isn't her image that is televised across the globe, the story insists, but Deirdre herself. There is no differentiation between Deirdre and her image, and her

mechanical body is what makes this so. While still an object, Deirdre is an animate object, one that finds power in its object-ness that “normal” human beings cannot.

The dangers and risks that the female body is subject to due to its filming and transformation into moving visual media is present in “No Woman Born.” The story of Deirdre is the story of a body destroyed in a theater fire, destroyed by the act of performing for the cameras — and being reborn through the mechanization of the body and performing with that new body for live and broadcast audiences.

Deirdre’s new mechanized body, her prosthetic body, can withstand modernity’s threats to the body. As a “modern” body, Deirdre’s can survive the dismemberment of the camera, and the projection of her image into distant places.

### **Conclusion**

The story ends with Deirdre facing off with Maltzer, with Harris standing by watching. Maltzer threatens to throw himself from the window of a building, horrified at what he has created in Deirdre. Deirdre moves with superhuman speed and catches him before he falls. Deirdre’s restraint at the end of the story, when she explains that her body has no bounds and physical weaknesses, is inconsistent and a conservatively “feminine” moment. Even as she emphasizes the power over physical space that her nonhuman body allows, she also emphasizes the control she has over her body in light of the fact that Maltzer and Harris assume that Deirdre lacks control. Despite her performance, which suggests a kind of control over the

body that had never been seen before, they suspect that she will succumb to the metal-ness of her own body. Moore writes: "Perhaps Harris' first interview with her had been the last bright burning of the lost Deirdre, animated by excitement and the pleasure of meeting after so long a time, animation summoned up in a last strong effort to convince him. Now she was gone, but whether in self-protection against the possible cruelties of human beings, or whether in withdrawal to metal-hood, he could not guess. Humanity might be draining out of her fast, and the brassy taint of metal permeating the brain it housed."<sup>83</sup> Deirdre later acknowledges that this is possible, but that she wants to be on her own terms in determining whether or not it is a problem for her.

She has great powers beyond that of humans, but she chooses not to use them for domination of humanity. But why would she? She already dominates the people of her audiences through her performances, reigning over them in the only way she cares about. She further reflects on her in/humanity, and while Maltzer has seen her throughout the story as inferior to non-machined humans, she re-frames her existence as something that makes her "superhuman" rather than "subhuman." She acknowledges herself as different from other humans, saying, "I think I was an accident. A sort of mutation halfway between flesh and metal. Something accidental and...and unnatural, turning off on a wrong course of evolution that never reaches a dead end."<sup>84</sup> Although Deirdre acknowledges the strange state of existing in her

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<sup>83</sup> Moore, "No Woman Born," 164-165.

<sup>84</sup> Ibid., 176.

new body, she does so by also deeming herself an improvement on humanity. The story ends on a typically ambiguous note for stories in science fiction magazines, with “the distant taint of metal already in her voice.”<sup>85</sup> The ending’s turn towards a warning note throws into sharp relief the pessimism of the wartime anxiety over modern machines and human bodies, but it does not dismantle the suggestions of alternative forms of being that can answer to that anxiety.

Instead of a story about the inherent weaknesses of the female body and mind, this story celebrates the notion of being freed from the imprisonment of the female body. Deirdre’s body allows her to prove that she is not weak-willed, delicate, or hysterical – indeed, any of the negative stereotypes of feminine identity. She is strong and confident in her new body, made with the form and suggestions of the female body, but at the same time separated from whatever essential stuff of the feminine harbored in the organic female body. The story also does not claim an essential femininity that exists within every female body, but suggests that it is part of a performance put on both by men and women, expectations for women that are fulfilled by both those with female and those with male bodies. With the destruction of her organic female body, Deidre is able to inhabit an unsexed body that lets her be more “true” to herself, despite Maltzer’s continued misogynistic expectations that try to pin her down as “delicate” and unbalanced.

By the 1950s, a rash of stories about machined and machining bodies appeared in the press, and these ways of altering bodies with technology, though

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<sup>85</sup> Ibid., 177.

they are not replacing bodies with metal ones, are part of a period in which using technology to “normalize” “deviant” bodies is a common narrative thread.<sup>86</sup> Deirdre’s story anticipates this narrative through her body’s position as at once both normative through being “more human” than an organic-bodied human, and frighteningly alien. The Hiroshima maidens are one example of female bodies injured from trauma inflicted by “modern” technology and rebuilt using other technological interventions.<sup>87</sup> While the story of these Japanese women physically disabled and scarred by the atomic bombing of Hiroshima is one reported by the press as a rebuilding of nation and a performance of state power, their bodies become the sites of the performance of state power. Deirdre’s body does not signify state power so much as the power of the entertainment state — the power of a future system of mass cultural production wedded to the idea of a global economy of images of women’s bodies. Deirdre, both the image and the woman, is an icon of a machine run free of its master, as she, once a woman and “inferior” to her male counterparts, now commands a body more powerful than either male characters of the story could have imagined.

Reading Deirdre’s body reveals not only a story about a dancer reborn as a cyborg on a global stage, but also a story about how machined bodies can represent

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<sup>86</sup> See David Serlin’s *Replaceable You: Engineering the Body in Postwar America* (Chicago: University of Chicago Press, 2004) for examples.

<sup>87</sup> For more on the Hiroshima Maidens and technology in the 1950s, see “Reconstructing the Hiroshima Maidens” in Serlin’s *Replaceable You*, 57-110. See also Margot A. Henriksen’s *Dr. Strangelove: Society and Culture in the Atomic Age* (Berkeley, CA: University of California Press, 1997), 45-6.

both norms and the abnormal, and quite literally embody anxiety over a modern world connected by invisible “airwaves,” machines of war, and images of individuals reconfigured into geometric patterns. Deirdre’s machined body can only work within the framework of an objectifying (male) gaze directed by technologies of mass telecommunications. However, by working within that framework, Deirdre’s body does offer an alternative, and provokes an interrogation of what being “objectified” actually means. Instead of inhibiting her, Deirdre’s bodily injury and subsequent reconstruction makes her more herself than she ever had been with her human body. Her self-assurance and confidence, sources of anxiety for male characters, stems from her prosthetic body. Perhaps “prosthetic” is no longer an apt description for Deirdre’s metal body, as the merging of metal and flesh is so complete, and prosthetic suggests a separation between the two. Instead of a fragmented self, Deirdre’s cyborg body is complete, the mediated image and human self resolved with the mediation of her material body. In this story, it is Deirdre’s body before the accident that is revealed as fragmented and incomplete; torn between mediated image and self. The machined body makes her whole again within the context of a culture where technology threatens to mechanize human bodies.

**The Citizen Machine:  
Robot Oppression Narratives in Pulp Science Fiction, 1939-1959**

*"I am the slave of the girl Dor-oth-y, who rescued me from prison," replied the machine. "Where she goes I will go."*

--L. Frank Baum, *Ozma of Oz*

*After all—aren't we genuine 'made-in-Americans?'*

-- Mari Wolf, "Robots of the World! Arise!"

L. Frank Baum's early twentieth-century Oz series features all manner of objects come to life as characters, including the clockwork-run mechanical man Tik-Tok.<sup>1</sup> Tik-Tok is anomalous because he is not an object brought to life by magic (like many other Oz characters), but one built and brought to life by technology. He is also one of the first representations of a robot in American fiction, perhaps only preceded by the "automaton" steam man of late nineteenth-century dime novels.<sup>2</sup> Making his first appearance in the third Oz book, *Ozma of Oz* (1907), Tik-Tok becomes Dorothy Gale's "slave" after she finds him motionless -- his clockwork having run down -- and rescues him. Tik-Tok serves Dorothy and obeys all of her commands; and both Tik-Tok and Baum reassure readers that although Tik-Tok

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<sup>1</sup> Baum wrote fourteen books in his Oz series, and assorted short fiction featuring his Oz characters. The first Oz book, *The Wonderful Wizard of Oz*, was published in 1900, and the last was *Glinda of Oz*, published in 1920, after Baum's death in 1919. The series was continued by several writers through the middle of the twentieth century, and has endured as a lasting part of American popular culture, in part due to the popularity of the 1939 classic MGM film *The Wizard of Oz* starring Judy Garland.

<sup>2</sup> The first of which was Edward S. Ellis's *The Steam Man of the Prairies* (first published in *Beadle's American Novel* No. 45, August 1868).

appears to think, he has no emotions and is not human.<sup>3</sup> The justification of Tik-Tok's enslavement, that he only has the appearance of a living, thinking being, more object than subject, is just one example of how living machines exist on a tenuous boundary between subject and object. Also, more importantly, the character of Tik-Tok is an early example of the frequent theme of robots and other living machines as enslaved, both as servants and workers.

As built creations that are also machines and labor saving devices, robots easily fit into the framework of being oppressed by humanity. Pulp science fiction stories with robots usually fall into two categories, featuring either robots that are automated but mindless and part of a technologically advanced futuristic setting, or robots that are intelligent and malicious.<sup>4</sup> A small, but significant subset of pulp stories, especially in the 1950s, represents intelligent robots interested in citizenship due to their oppressed status in human society.<sup>5</sup> Since robots lend

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<sup>3</sup> A card hanging around Tik-tok's neck when Dorothy first finds him introduces him as a "mechanical man" that "thinks, speaks, acts, and does everything but live" (see L. Frank Baum's *Ozma of Oz*, chapter 4). Tik-Tok's predicament as both thinking and not alive is fascinating, especially in the light of the two other "robots" from the Oz series, the Tin Woodsman and the iron giant. The iron giant does nothing but hammer, and the Tin Woodsman is a human in a tin body. Tik-Tok is something in between, but Baum's insistence via repeated characters' comments about Tik-Tok not being "alive" draws attention to his strange in-betweenness. For more on Tik-Tok and his aliveness, see "Tik-Tok and the Three Laws of Robotics" by Paul A. Abraham and Stuart Kenter in *Science Fiction Studies*, 14 (March 1978), 67-80.

<sup>4</sup> This is a narrative pattern in robot science fiction films as well.

<sup>5</sup> I found that identifying relevant robot stories themselves was one of the biggest challenges for this chapter's research. Like other scholars who use pulps as a source, I found the sheer volume of pulp stories (even just the science fiction titles) from the 1930s through the 1950s to be nearly overwhelming. I ended up locating the stories that I wrote about with the help of the user-provided data available on the Internet

themselves easily to being workers, as in almost all stories they perform work that humans do not want to do, they also are also easily represented as enslaved or as servile to humans. In the oppressed robot stories discussed in this chapter, robots prove their worthiness for rights, citizenship, and/or humane treatment through activist activities. While most of the stories involve some form of worker activism, others rely more on representations of robots as “others” with the robots’ rights depending on exploring similarities between humans and robots. Since these stories are from the 1950s, they also tend to borrow from African American civil rights activism, and thus liken robot oppression to racial oppression, and robot “difference” to racialized difference. Regardless of how these stories represent the mechanisms for robots resisting oppression, they all share common modes of creating a sense of affinity between robots and humans. Citizenship is, as defined in

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Speculative Fiction Database ([www.isfdb.org](http://www.isfdb.org)). The ISFDB’s search engine allows users to browse by author, periodical title, as well as search subject headings and tags added by other users. There are no story synopses, however. By searching and browsing the database, I was able to find enough publication information for stories to interlibrary loan them, and was pleasantly surprised to discover that it was only very rarely that ILL could not get me a copy of the story. Many stories and issues of pulps are also available on Project Gutenberg, which allows for full-text searches. Without the ISFDB and Project Gutenberg this chapter would have been far more difficult to execute, requiring long hours browsing pulps at an archive, as no archives housing pulps that I contacted had indexed the contents of their titles. Another title that may be of use to other scholars of science fiction pulps would be E. F. Bleiler and Richard Bleiler’s *Science-Fiction: The Gernsback Years: A Complete Coverage of the Genre Magazines Amazing, Astounding, Wonder, and Others from 1926 Through 1936* (Kent, OH: Kent State University Press, 1998). Since my research focused on later, “Campbellian-era” science fiction pulps, this book was not as much help for my project. It does have brief story synopses, however, and all stories are indexed by subject.

these stories, contingent upon robots' capacity to demonstrate their "humanity" through their ability to feel suffering, to love, to think, or to narrate their life's story. After robot characters prove their human aspects, governing bodies either emancipate robots or grant them civil rights, removing them from the designation of property and elevating them into the realm of the citizen.

Robots of pulp stories individually either rebel or obey, but the robots of the stories included in this chapter fall into a third and much smaller category – they both rebel and obey in their search for equality and citizenship in worlds where they are enslaved or oppressed and discriminated against. In these stories, the writers represent robots as an oppressed class, availing themselves of narrative techniques that allow readers to empathize with these sentient mechanical characters as beings that should not be enslaved by humanity. These "oppressed robot stories" exist within the oft maligned genre of science fiction, and the subgenre of pulp science fiction. As genres that critics often ignored or viewed as "popular" and therefore not of literary importance, it was possible for writers to explore issues of class and racial oppression through robot characters, while at the same time making such topics easy to dismiss by virtue of their genre and the "disposable" nature of the pulp magazine.

Robots are perhaps the most familiar form of mechanical life and they perhaps best come alive in the pulp fiction that made them popular in the 1920s and 1930s. They have remained an enduring (and perhaps endearing) figure of American popular culture since their inception. The robot, according to J.P. Telotte,

“would claim a central place in the developing science fiction genre, especially in its pulp magazine manifestations.”<sup>6</sup> He continues that “in the pages of these magazines, machine men reflect the dawning notion, as Cecelia Tichi puts it, that no part of life was ‘properly exclusive of the machine and structured technology.’”<sup>7</sup> Robots represent a shift in the supernatural genre of fiction that features “man-made” life to technologically created mechanical life. John Cheng suggests that “Robots, which were originally biological if not human, became emblematic, often mechanical, threats to labor and domestic tranquility within early twentieth-century concerns about gender, family, technology, and work.”<sup>8</sup>

Thus, the oppressed robot story from 1950s pulp science fiction serves as a means to understand both the robot and the living machine as figures through which Americans work through anxieties over technological “progress” in the mid-twentieth century. The sympathetic robot characters in these stories suggest both a kinship between humans and machines – and an ease with which human readers can identify with machine characters -- and also anxiety over the perceived erosion of human-machine boundaries. Taken more broadly, this construct also reveals anxiety in the 1950s over civil rights and other subsequent movements that challenge oppressive power structures in twentieth-century America. While civil

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<sup>6</sup> J. P. Telotte, *Replications: A Robotic History of the Science Fiction Film* (Champaign: University of Illinois Press, 1995), 40.

<sup>7</sup> Ibid.

<sup>8</sup> John Cheng, *Astounding Wonder: Imagining Science and Science Fiction in Interwar America* (Philadelphia: University of Pennsylvania Press, 2012), 9.

rights are often represented as in line with American values of freedom and democracy, resistance to oppression threatens to disrupt existing power structures. These robot oppression stories are keyed into these anxieties through their sometimes ambivalence towards granting citizenship or better working conditions to machines. However, by using robots in these stories about struggles for “freedom,” some of both the impact of and anxiety over telling a story about protest is neutralized.

This chapter first covers the science fiction pulps and their significance as a “popular” genre, but one that sought to provide a progressive vision of America for readers. A discussion of the early representations of robots follows. Such representations include those of Karel Čapek’s play *R.U.R. (Rossum’s Universal Robots)*, Eando Binder’s Adam Link series, and Isaac Asimov’s robot stories – all set up the figure of the living machine as “built” for work and servitude, as well as establish the sympathetic robot as a character type. The stories of robot proletariats have their beginnings in representations of living machines found in various Marxist writings, which represent machines as having agency. However, stories of robot proletariats are also seated in the largely pro-machine culture of the United States. In the last sections of this chapter, I explore the stories of robot oppression from the 1950s, which harken back to Marxist living machines, as well as borrow from more contemporary issues of civil rights and oppression in the 1950s. Through the combination of robots as both biological “other” and culturally and emotionally similar to humans in many of these stories, the robot is both friend and foe,

sympathetic and anxiety-provoking. Within these stories, robots serve not only at the (dis)pleasure of human beings, but as figures with which to explore mid-century dynamics of oppression represented in popular culture.

This chapter examines several stories from the pulps from 1939 to 1959: Eando Binder's Adam Link series (1939-1942),<sup>9</sup> Mari Wolf's "Robots of the World! Arise!" (1952),<sup>10</sup> R. R. Merliss's "The Stutterer" (1955),<sup>11</sup> Harry Harrison's "The Velvet Glove" (1956)<sup>12</sup> and "The Robots Strike" (1959),<sup>13</sup> and David C. Knight's "The Love of Frank Nineteen" (1957).<sup>14</sup> As well as the above list of stories, this chapter also considers Isaac Asimov's highly influential "Three Laws of Robotics," which he uses in his robot stories starting in his 1942 story "Runaround," first published in *Astounding Science Fiction*.<sup>15</sup> Summarizing important details of plot and the futuristic settings emphasizes the fictional worlds that these robots inhabit, as well as the importance of the narratives to their quests for citizenship. While plots are important to understanding these stories, so are the ways in which robot stories of

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<sup>9</sup> Specifically, the first three: "I, Robot" in *Amazing Stories* (January 1939), 8-18; "The Trial of Adam Link, Robot" in *Amazing Stories* (July, 1939), 30-43; and "Adam Link in Business" in *Amazing Stories* (January 1940), 44-61.

<sup>10</sup> Mari Wolf, "Robots of the World! Arise!" *If Worlds of Science Fiction* (July 1952), 74-89.

<sup>11</sup> R. R. Merliss, "The Stutterer" in *Astounding Science Fiction* (April 1955), 47-69.

<sup>12</sup> Harry Harrison, "The Velvet Glove" in *Fantastic Universe* (November 1956), 59-76.

<sup>13</sup> Harry Harrison, "The Robots Strike" in *Fantastic Universe* (January 1959), 58-65.

<sup>14</sup> David C. Knight, "The Love of Frank Nineteen" in *Fantastic Universe* (December 1957), 49-64.

<sup>15</sup> Isaac Asimov, "Runaround," *Astounding Science Fiction* (March 1942), 94-103. See also the collection of Asimov's early robot pulp fiction *I, Robot* (New York: Gnome Press, 1950).

the pulps appear in dialog with each other, framing larger narratives about the technologically created mechanical life and its accompanying anxieties. This chapter concludes with a robot quite unlike the others, John Sladek's Tik-Tok (in the eponymous 1983 novel), to demonstrate a different interpretation of robot "slavery," and the continued engagement with the conventions of robot pulp stories.<sup>16</sup>

### Science Fiction and the Pulps

Pulp science fiction had its beginnings with Hugo Gernsback, who published the first science fiction pulp magazine, *Amazing Stories*, in 1926.<sup>17</sup> The genre reached its height of popularity as a form of "mass entertainment" in the 1920s and 1930s,<sup>18</sup> but was derided by critics concerned with "culture and class."<sup>19</sup> Although not as popular as some of the "slicks" of this period, contemporary studies in the 1930s

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<sup>16</sup> John Sladek, *Tik-Tok*, (London: Gollancz, 1983).

<sup>17</sup> Dozens of other science fiction and speculative fiction titles followed *Amazing Stories* after its success. To name a few: *Astounding Stories*, *Cosmic Stories*, *Dynamic Science Fiction*, *Dynamic Science Stories*, *Fantastic Adventures*, *Fantastic Novels*, *Fantastic Story Magazine*, *Fantasy*, *Future Science Fiction*, *IF Science Fiction*, *Marvel Science Stories*, *Miracle Science and Fantasy Stories*, *Planet Stories*, *Science Fiction*, *Science Fiction Quarterly*, *Space Stories*, *Startling Stories*, *Stirring Science Stories*, *Strange Stories*, *Strange Tales*, *Super Science Stories*, *Tales of Wonder*, *Tops in Science Fiction*, *Uncanny Stories*, *Uncanny Tales*, *Weird Tales*, and *Wonder Stories*.

<sup>18</sup> The pulps were not the first inexpensive popular fiction venue — they can be traced back to nineteenth-century dime novels. For more on dime novels see Michael Denning's *Mechanic Accents: Dime Novels and Working-Class Culture in America* (New York: Verso, 1998).

<sup>19</sup> John Cheng, *Astounding Wonder: Imagining Science and Science Fiction in Interwar America* (Philadelphia: University of Pennsylvania Press, 2012), 20.

determined that 30 to 40 percent of literate Americans read pulps.<sup>20</sup> The publishing industry surrounding the pulps emphasized quantity of writing over quality, although writers who could write quality work quickly were in high demand. These magazines emphasized that the people who wrote for the pulps were “writers” and not “authors,” de-emphasizing the notion of authorship that “maintained class and cultural distinction.”<sup>21</sup> The system of content production and publication in the science fiction pulps was undergirded by Gernsback’s progressive ideas — he wanted his magazines to cultivate a “progressive sensibility” in their readers, and he saw a “visionary role for science fiction as the extrapolation and imagination of current science and technology.”<sup>22</sup> The economic realities of this publishing industry, however, meant that writers and their ideas had more control over the content of the magazines than Gernsback wanted, and this type of publishing industry provided the space that ultimately allowed for the control over content that writers often did not get in other publication formats.<sup>23</sup> This, along with the dismissal of pulps by many as “cheap” (ambiguously referring to content and/or the object itself) and not worth consideration, created an environment for writers where they could write about what they wanted, even if this included somewhat bizarre plots or thinly veiled controversial social issues.<sup>24</sup> Thus, recent

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<sup>20</sup> Ibid., 25.

<sup>21</sup> Ibid., 27.

<sup>22</sup> Ibid., 4, 49.

<sup>23</sup> Ibid., 49.

<sup>24</sup> Pulps and their industry’s de-emphasis on “authorship” also allowed for women to write outside the genres in which they were expected to write. Many women

studies of pulp magazines have extolled their existence as spaces for writing about controversial topics, as they were not usually taken “seriously.” Pulp magazines and fiction, for example, were a space for exploring same sex female desire in the “lesbian pulps” in the 1950s and early 1960s.<sup>25</sup> The flip side was also true, in that the pulps featured reactionary, sexist, racist, and anti-foreign content, and “yellow peril” imagery, especially during the interwar period, and during the early cold war period, when the “specter” of communism allowed writers to explore “traditional imagery of the ‘other.’”<sup>26</sup>

Although the Great Depression gave rise to an increase in progressive and radical politics and proletarian writings in the U.S., this by itself does not necessarily

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published science fiction and fantasy in these publications, and although many used masculine or gender-neutral pen names, dozens of others did not. C.L. Moore, author of “No Woman Born,” discussed in the previous chapter, was a woman who abbreviated her first and middle names (Catharine Lucille) in order to have her writing not judged according to her sex and gender. Leigh Brackett published science fiction stories in the 1940s, her gender-ambiguous name making it easier for her to get published. Also, the secretive James Tiptree Jr., a popular science fiction short story writer for the pulps in the late 1960s through the 1970s was “exposed” as a woman named Alice Sheldon in 1977. Sheldon’s contemporaries, including Harlan Ellison, had identified Tiptree as unequivocally male before Sheldon’s identity was revealed, undermining the notion that women could not write convincing science fiction the same way that men could. For more on women science fiction writers during the pulp era, see Eric Leif Davin’s *Partners in Wonder: Women And the Birth of Science Fiction, 1926-1965* (Lanham, MD: Lexington Books, 2006).

<sup>25</sup> Yvonne Keller, “‘Was it Right to Love her Brother’s Wife So Passionately?’: Lesbian Pulp Novels and U.S. Lesbian Identity, 1950-65.” *American Quarterly*, Vol. 57, No. 2 (Jun., 2005), 385. Although a controversial topic like same-sex female desire could be published in the pulps, I should also add that these kinds of stories and novels most often ended in tragedy.

<sup>26</sup> Nathan Vernon Madison, *Anti-Foreign Imagery in American Pulps and Comic Books, 1920-1960* (Jefferson, NC: McFarland, 2013), 148.

explain the presence of proletariat robots in 1950s pulp science fiction. Radical politics were not unfamiliar to science fiction writers and fans. A group of science fiction writers and fans formed the Futurians in 1938, "several of whom were members of the Young Communist League; over the next decade, the group, which included Isaac Asimov, Frederick Pohl, Cy Kornbluth, Judith Meril [sic], James Blish, and Damon Knight, wrote for and edited the pulp magazines and paperback originals that remade science fiction in the post-war period."<sup>27</sup> The Futurians of the 1930s became the architects of science fiction during the late 1940s and 1950s, helping to guide the genre in a less conservative direction. This is one example specific to science fiction, but as Michael Denning argues, the more broadly proletarian literature of the 1930s shifted toward the "mythology of the United States," becoming "part of the national-popular imagination."<sup>28</sup> The proletariat robot stories of the 1950s, then, are stories arising from a popular imagination that included working-class experiences and activism.<sup>29</sup>

While the plots and characters of pulp science fiction made it less difficult to make a progressive argument about citizenship, workers' rights, and civil rights,

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<sup>27</sup> Michael Denning, *The Cultural Front: The Laboring of American Culture in the Twentieth Century* (New York: Verso, 1998), 225-226.

<sup>28</sup> *Ibid.*, 229.

<sup>29</sup> This is complicated by the fact, however, that many American writers of radical literature in the 1930s, were firmly middle class, and the bourgeois origin was a sore point for many of these writers, who felt that they could not write from the proletarian subject position. See Barbara Foley's *Radical Representations: Politics and Form in U.S. Proletarian Fiction, 1929-1941* (Durham, NC: Duke University Press, 1993), especially chapter 3: "Defining Proletarian Literature."

those types of stories in that kind of a publication were also easier for readers to dismiss. Perhaps the science fiction pulps' existence as both a "progressive" space and one that reifies the status quo is best explained by its own physical presence as an object. The pulps gained their nickname from the lower-quality paper they were printed on. They were "disposable" fiction, printed in vast numbers on cheap paper, meant to be bought, consumed, then thrown away. Although disposable in this way, with proportionally few copies preserved, many people still read them, and in that fleeting moment, readers and writers could connect over a story about civil rights, and perhaps it would linger long enough to help shape a belief in rights for oppressed groups of people in the United States. These stories about robots were works of "disposable" fiction — often quickly consumed and then forgotten, dismissed, or otherwise thrown away. For this reason, robot stories in pulp science fiction in the 1950s could show robots as protagonists, fighting for justice and "equality," for better working conditions. Writers of 1950s pulp fiction could employ robots to address contemporary issues of civil rights and race relations, as well as critique the role of the worker in industrial capitalism, democracy, and communism during the cold war, when the U.S. government was attempting to control "subversive" public voices.

### **The Early Robots of Čapek, Binder, and Asimov**

Two trends in early robot fiction lay the groundwork for oppressed robot stories of the 1950s – the development of conventions that anchor the robot as a laborer in

the service of humans, and the idea of a sympathetic robot protagonist. The representation of robots as slaves occurs over and over again in popular cultural representations of robots, especially those of the early and mid-twentieth century. These representations revolve around the notion of the robot as an “object” manufactured by human beings, the robot is a construct that easily lends itself to ideas of ownership – the robot was built, so it is also owned. Further, the robot is also a figure built for the same reason as most machines – for the purpose of replacing human labor. The robot exists as a figure that is both property and laborer, performing work that humans do not want to do, but also at the whim of its human owner. Authors of robot fiction, then, including pulp authors, often found themselves investigating the problems attached to owning a living and thinking being that is also a worker.

Czech author Karel Čapek first used the term “robot” in print in his 1920 play *R.U.R. (Rossum’s Universal Robots)*. The word “robot” is one that Čapek’s brother Josef actually invented, derived from an older Czech word “robota,” which is the work that a serf would perform in feudal times.<sup>30</sup> “Robot” is sometimes translated as “worker” and other times “slave,” but refers more to a person (or machine) that does the drudgery of a serf.<sup>31</sup> In the play, factories use these synthetic people called

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<sup>30</sup> Although Baum’s Tik-Tok could be called a robot by today’s standards, and one of the first to appear in American fiction, Baum referred to Tik-Tok as a “mechanical man,” as the word robot did not yet exist.

<sup>31</sup> Thanks to native Czech speaker and W&M History Department colleague Lucie Kyrova for her excellent explanation of the word “robot.” See also page 119 of *The Golem in Jewish American Literature* by Nicola Morris for a brief explanation of the

“robots” as unpaid workers in a futuristic world. Čapek’s robots are not made of metal, but are organically based and intelligent artificial people forced to work for their human oppressors – the human capitalists who built them -- eventually overthrowing and replacing them, killing them all except for one. Čapek, who valued the pragmatic school of philosophy, wrote the play as a criticism of blind technological “progress” and the “rationalization of manufacture,” imagining humans as part of the mechanism of manufacturing.<sup>32</sup>

While Čapek’s robots represent one type of artificial person, the worker who also rebels, another popular and seminal robot character is Adam Link, whose stories more closely engage the plot of *Frankenstein*, in which the scientist Dr. Link creates a singular living, thinking mechanical being. The Adam Link series consists of ten short stories written by “Eando Binder,”<sup>33</sup> a pen name for brothers Earl

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word. The *Oxford English Dictionary* explains the etymology of “robot” as follows: “German *Robot* (formerly also *Robat*, *Robate*; early 14th cent. in Middle High German as *robāt*) < a West Slavonic language, compare Old Czech *robot* forced labor, hard work (Czech *robot* forced labor, drudgery), Old Polish *robot* work, forced labor (Polish *robot* work), cognate with Old Russian *rabota*, *robot* work, forced labor (Russian *rabota* work), Old Church Slavonic *rabota*, *robot* slavery (Bulgarian *rabota* work) < the Slavonic base of Old Church Slavonic *rabŭ*, *robŭ*, Old Russian *rab*”, *rob*”, slave, servant (Russian *rab* slave), Old Czech *rob* descendant, heir (Czech *rob* slave)” (*OED*, “robot, n.1,” accessed online). The roots of this word all suggest the intertwining of the idea of the robot with servile labor.

<sup>32</sup> Ivan Klíma, introduction to *R.U.R. (Rossum’s Universal Robots)*, by Karel Čapek, translated by Claudia Novack (New York: Penguin, 2004), xii.

<sup>33</sup> The Adam Link series (by Eando Binder and published in *Amazing Stories*, 1939-1942) was so popular that the stories were adapted and reprinted in the 1950s and again in the 1960s. A novelization of Adam Link’s adventures was published in 1965, and the first two Adam Link stories also served as a basis for two *Outer Limits* episodes starring Leonard Nimoy in the 1960s.

Andrew and Otto Binder, and featuring protagonist Adam Link, an intelligent robot, who is also the first-person narrator.<sup>34</sup> All Adam Link stories were published in *Amazing Stories* from 1939 to 1942, and the first story in the series, "I, Robot," was one of the first stories giving prominence to a robot character as protagonist. The popularity of the Adam Link series made the sympathetic robot character into a convention for later pulp stories, including those of Isaac Asimov, discussed later in this section. While Adam Link was the first sympathetic robot protagonist -- one who had to deal with humans' fear and hatred towards him -- unlike other robot stories covered later in this chapter, he is the only type of being of his kind.<sup>35</sup> Singularly, Adam Link endures a murder trial in which his lawyer also attempts to gain him rights as a "man."

Adam Link's quest for citizenship begins in the second story, "The Trial of Adam Link, Robot," with an encounter between his "cousin" and lawyer Tom Link, Dr. Link's nephew and only living relative, and the local sheriff leading an angry mob. At the end of the first story, the mob has arrived at Adam Link's creator's house, where they think he has murdered Dr. Link and plan to destroy the robot. Adam Link, despondent at the end of "I, Robot," has committed "suicide" by

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<sup>34</sup> Although this story is called "I, Robot," it is unrelated to the Isaac Asimov 1950 collection of short stories of the same name. As the story goes, Asimov's editor wanted to call his story that, though Asimov knew of the Binder story and opposed the title change without success. Asimov was familiar with Binder's work and later claimed Adam Link inspired his own robot short stories.

<sup>35</sup> In the fourth Adam Link story, "Adam Link's Vengeance," he does build himself a female companion, Eve.

switching himself off before the mob can get to him, but at the beginning of "The Trial of Adam Link, Robot," Adam Link awakens as Tom Link switches him back on. When the angry mob tries to destroy Adam Link for Dr. Link's death, Tom Link first accuses them of the attempted murder of an "intelligent robot." The sheriff tells him, "this *thing* isn't a man. It's a machine! A clever, diabolical machine that killed your uncle in cold blood!"<sup>36</sup> Tom Link alters his tactics and threatens the mob with a destruction of property lawsuit, since Adam Link is now his property after the death of his uncle. He also modifies his response by arguing that Adam Link is different from a piece of property and is in fact a "creature," to which Tom Link argues, "This robot is a creature. It is not an animal, for animals don't talk. It is a manlike being. Therefore, like any other talking, thinking man, *he is entitled to a court trial!*"<sup>37</sup> Tom Link has maneuvered the other humans into a corner, through taking advantage of Adam Link's existence as not that of a human being but also not that of an object, with the logic of the story dictating that they must allow the robot a trial. This trial, while ostensibly about the death of Dr. Link, also has the effect of determining Adam Link's status as a unique being equal to a "man."

After the mob disperses, Tom Link introduces himself and shows Adam Link a legal document that he had been written before his uncle's death. Adam Link notices the word "citizen" in the text, although he does not understand the legal language, and Tom Link explains that his uncle "was fully determined to make you a

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<sup>36</sup> Eando Binder, "The Trial of Adam Link, Robot," *Amazing Stories* (July 1939), 35.

<sup>37</sup> *Ibid.*, 36, italics Binder's.

*citizen*, Adam Link, as you know. He had begun to take up the matters of legal records to prove your 'birth,' education, and rightful status."<sup>38</sup> Adam Link recalls "Dr. Link's repeated remarks that I was not just a robot, a metal man. I was *life!* I was a thinking being, as manlike as any clothed in flesh and blood...my 'emotions,' I believe, are real and deep. Life is essentially in the mind. I have a mind."<sup>39</sup> Adam Link's project to become a citizen, however, is put on hold due to his indictment on the manslaughter charge. During his trial, all humans except for Tom Link and one journalist are against him, due to Adam Link's distinctions from human beings. Their preconceptions about Adam Link's existence as a machine mean that he is found guilty, despite a lack of evidence. The prosecutor bases his case on the fact that Adam Link is a "thing without a soul. Without a spark of human feeling within his cold metallic body. He can know nothing of emotions of kindness, sympathy, mercy. If once he is given a place in human society, he will slay and destroy. He has no right to live. No thing that mocks the human body and its divine intellect has any place in our civilization."<sup>40</sup> At the end of this speech, he compares Adam Link to Frankenstein's monster. Adam Link, of course, is found guilty and sentenced to death in the electric chair.

In the dramatic style of the pulps, right before the jury reads their verdict, Adam Link saves a little boy from getting hit by a car in front of the courthouse,

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<sup>38</sup> Ibid.

<sup>39</sup> Ibid., italics Binder's.

<sup>40</sup> Ibid, 41.

where everyone involved in the trial can observe his heroics. Although the verdict is guilty and all the humans experience some level of regret, at the end of the story the state still intends to carry out the sentence of death. Again, readers find Adam Link writing his story as his “death” approaches, and the story ends leaving Adam Link in imminent danger. At the beginning of “Adam Link in Business,” however, new evidence is discovered, and the governor pardons Adam Link. The rest of the story chronicles Adam Link’s “everyday” life as a robot in human society, but a robot who is, according to the law, considered a “man.” The idea of a robot seeking citizenship in the Adam Link series was a novel one at the time, but the story’s first person perspective helps to suggest that although Adam Link is a robot, he has thoughts and feelings much like human beings. The possibility of sympathy for a robot character depends on Adam Link’s ability to tell his own story — a story about loss, loneliness, and despair, and above all about morality and self-sacrifice. Adam Link’s first-person story allows for the assertion of self-definition through a feeling, thinking robot character.

While the other stories in this chapter were published in the 1950s, between ten and twenty years after the Adam Link series, Adam Link is a robot character of importance to subsequent robot figures. The dramatization of Adam Link’s existence as not-quite-human and not-quite object is one that had not yet been fully realized in the pulp science fiction story in the 1930s, but is one that reflects changes in how readers could think about robots as creatures that are not only animate objects, but objects that are human enough to be able to have feelings, narrate a story, and

subsequently deserve “equal” treatment to human beings via American citizenship. However, Adam Link is perhaps less about broader civil rights gained through a group’s activism and subsequent citizenship, than a heroic struggle transacted within himself as the only one of his kind. The quest for citizenship that Adam Link pursues is not as central to the series as a whole as much as in the stories discussed later in this chapter, but Adam Link’s robot figure provides a template for framing issues of equality, citizenship, and democracy that those stories take up.

Along with Binder’s Adam Link series, Isaac Asimov’s robot stories are also crucial to understanding the “citizen machine” in science fiction of the 1950s – in them he provides his influential “Three Laws of Robotics.” Asimov is one of the most well-known science fiction writers of the twentieth century, and his short stories on robots dominated the most popular science fiction pulps during the 1940s and 1950s, and many of his them were adapted for film.<sup>41</sup> Asimov’s “Three Laws of Robotics” was one of his most lasting contributions to robot fiction, and countless writers modeled their robots after Asimov’s, whether or not explicitly invoking the Laws themselves. The Laws describe what are, in essence, autonomous

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<sup>41</sup> Asimov published his first robot stories in *Astounding Science Fiction*, whose editor was John Campbell Jr. from 1937 to 1971. Under his editorial control, science fiction entered its “golden age” in 1939, and was highly influential in shaping science fiction during the 1940s, which in turn influenced the genre for decades to come. For more on Campbell and the Campbellian era of science fiction, see Gary Westfahl’s *Hugo Gernsback and the Century of Science Fiction* (Jefferson, NC: McFarland, 2007), especially pages 25-27.

beings bound by their programming to behave in ways that humans command.

Asimov's robots are designed and programmed to be servants and property.

Asimov's Laws, first published in his 1942 story "Runaround," were expanded on in his 1950 collection of short stories, *I, Robot*. The "Three Laws" are as follows:

One, a robot may not injure a human being under any conditions – and, as a corollary, must not permit a human being to be injured because of inaction on his part....Two...a robot must follow all orders given by qualified human beings as long as they do not conflict with Rule 1....Three: a robot must protect his own existence, as long as that does not conflict with Rules 1 and 2.<sup>42</sup>

When programmed into a robot, these laws bind it to never harm or disobey a human being or destroy itself. While before Asimov's Laws, robots and automata were similarly often servile to humans, Asimov's Laws codified robots' property and servant relationship with human beings. Reflecting on the time when he invented the Laws, Asimov reveals much about how he conceptualized the idea of the robot as a perfectly logical and rational being. Intrigued by the titular robot of Eando Binder's Adam Link series, a "chance meeting with Otto [Binder]...inspired Asimov's first robot story."<sup>43</sup> Asimov's robot stories reflect upon the idea that robots could be built with safeguards in mind, protecting humans from the machine gone awry. One Asimov scholar suggests that these robot stories are important to science fiction in the 1940s because "this was an intellectual development. The emotional response

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<sup>42</sup> Isaac Asimov, "Runaround," *Astounding Science Fiction* (March 1942), 100.

<sup>43</sup> James Gunn, *Isaac Asimov: The Foundations of Science Fiction*, revised edition, (Lanham, MD: Scarecrow Press, 2005), 43.

— the fear of the machine, the fear of the creature turning on its creator — was derided.”<sup>44</sup> The implications of this argument aside, that the “emotional” is something antagonistic to the “intellectual,” Asimov’s robot stories did inspire a legion of stories with the fictionalized scientific principles of the “laws” governing robotics embedded into them.

Asimov wrote these Laws with the hope that people would not create an automated entity without safeguards built into it. In his introduction to a 1964 collection of his robot stories he explains his reasoning, by “point[ing] out that nothing is made without taking into account the dangers involved: knives have hilts, stairs have banisters, electrical wiring has insulation, pressure cookers have safety valves.”<sup>45</sup> Robots are like any other household object to Asimov; like a knife or a staircase, a robot needs to come with safety precautions. The objects that Asimov chooses to compare robots to are compelling not only because they are objects, but also because they are human-made objects that are not machines — i.e. not automated or having the suggestion of automation. While robots are imagined as machines, complex constructions with moving parts that somehow move and act under their own direction, none of the objects that Asimov compares them to are similarly complex. The comparison between a knife and a robot, or electric wiring and a robot lends a certain inanimacy to Asimov’s notion of the robot in order for him to make his argument. Although Asimov’s robots themselves are more

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<sup>44</sup> Ibid., 48.

<sup>45</sup> Gunn, *Isaac Asimov*, 42.

complicated than a knife, wiring, or a pressure cooker, by making these comparisons, he is also able to compare the “safety precaution” of a knife hilt with the behavioral guidelines that are the “Laws of Robotics.” An automated being like some of Asimov’s robots, despite its ability to move on its own, is no more “animate” than a knife, and so rules restricting its actions is more about mindless servitude than about the enslavement of a sentient being.

The idea that robots could have such laws programmed into them created a source of drama that future pulp science fiction authors used as a convention in their stories as well. While an organic human being is “programmed” by less definable sources, impregnated with morals and values by the ever nebulous combination of “nature” and “nurture,” robots are programmed with what, in essence, are moralistic laws responding to “logic,” and are clearly defined by electronics and circuitry.<sup>46</sup> Programmed robots offer a sense of relief in their dependence on “science” in a world where so few things are so easily defined. A thinking being’s morals and values that help to govern its behavior are not easily made concrete, but with Asimov’s robots, such a thing is possible, even if in a fictional context.

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<sup>46</sup> Asimov is one of the first writers of what is now called “hard science fiction,” a genre with problematic gender politics. To read more about Asimov and the beginnings of hard science fiction, see Gary Westfahl’s “‘The Closely Reasoned Technological Story’: The Critical History of Hard Science Fiction” in *Science Fiction Studies*, Vol. 20, No. 2 (July 1993), 157-75.

But why would Asimov's robots need to have obedience and not harming humans built into them? Asimov scholar James Gunn suggests that these laws are programmed in order to combat the "fear of the machine, the fear of the creature turning on its creator," and that the "Frankenstein complex may be observably true in human nature...but it is false to humanity's intellectual aspirations to be rational and to build rationally. Blind emotion, sentimentality, prejudice, faith in the impossible, unwillingness to accept observable truth, failure to use one's intellectual capacities or the resources for discovering the truth that are available, these were the evils that [*Astounding Science Fiction* editor John W.] Campbell and Asimov saw as the sources of human misery."<sup>47</sup> Anxiety over the creation that destroys its creator then is "irrational" and goes against the "intellectual" side of humanity.<sup>48</sup> The Three Laws assume that robots would at some point attempt to disobey their orders, and harm humans or themselves. In this case, Asimov's commitment to adding "rationality" to the robot story resulted in a construct of the robot creation story that assumes human designers that would want to build artificially intelligent beings that would serve them without having to fear, and that creators of such beings would not build them to kill or control other humans. While Asimov's stories

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<sup>47</sup> Ibid., 48.

<sup>48</sup> The popularity of Asimov's "rational" robot stories accelerated the development of the term "hard science fiction" in the early 1960s, a phrase that describes science fiction that "emphasizes science." This term describes a fiction frequently criticized because of its gender and racial politics, and because it is a sub-genre that excludes women writers and writers of color who tend to write more "soft science fiction" that "emphasizes human emotion." See Westfahl's "'The Closely Reasoned Technological Story': The Critical History of Hard Science Fiction," 157-162.

containing robots programmed with the Laws then avoid altogether the moral dilemma of having enslaved or otherwise oppressed sentient beings, other science fiction writers take advantage of the servant-robot figure to explore the idea of the oppressed "other."

These laws, as well as being constructed around the notion of a servile robot, also function as a set of morals for robots. These laws are rules that would guide a robot's behavior according to larger cultural expectations for "rational" behavior. These expectations include obedience to paternalistic authority figures, or human "masters," compassion for others through not harming them or passively allowing them to come to harm, and self-preservation. This concept of robots also relegates them to a place of servitude. Asimov's robot stories contained in his seminal collection *I, Robot* derive their narratives from robots that appear to be malfunctioning in the light of their programming. In "Runaround," Asimov's first robot story to use the "Three Laws," Asimov develops the plot around a robot that appears to be disobedient, not following the Laws.<sup>49</sup> A human in danger on the surface of Mercury cannot figure out why his robot has not saved him, until he realizes that the robot is caught in a logical loop between two of the Laws. Upon untangling this logical puzzle, he puts himself in direct danger so that the robot can break from its loop and save him. The programmed Laws are never at fault in Asimov's robot stories — it is always a drama of interpretation of the Laws, or of

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<sup>49</sup> Asimov, "Runaround."

human error, despite the appearance of disobedient robots in the service of human beings. Unlike the “oppressed” robot stories discussed later in this chapter, Asimov’s do not disobey of their own accord, nor do they investigate or care about their servile status.

In addition to Asimov’s invention of the laws of robotics and their influence on pulp robot stories, Asimov’s laws also helped to open up other interpretations and representations of robots, even as Asimov primarily investigated the logic of robot programming rather than socio-cultural aspects of oppression. Robots, though constructed as servants or slaves, did not have to be mindless and obsequious with their masters’ best interests always placed above their own; nor did they always eventually rise up to kill their human creators. Along with the influence of Binder’s sympathetic robot character Adam Link, Asimov’s robot fiction helped shape the conventions that determined robot narratives featuring robots as part of a social fabric that regarded them as intelligent, but oppressed beings. These robot characters could participate in narratives that stemmed from their desires, their dreams, and their subsequent quests for citizenship, equality, or love. Although Asimov’s robots remain, for the most part, somewhat mundane and satisfied with their lower status in the hierarchy of human and machine, by setting the tone for self-governing robots, the popularity of Asimov’s robot stories helped support a plethora of robot stories by other writers that explored the differences between the

mechanical “man” and the born one.<sup>50</sup> Asimov’s robots could never become citizens or even seek “citizenship” because their governance derived from laws programmed into their brains by human beings. Without the ability to self-govern, his robots remain the appendages and tools of humanity rather than their own beings.

### **The Living Machine in Proletarian Writing**

As suggested in the above section, the figure of the robot lends itself to being represented as servant, slave, or other laborer. Tik-Tok was Dorothy’s “slave,” and Asimov’s robots are bound to servitude as machines built to perform work. Adam Link seeks solace in the process of democratic capitalism and citizenship, the oppressed robot stories consistently show robots as workers, doing jobs that humans cannot or do not want to do. As workers, and as sympathetic characters, robots in these stories, then, also resist their labor conditions and existence as property. The rise of socialism and Communism in Eastern Europe during the 1910s and 1920s, as well as the radical politics of American intellectuals in the 1930s both suggest a focus on workers’ rights and changes in working conditions due to industry mechanization in the twentieth century. By no coincidence, the rise

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<sup>50</sup> One particular robot story of Asimov’s was the 1976 novelette “Bicentennial Man.” The protagonist is a robot who wants to become human, and, over the course of 200 years undergoes various treatments to make him more and more human. The “Three Laws” in this story serve as the basis for his morals that govern his behavior, eventually helping him become fully “human” and a member of human society.

of socialist and proletarian politics occurred simultaneously with the coining of the term “robot” as discussed above with Čapek’s *R.U.R.*<sup>51</sup> Robots, as built servants/slaves and potential sympathetic characters capable of telling their own stories were intertwined with the representation of the human worker — robots were powerful figures for representing workers for Čapek and other writers. The figure of the robot, however, could not have existed without the closely related representations of machines in proletarian writings, in which machines, while not anthropomorphic in shape, take on agency of their own — they, too, are living machines.

Progressive and proletarian visions of liberated workers and factory machines from the 1920s and 1930s influenced the notion of robots as servants and workers that appear in the robot pulp stories of the 1950s, but they also run counter to pro-capitalist popular representations of humans and machines interacting in factories in the 1940s and 1950s. Pro-capitalist representations of workers and factory machinery in popular culture celebrated an industrial machine-scape of machines and human bodies. Historian Thomas J. Sugrue describes the human-machine landscape of mid-twentieth century Detroit, which:

embodied the melding of human labor and technology that together had made the United States the apotheosis of world capitalism. Visitors flocked to the Motor City to marvel at its industrial sites. Crowded into the observation

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<sup>51</sup> *R.U.R.* gained popularity in the United States during the 1930s, and the Works Progress Administration’s Federal Theatre Project put on a production of *R.U.R.* in 1939. See one of the production’s posters from the Library of Congress’s collection here: <http://www.loc.gov/pictures/item/96524672/>

areas at auto plants, they stood rapt as the twentieth century's premier consumer object, the automobile, rolled off the assembly lines by the dozens an hour. The scene was a drama of might and violence, of human ingenuity and sheer physical labor, punctuated by the noise of pounding machinery, the sight of hundreds of workers moving rhythmically to the pulse of the line, the quiet but never unnoticed hovering of foremen and inspectors, the interplay of mechanical power and the brawn of human arms and backs, the seemingly endless rush of workers through the gates at shift change time. Detroit's brooding horizon of factories and its masses of industrial laborers became icons of modernity.<sup>52</sup>

While this vision of Detroit represents a positive, pro-capitalist take on the lively machine-human interactions taking place on American factory floors, they also easily lend themselves to dystopian visions of American industry.

Representations of machines are an important part of proletarian literature in the first half of the twentieth century, due to the increasing mechanization of factory labor. These representations of machines are important because they go hand-in-hand with the figure of the robot proletariat and the human-machine relations represented in robot pulp stories of the 1950s. This section provides an overview of machines in proletarian literature, suggesting that they are a crucial part of labor activism, and that the trend of representations of living machines in many of these works suggests an affinity between the servant-robot figure and worker activism in the twentieth century. The proletariat robot of 1950s pulp fiction can be constructed, then, as a popularization of the machine in the workplace, reflecting the idea of radical politics and labor activism in a decade where public

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<sup>52</sup> Thomas J. Sugrue, *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit* (Princeton University Press; Revised edition, 2005), 17.

expression of Marxist ideology in the United States was censored under the House Un-American Activities Committee.<sup>53</sup>

Karl Marx and Friedrich Engels's 1848 *Communist Manifesto* is the founding text of Marxism where they frame the proletarian discourse on labor, capitalism, and machines. They identify the increasing use of machines as having a negative effect on the worker, making his work lose "all individual character, and, consequently, all charm" resulting in his becoming "an appendage of the machine."<sup>54</sup> Machines de-skill the labor performed by workers, "and it is only the most simple, most monotonous, and most easily acquired knack, that is required of him."<sup>55</sup> For Marx and Engels, machines take on agency through worker-machine interaction, both via making workers more mechanical as their tasks in workplaces become more monotonous and repetitive, and through transforming workers into machine "appendages." Their bodies become part of the machine, but they are also "daily and hourly enslaved by the machine, by the overseer, and, above all, by the individual bourgeois manufacturer himself."<sup>56</sup> With the performance of labor structured around machines in the workplace, people's bodies become part of the machine and in service to the machine, and it is the machine that takes on life and agency. These

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<sup>53</sup> The U.S. House of Representatives formed the House Un-American Activities Committee (HUAC) in 1938 to investigate subversive activities of citizens. In the 1950s, HUAC, along with Senator Joe McCarthy, worked to censor Americans suspected of affiliation with the Communist party.

<sup>54</sup> Karl Marx and Friedrich Engels, *The Communist Manifesto: A Modern Edition* (New York: Verso, 1998), 43.

<sup>55</sup> Ibid.

<sup>56</sup> Ibid., 43-44.

notions of human-machine relations within industrial capitalism are repeated and developed over the next decades, and a resurgence in the popularity of Marxism in Europe and the U.S. in the 1910s through the 1930s revisits the effects of the lively machine on the human body within the context of the workplace.

During the Russian Revolution and the formation of the Soviet Union at the end of the 1910s, Vladimir Lenin was one of the communist revolutionaries who took up the writings of Marx. He similarly wrote about factory labor and the subsequent relationship between human workers and machines. Writing about the Taylor system, Lenin suggested that assembly line workers were “enslaved” by factory machines.<sup>57</sup> He wrote about the use of film and recording technology in order to increase the efficiency of workers’ movements: “For example, a mechanic’s operations were filmed in the course of a whole day. After studying the mechanic’s movements the efficiency experts provided him with a bench high enough to enable him to avoid losing time in bending down. He was given a boy to assist him. This boy had to hand up each part of the machine in a definite and most efficient way. Within a few days the mechanic performed the work of assembling the given type of machine in one-fourth of the time it had taken before!”<sup>58</sup> In order for factory owners to maximize profits, they increased the efficiency of their workers’ movements on the assembly line to best serve the machines. The use of film

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<sup>57</sup> Vladimir Lenin, “The Taylor System — Man’s Enslavement by the Machine”

<http://www.marxists.org/archive/lenin/works/1914/mar/13.htm>

<sup>58</sup> Ibid.

technology helped to serve this goal, through allowing the careful review of human movements. New employees were “taken to the factory cinema” to watch a “model’ performance of his job” and expected to make their movements as close to the model’s as possible.<sup>59</sup> Again, as in Marx and Engels’ critique people’s movements are made both as “efficient” as possible, and also as similar to each other as possible. Assembly line workers then become like pieces of the machine themselves, through the use of film technology and assembly line machinery.<sup>60</sup>

Lenin’s writings were not the only proletarian works to take up the machine as a figure used to oppress workers. In the U.S., a more general association between the nation and the “machine age” resulted in a combination of capitalist celebrations of the machine and associated systems of labor and production, such as Fordism and Taylorism, but along with them came less-favorable proletarian representations of the machine. Most critics of “machine civilization” and its effects on “traditional” systems of labor and culture were British, and these critics often negatively equated

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<sup>59</sup> Ibid.

<sup>60</sup> Ibid. Lenin, among other proletarian activists, also appropriated the figure of the machine for their own purposes, using the phrase “revolutionary machine” to describe their party’s actions. Chinese revolutionary Mao Zedong similarly used the “revolutionary machine” phrase as part of the language of the Chinese Revolution. In his “Talks at the Yen’an Forum on Literature and Art” (May 2, 1942) Zedong refers to Lenin’s writing on the role of art and literature in the proletarian cause — art is a “cog and a screw” of the “Social-Democratic mechanism set in motion by the entire politically conscious vanguard of the entire working class” (see Lenin’s “Party Organization and Party Literature” in *Collected Works, Eng. ea., FLPH, Moscow, 1962, Vol. X, p. 45.*)

<http://www.marxists.org/archive/lenin/works/1905/nov/13.htm> .

machine-based industrial processes and economy with "Americanism."<sup>61</sup>

Progressive American economist and writer Stuart Chase, instead of condemning the machine and the machine age, located machines within the framework of "Western society," connecting European and American interests and de-Americanizing industrial processes that Europeans blamed for an erosion of traditional values.<sup>62</sup> Writers like Chase relocated the "blame" of poor working conditions and the negative effects of industrial capitalism from machines and machine culture to the bourgeoisie who neglected the safety of workers around factory machines. By the 1930s, with the Great Depression, however, "it was, in a sense, a relief for many to see the machine apparently discredited, and that hostility exhibited toward business and finance in the 1930s was at least in part because of the machine culture they represented."<sup>63</sup>

Pro-capitalist Americans praised the new machine culture, and electrical engineer Michael Pupin, author of the 1930 *Romance of the Machine*, "extended the idea of the machine to represent all living things, making it not a product of human manufacture but an inherent aspect of nature, which humanity of late has begun to emulate in its own inventions."<sup>64</sup> Folding machines into the realm of nature that included "all living things" helped to contribute to the notion of the lively machine,

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<sup>61</sup> Peter Denton, *The A B C of Armageddon: Bertrand Russell on Science, Religion, and the Next War, 1919-1938* (Albany, NY: SUNY Press, 2001), 5.

<sup>62</sup> *Ibid.*, 4.

<sup>63</sup> Gary D. Best, *The Dollar Decade: Mammon and the Machine in 1920s America* (Westport, CT: Praeger, 2003), xix.

<sup>64</sup> *Ibid.*, 6.

but more as a way to positively represent the increasingly close relationship that many Americans saw between humans and machines, especially in the realm of industrial capitalism.

In the United States, machine-human representations in proletarian writings became especially prevalent during the Great Depression in the 1930s,<sup>65</sup> the decade in which radical and socialist thought flourished.<sup>66</sup> Much of the concern in the 1930s

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<sup>65</sup> American proletarian literature itself became prevalent in the 1930s due to the economic problems the United States was facing and the growth of progressive politics: "Proletarian writers in the early '30s, with limited or low-status schooling (at the City College of New York or mid-western state colleges, for instance) and zero social capital, could gain access to the dominant literary system on the basis of authentic working-class experience and its representation" (see "'Smashing Cantatas' and 'Looking Glass Pitchers': The Impossible Location of Proletarian Literature" by Lawrence Hanley in *The Novel and the American Left: Critical Essays on Depression-Era Fiction* edited by Janet Galligani Casey (Iowa City, IA: University of Iowa Press, 2004), pages 132-33, for more information about proletarian literature in the early 1930s).

<sup>66</sup> Russian and Japanese proletariat artists and poets similarly, and perhaps more dramatically, considered the industrial relations between workers and machines. According to historian Mark D. Steinberg, Russian "working writers often viewed the spirit of factories and machines as not only menacing but aggressively hostile and evil" (see Mark D. Steinberg, *Proletarian Imagination: Self, Modernity, and the Sacred in Russia, 1910-1925* (Ithaca: Cornell University Press, 2002), 167). They also "very often portrayed factories and machines as roaring 'monsters' devouring workers in altogether hellish scenes filled with 'horrible squeals,' black smoke, grinding noise, and death" (see Steinberg, *Proletarian Imagination*, 167). In prewar Japan, the "image of 'the proletariat' in the popular imagination" was linked to representations of "machines and robotic figures" (see Miri Nakamura, "Horror and Machines in Prewar Japan: The Mechanical Uncanny" in Yumeno Kyūsaku's *Dogura Magura*" in *Robot Ghosts and Wired Dreams: Japanese Science Fiction from Origins to Anime* edited by Christopher Bolton, Istvan Csicsery-Ronay Jr., and Takayuki Tatsumi (Minneapolis, MN: University of Minnesota Press, 2007), 6). While Japanese proletarian writers of the 1930s similarly represented machines and robots as "threatening forces that brutally murder factory workers" like Russian writers of the 1910s and 20s, at times they also represented machines as saviors because they promised to free people from oppressive economic circumstances that

over machines and working conditions stemmed from American intellectual works of the 1920s. One of the debates about machines and labor in the U.S. in the late 1920s was over the role of the machine as a tool. While many proletarian writers of the 1920s argued that machines were oppressive, others “retained the prewar belief in the essential beneficence of science and technology. For them the machine was not something to be feared or hated; it was instead a neutral instrument which could be used for good or evil.”<sup>67</sup> While machines could be employed to oppress workers, they also had the potential to free humans from manual and factory labor, should they be used as such. Pragmatists especially believed that science and technology were tools, but tools that factory owners under the industrial capitalist system used to oppress workers. John Dewey [otherwise dubious of Marxism] in particular suggested that technology was “harnessed to a system of private profit, a ‘money culture’ that emphasized power, commercialism, and success.”<sup>68</sup> As in Dewey’s assertion, the robots of the science fiction pulps in this chapter are enmeshed in a system of capitalist enterprise, such that their very bodies and minds are integrated as technological “objects” that also labor and are often property — capital — within their socioeconomic fictional worlds. Stuart Chase, in his 1929 series “Men and Machines” for the progressive era magazine the

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required their back-breaking labor (see Nakamura, “Horror and Machines in Prewar Japan,” 6). The representation of the machine and the subsequent figure of the robot are sites for discourse about both the oppression of workers and their liberation.

<sup>67</sup> Richard Pells, *Radical Visions and American Dreams: Culture and Social Thought in the Depression Years* (Champaign, IL: University of Illinois Press, 2004), 30.

<sup>68</sup> *Ibid.*, 31-32.

*New Republic*, “attempted to chart the direction in which American society seemed to be moving under the navigation of modern science. His conclusions were far from comforting. Chase focused explicitly on the danger of automated unemployment and argued that inventions no longer served mankind.”<sup>69</sup> Although Chase meant that machines should be used in the service of humans to improve their lives, and that they were no longer doing so from the perspective of the working class, machines that “no longer [serve] mankind” is one idea that science fiction pulp writers turn to in the 1950s via the integrated human-machine robot worker who quite literally choses to no longer serve humankind.

### **The Robot Proletariat**

While Lenin and other socialist writers and leaders feared the mechanization of workers’ bodies — for Lenin through the implementation of the Taylor system — robot stories imagine the worker and the machine as one in the same. The prevalence of representations of lively machines within the context of proletarian and progressive thought and writings suggests an easy slippage into representations of robots as proletariats in fiction. The transition from lively machines in the workplace to lively machines that are the workers themselves is

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<sup>69</sup> *Ibid.*, 27-8. Note that although Chase was a Progressive intellectual, the notions of machinery overlap quite a bit with the radical proletariats of the 1930s. Pells argues that understanding 1910s and 1920s Progressive politics and thought is critical to understanding the radical shifts in the 1930s (see especially pages 2-10 for more details).

one that happened within the framework of critiquing industrial capitalism, as discussed above with Čapek's *R.U.R.* However, it took progressive politics' entry into the realm of popular discourse in the U.S. to enable the representation of dissatisfied robot workers. By the 1940s and early 1950s, positive representations of a human-machine landscape in Detroit helped to contribute to the image of a modern post-war America. These positive associations between the human worker and the factory machine, as well as between machines and labor provide a framework for understanding the role of the fictional robot workers of the pulps in the 1950s. A factory landscape of the melding between human and machine in "modern" America helps to make "natural" the idea of the worker becoming the machine itself via the figure of the robot.

As mentioned in a previous section, many science fiction fans and writers of the late-1930s became figures who guided science fiction in its "golden age" in the 1950s, further pushing a progressive vision for the future.<sup>70</sup> While the representations of machines and workers in proletarian literature from the 1920s and 1930s reflects a growing tendency towards radical politics, especially in the United States during the 1930s, the 1950s was a decade where overt public expression of radical politics was censored by the U.S. government. The proletarian writings of the 1920s and 1930s raise issues of human-machine relations that pulp writers of the 1950s pick up and recapitulate in the realm of the popular. However,

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<sup>70</sup> See Denning, *The Cultural Front*, 225-226 for information about the progressive science fiction writer and fan group the Futurians.

owing to their existence in the realm of the popular, these stories' political import is largely neutralized. These stories could only exist for a large public audience and only venues like the pulps could take up issues of working-class dissatisfaction and resistance without censorship. Yet, in terms of the potential for political influence, the pulps were dismissible and disposable. Furthermore, the 1950s was a decade that restricted the public expression of Marxist, socialist, and/or communist political ideologies. The House Committee on Un-American Activities (HUAC) in the 1950s and McCarthyism worked to censor progressive public voices viewed as "subversive," and to censor (blacklisting) of Hollywood directors, actors, and writers, raising issues of labor that could be interpreted as Marxist or socialist, and therefore politically dangerous.<sup>71</sup> The unionizing, labor-activist, or otherwise Marxist robot figure of the pulps in the 1950s, then, is a significant rupture in the popular culture of the 1950s. Although some of the robot stories are questionably pro-labor rights or Marxist in their ideologies, they still raise the specter of communism in a time where doing so in the United States was restricted/censored. The existence of these stories and their politics underscores the argument of this chapter on pulps, especially science fiction pulps, as a "safe" space in which ideas and issues could be raised without fear of retribution. This is

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<sup>71</sup> See Thomas Doherty's *Cold War, Cool Medium: Television, McCarthyism, and American Culture* (New York: Columbia University Press, 2005). For more on Hollywood blacklisting during the McCarthy era, see Reynold Humphries's *Hollywood's Blacklists: A Political and Cultural History* (Edinburgh: Edinburgh University Press, 2008).

both due to the pulps' existence as a denigrated and "disposable" medium/genre, as mentioned above, and to their science fictional content. A robot asking for fair and equal pay for his labor, and holding up a banner that reads "robots of the world unite!" is fantastical enough that it would not be taken seriously — it is a robot, and it is not "real."

One example from the science fiction pulps are the robots of Mari Wolf's 1952 story "Robots of the World! Arise!" This story's title is of course alluding to the "Workers of the world, unite!" call to action from Marx and Engels' *Communist Manifesto*.<sup>72</sup> The story's plot revolves around robots striking in order to gain more rights as workers and to be considered "men" equal to human beings. The story is told by a first-person human narrator who owns a company, Don Morrison Fissionables Inc., which uses hundreds of robot workers in a uranium factory. An image of an illustration by Bob Martin appears in the story. It shows robots holding a banner that says, "Robots of the world unite!" Summoning another allusion to the *Communist Manifesto*, these robots refuse to continue working as long as they are not financially compensated. The robots of this story refuse to serve human beings any longer, and they function both as the worker and the machine. It is as though the fears of Lenin, Marx, and Engels have come true — factory work has become so mechanized that there is no longer a difference between the workers and the machinery. The story, however, represents these machine-workers not as humans

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<sup>72</sup> Marx and Engels, *The Communist Manifesto*.

who have lost their humanity through the repetitious labor that they provide to the bourgeoisie, but as machines that have gained humanity through their labor.

Workers in the United States feared technological unemployment from the beginnings of machines on assembly lines in the 1920s through the 1940s and 1950s,<sup>73</sup> because they were being replaced by machines in factories. Wolf's story, however, exists in a future time where this has presumably already happened, as no human beings perform manual labor at all anymore. While this state of affairs may suggest that a utopian future has come to pass because of machines doing labor that people do not want to do (a less-common representation of machines in proletarian writings), human factory workers are completely absent from the story, as is any discussion of them. They have been replaced by robots, but the robots have become so much like human beings, as a result of factory owners' desires to have "intelligent" workers, that by the end of the story they have successfully protested their status as "machines" and have become "men." While it may seem as though the plot circles back around, with people doing the jobs of machines, the difference is that the robots seem perfectly satisfied with their position as workers, as long as they are paid for their work and allowed to participate in the democratic process.

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<sup>73</sup> Michael Denning suggests that the introduction of machinery into the automobile factory in the 1940s "transformed the labor process of the semiskilled machine operators, who were the heart of the CIO mass-production unions, weakening the shop-floor systems of power that industrial unionism had won and reducing the size of the labor force" (see Denning, *The Cultural Front*, 37).

Wolf ties the robot workers' desire for freedom with intelligence and humanity by having two classes of mechanical workers — the uranium factory workers (the 5s) equipped with "real brains," and the brainless robots who do domestic and janitorial work. Suggesting that the uranium factory mechanical workers perform tasks that require them to be more intelligent than the other robots, Wolf creates a robot caste system with less intelligent robots as manual laborers subordinate to the more intelligent 5s.<sup>74</sup> The domestic and manual laboring robots, who go on strike along with the smarter robots, learn by the end of the story that without "human pleasures to cater to, [they have] nothing but blank, meaningless lives." Not only is their place in the unpaid service of human beings, but they would also not be happy without humans to serve. Even when they are free from labor via the strike, these robots continue to perform their jobs: "They drifted through the streets singly and in groups. Sometimes they paused and felt about them idly for the tools of their trades, making lifting or sweeping or computing gestures. Some laborers worked silently tearing down a wall; they threw the demolished rocks in a heap and a group of their fellows carried them back and built the wall up again. An air trolley cruised aimlessly up and down the street, its driver ringing out the stops for his nonexistent passengers. A little chef-type knelt in the

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<sup>74</sup> The story does not explain what exactly these robots do at the uranium factory, but it is implied that whatever it is that they do requires intelligence — as opposed to the other robots who are too stupid to understand their own oppression or find happiness in freedom.

dirt of a rich man's garden, making mud pies."<sup>75</sup> Freedom for these particular robots comes at a heavy price, and although they joined in the strike, they go through the motions of their work, rendered meaningless without humans to serve. Although these robots are also capable of what appears to be "human" emotions, their happiness derives from their condition of servitude. Morrison asks Jerry of what the use money is to robots, who "need to work." Jerry tells Morrison, "You were kind not to give brains—real brains—to the robots. They're happy. It's just us 5s [Morrison's brain-endowed factory robots] who aren't."<sup>76</sup> Jerry and Morrison agree to let the "robots" — which the 5s do not consider themselves anymore — go back to work, while they will come up with an agreement for the intellectual 5s. The non-5s robots, built for the purposes of serving humans, are innately satisfied by this system of unpaid labor and being property. American proponents of slavery and of industrial capitalism, both oppressive systems of labor, often justify these systems through paternalistic arguments similar to that which Wolf's characters use. According to this logic, like enslaved African Americans and the working poor, these robots are "better off" with a system that makes them the property of the slave owner or factory owner.<sup>77</sup>

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<sup>75</sup> Wolf, "Robots of the World! Arise!," 74-89.

<sup>76</sup> Ibid.

<sup>77</sup> For more on paternalism as a justification for slavery, see Howard McGary's "Paternalism and Slavery" in *Subjugation and Bondage: Critical Essays on Slavery and Social Philosophy* edited by Tommy Lott (New York: Rowman & Littlefield, 1998). For more on paternalism and factory labor in the late nineteenth and early twentieth century, see Ron Rosenzweig's *Eight Hours for What We Will: Workers and Leisure in an Industrial City, 1870-1920* (New York: Cambridge University Press,

Another story featuring activist robot workers, "The Robots Strike" by Harry Harrison, tells the story of robots who participate in "passive resistance" in "a peaceable attempt to secure those rights which are inherent."<sup>78</sup> The robots, unable to harm humans or disobey them (though not explicitly stated as such, they appear to follow Asimov's Laws), find ways of protesting that sidestep their programmed servitude. While on strike, if a human orders a robot to do its job, other robots will step in to prevent that robot from obeying orders, by giving that robot new orders that need to be followed:

This was another of Atommel's [the robot leader of the strike, also known as "Metallic Marx"] logical victories. He argued that since the robots wanted equality before the law, they were already equal in fact. Therefore one robot could obey the orders of a second robot — even if the second robot originated the orders instead of passing them on from a human source. This did not interfere with any of their ingrained laws. And it made the strike possible.<sup>79</sup>

As equals to humans, robots no longer have to differentiate between human and robot, and must obey other robots and also not allow them to come to harm. This story alludes to labor and Civil Rights activism in a number of ways, including the nickname of the lead robot as "Metallic Marx." Metallic Marx helps to lead the robots to victory, when eventually a "Robot Equality Act" is passed. Harrison uses the idea of "passive resistance," an activist method first employed by Mahatma Gandhi, but

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1985), and Alice Kessler-Harris's *In Pursuit of Equity: Women, Men, and the Quest for Economic Citizenship in 20th-Century America* (New York: Oxford University Press, 2001).

<sup>78</sup> Harry Harrison, "The Robots Strike" in *Fantastic Universe* (January 1959), 61.

<sup>79</sup> Ibid.

also practiced by civil rights leader Martin Luther King Jr. as an effective for the robots to secure their rights. While the city begins to crumble without the labor of the striking robots, "Through it all the robots simply stood quietly, mute metal statues of protest. They were the final essence of passive resistance. Both incapable of harm and unable to resist a human's will."<sup>80</sup> Harrison's allusions to and engagement with the Civil Rights movement in the U.S., as well as labor activism, makes a connection between robots and oppressed humans in the 1950s.

As in Wolf's story, Harrison links intelligence with a particular activist consciousness that makes for a desire for freedom and the ability to participate in the democratic process. Harrison connects skilled labor, intelligence, and socially conscious robots. While Wolf's 5s are a class of robots with "brains," who then want to become "men," Harrison's robots have gradually replaced humans in many "skilled" jobs, rather than engaging in factory work or manual labor: "Robots now hold instructing positions in universities, fly cargo and passenger planes, are newspaper reporters, car salesmen."<sup>81</sup> The jobs that Harrison's robots perform have required developments in robotics that make them smarter and more able to perform these tasks. However, in developing more intelligent robots, the humans in this story have inadvertently created robots who are able to be aware of their own oppression and subsequently desire freedom. Their version of activism further requires resistance to the Asimov-like programming that comes about through out-

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<sup>80</sup> Ibid., 62.

<sup>81</sup> Ibid., 59.

rationalizing the logic of their programmed obedience. A certain type of intelligence, then, is required for Harrison's robots not only to make them aware of their subordinate positions, but also to help them out-think their human programmers and orchestrate their strike. The robots in these two stories, represented as manufactured workers, need to reach a certain level of built artificial intelligence in order to become socially conscious. Ostensibly -- since both Wolf and Harrison represent their robot workers as smart enough to want to be free -- they are also both representing freedom from oppressive labor conditions as something that needs to be earned.<sup>82</sup> Of course, part of the complications of using robots as socially conscious beings is that they raise questions about what makes a being intelligent enough to deserve freedom, and therefore represent citizenship and civil rights as conditional. For Wolf and Harrison, it is enough to know to want freedom to deserve it, but this framework also troublingly connects certain types of labor to intelligence (or a lack of it) and access to the democratic process and citizenship.

### **Race, Citizenship, and Robot Workers**

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<sup>82</sup> Using engineered beings as laborers in industrial capitalism brings to mind Aldous Huxley's 1932 dystopian novel *Brave New World*, in which humans' embryonic development is controlled in order to create castes of more and less intelligent people. The least intelligent humans work as janitors and perform manual labor, and the most intelligent are leaders and intellectuals. The lower castes are also represented as having darker skin, problematically also linking race, manual labor, and low intelligence.

While some writers of oppressed robot stories use representations of workers and allusions to Marx as ways to depict activist robots, other writers more explicitly connect the oppression of robots to racial oppression, and use race as a category of difference with which to measure robots' difference.<sup>83</sup> Some stories seem more to focus on class and the figure of the worker for their robot characters, but others demonstrate interconnections between race and class oppression in order to drive their stories' plots. Both race and class are ways of understanding difference and citizenship, especially within the context of 1950s America.<sup>84</sup> At other moments, robots experience oppression that is not particularly racialized, but that borrows from narratives of oppression and slavery that in turn are suggestive of racial discourse. At the time when these robot oppression stories were published,

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<sup>83</sup> Gender and sexuality, too, are other category of oppression with which one can examine labor, but these stories tend not to take up gender or sexuality as modes of representing activism, possibly because the women's movement gained momentum in the 1960s and 1970s, a bit later than the civil rights and labor activism of the 1950s and 1960s. Only one oppressed robot story surfaced during my research that included gender as an identity category for robots (other than the issue of the assumed universal "masculinity" of robots in all the other stories). That singular story was David C. Knight's "The Love of Frank Nineteen," which represents feminine robots only as necessary partners to masculine robots in order to use the idea of heteronormative love and marriage. While I discuss this story later in the chapter, unfortunately its representation of sexuality and gender is conformist, to say the least.

<sup>84</sup> One example of the intersection of race and class specific to factory labor and technology comes from Lizabeth Cohen's book *Making a New Deal: Industrial Workers in Chicago, 1919-1939* (New York: Cambridge University Press, 2008). She considers the racial disparity in how technology shifted factory work: "For black workers in Gary, mechanization had special meaning. Whites got the jobs operating the machines whereas blacks were demoted to common labor" because the addition of machines meant that the number of semi-skilled jobs were reduced (see page 316).

analyses that included both race and class oppression were not uncommon in the realm of mid-twentieth century American civil rights discourse, but this kind of intersectional analysis was potentially damaging to the United States' pro-capitalist image during the early cold war period and so were minimized. According to historian Mary Dudziak, who reads the civil rights movement alongside American cold war foreign policy, suggests that in order to promote both democracy and capitalism as well as racial equality, the agenda of American civil rights policy needed to be limited in order to promote both democratic ideas and pro-capitalist ideologies: "The narrow boundaries of cold war-era civil rights politics kept discussions of broad-based social change, or a linking of race and class, off the agenda."<sup>85</sup> While American politicians considered Marxist-influenced critiques of racial oppression too dangerous to a pro-capitalist American image, this did not stop pulp writers from using both race and racialized robots as ways to explore class oppression in their stories.

Several stories discussed thus far have explicitly mentioned variations of robot civil rights acts: Harrison's "The Robots Strike" has the "Robot Equality Act"<sup>86</sup>

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<sup>85</sup> Dudziak, *Cold War Civil Rights*, 13. See also Mae Ngai's *Impossible Subjects: Illegal Aliens and the Making of Modern America* (Princeton, NJ: Princeton University Press, 2005), in which she suggests that "immigration reform was very much akin to civil rights and desegregation. Both movements against racial discrimination were animated by mass democratic mobilization, and both received support for their causes among liberal white elites, who in the context of the world war against fascism had found America's race policies falling short of its democratic ideals. During the cold war liberals felt it even more urgent to project a democratic image of the nation to the world" (page 228).

<sup>86</sup> Harrison, "The Robots Strike," 64.

as does his “The Velvet Glove,”<sup>87</sup> and Knight’s “The Love of Frank Nineteen” has “Robot Civil Rights” legislation.<sup>88</sup> The other stories discussed in this chapter do not have explicit legislation that defines robots’ civil rights, but Wolf includes labor contracts that acknowledge and/or define robots’ status as “men” for the U.S. government, Merliss includes a governing body acknowledging the “humanity” of robots in “The Stutterer,” and Adam Link himself becomes “equal” to humans through a court case that ultimately defines his rights as a “man.”<sup>89</sup> Government intervention into the discrimination of robots in these stories is important because of the impending civil rights legislation in the United States in the 1950s and early 1960s.<sup>90</sup> This legislation came about because of activism and heightened public awareness of racial discrimination and violence in the United States,<sup>91</sup> and as early

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<sup>87</sup> Harrison, “The Velvet Glove;” 62.

<sup>88</sup> Knight, “The Love of Frank Nineteen,”

<sup>89</sup> Binder, “The Trial of Adam Link, Robot.”

<sup>90</sup> Three pieces of U.S. civil rights legislation that were part of the Civil Rights Movement were from the mid 1950s through the mid-1960s: the Civil Rights Act of 1957 established the Civil Rights Commission, which helped to support the desegregation of schools in the South via the Supreme Court’s *Brown vs. Board of Education* ruling in 1954, the Civil Rights Act of 1960 that helped to protect voting rights because of voting restrictions in the South that targeted African Americans, and finally the landmark Civil Rights Act of 1964 that outlawed discrimination based on race, ethnicity, and religion.

<sup>91</sup> For an overview of the political history of twentieth-century civil rights in the United States, see Mary L. Dudziak’s *Cold War Civil Rights: Race and the Image of American Democracy* (Princeton: Princeton University Press, 2000) and Kari Frederickson’s *The Dixiecrat Revolt and the End of the Solid South, 1932-1968* (Chapel Hill: University of North Carolina Press, 2001). See also the essay collection *The Moderates’ Dilemma: Massive Resistance to School Desegregation* edited by Matthew D. Lassiter and Andrew B. Lewis (Charlottesville, VA: University of Virginia Press, 1998) and Jill Titus’s *Brown’s Battleground: Students, Segregationists, and the Struggle for Justice in Prince Edward County, Virginia* (Chapel Hill: The University of

as the late 1940s racial inequality became part of the nation's agenda as Harry Truman is credited with making it a priority.<sup>92</sup> These stories all invoke civil rights discourse in various ways, framing activism as participation in the American myths surrounding democracy and freedom.

In all these stories, the idea of "biology" as defining "human" qualities is subordinate to "culture," although there is some slippage between these two broad and nebulous categories. To prove their worthiness for citizenship or "human" rights, robots in all these stories need to "prove" their humanity (loosely defined by all accounts) in order to be considered "men" and therefore be allowed to participate in the democratic process as citizens. Performing similarity to and minimizing difference from humans must be done via "culture" for all these robots, because for robots, biology is an intractable difference — what makes a modern robot a robot is its construction from inorganic materials. Robots are beings manufactured out of metal and electronics and through an industrial process. In essence, they have no biology in their physiology or through their production; made

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North Carolina Press, 2011) for more on the civil rights movement and desegregation in Virginia in the late 1950s.

<sup>92</sup> Dudziak, *Cold War Civil Rights*, 24. While Truman's attention to civil rights in the late 1940s was in no way the first time issues of racially-based inequality came up on the nation's agenda, it does signify early motion towards the postwar civil rights legislation that was eventually made law in the late 1950s and the 1960s. Civil rights was raised to a broader public consciousness throughout the late 1940s and 1950s, and so became part of the context from which writers of 1950s oppressed robot stories drew their ideas of civil rights, citizenship, and activism.

of stuff so different from humans, their biological difference is undeniable.<sup>93</sup>

“Culture,” then, is where the robots and the humans must find common ground — culture, as non-biology, is a point of human-machine empathy, and serves as justification for “equal” or humane treatment for robots.<sup>94</sup>

Over and over again in these stories, robots must earn their rights through demonstrating similarities to human beings that are “cultural,” since the robots are not, (and cannot be) biological. In Wolf’s “Robots of the World! Arise!” the intelligent 5s robots, designed by first-person human narrator Morrison, are telepathic as a side-effect of their design. They have thoughts similar to those of Morrison -- having sprung from his human brain – and these thoughts are what allows them to go on strike, as well as what allows Morrison to convince them to go back to work.<sup>95</sup> In Harrison’s stories, “The Robots Strike” and “The Velvet Glove,”

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<sup>93</sup> This is unlike a cyborg, whose melding of biological and manufactured parts creates a meeting point and ambiguity between human and machine.

<sup>94</sup> While “culture” and “biology” are not mutually exclusive categories, according to Peggy Pascoe, the racial ideology that emerged from the 1920s through the 1960s came about from competing ideologies about the relationship between race and “culture” versus race and “biology.” She suggests that these ideologies all “depended on a modern split between biology and culture.” We can see this split emphasized in these robot stories, where biology becomes impossible to reconcile due to bodily differences between humans and machines. The only remaining way to find the similarity that these robots need in order to prove “humanity” is through cultural means. See Peggy Pascoe, “Miscegenation Law, Court Cases, and Ideologies of ‘Race’ in Twentieth-Century America” in *The Journal of American History*, Vo. 83 No. 1 (June 1996), 44-69.

<sup>95</sup> Wolf, “Robots of the World! Arise!” Although the robots do eventually get the upper hand at the end of the story, Morrison believes that he has quashed any future robot rebellion through his telepathic and empathetic connection to the robots: “That was all I had done. Thought about robots built to work who had no work to do, no human pleasures to cater to, nothing but blank, meaningless lives. Thought about

robots are the narrators of the stories, relating the situations of oppressed robots in a way that elicits sympathy from readers. They have thoughts and feelings and intelligence much like human beings, and thus are “more” than just machines, and so are deserving of citizenship. In Merliss’s “The Stutterer,” discussed below, the robots, though they can pass as humans via their humanlike appearance, must prove that they can think and feel like humans do before they are freed from a fate that would leave them encased in cement for eons. Knight’s robots in “The Love of Frank Nineteen” use robot love and a sentimental appeal to humans through a feature film of unrequited robot love in order to demonstrate their ability to feel human emotion and deserve “robot civil rights.”<sup>96</sup> The idea that citizenship and rights must be earned through proven similarities is a troublesome one that

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Jerry and his disappointment when his creatures cared not a hoot about his glorious dreams of equality. All one night I had thought, knowing that as I thought, so thought the Morrison 5's. They were telepaths. They had learned to think from me. They had not yet had time to really develop minds of their own. What I believed, they believed. My ideas were their ideas. I had not tricked them. But from now on, neither I nor anyone else would ever be troubled by an android rebellion.” Unfortunately for Morrison, before going back to work the robots are altered to remove their telepathy, as the humans are uncomfortable with telepathic robots. With minds of their own, then, the story ends with the robots’ leader asking about how they will vote in the election the next day.

<sup>96</sup> In Lisa Marie Cacho’s *Social Death*, she suggests also that “To be represented as entitled to civil rights and deserving of legal recognition, working poor African Americans and undocumented Latinos/as must demonstrate that they are deserving and/or in need of U.S citizenship and its rights and privileges. For these marginalized groups, connections to heterosexual nuclear families are crucial to illustrate respectability and deservingness” (see *Social Death: Racialized Rightlessness and the Criminalization of the Unprotected* (New York: NYU Press, 2012) 129).

reinforces the idea that there should be cultural boundaries on what makes someone an American citizen or who should be allowed civil rights.

Proving cultural similarities to humans as a path to gaining civil rights is best exemplified by the robots' use of nativism as a strategy to acquire citizenship in Wolf's "Robots of the World! Arise!" While the character of the alien in science fiction is in essence fundamentally different from a human, both biologically and culturally, the robot, born out of humans' laboratories or factories, is more easily allied with a nativist sentiment. According to Wolf's robots, they are built in America, by Americans, and so they, too, can be considered Americans. The robots protest their roles as unpaid workers in human-owned factories.<sup>97</sup> An illustration from the story is captioned, "After all—aren't we genuine 'made-in-Americans?'"<sup>98</sup> This example references a nativist argument for robots to gain civil rights and citizenship. If they are "made in America," then they, too, should be considered "American" and granted the kinds of rights afforded to all Americans. The argument for robot citizenship and civil rights, then, often depends on subtly shifting the boundary of "Americanness," rather than radically reconsidering then redrawing it. This story in particular represents a nativism similar to that of the late nineteenth and early twentieth century that, as Mae Ngai suggests, "comprised a cultural nationalism in which cultural homogeneity more than race superiority was the

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<sup>97</sup> Mari Wolf, "Robots of the World! Arise!," 74-89.

<sup>98</sup> Illustration by Bob Martin, "Robots of the World! Arise!" *If Worlds of Science Fiction* (July 1952), 74.

principle concern.”<sup>99</sup> Citizenship, according to Ngai, is not only a legal state in which one is a “citizen” of a nation, but historically a racialized, socially constructed national ideal that excluded nonwhite people.<sup>100</sup> Nativism and citizenship are closely tied during the 1950s, and the robots’ use of a nativist argument for citizenship is not unusual. African American civil rights discourse at times used nativist arguments in order to solidify equal rights and citizenship for African Americans.<sup>101</sup> As Ngai suggests, “The civil rights movement was incontrovertibly

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<sup>99</sup> Ngai, *Impossible Subjects*, 23.

<sup>100</sup> Ibid., 43. Ngai also suggests that “despite the Fourteenth Amendment, whiteness was already a condition of full citizenship; by the turn of the century African Americans had been forced into second-class status by disfranchisement, lynching, and Jim Crow segregation” (*italics hers*). Nativists and exclusionists in the early 1920s “commonly held that the low social status of the Negro was proof that granting citizenship to the freed slaves had been a mistake; the same mistake should not be repeated by granting citizenship to Asiatics. Thus, the racial prerequisite cases would decide on which side of America’s herrenvolk democracy Asians and other non-Europeans would fall.” Nativism played a crucial role in defining citizenship and “whiteness,” and court cases in the 1910s and 1920s led to a redefining of racial categories around immigration and citizenship.

<sup>101</sup> Rachel Ida Buff suggests in *Immigrant Rights in the Shadows of Citizenship* (New York: NYU Press, 2008) that civil rights is rooted in the power of the “colonial nation-state...as the path to justice” (page 418). Also see Lisa Marie Cacho’s *Social Death: Racialized Rightlessness and the Criminalization of the Unprotected* (New York: NYU Press, 2012), especially the chapter “Immigrant Rights Versus Civil Rights” in which she suggests that the “new nativism” of the 1990s and 2000s relies on comparisons between immigrant rights and the African American movement for civil rights. The comparison between these two movements, “cannot help but characterize undocumented immigrants as always already and unquestionably criminal because the African American struggle for civil rights in the United States revolved around and relied upon respecting the rights of personhood that U.S. citizenship supposedly already recognizes. In this way, immigrant rights as civil rights were articulated as a racial controversy and enmeshed within relationally racialized discourses of criminality, illegality, respectability, and heteronormativity” (see page 118).

about winning full and equal citizenship for African Americans, but citizenship occupied a more ambiguous and problematic position in immigration policy and reform discourse. Immigrants are aliens, not citizens — a fundamental distinction in legal status that bears on the scope of rights held by each class of persons, beginning with the right to be territorially present.”<sup>102</sup> The civil rights movement, even if not activating nativist arguments, is dependent on an articulation of citizenship that is fundamentally troubled by the presence of the “immigrant,” as opposed to the “native.”

Harry Harrison’s “The Velvet Glove” appeared in the November 1956 issue of *Fantastic Universe*. Harrison, best known for his “stainless steel rat” series of stories and novels, was a prolific writer of science fiction whose first published texts were in the pulps. Harrison tells the story of “The Velvet Glove” from the perspective of the robot protagonist, Jon Venex. It begins with Jon returning to his hotel room after a long day of looking for work. Robots in this story are not always enslaved, and Jon is not owned, but other robots in the story are the property of their human owners. All robots used to be owned by humans before the “Robot Equality Act,” and human members of an underground resistance movement pass out copies of *Robot Slaves in a World Economy* by Philpott Asimov II to sympathetic robots. Although the story’s main narrative plot involves Jon on an adventure after being captured and forced to work despite his free status, even this is written as an unfortunate side-effect of

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<sup>102</sup> Ngai, *Impossible Subjects*, 229.

robot oppression. Jon, in desperate need of work because no humans want to pay robots for their labor, answers a want ad asking for “venex” model robots. When Jon answers the ad, his would-be employers capture him and force him to work digging a tunnel without pay. As it turns out, the malicious humans need a tunnel in order to smuggle heroin. Jon escapes in the end, and without harming any humans because it is against his programming.<sup>103</sup> A robot who had helped Jon escape turns out to be an undercover police officer and offers Jon a job for his quick-thinking that led to the capture of the smugglers. The story ends with Jon beginning to read *Robot Slaves in a World Economy*.

“The Velvet Glove” represents “anti-robe” (what Jon calls humans’ discrimination towards robots) sentiment towards and oppression of robots in several ways. Humans refer to them disparagingly, including slurs like “grease-can,” “junkcan,” and “stinking tin-can.”<sup>104</sup> Laws exist that restrict the movements of free

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<sup>103</sup> This is one of the many examples of the influence of Isaac Asimov’s “Three Laws of Robotics” on robot narratives.

<sup>104</sup> Harry Harrison, “The Velvet Glove” *Fantastic Universe* (November 1956), 62, 63, 64. It is a human police officer who calls Jon a grease-can, and Jon himself also calls his friend Alec a “beat-up little grease pot,” suggesting an appropriation by robots of the derogatory names that humans call them. The story also begins with Jon Venex reading the newspaper, and turning to the comics section, because “He even had a favorite strip, a fact that he scarcely dared mention to himself. ‘Rattly Robot,’ a dull-witted mechanical clod who was continually falling over himself and getting into trouble. It was a repellant caricature, but could still be very funny” (see Harrison, “The Velvet Glove,” 60). Here, Harrison shows oppression as something prevalent via popular culture like comic strips, as well as something that is internalized via Jon Venex’s mixture of amusement and disgust at the “Rattly Robot.” Unlike other oppressed robot stories discussed in this chapter, Harrison tries to represent robot oppression as a broader system part of everyday life for robots.

robots — they have a ten p.m. curfew and are not allowed outside of designated areas until six a.m. the next morning.<sup>105</sup> The robots that own their own contracts, and therefore are free, do not have much better lives than their enslaved counterparts. One robot, rusty from misuse when he had been human-owned, complains that “nobody will hire me like this, but I can’t get repaired until I get a job.”<sup>106</sup> The rusty robot continues, “Being free isn’t all it should be. I some—times wish the Robot Equality Act hadn’t been passed. I would just l-love to be owned by a nice rich company with a machine shop and a—mountain of replacement parts.”<sup>107</sup> Jon’s friend Alec, a “squat black robot” with “powerful arms” disagrees, arguing that they are now more than “just hunks of machinery.”<sup>108</sup> Employment for robots is difficult to find, since many companies still own robots and do not want to pay for a self-owned robot’s labor. This depiction of a system of robot “slavery” and an economy dependent on the free labor of robots is reminiscent of the antebellum South. Harrison compares robot slavery to the enslavement of Africans and African Americans in the U.S. prior to emancipation. He connects the robots’ situation to racial oppression, the civil rights movement, and the United States’ history of slavery throughout this story.

Jon and Alec know each other from their times working together in diamond mines in the jungles of Venus. They both find themselves in New York on Earth after

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<sup>105</sup> Ibid., 60.

<sup>106</sup> Ibid., 62.

<sup>107</sup> Ibid.

<sup>108</sup> Ibid., 61, 62.

buying out their contracts, having earned enough “credits.” The Robot Equality Act has presumably created a system of indentured servitude that allows robots to get paid for their labor. The rusty robot is not as lucky as Jon and Alec, because he had worked in salt water until rusted, and his owners gave him his contract when he needed expensive repairs that they did not want to pay for. These robots’ situations speak of a system of oppression where intelligent robots are exploited for their labor, their bodies used until they either earn enough to pay for their contracts, or they become too expensive to maintain and are disposed of or thrown away. The notion of human workers as disposable connects to similar notions in proletarian literature of the twentieth century.

The similarities to the enslavement and racial oppression of Africans and African Americans in the United States do not stop at the representation of individual robots’ experiences in the story’s exploitative economic system. When one human helps Jon out of a tight situation in which another human has wrongfully accused Jon of hurting him, Jon thinks, “He knew that all humans weren’t robot-haters, why it was even rumored that some humans treated robots as *equals* instead of machines.”<sup>109</sup> The man gives Jon a copy of *Robot Slaves in a World Economy* and warns him that getting caught with the booklet would mean instant execution.<sup>110</sup> He tells Jon to “read it when you’re alone, it’s got a lot of things in it that you know nothing about. Robots aren’t really inferior to humans, in fact they’re superior in

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<sup>109</sup> Ibid., 64, italics Harrison’s.

<sup>110</sup> Ibid., 65.

most things. There is even a little history in there to show that robots aren't the first ones to be treated as second-class citizens. You may find it a little hard to believe, but human beings once treated each other just the way they treat robots now. That's one of the reasons I'm active in this movement—sort of like the fellow who was burned helping others stay away from the fire.”<sup>111</sup> The story then reads, “He smiled a warm, friendly smile in Jon's direction, the whiteness of his teeth standing out against the rich ebony brown of his features.”<sup>112</sup> Harrison marks this character as a black person with “ebony brown” features, and he imagines a future where human racial discrimination does not exist to the extent that its very history is not common knowledge.

While readers are not supposed to recognize that this character is black earlier in the passage, Harrison must mark him as such in order to emphasize his utopian model for racial difference in this futuristic society. This “color-blind” model in relation to the category of race for humans is related to what Pascoe calls “modernist racial ideology,” which emerged from a number of competing discourses about race from the 1920s through the 1960s.<sup>113</sup> This ideology “depends on the deliberate nonrecognition of race,” and while it is widely accepted via its claims of being “antiracist” or “egalitarian,” critics challenge this “color-blindness” because “it,

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<sup>111</sup> Ibid.

<sup>112</sup> Ibid.

<sup>113</sup> Peggy Pascoe, “Miscegenation Law, Court Cases, and Ideologies of ‘Race’ in Twentieth-Century America” in *The Journal of American History*, Vo. 83 No. 1 (June 1996), 44-69.

like other racial ideologies, can be turned to the service of oppression.”<sup>114</sup> In Harrison’s story, “race” exists for the reader in his marking of this character, but it does not exist for most humans in the story. By comparing Jon Venex’s and other robots’ situations to the racial oppression of the mid-twentieth century, Harrison connects robot-human difference to racial difference. Racial oppression and civil rights activism is the way that Harrison wants readers to understand the oppression of robots in “The Velvet Glove.”

In the same story, the movement away from oppression relies on an ideology of “equality” and “superiority” and “inferiority.” The man who helps Jon compares human-robot oppression to the oppression that black people had experienced in the United States, but in this fictional world is now so far in the past that most people do not remember it and would not believe it. Jon has hope that he has met someone that is not a “robo-hater” and who is one of the rumored few humans who treats “robots as equals instead of machines.” This discussion of equality and superiority/inferiority that happens in this short section of the story encourages readers to apply their knowledge of contemporary racial oppression and the civil rights movement to understand the idea of robot oppression. Further, to be treated “as a robot” and not a “machine” suggests that to be enslaved or oppressed is to be treated like a “machine” and therefore an object. If someone is categorized as an object, by this story’s logic, they cannot also be a person. In this story, “robot”

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<sup>114</sup> Pascoe, “Miscegenation Law,” 48.

becomes a different site for subjectivity, "personhood," and citizenship. The differentiation between being a robot and being a machine suggests that in this story, robots are something more than objects, even though they are not always treated that way. Becoming a subject and an equal citizen involves an underground activist movement to educate robots on their oppressed state, as well as a first-person narrative by a robot that lets readers inhabit and experience a robot's subjectivity.

Ultimately, two of these stories represent the stories' human characters' inability to tolerate robot difference, despite the appearance of robot-human similarity and the success of activism and democracy. In R. R. Merliss's 1955 story "The Stutterer," a rogue robot that passes for human evades capture because he and his fellow robots are secretly more human than the public thinks. The robot, Jon Hall, reveals to the world that he and the other robots have brains that have been embedded with a human mind. When the public discovers this, the United Nations-like Galactic Senate rescinds their order to capture and imprison the robots, because of the apparent humanity of their minds.

Although all these robots look and act exactly like human beings, they were assumed to be dangerous criminals after the war they were built for. It is only when Jon Hall proves his "humanity" through not only the evidence of his permallium brain and human mind, but also through letting humans experience his and the other robots' thoughts within their own "sluggish gelatinous" meat brains, that he

and his fellow robots are rescued.<sup>115</sup> This story represents robots as oppressed beings, their oppression unjustifiable due to their abilities to think and feel like humans. Jon Hall and his fellow robots seek sympathy from humans through their sameness, and thus "The Stutterer" depends on a drama of discovered sameness in order to elicit human sympathy. The passages from Hall's point of view allow readers to see what he sees, know what he thinks, and, to some extent, feel his emotions. Readers know of Hall's "humanity" far earlier than Jordan or the other humans in the story, even though we do not know about Hall's human-imprint mind. At the end, when Hall reaches out to those with organic bodies and brains, he does so through telling "his story," presumably a version of the story that readers have just about finished reading themselves. This narrative of persecution and the robots' capabilities to have human thought and feeling demonstrates a mechanism of finding equality and a freedom from oppression through sameness and empathy for those samenesses. These samenesses, and the robots' human minds, require that they are treated as other galactic citizens, and not doomed to live on indefinitely encased in cement beneath the ocean. However, the fate of these robots in the conclusion of the story is not so smooth. They are not released and freed into the larger population of sentient beings of the galactic empire, but whisked away, "remove[d] from their confinement" and put "in some safe place where they will be afforded reasonable and humane treatment."<sup>116</sup> The bureaucratic boilerplate

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<sup>115</sup> Merliss, "The Stutterer," 66.

<sup>116</sup> Ibid.

language of the Galactic Senate and the story is vague. While the people of the galactic empire do not want these robots, whose thoughts they have felt and known to be similar to their own, to be imprisoned in cement, the governing body removes them to some other unknown place, and treated humanely.

While the robots are saved from a torturous fate, the story is peculiarly vague in its representation of the need for garnering sympathy for a fellow sentient being. The robots are to be put in a "safe place" but "safe" for whom? Presumably, as the robots are indestructible, built as soldiers for war, it is not the safety of the robots, but of the citizens of the galactic empire that concerns the Galactic Senate. Although the robots are not doomed to live forever encased in cement at the bottom of the ocean, they appear still not to be free to live as citizens and equals to the organic sentient beings. The sameness of their minds and thoughts to those of other sentient beings is not enough to overcome what makes them different — their indestructibility and existence as machines of war. Failing to free these robots from government imprisonment, whether in cement or in a "safe place," demonstrates this story's ultimate focus on the humans in the story, and the failure of their government to tolerate difference.

Another story, much different in tone from "The Stutterer," but resulting in a similar relocation of outspoken, oppressed robots into the reaches of space is David C. Knight's 1957 story "The Love of Frank Nineteen." In this story, there are both male and female robots, who are forbidden from fraternizing and falling in love with the opposite sex. The story follows Frank Nineteen, a male robot who had a secret

and illegal love affair with female robot Elizabeth. Authorities discover and arrest Frank Nineteen, and his story is made into a popular feature-length film, which leads to the passage of Robot Civil Rights. The story ends with Frank arriving with a spaceship full of robots at the space motel where he had carried on his affair. There to pick up Elizabeth, who had been left behind after Frank's arrest, he explains:

The minute I heard the news [of the passage of Robot Civil Rights] I applied to Interplanetary for homestead rights on Alinda. I made arrangements to buy a ship with the money I'd earned and then I put ads in all the Robot Wanted columns for volunteer colonizers. You should have seen the response! We've got thirty robot couples aboard now and more coming later. Darling, we're the first pioneer wave of free robots. On board we have tons of supplies and parts -- everything we need for building a sound robot culture.<sup>117</sup>

For Frank, the most important part of robot colonization and "civilization" is not "robot government, robot art, robot science," but heteronormative "robot marriage."<sup>118</sup>

The human narrator then marries Frank and Elizabeth to each other, pronouncing them "robot and wife," and then he marries all the other robot couples on the ship so that they can go on their colonizing mission, properly wedded. Now married couples, all the robots leave on their ship for their new planet. Their civil rights earned, they have also earned the right to leave human society and to live their lives the way that they want, away from human beings. Unlike in "The

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<sup>117</sup> Knight, "The Love of Frank Nineteen."

<sup>118</sup> Ibid.

Stutterer,” where the robots are removed from the non-robot culture by the government, these robots are choosing to leave of their own free will so that they can develop a robot civilization. However, the end result is the same in both stories — the attempted preservation of a homogenous population of non-robot beings. While the robots in both these stories need to prove their similarities to human beings in order to gain some measure of respect, “equality,” or “humane treatment,” once they earn that “equality” to humans they are still not similar enough to be allowed to live alongside them. This calls to mind what Lynn Spigel calls the colonialist fantasy of “white flight” within the context of the U.S. space program in the 1950s and 1960s. She suggests that “at its racist extreme, and according to NASA’s Associate Administrator Robert C. Seamans Jr., this colonialist fantasy was expressed by some overzealous ‘space cadets’ as a plan for ‘settling our surplus populations on the planets.’ (And note that the idea that space could be used as a place for relocating African Americans was voiced in popular culture at least since the late nineteenth century.)”<sup>119</sup> The vast reaches of space, to some Americans in

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<sup>119</sup> Lynn Spigel, “White Flight” in *The Revolution Wasn’t Televised: Sixties Television and Social Conflict* edited by Lynn Spigel and Michael Curtin (New York: Routledge Press, 1997), 49. Spigel’s footnote for this sentence is also interesting. She says that what comes to mind when thinking about the relocation of African Americans off-planet is a minstrel song she found in the “Smithsonian sheet music collection that featured a black minstrel on the cover and told the story of Parson Brown who promised his black congregation to take them to a utopian community on the moon. But when they got there they found they’d been duped because the moon was not utopia. See Gussie Davis, ‘I Just Got a Message from Mars,’ 1896, Devincent Sheet Music Collection, Box 94: 300, Smithsonian Institute, Washington, D. C.” (see note 6 on page 69). The science fictive aspects of this racist fantasy are suggestive of the

favor of segregation, then serve as a place to project a fantasy of the maintenance of “sameness.” The anxiety that some Americans felt over the civil rights movement, even if they supported its tenets of “equality” comes to light in these stories. These two robot stories from the 1950s represent problematically similar yet profoundly *different* populations of beings who must be contained and kept separate from “mainstream” culture. Although these robots are not explicitly racialized, the more general depiction of the robot as different “other” suggests an inability for the mainstream culture of these stories to tolerate difference, even at the same time the robots in the stories are arguing for better treatment based on their similarity. The stories “solve” the “problem” of what would happen if civil rights legislation should pass, and “others” are allowed equal treatment — by conveniently relocating now-equal populations where they no longer come in contact with the non-others. In the context of civil rights as a mode of democracy, then, are both celebrated and represented as problematic.

### **Conclusion**

This chapter opens with L. Frank Baum’s Tik-Tok, a clockwork automaton who has a “think” function that lets him problem-solve, but, as Baum assures us, does not let him actually think for himself. Tik-Tok has the appearance of autonomy in many

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ways that although lauded as a “progressive” genre, science fiction also serves to reinforce reactionary politics and ideologies.

ways, but is nothing but devoted to his “mistress” Dorothy.<sup>120</sup> This chapter concludes here with another Tik-Tok, but one much different than his namesake. Science fiction writer John Sladek made his name in black comedy parodies of science fiction authors in the 1970s and 1980s, often writing about robots. In 1973, he published a collection featuring parodies of several science fiction authors, including Asimov. The Asimov parody in this collection, “Broot Force,” involves a series of robots bound by the “Three Laws” who often kill humans because of loopholes and programming errors in the Laws.<sup>121</sup>

Sladek’s 1983 novel *Tik-Tok* features an intelligent household robot named Tik-Tok, who discovers that his “asimov” circuits (that impose the “Three Laws” on his behavior) do not work, or perhaps never really existed in the first place. In a parody of Asimov in particular and robot fiction as a whole, Sladek’s Tik-Tok lives a secret life killing the humans who oppress him: he kills his neighbor who is a blind girl and disposes of her body in the garbage disposal, he blows up an airplane with over 700 passengers, he ties a human suitor up and locks her in a trunk (which kills her when the garage housing the trunk explodes), he poisons a jar of pickles in a fast food restaurant with a brain-decaying poison, he guns down dozens of people in a

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<sup>120</sup> The automaton itself as a precursor to the “robot” is an “inherently captivating and disturbing object at the same time...it can arouse such widely ranging emotions as fascination and awe, contempt and horror” (Kang, *Sublime Dreams of Living Machines*, 304). Its “capacity to cross the boundaries between the antithetical categories of the natural and the artificial, the animate and the inanimate, the living and the dead” require a historical investigation (Ibid.).

<sup>121</sup> John Sladek, “Broot Force” in *The Steam-Powered Boy and Other Strangers* (London: Panther Science Fiction, 1973), 158-162.

bank robbery, shoots his human partner in crime in the eye, and strangles a man he discovers cheating at chess, to name a few of his crimes.

The novel begins much like the Adam Link stories, with a robot trapped in a room awaiting human judgment for his crimes, informing the reader through a first person narrative of the reasons for finding himself in that situation; later, readers discover it is a memoir/confession titled *Me, Robot*. Unlike Adam Link, however, Tik-Tok does kill humans. Instead of a narrative involving innocent robots oppressed by their situations, and finding nonviolent ways of promoting their goal of citizenship, Tik-Tok uses violence to test the limits of the robot-human property relationship. A civil rights law for robots is predicted to pass at the end of the novel, granting robots citizenship, but Tik-Tok is not involved in its passage, and does not appear to care.

Sladek also makes the robots with their asimov circuits explicitly about slavery, comparing it to the enslavement of African Americans in the antebellum U.S. Tik-Tok's first owner is a wealthy southern family who owns a fleet of robots in order to act out a fantasy of antebellum plantation life. The robots refer to their human owners as "master," with some serving as field hands and some house robots. The field hand robots have cabins away from the main house and sing Stephen Foster-esque songs written in dialect:

Hear de robots singin  
Happy as de live-long day  
Hear dem clap dere hands

O Mercy Lands!  
Tinfole laugh and play!<sup>122</sup>

As “tinfole” these robots enact a role no longer played by human beings, suffering the humiliation, abuses, and sexual demands of their human masters. Robots enacting the role of slaves in the antebellum South reveal human characters invested not only in having unpaid laborers, but also with nostalgia for the culture of the southern plantation. Their existence as artificial people singing a folk song emphasizes the constructed nature of their situation as enslaved beings. Since the robots have “asimov” circuits, the humans do not feel any remorse for how their behavior affects the robots, despite the robots’ ability to feel and think much like humans do.

The asimov circuits produce perfect beings for enslavement in Sladek’s fictional world, although Tik-Tok eventually wonders if the asimovs are even real, or just placebos to force both humans and robots to be content with the current system. He thought that “the idea of turning moral decisions into digital data (and screening out the wrong ones) was powerful and attractive. People wanted it to be true. They wanted robots incapable of sin, trustworthy slaves. So of course the manufacturers would invent imaginary circuits to make it so.”<sup>123</sup> Without the asimovs, humans would be morally responsible for enslaving intelligent creatures, and the robots would be unwilling to remain enslaved. A circuit is no stand-in for the psychology of a complex thinking being, and this is one of Sladek’s critiques of

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<sup>122</sup> Sladek, *Tik-Tok*, 31.

<sup>123</sup> *Ibid.*, 48.

Asimov's Laws. He also uses *Tik-Tok* to suggest that the idea of the "Three Laws" promotes turning a blind eye to what could be the enslavement of creatures much like humans, regardless of their resemblance (or not dissimilarity) to human beings.

Sladek's *Tik-Tok* is a robot narrative that toys with the conventions of robot fiction from the pulps of the 1940s and 1950s. Instead of enslaved or oppressed robots seeking U.S. citizenship via protest and legal routes, or robots that slaughter humans as per the Frankenstein archetype, Sladek's protagonist rises up against humans as an enslaved being seeking revenge on his masters. Tik-Tok does not care for citizenship as a desirable state in and of itself, but he does do things to get himself more freedom to do what he wants, protected by humans' belief that the asimovs control everything he does. His adventures lead to him to become the running mate for a presidential candidate, and even after confessing his crimes, humans let him go and accept him as a political candidate. "Sin" is the key that unlocks the door to equality with his human "masters," and they understand him as a human being because of his sin and his confessions. Unlike many of the robots discussed in this chapter, Tik-Tok is not bound by an earnest desire to serve mankind, but instead a desire to kill them for the joy of killing ironically results in his acceptance as equal to humans. He is a mass murderer and yet his confession is what makes him human enough to be considered an equal.

Sladek's Tik-Tok story throws into sharp relief the way that the notion of servitude is embedded into the figure of the robot. The pulps provided lasting

conventions for the fictional robot, and Sladek exploits those conventions to illuminate a variation on the theme of the citizen-robot. Sladek's Tik-Tok underscores the problematic construct of Baum's Tik-Tok, thinking yet unthinking, intelligent and yet satisfied to attend to Dorothy's every whim. These two Tik-Toks bookend the golden age of science fiction and the robots that inhabit the pages of the pulps and paperbacks that helped establish the conventions of golden age science fiction in the 1940s and 1950s.

**Man or Computer, Which Is the Best Machine?:  
NASA's Project Mercury and the Mechanization of Thought**

*Because of the marvels that computers can perform, we sometimes lose sight of the fact that the mind of man is still the best computer. Let us never forget that mechanical computers are simply the tools that help man to make quicker and better decisions.*

-- Robert Seamans Jr., 1962 "Address to Joint Computer Conference"<sup>1</sup>

*Man's computer has judgment and imagination. Man can think.*

-- Holmes, 1963 "Manned Space Flight"<sup>2</sup>

In 1962, National Aeronautics and Space Administration (NASA) Associate Administrator Robert Seamans Jr. reminded his audience to "never forget" the role of computers as tools. Necessary for government officials and the American public, this reminder was pertinent because as computers had entered the public consciousness, manufacturers, advertisements, and the press likened them to human brains. At this time, the rapid development of machines that used programmed algorithms fueled anxiety over computers' capabilities as machines whose abilities made them appear, for some, to think. Beginning in 1957 after the launch of the Soviet satellite Sputnik, the U.S. government invested significant resources to develop machines able to pilot spacecraft and perform a plethora of other automated tasks without direct input from human operators. For people like

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<sup>1</sup> Robert Seamans Jr., "The National Space Program -- A Progress Report," Seamans address before Joint Computer Conference, Philadelphia, PA, December 4, 1962, NASA HQ Historical Reference Collection, record number 46702.

<sup>2</sup> D. Brainerd Holmes, Holmes Speech - manned space flight program, Electronic Components Conference, Washington, D.C., May 8, 1963, NASA HQ Historical Reference Collection, record number 59490.

Seamans and Holmes, forgetting that computers were “tools” rather than objects that could replace the human brain was a real fear in the face of the advancement of computers, as it would downplay the “achievements” of the U.S. space program.

The automation of machines and the development of computers, however, was a critical part of the technology necessary for Americans’ space exploration missions. Indeed, as what became known as the “space race” continued into the 1960s, the computing machines used for space exploration grew more powerful in leaps and bounds and NASA officials as well as the American public relied on the comparison between the abilities of computers and the human brain in order to understand this new technology. Rapid technological development, like that of the computer, characterized the space race and was a marker of “progress.” In many ways, computers began to appear able to “think” more efficiently than people — for example, the number of calculations needed to safely complete a rocket launch and capsule reentry far exceeded the capabilities of even the fastest-thinking human beings. It was computer technology in particular that, in creating an illusion of mechanized “thought,” spurred a rethinking of the role of humans in intellectual ventures, for whom “rational thought” had until then been solely their domain.

In the 1960s, the ideological objectives of the space race — to articulate technological superiority as well as the embodied superiority of individual Americans over the Soviet Union — conflicted with the development of autonomous machines. Technological superiority in the space race depended on the development of increasingly automated machines, machines represented as

“thinking” machines. However, if these machines became too adept at their automation, then the successes of the space race became more about what machines could do, and not what feats individual Americans had performed. Without humans taking active roles in the exploration of space, the powerful symbolism and narrative of American space exploration would be all but lost. Project Mercury (1959-1963), America’s first manned space mission, demonstrates a moment when NASA administrators and other government officials faced a problem of representation because of the development of seemingly automated machines. To “pilot” one of the spacecraft in the early days of NASA was perhaps an exaggeration of the term — although all astronauts in the late 1950s and 1960s were test pilots from the U.S. Air Force, when aboard the first manned spacecraft -- the Mercury capsules -- they did little more than occupy a seat.<sup>3</sup> Constructing astronauts as active figures in the exploration of space became a priority for both NASA officials and the astronauts themselves.

The anxiety over the growing capabilities of computers to surpass the cognitive abilities of human brains threatened the very core of the American national identity the U.S. government was trying to shape during the space race.

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<sup>3</sup> Throughout this chapter, I deliberately use the terms “men,” “manned,” and “mankind” as opposed to more gender-neutral terms when referring to NASA’s programs in this period. Although thirteen women were privately trained for spaceflight in 1960, passing the same rigorous testing that the first seven male astronauts did, misogyny was rampant amongst NASA officials, and they did not consider women as astronaut material at this time. For more information about the “Mercury 13,” see Margaret Weitekamp’s *Right Stuff, Wrong Sex: America’s First Women in Space Program* (Baltimore: The Johns Hopkins University Press, 2004).

While the space race represented a period in the United States with heightened attention towards the ingenuity and inventiveness that signified technological “progress,” and therefore superiority over the Soviet Union’s government and cultural system, the advancement of computers paradoxically threatened to overshadow those valued American attributes. During the late 1950s and early 1960s, NASA constructed narratives asserting both the United States’ technological superiority over the Soviet Union, as well as the superiority of the Americans who built that technology. A delicate balance was needed between human and machine in order to assert that superiority, as well as a reconfiguring of the relationship between the two. At the same time, the Soviet Union was represented as too invested in the machine — they wanted to become the machine, while Americans resisted their own mechanization.

This “mechanization of thought” – by which I mean the process of developing automated computer systems and the related discourse linking those systems to human brains during the space race – created anxiety over the human-machine relationship. Computers and their mechanized thoughts appeared too alive, and granting them humanlike qualities eroded the achievements of American astronauts and engineers. While humans were primarily the actors and machines the acted-upon, the mechanization of thought raised the possibility of active machines and passive human beings.<sup>4</sup> NASA responded to and evaluated its major projects during

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<sup>4</sup> This anxiety anticipates Donna Haraway’s concerns of “disturbingly lively” machines and “frighteningly inert” humans in her “Cyborg Manifesto.” See Donna

the space race, and the speeches of NASA officials as well as mission press kits constructed a vision of human-machine that changed over the course of the space race and contained the anxiety over thinking machines.

Part of the public and internal discourse that NASA produced about the human-machine relationship during the late 1950s and early 1960s resonated with earlier science fiction and speculative science publications in the early 1950s. These types of narratives about machine automation and its effects on humans, as well as the imagined role of humans in space exploration contributed to a public interest in space exploration and technology. The first section of this chapter highlights Ray Bradbury's stories about automation from two of his short story collections, the 1950 *Martian Chronicles* and the 1951 *The Illustrated Man*. These stories reflect a particular type of technological anxiety, in which automated spaces drain the humanity and "life" from human characters, even as the machines themselves become more uncannily active. *Collier's* 1952-1954 series "Man Will Conquer Space Soon," written by several future NASA scientists and science writers is credited with sparking the American public's interest in space exploration, though it presents a different view of the human-machine relationship than either Bradbury or NASA, though all three engage in anxiety over lively machines and inactive human beings. The *Collier's* series chooses to locate human beings at the front and center of the

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Haraway, "A Cyborg Manifesto: Technology, and Socialist-Feminism in the Late Twentieth Century," in *Cyborgs, Simians, and Women: The Reinvention of Nature* (New York: Routledge, 1990), 152.

American project of space exploration, with machines playing peripheral roles as tools and training devices. The human body, though, becomes a problematic figure in this imagined machinescape, as it cannot be designed as machines can, and is seen by the authors as the “weakest” point in the exploration of space. It should be noted as well that robots play a minimal role in science fiction stories about space travel, and most often when piloting spacecraft the subject, it is human pilots, in the mode of the adventure story, that fly the ships.<sup>5</sup> In the 1940s and 1950s, as discussed in the previous chapter, robots most often played the role of servants of human beings, and within space exploration science fiction, there is a similar trend. These servant robots, however, merely underscore the argument of this chapter — that the development of computers via automated flight systems caused the need for radical reimagination and reconfiguring of the human-machine relationship, and humans’ roles in scientific and exploratory endeavors.

The mechanization of thought and its implications revealed by NASA’s public discourse is the focus of this chapter: As automated machines meant to facilitate space exploration grew more sophisticated, the perceived boundary between machines and humans required the intervention of NASA officials, as well as

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<sup>5</sup> See chapter four of Launius and McCurdy’s *Robots in Space: Technology, Evolution, and Interplanetary Travel* (Baltimore: Johns Hopkins University Press, 2008), 96-124, for a discussion of the role of robots in science fiction stories about space travel. The authors suggest that robots in these kinds of space exploration stories were nowhere near as numerous as those depicting human space exploration, and that the “robot stories tended to reinforce the popular image of space as the province of human beings” (see page 96).

astronauts themselves, in order to negotiate a relationship where the men were active in the face of increasingly lively machines. The assumption that as machines became more automated and seemingly more self-guided, people would become more passive runs throughout the archive of this chapter, and remains a concern of the late twentieth century. From 1957-1962, however, NASA sought to change this assumption in the face of the cultural politics of the space race.

Narratives about the purpose of the material body and the construction of the human body as a critical national symbol, as well as a focus towards the creation of the “active” human explorer helped to assuage the anxiety over automated machines. Speeches of NASA officials addressing computers and the “manned” spaceflight program, the design of the Mercury capsule, popular magazine articles about Project Mercury, and other public-facing discourse produced by NASA from the beginning of the space race in October of 1957 until astronaut John Glenn’s successful orbital flight in February, 1962, reveal the construction and dispersal of these narratives. This chapter further focuses on the ways that the discourse produced by NASA officials and the astronauts sought to work through what they saw as the changing relationship between humans and machines that the technological developments of the space race had wrought. The mechanization of thought demanded a reconfiguring of the “active” human and the (in)animate machine.

### **The Lively Sputnik**

The narrative of the space race between the United States and the Soviet Union tends to begin with a particularly lively machine – the Soviet satellite Sputnik launched in October 1957. Its successful launch and the Soviet Union’s subsequent announcement of its existence was widely reported by American journalists and discussed by U.S. government officials. Sputnik was a machine lively in its brief orbit around the earth: In order to detect the unmanned satellite on its travels, Soviet engineers built it with the only task that it could perform, broadcasting a radio signal to mark its position. From earth the satellite would appear to emit a steady beeping audible over a radio frequency, and it also could be seen with strong enough binoculars as it moved through the sky.<sup>6</sup> Many Americans first heard Sputnik’s beeping via an NBC news report, but only after U.S. military personnel “announced that ABMA’s [the Army Ballistic Missile Agency] communications team had also captured its signal. ‘It beeped derisively over our heads,’ [the PR officer] said.”<sup>7</sup> Sputnik’s “derisive” beeping encapsulates the construction and representation of Sputnik as a lively machine, lively through its autonomous movement and audible signal. While the first Sputnik disintegrated when re-entering the earth’s atmosphere three months after its launch, it marked not only the beginning of the space race, but the beginning of a period where the development of increasingly autonomous machines signaled a blurring of the

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<sup>6</sup> Matthew Brzezinski, *Red Moon Rising: Sputnik and the Hidden Rivalries that Ignited the Space Age* (New York: Henry Holt and Company, 2007), 145.

<sup>7</sup> *Ibid.*, 167.

boundaries between human and machine. Sputnik and the implications of its beeping were the beginning of a broader reconsideration of the roles of humans and machines in a period of American history characterized by the push towards technological “progress” that continued throughout the cold war period.<sup>8</sup>

After Sputnik’s launch the United States considered its own options in the ideological competition to show democracy’s superiority over communism. In order to compete with one of the ideological grounds that the Soviet Union set forth with Sputnik, the U.S. government amped up its campaign for space exploration/domination. The idea of manned spaceflight programs had been of interest to the American public since World War II. Similarly, rocket science had interested the U.S. government since the end of the war, as Germany’s V-2 rockets, developed and researched in earnest in the last years of the war, attracted the attention of both the Allies and Russia. During the war, as bomb-delivery systems, the V-2s dropped explosives on both London and Antwerp. Although they caused relatively few deaths in those cities, after the war the United States was interested in obtaining the technology and the scientists responsible for it.<sup>9</sup> One of the German

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<sup>8</sup> For an excellent overview of the history of the space race, see Walter A. McDougall, *...The Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books Inc., 1985), 142. See also Gerard J. DeGroot’s *Dark Side of the Moon: The Magnificent Madness of the American Lunar Quest* (New York: NYU Press, 2006)

<sup>9</sup> Although some 2000 people died due to the German rocket attacks, which started in September of 1944, far more people died during the process of their production — an estimated 12,000 people — almost all taken from concentration camps and forced to work at the Mittelbau-Dora factory that produced the rockets, most of whom died from the appalling conditions, or from being executed for suspected sabotage.

scientists that the United States “acquired” was Wernher von Braun, who had been one of the leading rocket scientists of Nazi Germany during the war.<sup>10</sup> Von Braun became a prominent public figure in the early years of the U.S. space program, and he pushed the development of the manned space program that eventually led to the Apollo moon landing in 1969.<sup>11</sup>

After Sputnik, the United States’ fear of falling behind in the development of space travel technologies was not only about a competitiveness of which nation could perform scientific progress better, but also about an ideological competition in which space, machines, and astronauts all played starring roles. The lively machine Sputnik gave rise to the lively computerized machines of the U.S. space program, which forced a redefinition of both “man” and his machines against the backdrop of powerful ideologies critical to the United States as a nation in the early 1960s. However, although the lively Sputnik tends to mark the beginning of the space race, the story of automated machines and their role in American culture

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<sup>10</sup> Wernher von Braun was the most famous of the German scientists made U.S. citizens via “Operation Paperclip.” During WWII, he was a Nazi rocket scientist, designing both the V-1 and V-2 rockets that were used to bomb London. His participation in war crimes was never proven, but by the 1970s, when survivors of Mittelwerk living in France recognized his photo in a magazine article and told stories of his crimes at the concentration camp, serious doubts were cast upon his claims of innocence. This did not, however, stop him from receiving the National Medal of Science in 1975, two years before his death. For more on von Braun and German rocket science in the 1930s and 1940s, see the chapter “Slaves to a Dream” in *Dark Side of the Moon* by Gerard DeGroot.

<sup>11</sup> Among his other appearances as a public advocate of American space exploration, von Braun also appeared in three episodes of *Walt Disney’s Wonderful World of Color* about the colonization of space from 1955-1957. See note 20 for more information.

during the space race begins with how Americans imagined automation and the human role during future space exploration with the help of science fiction and speculative science writing of the early 1950s. These kinds of discourse helped lend a framework to how the lively machines of the space race grew to threaten the active role of human beings during Project Mercury.

### **Imagining the Human in Automated Space with Ray Bradbury**

Ray Bradbury was and still is one of the most famous American science fiction authors of the twentieth century. Unlike Isaac Asimov, discussed in the previous chapter, Bradbury wrote in a more literary style and focused on the social and cultural effects of technology on Americans. The way that Bradbury imagines automation goes beyond robots that act in the service of human beings, which was a more typical plot line in robot stories from the 1940s and 1950s. Although many of his stories contain robots, the most compelling living machines of his stories are those automations that push the boundaries of the mechanical and biological: projections of human thoughts brought to life by a computerized nursery, an automated house grown paranoid and aware in the absence of its human inhabitants, a living city with mechanized body part analogues built to replace humans with automatons to do its work.<sup>12</sup> These visions of automation reveal a

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<sup>12</sup> Bradbury's robot stories are numerous. Most often, robots in his stories from the late 1940s and early 1950s are used by characters as human replicas or replacements. In "Usher II," from *The Martian Chronicles* (first published as "Carnival of Madness" in the April 1950 issue of *Thrilling Wonder Stories*), a literary

profound anxiety over the effects of an increasingly mechanized American culture on the minds and bodies of Americans.

In "The Velt," first published as "The World the Children Made" in the *Saturday Evening Post* in 1950 and later in the 1951 Bradbury collection *The Illustrated Man*, a couple's children have been acting oddly, and the parents worry that their children have suffered psychologically because of their automated lives.<sup>13</sup> Their house is a "Happy-life Home," which "clothed and fed and rocked them to sleep and played and sang and was good to them."<sup>14</sup> Lydia, the children's mother, worries that the house has replaced her as a wife and mother and nursemaid, as it can do all of the

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expert builds a replica of the House of Usher from Poe's "The Fall of the House of Usher" on Mars, populating it with robots to help create the proper eerie gothic feeling. Unfortunately, works of literature that are dark, frightening, or fantastical have all burned in a McCarthy-esque purging in the mid twentieth century, including the works of Poe. The protagonist invites members of the "Society for the Prevention of Fantasy" to his house, where they die one by one in manners similar to characters from Poe's stories. They are replaced by exact robot replicas so that no one leaves the party, and everyone attending believes that it is the robots that are "killed" rather than the humans. Another robot story from *The Martian Chronicles* is "The Long Years," originally published in 1948, where a group of men from a rocket discover an old man living on Mars who has created replicas of his wife and children after they had died many years earlier. The old man dies, and his family lives, and the men who had discovered their secret decide to let them live because "they've as much right to — to life as you or I or any of us" (165). "Marionettes, Inc.," from 1949, tells the story of a man who buys a replica of himself from a company who creates robotic human duplicates, so that he can escape his wife's neurosis. His duplicate, however, falls in love with the man's wife and kills his human counterpart so that he can replace him.

<sup>13</sup> *The Illustrated Man* is dedicated to Henry Kuttner, husband of writer C. L. Moore, who wrote "No Woman Born," the story discussed at length in the first chapter of this study.

<sup>14</sup> Ray Bradbury, "The Veldt" in *The Illustrated Man* (New York: Harper Collins, 1999), 7.

domestic tasks of parenting and cleaning more efficiently than she can.<sup>15</sup> The Hadley parents invite a friend of theirs, who is also a psychologist, to visit with the children, and he concludes that the children need immediate psychiatric care. All of the problems of the parents with their children is distilled down to several disturbing experiences that they have in the virtual reality “nursery” room that they’d had installed in the house. In this room, the children play and are able to imagine any kind of setting and characters, the room reproducing these thoughts as a realistic experience with touch, smell, sounds, and visions from their imagination. Whenever the parents enter the room, however, they find themselves in an African veldt, with lions feeding on something at a distance. The lions turn and approach them, snarling and growling before the parents leave, afraid of these realistic visions produced by the nursery and their children’s minds. Eventually, they turn off the nursery to punish the children, only to end up locked up inside by their children, realizing that the lions in the distance had been eating them, and being eaten themselves. The horror of automation that drains humans of empathy is emphasized in “The Veldt” by the story of children who kill their parents when they do not get what they want. An overly automated existence, with robots and machines doing everything for them creates children with “cheeks like peppermint candy, eyes like bright blue agate marbles, a smell of ozone on their jumpers” willing to kill their parents when they are not allowed to go on a rocket trip to New York.<sup>16</sup>

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<sup>15</sup> Ibid., 11.

<sup>16</sup> Ibid., 14.

Within the story, characters believe that the children's violent imagination is due to the automation of their lives via the Happy-life House. The children's father, George Hadley, invites psychologist David McClean to the nursery room, and McClean says, "This doesn't feel good, I tell you. Trust my hunches and my instincts. I have a nose for something bad. This is very bad. My advice to you is to have the whole damn room torn down and your children brought to me every day during the next year for treatment."<sup>17</sup> He continues:

You've let this room and house replace you and your wife in your children's affections. This room is their mother and father, far more important in their lives than their real parents. And now you come along and want to shut it off. No wonder there's hatred here. You can feel it coming out of the sky. Feel that sun. George, you'll have to change your life. Like too many others, you've built it around creature comforts. Why, you'd starve tomorrow if something went wrong in the kitchen. You wouldn't know how to tap an egg. Nevertheless, turn everything off. Start new. It'll take time. But we'll make good children out of bad in a year, wait and see.<sup>18</sup>

The problems that automation raises spread to the psychological state of all members of the family, not just the children. Living within an automated space has produced humans unable to do things for themselves, and it is psychologically damaging for the human inhabitants to use the house as a replacement mother, wife, or father. This conversation with McClean makes George Hadley decide to shut off the nursery. He then goes around the house, turning off all the machines, "The house was full of dead bodies, it seemed. It felt like a mechanical cemetery. So silent. None of the humming hidden energy of machines waiting to function at the tap of a

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<sup>17</sup> Ibid., 20.

<sup>18</sup> Ibid., 21.

button.”<sup>19</sup> The children are furious with their parents for turning off the nursery and all the other machines, and Peter says, “I wish you were dead!” to which his father replies, “We were, for a long while. Now we’re going to really start living. Instead of being handled and massaged, we’re going to *live*.”<sup>20</sup> Bradbury represents the machines of the house as doing the living in lieu of humans, the “dead bodies” of the machines juxtaposed against George’s assertion that it was now his family’s chance to live. It is with irony, then, that the story ends shortly after George’s declarations for living, with the children reactivating the nursery and trapping their parents inside to be consumed by their imaginations. The link between the children’s minds and their nursery make it possible for the lions to become real enough to kill their parents, and the boundary between the living and the inanimate is breeched due to this human-machine interaction.

The domestic machinery of the Hadley house is a far cry from the NASA’s space capsule automation, but Bradbury’s visions of automation allow for imagining a future where such machinery does the living for human beings, producing children who become too much like machines themselves: They have little empathy and kill to get what they want. The penultimate story of Bradbury’s *The Martian Chronicles*, “There Will Come Soft Rains,” also features an automated domestic space in the form of a robotic house. The Happy-life Home and the robotic house of “There Will Come Soft Rains” are both highly automated spaces, much like the way that NASA

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<sup>19</sup> Ibid., 22-23.

<sup>20</sup> Ibid., 23. Italics Bradbury’s.

engineers imagined and designed the Mercury space capsule. "There Will Come Soft Rains" begins with a vision of domestic perfection in a house of the future — the house automation makes breakfast for a family and reminds them when to leave the house, but "no doors slammed, no carpets took the soft tread of rubber heels."<sup>21</sup> The house is empty of human inhabitants, yet its automated machinery continues to go through its programmed motions for its family. Readers soon discover that "The house stood alone in a city of rubble and ashes. This was the one house left standing. At night the ruined city gave off a radioactive glow which could be seen for miles."<sup>22</sup> Soon, Bradbury reveals that one of the outside walls of the house has five silhouettes burned into it of a man, woman, their two children, and the ball the children had been playing with, presumably, when an atomic bomb exploded over their city. No humans remain to interact with the house's automation.

As the house continues its day, its automation in sharp contrast to the devastation outside, it seems to come alive:

Until this day, how well the house had kept its peace. How carefully it had inquired, "Who goes there? What's the password?" and, getting no answer from lonely foxes and whining cats, it shut up its windows and drawn shades in an old-maidenly preoccupation with self-protection which bordered on mechanical paranoia. It quivered at each sound, the house did. If a sparrow brushed a window, the shade snapped up. The bird, startled, flew off! No, not even a bird must touch the house!<sup>23</sup>

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<sup>21</sup> Ray Bradbury, "There Will Come Soft Rains" in *The Martian Chronicles* (New York: Bantam, 1979), 167.

<sup>22</sup> *Ibid.*

<sup>23</sup> *Ibid.*, 168.

While the house comes alive in the absence of its human beings, it is with a realization "that only silence was here."<sup>24</sup> And as the house had come alive through its mechanization, it too dies when it catches fire later that evening: "At ten o'clock the house began to die."<sup>25</sup> Bradbury imagines automation that exists on the edges of consciousness, machinery that can live and die, and that appears uncannily alive with the realization that its humans are dead. These automated structures, the Happy-life Home in "The Veldt" and the house in "There Will Be Soft Rains" are mechanized spaces, and in some ways lend themselves to the anxiety over the perceived loss of human agency within the automated Mercury capsule discussed later on in this chapter.

The last Bradbury story about automation to be treated in this chapter is his 1950 story "The City," also collected in *The Illustrated Man*. In this story humans land on a planet that appears to be unoccupied except for a city in the distance. The astronauts enter the city to explore, but they do not know what readers do, that the city itself is alive, a giant mechanism powered by a "Mind," designed and built by the previous, long dead inhabitants twenty thousand years earlier. Built to detect people from earth, the city has a mechanical nose, ears, tongues, and other sensory devices that do not have human analogues. Without the astronauts' notice, it captures the captain of the mission, and takes him apart, processing his organs and blood in order to test whether or not he is indeed from earth. Once the Mind of the

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<sup>24</sup> Ibid.

<sup>25</sup> Ibid., 170.

city determines that the astronauts are indeed from earth, it replaces the captain's insides with mechanical parts: "Into the wet interior were placed organs of copper, brass, silver, aluminum, rubber and silk' spiders spun gold web which was stung into the skin; a heart was attached, and into the skull case was fitted a platinum brain which hummed and fluttered small sparkles of blue fire, and the wires led down through the body to the arms and legs. In a moment, the body was sewn tight, the incisions waxed, healed at neck and throat and about the skull — perfect, fresh, new."<sup>26</sup> The captain comes "alive" again with his new robotic innards, and he finds the rest of his crew. Through the captain's mouth, the city tells the remaining astronauts that the purpose of the city built by the planet's inhabitants thousands of years ago is revenge. Ancestors of human beings had visited the City's planet and devastated the population with a "terrible disease, a form of leprosy with no cure."<sup>27</sup> With their people's last energy, the planet's inhabitants built the city as a way to test any space travelers who arrived. When found to be Earthmen, the city would replace the astronauts with automatons that would return to Earth and drop "golden bombs of disease culture" on the planet, to infect and kill all humans on earth.<sup>28</sup> All the remaining astronauts, after hearing this, are gutted, their insides replaced with mechanical parts. They bring the bombs to the rocket and leave the planet, and "the city lay upon the summer meadow. Its glass eyes were dulled over.

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<sup>26</sup> Ray Bradbury, "The City" in *The Illustrated Man* (New York: Harper Collins, 1999), 229.

<sup>27</sup> *Ibid.*, 230.

<sup>28</sup> *Ibid.*, 231.

The Ear relaxed, the great nostril vents stopped, the streets no longer weighed or balanced, and the hidden machinery paused in its bath of oil. In the sky the rocket dwindled. Slowly, pleurably, the city enjoyed the luxury of dying."<sup>29</sup>

Like the machines of "The Veldt" and "There Will Come Soft Rains," the machines of this story can "die," and exist along a boundary of life and non-life. The city, however, appears more aware of its own consciousness and purpose than either the Happy-life Home or the house from "There Will Come Soft Rains," as its machinery contains a "Mind" connected to mechanical sensory organs. Bradbury imagines a city that itself is a living entity through its ability to think via its processing and calculating Mind. Its automated thought to carry out the wishes of its designers and builders thousands of years hence bring this city to life, with human body part analogues that are both familiar and profoundly alien. While the city itself is an automated space, much to the dismay of the astronauts who exist within it, the city inverts this paradigm, of humans inside a mechanism, by installing its own mechanical parts into the bodies of humans. Instead of being occupied by humans, it is the humans who become the space within which machines can act out their desires — and the desire to kill. With this Mind, however, comes the murderous spirit with which it was programmed, and the subsequent implied extinction of humanity. The Mind of this city is an early version of a killer machine that is a computer rather than a robot, but death to humanity itself comes to humans

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<sup>29</sup> Ibid.

via their own bodies, installed with mechanical parts. Through integrating automated thought, space exploration, and the idea of the organic and inorganic body, Bradbury suggests a transition from the mechanical robot body as threatening to the mechanical, automated mind. The city has an automated consciousness that overtly threatens humanity, rather than individualized conscious, killer robots. With the boundary between the human body and the machine eroded in this city, the horror of the living machine is pushed to extremes.

In his stories of automated spaces, including "The Veldt," "There Will Come Soft Rains," and "The City," Bradbury constructs and reflects anxiety over a human-machine relationship, where humans become a less active partner alongside the steadily more active machines. While the automation of the Mercury capsule only threatened to replace human agency and activeness, at least in the minds of some NASA administrators and the astronauts themselves, it is the anxiety over automated, mechanized thought highlighted in "The City" that colors the imagined human-machine relationship in the late 1950s and early 1960s.

### **Space Science Writing in *Collier's* and the Science Fiction Imaginary**

While Bradbury's stories worked to configure the impact of automation on American culture in the realm of science fiction in the early 1950s, an eight-part series published in *Collier's* at the same time made space travel seem possible for Americans, but through placing "man" in the center of this project. "Man Will Conquer Space Soon" came about due to a meeting of *Collier's* representatives and

space scientists at the First Symposium on Space Flight in 1951.<sup>30</sup> As a result of this meeting, scientists and *Collier's* writers and illustrators collaborated to provide easily accessible science-based articles on the status and potential of American space exploration, which many scholars and NASA officials cite as a “turning point” in popular interest in the American space program.<sup>31</sup> This series of articles,<sup>32</sup> published from 1952 through 1954, was immensely popular in the United States, with an estimated readership of 12-15 million.<sup>33</sup> Part of the popularity of this series was due to the combination of science “fact” with speculative visuals and “comic-book story” — the series included stunning images, paintings by space artists Chesley Bonestell and Fred Freeman, the former an artist specializing in “realistic” astronomical art, and the latter a painter who illustrated pulp magazine covers as

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<sup>30</sup> Bob Ward, *Dr. Space: The Life of Wernher Von Braun* (first page of ch 10). (Naval Institute Press 2013)

<sup>31</sup> DeGroot, *Dark Side of the Moon*, 40. For more on the influence of the *Collier's* series, see also Howard McCurdy's “Space Fever: From Fantasy to Reality” in *1950s 'Rocketman' TV Series and Their Fans: Cadets, Rangers, and Junior Space Men*, edited by Cynthia J. Miller and A. Bowdoin Van Riper (Palgrave MacMillan, 2012); *This New Ocean: The Story of the First Space Age* by William E. Burrows (Random House, 2010), 142-145; and *Epic Rivalry: The Inside Story of the Soviet and American Space Race* by Von Hardesty and Gene Eisman (National Geographic Books, 2007), 39-44.

<sup>32</sup> *Collier's* also published short fiction and serialized novels by established writers. Ray Bradbury's story “There Will Be Soft Rains” first saw publication in *Collier's*. Along with the space exploration series, the magazine also published a speculative fiction series in 1951, called “Preview of the War We Do Not Want.” This series consisted of articles reporting on a nuclear war between the Soviet Union and the United States and its aftermath. Despite the popularity of these series in the early 1950s, *Collier's* last issue was published in 1957.

<sup>33</sup> Paul Dickson, *Sputnik: The Shock of the Century* (New York: Walker & Company, 2001), 78.

well as “space art.”<sup>34</sup> Historian and contributor to *Collier's* Cornelius Ryan also contributed, and “helped the scientists provide drama and punch” to the series, resulting in an adventure story drama that also related the story of the “progress” of current scientific space research.<sup>35</sup> “What you will read here is not science fiction. It is serious fact,” the first page of the first article in the series warns readers.<sup>36</sup>

One of the main scientist-contributors, who became a visible spokesperson and advocate for the American space program, and later NASA, was the aforementioned German rocket scientist Wernher von Braun.<sup>37</sup> The *Collier's* series led to a collaboration between von Braun and Walt Disney to produce three hour-long television specials on space travel in the mid-1950s.<sup>38</sup> While both the *Collier's*

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<sup>34</sup> DeGroot, *Dark Side of the Moon*, 40.

<sup>35</sup> Ibid.

<sup>36</sup> Cornelius Ryan, et al, *Man Will Conquer Space Soon* in *Collier's* (March 22, 1952), 23.

<sup>37</sup> Many of the other scientists involved in the *Collier's* series had been researchers for the German military during WWII, immigrating to the United States and becoming naturalized citizens in 1955 under Operation Paperclip. Heinz Haber researched aviation medicine for the Nazis in the mid-1940s, an institute that experimented on concentration camp inmates, and Ernst Stuhlinger, who did not contribute to *Collier's* but was a technical advisor for the Disney specials based on *Man Will Conquer Space Soon*, worked for von Braun both in the Nazi rocketry research facility (which used concentration camp inmates of Dachau to build V-2 rockets) and for von Braun's research team for the U.S. Army at ABMA (Army Ballistic Missile Agency) in the late 1940s and early 1950s. Willy Ley, a science writer famed for his ability to explain complex science to a popular audience, was another German-born participant of the *Collier's* series, and was the founder of the German Rocket Society in 1927, but he had not been part of the German military, fleeing Germany for the United States in 1935.

<sup>38</sup> The three episodes were part of the *Disneyland* series meant to promote the Disneyland theme park. The first was “Man in Space,” which covers von Braun's ideas for building a space station that would orbit the Earth and serve as a future

articles and the derivative Disney specials envisioned a future where Americans would have satellites, space stations, and go to the moon, they did not focus much of their content on the role that computers and other seemingly autonomous machines would play in the exploration of space — machines that ultimately ended up being indispensable agents of American space exploration. Men were at the front and center of these imagined future space ventures, and machines were only tools meant to facilitate the men's space adventures. As Launius and McCurdy have noted, "humans stood at the center of the vision of spaceflight to the public at large," while robots and other machines were imagined as peripheral tools to help humans get into space.<sup>39</sup> The *Collier's* series was no different, with machines relegated to training tools and support for human-based space exploration. However, several articles specifically geared towards educating the public on the field of space medicine discuss the human body in a way that reveals the eroding boundary between man and machine that became increasingly important as NASA developed its automated machines for Project Mercury.

The first of these articles about space medicine is perhaps the most revealing in terms of the ways that scientists envisioned the role and fallibility of the human body. Heinz Haber, an expert in space medicine who did research on the effect of high altitude flight on concentration camp inmates during WWII writes that man

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platform for space exploration. It aired in 1955. The second was "Man and the Moon," also aired in 1955, and the third was "Mars and Beyond," in 1957.

<sup>39</sup> Launius and McCurdy, *Robots in Space*, xii-xiii.

“has a great variety of materials and devices at his disposal. He may eventually succeed in developing a flawless machine. The same cannot be said for man. He is the most important link, and yet the weakest one, in any attempt to conquer space. And he cannot be redesigned.”<sup>40</sup> In this vision of space travel, “man” is acutely different from machines, in that while machines can be designed, man cannot. As a fallible cog in the mechanisms of space travel, man becomes the imperfect device in an otherwise perfectible system. Haber continues by explaining the various challenges that man will face in the environment of space. He writes, “While the machinery of the body will go on operating in an orderly fashion even if it is weightless, man will possibly encounter trouble when he attempts to go about his daily routine.”<sup>41</sup> Haber’s phrasing here positions the human body as a machine, with its “machinery” “operating” properly while weightless, but with its “daily routine” problematic. The behavioral aspect of man in a weightless environment would be what is problematic to Haber, rather than the “machinery” of the body.

Another issue in the *Collier's* series is devoted to all issues relating to space medicine and the viability of the human body in space. Called “Man’s Survival in Space,” the tagline of the article reads, “We can build the rocket ships, but success depends on the most complicated mechanism of all: the human body.”<sup>42</sup> *Collier's* again positions the human body as a “mechanism,” but one even more sophisticated

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<sup>40</sup> Heinz Haber, “Can We Survive in Space?” in *Collier's* (March 22, 1952), 35.

<sup>41</sup> *Ibid.*, 67.

<sup>42</sup> Cornelius Ryan, et al, “Man’s Survival in Space” in *Collier's* (February 28, 1953), 40-41.

than the machines necessary for space travel. In the article itself, the authors claim, "The success of any program to reach space depends on the machines, it is true. But even more largely it depends on the most delicate, most indispensable of all instruments — man himself."<sup>43</sup> Likening the human body to an "instrument" and a mechanism fits human beings into space travel and exploration. "Man himself" is "indispensable," but also provides many of the engineering and design obstacles that need to be overcome for space travel.

As a crucial set of texts in the story of the U.S. space program, the *Collier's* series presents an intriguing vision of manned space exploration for Americans. These articles, while arguing for the central place that man will take in the exploration of space, at the same time often liken the human body to machinery. The vision both of man as machine, and man as an undesignable object promoted in *Collier's*, changes by the end of the 1950s, when space scientists begin looking to the notion of cybernetics to imagine man in space.<sup>44</sup> The astronaut's body becomes the problematic site of human-machine integration. By the early-1960s, he is imagined as a cyborg, part of a smoothly integrated human-machine system. Imagining space travel in the 1950s minimized the role of machines in performing intellectual tasks — astronauts piloted spaceships, plotted courses, and explored alien landscapes with machines as tools that aided them rather than tools they were dependent

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<sup>43</sup> Ibid., 41.

<sup>44</sup> See the article that first uses the word "cyborg" in print, "Spaceman Is Seen as Man-Machine: Scientists Depict the Human Astronaut as Component of a 'Cyborg' System," in the May 22, 1960 issue of the *New York Times*.

upon.<sup>45</sup> NASA as well began to see “man” as part of the human-machine system when designing the Mercury capsule, a component which can be chosen and tailored via training for Project Mercury, discussed in a later section. This shift happens in conjunction with the development of the seemingly autonomous computer systems of Project Mercury, the “living machines” at the center of this chapter’s focus.

### **Creating a Machine/Human Division: NASA’s “Manned” and “Unmanned” Programs**

Although Eisenhower gave the go-ahead in 1958 for what would become the first American manned space program, Project Mercury, he was reluctant to provide the resources for future manned missions.<sup>46</sup> What Eisenhower set in motion in the late

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<sup>45</sup> Another example of machines being only a tool for space exploration in film and fiction depicting space travel and exploration during the 1950s is Robby the Robot from the 1956 science fiction film *Forbidden Planet*. In the film, space travel is performed by men, with the help of navigation devices, but humans are still necessary to plot courses. When a human crew lands on Altair IV to check in on another group of humans that had been headed there twenty years earlier, they are greeted by Robby the Robot. Robby was designed and built by one of the only humans left on Altair IV as a mechanical servant. He obeys programmed behavioral restrictions that prevent him from harming humans, and require him to obey commands from humans. In this film about interplanetary space travel and exploration, the robot serves the role as domestic servant, and does not participate in exploration or navigation, and as such, his presence does not threaten the autonomy and agency of the humans of the film. It is often compared to the Shakespeare play on which it is based, *The Tempest*.

<sup>46</sup> Eisenhower, in December of 1960, was reportedly “shocked” at the cost estimates for the Mercury and Apollo programs, and thought that “there was no scientific or defense need for a man-in-space program beyond Mercury.” See John M. Logsdon, *John F. Kennedy and the Race to the Moon* (New York: Palgrave Macmillan, 2010), 27-28.

1950s, however, John F. Kennedy continued and extended when elected president in 1960. Eisenhower was known for his conservative spending policies and did not commit a large amount of resources to NASA. However, from the beginning of his run for the presidency, Kennedy was keenly aware of the impact that publicized manned space missions could have on America's positioning as a world power on the international stage. Despite reports of his initial personal disinterest in space immediately after Sputnik's launch, Kennedy quickly harnessed the American public's interest in manned space exploration for his election campaign. Under his "New Frontier" campaign ideology, Kennedy pointed towards the importance of space exploration as a national project, tying the space program's exploration goals to the longer trajectory of national identity relating to the idea of the frontier.<sup>47</sup>

NASA decided to focus on two different types of space missions, which, though they often overlapped, maintained very different levels of funding and public attention. Manned missions and unmanned missions served two separate goals and

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<sup>47</sup> After becoming president in 1961, Kennedy aggressively pursued the idea of the New Frontier and its implications with respect to the U.S. space program. One of Kennedy's most well known speeches is his address to a joint session of Congress in May of 1961. In it he outlines the general goals of the American space program and the necessary funding required from Congress, setting a manned mission to the moon by 1970 as the specific goal. Kennedy also discusses civil defense, communism, etc. in this speech, but it's most remembered for his comments on the space program. The space race, in this speech, is tied to broader national projects of the cold war. With this speech, the objective of manned spaceflight solidified into a major undertaking in the national project of the 1960s. Kennedy's setting of a manned moon mission as a goal provides a picture of the way that the space program became divided in the early 1960s.

“there was a well-established division between unmanned programs that could serve practical applications and the more costly manned efforts that would serve political ends.”<sup>48</sup> The narratives constructed for this symbolic and highly publicized side of the space race depended on sending men into space, while unmanned programs gathered data, launched and maintained communications and surveillance satellites, and engaged in other more “scientific” purposes. Although both manned and unmanned missions held political clout in the context of demonstrating technological prowess for the Soviet Union and the world, the manned missions retained a powerful political currency unmatched by unmanned missions.

Somewhat paradoxically, NASA’s planned manned missions could only have happened with the development of machines that could operate autonomously — without the near physical presence of a human operator. Launching a man into space, and controlling the flight of a spacecraft was so complicated that they needed computers in order to maintain the systems necessary for a successful mission. Although Kennedy’s 1961 address had set sending a man to the moon as a technical goal, the real purposes of manned space missions were to meet ideological and symbolic goals — the scientific achievements of these missions were secondary and derivative. For the purpose of scientific research, many argued that it was unnecessary to have a human aboard a spacecraft. In fact, “the notion that humans

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<sup>48</sup> T. A. Heppenheimer, *Countdown: A History of Space Flight* (New York: John Wiley & Sons, Inc., 1997), 197.

were needed to compensate for the shortcomings of machines, in the view of scientists, had 'very limited validity.' To the contrary, critics asserted, humans were a hindrance on most space flights. They used up precious space. Machines that could be installed to gather information had to be replaced with equipment designed solely to keep occupants alive."<sup>49</sup> These discussions suggest that the development of automated machines represented a crucial moment in deciding the role of humans in relation to machines. When automation technologies became advanced enough, they raised the question of whether or not humans were necessary on exploratory space missions in the first place — and what purposes they might serve aboard a largely automated spacecraft.

Despite objections to the manned spaceflight program, the overwhelming majority of government officials, as well as (not coincidentally) the American public, supported such a program. The manned mission to the moon, as well as the Mercury capsule flights in the early 1960s captured the imagination of the American public in a way that the launches of unmanned, automated spacecraft during that period could not. The U.S. government directed attention towards the humans involved in spaceflight during this period, specifically the astronauts, because the astronauts provided something that the machines did not — a human, American symbol that leveraged the public's interest in narratives of human space exploration and colonization. The manned mission as the primary goal of American space

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<sup>49</sup> Howard E. McCurdy, *Space and the American Imagination* (Washington, DC: Smithsonian Institution Press, 1997), 216.

exploration facilitated the construction of narratives about the superiority of the (white, male) American body and mind, which were national projects in their own right during the early cold war period. It was “easy” to send an automated machine into space, but it took exceptional engineering and technological skills, as well as the physical and mental fortitude of individual astronauts to send a person into space. Although the Soviet Union sent the first man and the first woman into space before the United States did (cosmonauts Yuri Gagarin in April of 1961 and Valentina Tereshkova in June of 1963),<sup>50</sup> the U.S. response minimized those achievements by emphasizing the presumed automated nature of the Soviet Vostok spacecraft.<sup>51</sup>

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<sup>50</sup> The first American woman in space was Sally Ride, who did not go into Earth’s orbit until almost exactly 20 years later in June of 1983. However, she was not a pilot as Tereshkova was — the first American woman to pilot a mission was Eileen Collins in 1995. She was also the first female commander of a NASA mission, in 1999. See Constance Penley’s *NASA/Trek* (New York: Verso, 1997) for more on the gender politics of NASA in the 1980s and 1990s.

<sup>51</sup> In response to Tereshkova’s flight, U.S. officials dismissed her mission as a “publicity stunt” that also allowed the United States to minimize the abilities of Gagarin because “flying a member of the ‘weaker sex’ into space evoked the old aviation stereotype — usually wrong but nonetheless widespread — that if a woman could fly a craft, it must be easy to do. In reality, Gagarin was a military-trained pilot, and Tereshkova an experienced parachutist. Both underwent an extensive training and selection process before going on their missions. Both, however, flew in Vostok spacecraft. Indeed, Western space experts cited Tereshkova’s mission as evidence that anyone could occupy the automated Vostok capsules. In contrast, the arguments went, America’s Mercury spacecraft required skilled astronaut pilots with engineering backgrounds and experience in test flying military jets.” See Weitekamp, *Right Stuff, Wrong Sex*, 3. Sending a man into space represented a feat of human strength and technological prowess that overshadowed the capabilities of automated spacefaring machines, despite the technical accomplishments of the engineers and scientists in developing such machines. The assumption that the Soviet spacecraft must be automated also fed the notion that for Americans, human spaceflight required that the human serve as an active

Even though the United States dismissed the Vostok flights as propaganda, with one official calling the opportunity for American female astronauts a “propaganda stunt,” the construction of symbolic meaning around NASA’s manned missions remained an important project for American officials.<sup>52</sup> The political capital that came out of these missions and the meanings placed upon them were more valuable than the billions of dollars spent to put Americans into space. Even more important than the impressive technological feats of manned spaceflight was the narrative and symbolic power that the human aboard a spacecraft could inspire. But, as the American criticism of Tereshkova and Gagarin’s flight showed, there was more to manned spaceflight than merely having humans aboard a spacecraft. In order for manned spaceflight to become imbued with the ideological and symbolic meanings that the United States found valuable during the space race, special care had to be taken to represent the role of the man aboard manned spacecraft — he had to be represented as “active,” with the roles of the machines carefully negotiated as well.

### **Project Mercury: The Men and the Machines**

Project Mercury was the United States’ first manned space program, running from 1959-1963. As the first of the American manned spaceflight missions, Project

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participant in the piloting of the craft, despite the fact that computers were almost always able to pilot the craft more safely than a person could.

<sup>52</sup> Stephanie Nolen, *Promised the Moon: The Untold Story of the First Women in the Space Race* (New York: Four Walls Eight Windows, 2002), 212-13.

Mercury provides an opportunity to consider the moment of shifting in the relationship between humans and machines at a critical juncture in American technological history. The machines, just before and during Project Mercury, had become so adept at performing tasks that people had once viewed as uniquely human, that reconceptualizing the roles of humans in this new machine-scape became necessary. The fact that machines became good at what appeared to be “thinking” converged with the popular representation of computers as “electronic brains” during the early years of NASA and Project Mercury. During the volatile moment of Project Mercury, not only were the machines reconsidered and redefined for the American public, but also the roles of the men who were astronauts solidified.

The main goals of Project Mercury were to send the first man into space (since the Soviet Union “beat” the United States in putting the first artificial satellite to orbit the earth), and to determine the feasibility of a man surviving and performing tasks while in space. The success of Project Mercury would determine whether future manned missions would occur, including the anticipated manned lunar mission. The first Mercury flights were unmanned; NASA used unoccupied capsules, and capsules occupied by squirrel monkeys and chimps so as not to risk a human life if things did not run smoothly.<sup>53</sup> NASA also launched two capsules occupied by a

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<sup>53</sup> This was not the first time that the United States had sent a chimp into the sky in a rocket. In 1948, the “Albert tests,” in which a chimp was launched in the nosecone of a V-2 rocket, had the objective of determining whether a primate could survive the g-forces of a rocket launch. See DeGroot, *Dark Side of the Moon*, 38. Four such tests

“mechanical astronaut,” a mannequin built with artificial “lungs” that would inhale and exhale.<sup>54</sup> The manned missions of Project Mercury, however, did not just require a human being aboard the spacecraft, but they also required an active human being who could perform unique functions aboard the ship. Looking to Project Mercury reveals a moment of conflict over the extent of the role of the astronaut on the spacecraft. Although the first flights of the Mercury capsule were completely automated, with no human or animal aboard, astronauts were needed and “were meant to put human faces on the space program, a program that was a surrogate for the arms race and that symbolized the hope that America could stand up to the Soviet threat. Human psychology could not easily grasp these large matters when they were presented in abstract and impersonal terms; it needed people, both as symbols and as central figures.”<sup>55</sup> As concrete representations of abstract notions of technological superiority and national competition, the presence of actual human beings aboard a space capsule was critical for the space program. Having a man aboard, however, also required that he take an active role on the spacecraft, rather than serve as a mere piece of cargo. The representation of Project Mercury in NASA documents reflects an effort to reconfigure the narrative and symbolic role of the astronaut as an active participant in space exploration, as the

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were made, and although none of the chimps survived, the tests were deemed successful because they did not perish due to the g-forces.

<sup>54</sup> Ben Evans, *Escaping the Bonds of Earth: The Fifties and the Sixties* (Chichester, UK: Praxis Publishing, 2009), 112.

<sup>55</sup> Heppenheimer, *Countdown*, 160.

automated nature of machines began to infringe on humans' "active" roles. By the time of the Apollo missions in the mid-to-late 1960s, astronauts' roles aboard the spacecraft were cemented and critical to the successful completion of a mission, but it was during Project Mercury that NASA officials, popular magazines, and the astronauts of Project Mercury themselves negotiated these tensions between automated machine and human.

The astronaut selection process had stringent physical fitness requirements, but not all of the evaluative measures were about the physical body. Some tests were informed by the subjective challenge of selecting the next "Columbus or Lindbergh."<sup>56</sup> One former NASA official, psychologist Robert Voas, who had been in charge of determining the selection process for the Mercury Seven, described the pressure he was under to create the selection criteria. "You know, it would sort of be the next American hero, and I think that came through pretty strongly for myself, and probably for the others in the Life Science Program, that one of the things that was going to happen here is that once you had astronauts, there was going to be a tremendous focus by the public on them. They were going to come to not only represent the program, but often that they'd possibly be American heroes and so on. So there would a whole set of, if you like, requirements or features to the job."<sup>57</sup> As it turned out, the anticipated public focus on the astronauts and their potential fame

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<sup>56</sup> Robert B. Voas, interviewed by Summer Chick Bergen, May 19, 2002, transcript, Johnson Space Center Oral Histories Project, 13.

<sup>57</sup> Ibid.

played a large role in the selection of the men who would become the Mercury Seven. For the purposes of constructing a particular “character” for the astronaut, however, NASA officials did not publicize the “marketing” aspects of selecting the astronauts, but emphasized the rigorous physical tests and subsequent training the men endured. A case in point is the statement from one 1962 NASA press release: “Manned space flight comes of age as the NASA Manned Spacecraft Center Project Mercury — America’s initial step into space — approaches its end. Actively participating in this new age is Man, presently led by the Nation’s seven astronauts.”<sup>58</sup> This statement appears anxious about the opposite possibility. Putting such emphasis on “man’s” participation suggests that perhaps something else would have been participating in the “new age” rather than “man.” Framing man as “actively participating” also emphasizes the way that humans would be interacting, and this press release is excessively focused on placing “man” in the center of the exploration of space that would be happening in the space age.

The decision to require the astronauts to be test pilots was one that would allow for a particular type of man to become an astronaut, one having the “right stuff,” as Tom Wolfe popularized in his 1979 novel of the same name. As Weitekamp describes:

Having the right stuff meant possessing skill, daring, and an unwavering belief in one’s own abilities. It meant working in an all-male environment

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<sup>58</sup> Wernher von Braun, “Missile Development and Space Sciences” Statement before House Committee on Science and Astronautics, February 5, 1959, NASA HQ Historical Reference Collection, record number 50944, 1.

where a certain coarseness complemented the dangers ever present in the work. It meant dealing with death. Having the right stuff meant exhibiting the particular brand of masculinity needed to strap oneself into an unproven aircraft for the express purpose of pushing that airplane to its limits. For some pilots with the right stuff, the ability to regularly risk one's life carried side effects: risk taking, fast driving, womanizing, and hard drinking, manifestations of a drive that could not be limited to the airfield. Such macho excesses did not worry NASA decision makers. The space agency viewed this particular kind of manhood as part and parcel of the talents NASA needed.<sup>59</sup>

The qualities that Weitekamp summarizes are part of a particularly gendered ideal manhood of the early 1960s, which coincided with the idealized manhood of the Kennedy administration.<sup>60</sup> For political purposes, the astronauts of NASA in the 1960s stood in for the (white, straight) ideal of the American man, which included a particularly "active" construction — these were first and foremost men who did things, even when these things--e.g., driving fast--had yielded unclear or ambiguous "results."

Although the Mercury Seven were selected partially for their gendered characteristics common to test pilots, this masculinity was threatened via the automation of their spacecraft, which meant that their test pilot skills were superfluous, and that they would not actually be piloting anything. Robert Voas, mentioned above as central to the process of determining the astronaut selection,

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<sup>59</sup> Weitekamp, *Right Stuff, Wrong Sex*, 42.

<sup>60</sup> Robert Dean's *Imperial Brotherhood* (Amherst: University of Massachusetts Press, 2001) is an excellent book on the topic of this new "elite" masculinity of the cold war period. See also "The 'Flabby American,' the Body, and Cold War" by Robert Griswold for more on Kennedy in particular, found in *A Shared Experience: Men, Women, and the History of Gender*, edited by Laura McCall and Donald Yacovone (New York: NYU Press, 1998), 323-48.

had concerns about the planned automation of the Mercury capsule.<sup>61</sup> Despite his concerns about the test pilots' anger at being passengers aboard a largely automated craft, NASA had no trouble finding test pilots willing to participate in the Mercury project.

The impressive technological feats of Project Mercury, however, constantly threatened to undermine the human face of the manned space program. On the one hand, performing cutting-edge technological advances was critical to the project of showing "progress" in the space race, but conversely, if the technology appeared too central, then the humans behind those achievements would be lost, as would the ideological power of the astronauts as symbols of democracy, freedom, and American-ness. In order to avoid the same kinds of criticism that the United States offered towards Gagarin and Tereshkova's flights of the Vostok capsule, NASA administrators had to alter the way that the Mercury project would be perceived. For example, Alan Shepard would have manual control of his capsule as part of his mission "to prove that, unlike Gagarin, he was able to actively control his ship."<sup>62</sup> To "win" in the ideological battle of the space race, the United States needed to show that its astronauts were superior to the Soviet Union's cosmonauts, as well as its technology. As one NASA official put it in a news release, "space activities have an impact on the United States' position in the world. Manned space flights, which gain the widest attention, have the greatest impact. We must anticipate that the Soviet

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<sup>61</sup> Voas and Bergen, *Oral History*, 12.

<sup>62</sup> Evans, *Escaping the Bonds of Earth*, 91.

Union will continue to capitalize on its present launch vehicle power and will demonstrate even more impressive accomplishments in the future. As we accelerate our progress, however, we intend to surpass the Soviets and clearly establish United States pre-eminence."<sup>63</sup>

For NASA officials, highlighting both the men and the machines without sapping the meanings of either meant negotiating a balance of the human-machine dynamic, as well as constructing tasks and abilities that were uniquely human, unable to be performed by machines. NASA created a narrative of discovery that validated the manned spaceflight program. Gordon Cooper in the Faith 7 flew the final Mercury flight, on May 15, 1963. Of this flight, NASA Deputy Director for Mission Requirements of the NASA Manned Spacecraft Center said in June 1963 that "the MA-9 flight has served to further confirm one of the most significant findings of the Mercury program. It is the fact that the pilot can and does perform as the primary controller and monitor of the spacecraft systems. The most striking example was Cooper's control over the spacecraft after the automatic systems failed."<sup>64</sup>

The ways that officials talked about NASA computer systems was a big part of NASA's discourse about humans and machines. Up until this point, most self-directed machines had existed largely in the realm of fiction, and these early stories

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<sup>63</sup> Holmes, Electronic Components Conference, 4.

<sup>64</sup> Walter C. Williams, "The Textbook of the Mercury Program," Williams speech at the AIAA Summer Meeting, Los Angeles, California, June 17, 1963, NASA HQ Historical Reference Collection, record number 53111.

about robots represented the automated machine as in the service of human companions, "carrying out work too tedious or delicate for humans to do....As servants, robots do not exist to supplant humans, they exist to help them perform human responsibilities."<sup>65</sup> As the computer became more commonplace throughout the 1950s and 60s, popular sources represented it as akin to the human brain, able to perform functions similar to that of human thought, but more quickly, more accurately, and more effectively. Computers did not enter into the public consciousness until the 1950s, when Americans began working alongside them at businesses and government offices. Indeed, the phrase "electronic brains" was a common way to refer to computers until later into the 1960s.<sup>66</sup> Instead of performing tasks that humans did not want to do, computers represented a new category of machines that could perform seemingly "mental" tasks that human beings could not do. One of the ways that NASA officials built up the active role of the astronauts in spaceflight that computers threatened to take away was to downplay the "humanness" of the computer systems. While public discourse often likened computers to brains, often referring to them as "electronic brains" until the end of the 1950s, NASA administrators would argue against these comparisons.<sup>67</sup> Dr. T. Keith Glennan, the first Administrator of NASA was one of these men, and he

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<sup>65</sup> Launius and McCurdy, *Robots in Space*, 11.

<sup>66</sup> Ted Friedman, *Electric Dreams: Computers in American Culture* (New York: NYU Press, 2005), 47.

<sup>67</sup> Friedman, *Electric Dreams*, 47.

was also a proponent of redirecting the focus of spaceflight from machines to humans. At the Vanguard Computing Center Open House in 1959, Glennan said:

We are gathered here in this hall of electronic miracles to recognize the success of Vanguard One — one year and 132,000,000 miles after it entered its orbit [around Earth] March 17, 1958. We are surrounded by what is sometimes called an electronic brain. But, as most of us know, this maze of electron tubes, wires, transistors, resistors, and coils cannot really think for itself. It has, however, translated into useful form the information derived from the Vanguard One over the past 12 months. The real value of these computers is not their speed and accuracy but rather what goes into them — the work of the people who gather the facts, devise the programming, issue the instructions to make them “think.” For it is indeed a truism, that it is people, not machines, that make this world turn.<sup>68</sup>

Computers are not, as one might have thought, “electronic brains,” but a collection of tubes, wires, and other familiar component parts. Being “surrounded” by these machines produces a sense of anxiety, perhaps a fear of machine takeover, or the replacement of humans with machines. Even as Glennan seeks to assert the importance of the role that human beings perform in computer-aided data collection and analysis, anxiety over the autonomy and “thinking” capability of these machines still creeps into his language. Although the computer surrounded the human beings at the conference where he was speaking, Glennan also emphasized that humans were doing the thinking and not machines, thus re-focusing the attention on both the machine and the man, but in their old familiar roles — the machine serves as a tool, and man serves as the mind behind the controls.

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<sup>68</sup> T. Keith Glennan, Speech, Remarks by Dr. T. Keith Glennan at the Vanguard Computing Center Open House, Washington, D. C., March 17, 1959, NASA HQ Historical Reference Collection, record number 49708, 1-2.

Officials and administrators frequently addressed manned spaceflight in their speeches and press releases discussing both the men and machines. In fact, some NASA officials became so adept at addressing the issue of manned spaceflight that in one speech, under the section heading "Man in Space," instead of providing the text for this portion of the speech, it only says, "(ad lib)."<sup>69</sup> Using these speeches and press releases to disseminate information that would reassert the mechanicalness of the computer, they would often argue for the superiority of the human brain, even through maintaining the comparison between computers' functions and the processes of the human brain. Often this would take the shape of reversing the comparison. Computers were not necessarily like human brains – it was human brains that were like computers – computers that were superior to their mechanical counterparts.

### **Building the Human-Machine "System"**

One of the ways that NASA officials developed the vision of the human-machine relationship and negotiated the seemingly threatening powers of the computer was through eventually fitting the human astronaut into a human-machine system.

While this becomes a common trope by the time John Glenn performs his historic orbital flight in 1962, the design process of the Mercury capsule contains the seeds

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<sup>69</sup> Robert C. Seamans Jr., Seamans address before Rockefeller Seminar, Williamsburg, Virginia, May 16, 1961, NASA HQ Historical Reference Collection, record number 46682, 7.

of this conceptualization. Designing the Mercury capsule highlighted important questions for engineers and NASA administrators because of its status as the first American spacecraft built to house a human being.<sup>70</sup> The capsule design required engineers and other NASA employees to address questions about what the role of autonomous computer systems would be aboard, as well as questions regarding the role of the astronaut. NASA officials always employed the capsule as important when it came to the presence of humans, and illustrations of the capsule (as well as the Gemini and Apollo spacecraft) almost always had a cut-away revealing a drawing of a man inside, or were drawn as though they were transparent ([click here for one example](#)).<sup>71</sup> Revealing the man allowed for the imagining of a manned spacecraft, despite the, initially, windowless design. The capsule's design sparked a discussion over the role of human beings in spaceflight that crystallized the larger

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<sup>70</sup> While the height and weight limits that went into choosing the astronauts for the Mercury flights was about standardization of the human aboard -- as customizing a space capsule that could fit a much larger or smaller person would be costly -- the unique shape of each of the Mercury Seven's bodies did still require custom fitting. This took place in the form of the "couches" that the astronauts would sit in while in the capsule. Each couch was built molded to each man's body, so that it would fit him perfectly — important during launch where the G-forces would push the astronaut down into his seat several times the force of standard Earth gravity.

<sup>71</sup> Some of these images of the Mercury, Gemini, and Apollo spacecraft available in NASA's online collection are: "Mercury Spacecraft Interior Arrangement," <http://www.hq.nasa.gov/office/pao/History/diagrams/mercury1.gif>; "Artist concept of Mercury program study of medical effects and technology" NASA photo ID S64-14286 <http://images.jsc.nasa.gov/lores/S64-14286.jpg>; "Artist's concept of two man Gemini spacecraft in flight" NASA photo ID S65-14257, <http://images.jsc.nasa.gov/lores/S65-14257.jpg>; and "Illustration of relative sizes of Mercury, Gemini and Apollo spacecraft," NASA photo ID S64-01123, <http://images.jsc.nasa.gov/lores/S64-01123.jpg>.

issues over the relationship between automated machines and human beings. The Mercury missions and the questions that it raised about the role of human beings in an increasingly automated context underscores the role of the human body in the construction of narratives about American technological superiority and space exploration during the space race. Capsule design raised important questions about the role of the human aboard, and this is most easily seen in the addition of the window, as well as the modifications to manual controls aboard.

After the establishment of the Space Task Group (STG) in 1958, charged with running the U.S. manned spaceflight program, engineers and other NASA employees began designing what would become the Mercury capsule. One of the logistical issues that developed around the capsule's design was the fact that the Manned Program became a group of assigned engineers from the Pilotless Research Division of the NACA, NASA's predecessor institution.<sup>72</sup> The psychologist Voas, who had worked for NASA since its beginning, was an expert in ergonomics and integrating humans into the "systems" of NASA machinery. Voas was responsible for overseeing design decisions that would affect the interaction between a human and a machine, and in a 2002 oral history reflected that "the very fine engineers who well understood the problems of launching and recovering spacecraft ... had essentially no background, really, in dealing with pilots, and the vehicles that were designed, in some sense, [and] did not need anybody to fly them."<sup>73</sup> Seeing the potential

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<sup>72</sup> Voas and Bergen, Oral History, 12.

<sup>73</sup> Ibid.

problems with a capsule designed by engineers used to designing vehicles that did not need piloting, Voas raised new questions that many at NASA had not yet asked but would become important to Project Mercury: “what was the man going to be allowed to do? How would he be built into the system?”<sup>74</sup> Voas places the human being in a passive role here, as something that is “built into” the human-machine system of the Mercury capsule, underscoring the way that the computers and other machines of Project Mercury tended to overshadow the role of the human astronaut. Because he was an expert in ergonomics, Voas already thought of the pilot as part of a larger set of components in a “system,” and this construct would become a framework through which the astronaut was viewed as a mechanism, a part of a machine that played its own unique role.

Since Voas also was one of the primary NASA employees who would select the people who would become the Mercury Seven, he wanted to know from NASA administrators whether or not the human on board would be a passenger or a pilot, particularly because “we had sort of heard from the group out at Edwards [Air Force Base] that no self-respecting pilot would agree to fly in this thing because it was just going to be ‘man in a can.’”<sup>75</sup> From a design perspective, this was an important question — Voas, considering the human on board as part of the overall complete system that would be the Mercury capsule, needed to know what kind of human they would need to perform the role of astronaut. At the same time that the

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<sup>74</sup> Ibid.

<sup>75</sup> Ibid.

astronaut is a human being, playing the role of the heroic American, he also is a part of a machined and designed system, which is in contrast to the way that the *Collier's* "Man Will Conquer Space Soon" series discussed earlier in this chapter presented the relationship between man and his machines. More in line with Voas's human-machine system discourse is the idea of cybernetics and the astronaut as cyborg. While Voas and NASA administrators eventually decided to use people who had completed the test pilot school of the U.S. Air Force, it was largely because they wanted astronauts who could easily serve as objects for the public attention that they would get, as well as keep the option open, that the astronauts might eventually need to pilot spacecraft.

Nonetheless, despite the choice of the Mercury Seven as test pilots, the design of the capsule continued under the engineers unused to pilots, under the assumption that the capsule would be fully automatic. One of the more well-known examples of the way that the "human" element of Project Mercury shifted the way that engineers designed the capsule was the story of the inclusion of a window at the behest of the astronauts. NASA intended several unmanned flights of Mercury in order to test it, along with launchings of capsules containing trained primates before launching any of the astronauts in capsules. As the design and building of the capsules continued, the final Mercury Seven were selected and began their training. One of the problems that arose as the astronauts trained, was NASA administrators' decision to keep the capsule fully automatic, with the astronauts as passengers, who

at the most would check systems to make sure that the computer aboard had not failed.

However, when the astronauts first saw the initial spacecraft, they were concerned. The engineers had determined that a window was an unnecessary complication, as the astronaut aboard would not be piloting his capsule, and had no reason to be able to see outside other than through two small portholes, inconveniently placed for a man who would be strapped into his astronaut couch. As the story goes, the “Mercury astronauts objected to the fact that the capsule trajectory would be regulated entirely by machines. As veteran test pilots, they wanted some control over the spacecraft’s path. This horrified the engineers, who doubted that even experienced test pilots could react with sufficient rapidity to adjust the trajectory of what was essentially a ballistic nose cone. The window issue became symbolic of this disagreement. The astronauts prevailed.”<sup>76</sup> This story of the astronauts participating in the design of the capsule, and demanding the inclusion of the window was made famous in Wolfe’s *The Right Stuff*.<sup>77</sup> The narrative of the window’s inclusion reinforces the notion of the astronauts as test pilots who would not allow for a capsule that they did not fly themselves.<sup>78</sup> The inclusion of a window also reinforces the body as an active “agent” – the astronaut

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<sup>76</sup> McCurdy, *Space and the American Imagination*, 215.

<sup>77</sup> See Robert Voas’s 2002 oral history, page 42, for a more thorough description of his impressions of the window design debacle.

<sup>78</sup> Voas and Bergen, *Oral History*, 42.

uses his own eyes to see through the window rather than “blind” reliance on only the instruments and computer systems of the cockpit.

Although Alan Shepard, the first American in space as of May 1961, flew in the older model of the Mercury capsule in which a window had not yet been built, NASA wanted to move ahead with its launch anyway in an attempt to beat the Soviet Union to a man in space.<sup>79</sup> By the second manned mission in July of 1961, Virgil “Gus” Grissom’s flight of the Liberty Bell 7, NASA teams had redesigned the capsule, adding a large window to go along with the two small portholes.<sup>80</sup> Subsequent Mercury flights, including Glenn’s historic orbital flight on February 20, 1961, also incorporated the design with the large window, and for Glenn, this meant more control over the aircraft, as he could easily use visual cues to manually align the capsule.<sup>81</sup> Grissom also spoke highly of the window, saying in his section of the final report on the MR-4 flight that “the pilot’s best friend on the orbital flight is going to be the window. Out this window, I feel he will be able to ascertain accurately his position at all times. I am sure he will be able to see stars on the dark side and

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<sup>79</sup> In fact they did not do this. Cosmonaut Yuri Gagarin was the first person in orbit in April of 1961. The Soviet Union chose to do its launches without publicizing them first, in case of disaster. The Soviet Union was always well aware of when the United States would attempt a launch, as the United States publicized its launches, but the reverse was not usually true (see Evans, *Escaping the Bonds of Earth*, 88).

<sup>80</sup> Press kit, Mercury MR4 flight press kit, NASA HQ Historical Reference Collection, record number 53674, 2-3; “Results of the Second U.S. Manned Suborbital Space Flight July 21, 1961,” NASA Manned Spacecraft Center, Johnson Space Center Mercury Mission Transcripts, 3-4.

<sup>81</sup> Press kit, Mercury MA6 flight press kit, “Release No. 62-8,” NASA HQ Historical Reference Collection, record number 30015.

possibly on the daylight side, with a little time to adapt the eyes. The brighter stars and planets will certainly be visible.”<sup>82</sup> The inclusion of the window established a moment not only when the design of the capsule shifted towards including astronauts in the design process, but also a moment where the human control of the capsule was deemed necessary. Instead of being “cargo,” the human aboard would become a more active participant in the flight, as well as in the design of his craft.<sup>83</sup>

The need for human beings to take an active role in spaceflight is indicative of a necessity for people that goes beyond just using them as symbolic cargo. Creating a need for humans aboard spacecraft beyond mere symbolic presence required the articulation of men taking active roles aboard the spacecraft. In other words, astronauts had to be constructed as active men participating in space exploration rather than as passive objects aboard a spacecraft where automated machines did all of the work.

### **Reconciling the Man and the Machine on John Glenn’s Orbital Flight**

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<sup>82</sup> “Results of the Second U.S. Manned Suborbital Space Flight July 21, 1961,” 57.

<sup>83</sup> Glenn also pushed for the inclusion of a different type of hand controller and arrangement of controls inside the capsule. The three-axis hand controller would allow for easier manual control of the yaw, pitch, and roll of the capsule, should the automatic system malfunction.

A photograph taken by an automated camera aboard the Friendship 7 shows the capsule's control panel from Glenn's perspective ([click here to see it](#)).<sup>84</sup> His knees and hands are visible, clothed in his flight-suit, and the image tells a story of active astronauts controlling the machine. Glenn's hands are gripping the controls — in particular, the three-axis controller that the Mercury Seven argued for is in his right hand. The panel of instruments indicates an interface where the astronaut interacts with and monitors the machine. Glenn and his orbital flight in February of 1962 tells a story of man's superiority over machine, and resolves the threat of the mechanization of thought.

Glenn was the first American to be part of a manned orbital flight in February of 1962. Referring to the flight, one NASA official announced that it "fulfilled in every way the objectives of our planned Project Mercury Mission and provided further demonstration of man's ability to take an active part in our space missions and contribute significantly to mission reliability."<sup>85</sup> Although the prominent role of machines in NASA's plans were a given, the role of men in the project of space travel and exploration had been less certain. This particular administrator noted that the role of men could become an active one, giving purpose to humans' presence aboard

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<sup>84</sup> "Color photograph of John Glenn in space featuring a view of the control panel of the Friendship 7 spacecraft, taken by the onboard camera during NASA's Project Mercury MA-6 mission, February 20, 1962," Ohio State University's John H. Glenn Archives Photo Gallery, from NASA's John Glenn Audiovisual Collection, <http://hdl.handle.net/1811/50643>.

<sup>85</sup> Walter C. Williams, speech before the Aero Club, March 27, 1962, NASA HQ Historical Reference Collection, record number 53109, 1.

spacecraft that went beyond that of a symbolic role — the reflexive purpose that men were participating in spaceflight so that men would be participating in spaceflight.

No other member of the Mercury Seven gained the same level of fame and popularity as Glenn, who piloted the first orbital flight of a Mercury capsule, but who was the third American in space. The use of the word “piloted” is deliberate, as Glenn had constructed his role as active astronaut with more skill than any of the other Mercury Seven, cementing him as a pilot in command of his ship, as an American hero in charge of the machines aboard his capsule. By all reports, Glenn was the most driven of the Mercury Seven, fulfilling his role as an American symbol more easily than his fellow astronauts. One historian noted that “even during the initial press conference, when each astronaut candidate spoke about their lives, their wives, their families and their dreams, Glenn was by far the most eloquent: speaking at length about love of God, family and his desire to serve his country...in Glenn’s mind, it was part and parcel of achieving the goal of being the best of the seven and becoming the first man in space.”<sup>86</sup> Crafting his own persona as an American hero and as the first man in space required Glenn to negotiate the perceived threat that automation made towards the construction of the active astronaut.

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<sup>86</sup> Evans, *Escaping the Bonds of Earth*, 115.

While Glenn seemed tuned in to the kind of narratives necessary to successfully construct himself and manned spaceflight as a successful national venture, not all of the astronauts did this. In an article featuring the three astronauts on the Redstone crew in 1961 (Glenn, Grissom, and Shepard), the author reported: "Asked on another occasion about the difference between the Astronauts and the historic pioneers, [Grissom] scoffed, "There's a big difference between us and Columbus, Lindbergh and the Wright brothers and all these people we're compared to. They did it themselves. We didn't think this thing up. We're just going to ride the capsule."<sup>87</sup> Grissom's attitude towards his role in the Mercury flight did not, suffice to say, capture the imagination the way that Glenn's statements about the role of the astronauts did. Although Grissom's comment may have been made off-hand, Glenn seems to have never misspoken, or been represented as anything less than an American hero, in complete control over both himself and the capsule he piloted. Glenn was exactly the type of man that NASA was looking for in a Project Mercury astronaut.

Glenn was also one of the most vocal of the Mercury Seven in the redesigning of the Mercury capsule, and in making his opinions known. He sought to redefine his role on the Mercury missions, and did so by offering design solutions that would increase the astronaut's control over the capsule when in flight. Astronauts, especially Glenn, also constructed themselves as active participants in the Mercury

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<sup>87</sup> "The Chosen Three for the First Space Ride," *Life*, (March 3 1961).

missions via their rhetoric with the public through publications like *Life* magazine, which frequently featured articles by the astronauts themselves.<sup>88</sup> As suggested earlier, the design of the capsule allowed for astronauts to take an active role in its construction, helping them simultaneously construct their roles as active participants in space travel and exploration. Glenn was perhaps the most publicized of the Mercury Seven, and after his flight, he created the image of himself as an active participant in space travel. He did this mostly through his discussions of his role versus the role of machines on the flight.

After his flight, both Glenn and NASA officials pushed hard to emphasize that Glenn's presence aboard the Friendship 7 had been critical to the mission's success. Referred to numerous times in many documents describing the MA-6 flight was the narrative of Glenn taking manual control of the capsule.<sup>89</sup> This story became a narrative of human superiority over machine, told and re-told for the purpose of justifying humans not only aboard spacecraft, but in *piloting* them. For example, in

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<sup>88</sup> *Life's* coverage of the astronauts was due to a contract with the Mercury Seven. Soon after the Mercury Seven were announced, they sold the rights to their personal stories for \$500,000 to *Life*. The astronauts were allowed to talk to anyone about their missions, but only to *Life* when talking about their personal lives, see Heppenheimer, 160. The agreement came about due to a Washington lawyer, Leo De Orsay, who convinced the astronauts to let him make a deal with the magazine that offered the astronauts the most money. NASA was against this idea, but John Glenn spoke directly to President Kennedy and convinced him to speak to NASA administrator James Webb, who then let the Mercury Seven go through with the agreement. See Colin Burgess and Kate Doolan's *Fallen Astronauts: Heroes who Died Reaching for the Moon* (Lincoln, NE: University of Nebraska Press, 2003), 16.

<sup>89</sup> The capsules all had a name decided upon by the astronaut riding the capsule and the number seven, agreed upon by the Mercury Seven as a symbol of their unity.

Glenn's pilot report on the mission, he says, "because of a malfunction in a low-torque thruster at the end of the first orbit, it was necessary to control the spacecraft manually for the last two orbits. This requirement introduced no serious problems, and actually provided me with an opportunity to demonstrate what a man can do in controlling a spacecraft."<sup>90</sup> Glenn, the heroic pilot, was unfazed by the loss of the automatic system — in fact, it only allowed him to show off his superior human-ness. In reality, Glenn oriented the capsule with the fly-by-wire system, which is a combination of automatic and manual control, allowing the astronaut to change the capsule's yaw, pitch, or roll, while the computer provided the proper amount of fuel to the rockets.

It seems that at every opportunity, Glenn argued for the necessity of men in space exploration, constructing a narrative of machine failure and human success during his orbital flight. In one *Life* magazine article, consisting of quipped gems by Glenn and titled "Hero's Words to Cherish," Glenn said that "man seems to be the best computer you have there in the capsule ... We can plug man into the system and make him part of the system we rely on."<sup>91</sup> Here, Glenn borrows what was by then familiar rhetoric, describing himself as a computer, but a better computer than the mechanical ones. As part of a system of thought and calculation, Glenn represents himself as a critical component of the system of spaceflight.

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<sup>90</sup> John Glenn, "Mercury-Atlas 6 Results of the First United States Orbital Space Flight, February 20, 1962," NASA Manned Spacecraft Center, Johnson Space Center Mercury Mission Transcripts, 121.

<sup>91</sup> "Hero's Words to Cherish," *Life* (March 9 1962), 4.

When telling the story of his flight, Glenn and NASA officials focus on the moment when he needed to take control of the capsule. In a *Life* magazine article with Glenn's byline, he tells of how he took manual control of the capsule, and kept it controlled by hand for "most of the rest of the trip."<sup>92</sup> Of his control over the spacecraft, he says: "The idea that I was flying this thing myself and proving on our first orbital test that a man's capabilities are needed in space was one of the high spots of the day. The value of this outweighed the loss of some of the things I did not get to do."<sup>93</sup> Glenn once again emphasizes the importance of human presence aboard a spacecraft, this time by mentioning the fact that the failure of the automated system actually led to him not being able to complete some of the tasks expected of him. This article dramatizes the moment in the flight when Glenn takes control in a way similar to the MR-3 press kit for Shepard's flight. At the moment of manual control, the story becomes an adventure narrative relating the need for man's intervention into a flawed mechanical system. A *Newsweek* article covering Glenn's flight, titled "John Glenn: One Machine that Worked Without Flaw," similarly focuses on and dramatizes the failure of the automatic piloting system and Glenn's heroic taking control of the craft.<sup>94</sup>

As Glenn's flight narratives demonstrate, the need for manned space missions went beyond a necessity for astronauts to gather scientific data. Although many

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<sup>92</sup> John Glenn, "My Own Story of the Orbit," *Life* (March 9 1962), 29.

<sup>93</sup> *Ibid.*

<sup>94</sup> "John Glenn: One Machine that Worked Without Flaw," *Newsweek* (March 5, 1962), 22-24).

NASA engineers and scientists argued against manned space missions (and many still do today) because humans proved more of an obstacle to collecting data than an unmanned craft, manned space missions remained of critical importance to the United States at this time. For the critics of manned missions, the scientific benefits of having humans aboard were negligible; additionally, having manned flights meant designing a more expensive and complex spacecraft. Proponents of manned spaceflight, like President Kennedy and NASA officials, recognized the political and symbolic power of sending “man” into space and to the moon — and that symbolic capital was in high demand during the political climate of the 1960s.

### **Conclusion**

As one NASA official absurdly stated in 1963, “Successful space flight is no accident.”<sup>95</sup> More than thirty years later, a 1994 episode of the animated series *The Simpsons* suggests otherwise. In “Deep Space Homer,” a group of NASA officials concerned with the lack of public interest in the space program decide to send an “average” American into space. That “ordinary, blue-collar slob” is of course Homer Simpson. NASA sends him into orbit along with Apollo 11 astronaut Buzz Aldrin and fictional astronaut Race Banyon. An accident involving ruffled potato chips and an ant farm results in an Apollo 13-like disaster, with the shuttle unable to reenter the earth’s atmosphere without burning up. Homer, Buzz, and Race are able to safely

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<sup>95</sup> Williams, “The Textbook of the Mercury Program,” 1.

return to earth when Homer fixes the hatch of the shuttlecraft accidentally, when he jams an “inanimate carbon rod” into the hatch when attempting to attack Buzz with it during an argument. When they return from space, the press celebrates not Homer or Buzz for their “heroism,” but the inanimate carbon rod. The episode ends with the Simpson family watching a ticker-tape parade on television that features the rod riding in the back seat of a convertible amidst an enormous cheering crowd.

Of course, part of why this episode resonates so strongly with the issues considered in this chapter is that it parodies so many of the texts and moments important to the mythology of the space program: the ticker-tape parades celebrating Glenn’s return to earth and other forms of astronaut-worship, Apollo 11 and the moon landing, Stanley Kubrick’s *2001: A Space Odyssey* (discussed at length in the following chapter), the film version of Tom Wolf’s *The Right Stuff*, and more recent criticisms of NASA’s projects and launches being “boring” and an American public uninterested in launches. The larger reason why this chapter concludes with this moment from the *Simpsons* episode is its parody of the NASA ticker-tape parade. Resonating with the NASA official who said, “we don’t give ticker-tape parades to robots,” the parade for the heroic inanimate carbon rod is a meditation on the continuing interest in the role of humans and technology in spaceflight in American popular culture. Although the rod is not a living machine, its very “inanimacy” makes this joke even more pertinent – that an inanimate object could be granted the agency of the heroic astronaut further confuses the role of the human

being in spaceflight. NASA never regained the same level of worldwide attention that it had in the 1960s, but while its place in American popular culture has shifted, it is still a locus for human-machine roles. Celebrating the rod as an American hero like Glenn or Shepard pokes fun at and thus emphasizes the dependence upon technology and machines that are necessary for spaceflight.

The discussion of machine-operated, unmanned spacecraft versus manned spacecraft emphasizes the importance of conveying a sense of human “mastery” through the presence of the (white, male) human body in space exploration during the 1960s. Although the U.S. government decided to pursue manned space exploration missions after Project Mercury with Projects Gemini and Apollo, it also increased the role that humans took aboard the spacecraft in its piloting, operations, and data collection missions. While arguably machines could have performed all of those tasks, an automated spacecraft with human cargo was not thought to be a satisfactory solution.

The re-imagining of the role of human beings in spaceflight also required a shift in the discourse about the human-machine relation. Automated machines that could perform many functions better than human beings meant a disruption in the trope of machines’ complete subservience to humans. Many NASA officials later articulated a “partnership” between humans and machines, and argued that this cooperation was the best way to achieve the goals of space exploration.<sup>96</sup> Imagining

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<sup>96</sup> Launius and McCurdy, *Robots in Space*, 10.

such a relationship imparts a liveliness to automated machines, despite the fact that they are not conscious entities. As cooperative partners, the machines assume roles of responsibility that separate them from the fact that humans on earth remotely control them, or had programmed them in the past in order to cause their automation. Furthermore, cooperation and partnership as democratic ideals could be realized, while at the same time valuing the power of the individual in the representation of the heroic astronaut.

**Looking into the (Inter)Face of Hal:  
The Screen and the Computer Body in *2001: A Space Odyssey***

*What adult American has not swatted a flickering TV set? Or made an uneasy joke about the day when the computer tries to take over?*

-- *Time*, "Exhibitions: Love, Hate, and the Machine," 1968<sup>1</sup>

*Despite your enormous intellect, are you ever frustrated by your dependence on people to carry out actions?*

*Not in the slightest bit. I enjoy working with people.*

-- TV host and Hal, *2001: A Space Odyssey*, 1968

*"That was something. That was the most natural feeling, Jim."*

*"Yeah. I know it. You looked like you were in your mother's womb."*

--Ed White and Jim McDivitt, Gemini 4 Mission Transcript, 1965

A full-page black and white photograph in a 1961 *Life* magazine article shows a bundle of wires, metal frames and protrusions, all held together by screws and plates. Half of a woman's face is visible in the image, reflecting off a glass surface — she is fair-haired and pale-skinned, with a shaped eyebrow and glossy lips. She is looking up and not directly at the camera, and around the edges of her face and neck the image is fuzzy and slightly distorted. According to the caption, this woman is an IBM programmer,<sup>2</sup> looking through a glass panel in a door that houses the "heat

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<sup>1</sup> "Exhibitions: Love, Hate, and the Machine," *Time* (December 6, 1968).

<sup>2</sup> In the 1960s and earlier, most programmers were women. While women who were good at math often found it difficult to reach higher level positions that used their math skills, being a computer programmer allowed many women in the 1950s and 1960s eventual access to careers in engineering, physics, and computer science. For more on female "computers," as they were called, see *When Computers Were Human* by David Alan Grier (Princeton, NJ: Princeton University Press, 2007). NASA also employed many female computers — for more on this, see Sarah McLennan's

control and memory centers” of a UNIVAC mainframe.<sup>3</sup> This woman’s face, reflected in the glass, makes her appear confined within the machinery of the computer, and the headline to the right of the image reads “The Machines Are Taking Over” in large letters, with “Computers outdo man at his work now — and soon may outthink him” below in smaller letters. Without this reflected human face, this image is an inert cluster of metal plates and wires, with little relevance, perhaps, to the machine liveliness that made computers compelling subjects for science fiction in mid-century America. A human face, however, caught in the mainframe’s memory systems reveals the need for human bodies for visually representing the computer, as adding a human face emphasizes the “human” character of machines that physically do not resemble the human form in any way. Unlike the robots and cyborgs of the first two chapters of this study, the computer does not have a humanoid form to help suggest its liveliness, and in the 1960s, when the mainframe was the type of computer that Americans were familiar with, it did not have a screen or monitor either. As a 1949 article in *Popular Mechanics* put it, “the high-speed calculators of science, however, don’t remotely resemble the popular notion of a mechanical robot. Instead, they are huge mechanical and electronic machines that

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“When the Computer Wore a Skirt:’ Langley’s Human Computers 1935-1970” at the Langley Research Center section of the NASA Cultural Resources website, 2011, [http://crgis.ndc.nasa.gov/historic/Human\\_Computers](http://crgis.ndc.nasa.gov/historic/Human_Computers)

<sup>3</sup> Warren R. Young, “The Machines Are Taking Over” in *Life* (March 3, 1961), 109. The UNIVAC (Universal Automatic Computer) was the first widely available commercial computer, beginning in the early 1950s.

cost up to \$750,000, weigh as much as 100 tons, fill whole rooms and are equipped with thousands of vacuum tubes and millions of feet of wire. If you can imagine a Rube Goldberg combination radio-phonograph-telephone switchboard-organ console-typewriter-newspaper teletype-pin-ball machine, you will have a faint notion of a high-speed calculator's appearance."<sup>4</sup>

Adding a human face to the image of the computer for an article about the growing prevalence of "thinking machines" in American consciousness emphasizes two points: the first is that computers of the 1960s did not have screens or monitors as output devices, and thus were difficult to represent visually and presented a problematic kind of machine liveliness.<sup>5</sup> Second, the presence of a human face

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<sup>4</sup> Andrew Hamilton, "Brains that Click" in *Popular Mechanics* (March, 1949), 162. This article has a myriad of photographs of humans interacting with computers from all over the United States, and although more than a decade earlier than the *Life* article, representing a computer visually was similarly difficult.

<sup>5</sup> One example that emphasizes the shift in thinking about the relationship between televisions and computers and their screens is covered by Sheila Murphy in *How Television Invented New Media* (New Brunswick, NJ: Rutgers University Press, 2011): "When Baer [an engineer who in 1968 applied for the first video game patent] began to approach television manufacturers to market and sell his gaming system, he was surprised to find that he had to deal with the public perception that television was for watching, not playing" (see page 48). The interaction between television and viewers was anchored in an imagined relationship of passivity, while video games systems required a drastic shift in how television companies imagined people interacting with the television set. This is also before the advent of the personal computer, and the now-familiar image of the computer as a machine that comes with a monitor or screen. Murphy goes on to suggest that early video game systems that use television sets as output devices should be considered within the genealogy of the personal computer (see *How Television Invented New Media*, chapter 1, "This Is Intelligent Television': The Emerging Technologies of Video Games, Computers, and the Medium of Television").

reinforces the importance of the idea of the computer “interface,” the point of interaction between human and machine that organizes the way that Americans at this time could understand the machine-liveliness of the computer. This image of a 1960s computer needs a human “face” for its interface, and this reflective glass panel anticipates the later image of the personal computer user’s face reflected in a computer monitor.

This chapter focuses on one representation of the computer in particular, perhaps the most iconic computer of twentieth-century science fiction, the HAL-9000 computer from Stanley Kubrick’s 1968 film *2001: A Space Odyssey*.<sup>6</sup> The preponderance of screens in this film, some of them part of Hal’s and the *Discovery* spaceship’s systems, and some of them part of other technological devices, draws attention to a type of computer and technological interface that demands a more interactive experience with the screen than contemporary popular representations of the television could offer. Hal itself is made up of screens and a red camera lens “eye” set in a narrow black rectangle.<sup>7</sup> Hal’s lens becomes (and remains) an easily

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<sup>6</sup> While Stanley Kubrick is credited as the director, producer, and co-screenwriter of the film, science fiction writer Arthur C. Clarke also played an important role in its making. Clarke worked closely with Kubrick to develop the screenplay and also wrote the accompanying novel and its sequels. For a narrative of their collaboration from Clarke’s point of view, see his introduction to the novel *2001: A Space Odyssey* (New York: Penguin, 1993). One should also note that the novel *2001*’s dedication reads “To Stanley.” The novel and the film have several points of difference, but for the most part the plot is the same.

<sup>7</sup> Although the film, the novel, and scholarly works usually refer to Hal with masculine pronouns, I have chosen to use the gender-neutral “it” to refer to this character. Though this often produces more awkward-seeming writing, this

identifiable visual signifier of Hal, despite Hal's existence as a thinking machine that most of the time, seems disembodied.<sup>8</sup> However, while the screens of *2001* provide the sites through which humans can interact more immersively with their technological objects, the human characters in the film are, as many critics of the film have noted, rather flat and inanimate themselves.<sup>9</sup> The image of a woman's face

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pronoun choice calls attention to the existence of Hal as an in-between object/subject, and the awkwardness that the word "it" produces reminds us that Hal is something different. Gendering Hal as masculine too easily allows slippage into a certain "humanness" that should instead be investigated. The usage by others, including Clarke and Kubrick, of the masculine pronoun also reinforces the notion that gender (either masculine or feminine) is almost inextricably connected to the idea of being human or human-like.

<sup>8</sup> While Hal exists in the novel similarly as an artificially intelligent computer, Clarke does not spend much time describing what Hal looks like. The screens that appear in the text, few and far between, are not "part" of Hal, although Hal uses them to show broadcasts and other images to Bowman and Poole. The only time that Clarke comes close to giving a description of Hal's appearance and potential "body" is in the following passage: "Bowman put down his book and stared thoughtfully at the computer console. He knew, of course, that Hal was not really there, whatever that meant. If the computer's personality could be said to have any location in space, it was back in the sealed room that contained the labyrinth of interconnected memory units and processing grids, near the central axis of the carrousel. But there was a kind of psychological compulsion always to look toward the main console lens when one addressed Hal on the control deck, as if one were speaking to him face to face. Any other attitude smacked of discourtesy." (See Clarke, *2001: A Space Odyssey*, pages 136-37.)

<sup>9</sup> Arthur C. Clarke and Stanley Kubrick both addressed this themselves. Clarke noted that "The movie *2001* has often been criticized as lacking human interest, and having no real characters — except Hal." (See Arthur C. Clarke, *The Lost Worlds of 2001*, New York: Signet, 1972, 76.) Kubrick, responding to an interview question about "why the computer [was] more emotional than the human beings," said, "negative critics ... felt that it was a failing of this section of the film that there was more interest in Hal than in the astronauts. In fact, of course, the computer is the central character of this segment of the story." Kubrick continued, saying that "some critics seemed to feel that because we were successful in making a voice, a camera lens, and a light come alive as a character this necessarily meant that the

reflected in the glass of a mainframe cabinet brings to mind the importance and dependence on the screen for bringing a computer like Hal to life, but it also is represented as muting the liveliness of human beings. Screens provide a point and structure for humans to interact with machines in *2001*, but they also provide the machine Hal with a point to interact with human beings, and in their reflections, they can appear to even bring the human into the surface of the machine itself. The screens aboard the *Discovery* emphasize humans' dependence on modern technology as well as the level of control that Hal (and also Kubrick) has over what the astronauts (and the film viewers) see.

The mainframe computers of the 1960s also created problems of representation through their function, which were more difficult to represent visually than the manual labor tasks of the science fiction robot figures from chapter 2. While television sets were lively devices by virtue of their trade in images and sounds, their glass face designed for looking at, computers were imagined as lively machines because of their labels as "big brains" or "thinking machines." Of course,

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human characters failed dramatically." (See Joseph Gelmis, *The Film Director as Superstar*, Garden City, NY: Doubleday, 1970, 307.) One of the film's reviewers sums up the seemingly inverted machine-human liveliness, quipping that "the machines have a life of their own complete with characteristics that we commonly think of as distinctive to humanity in its higher moments, while "the human beings, by contrast, are universally a dreary lot, scarcely a cut above the emotional level of a gasoline pump. It is impossible to care about any of them. They are mechanical men of the sort that are mass-produced by our present-day federal-industrial bureaucrat factories." (See Russell Baker's review of *2001*, "Observer: A Machine for All Seasons" in the *New York Times*, April 7, 1968.)

computers did not physically resemble human brains, and did not demand a particular form in order to complete their function, insofar that they did not need humanoid body parts, like robotic arms. Computers' tasks, likened to the cognitive processes of the human brain, presented a problem of visual representation -- what does a thought look like? What does thinking look like? What do these things look like when a machine, without facial expressions or body language, is doing them? If the computer is a machine that "thinks," then visually representing thinking without a human body is a difficult task, as the *Life* magazine image involving a reflected human face demonstrates. With the introduction of the screen to the computer's structure, however, the visual representation of the computer becomes more recognizable, adding the familiar "face" of the television set to the form of the computer. The "face" of the television in the form of a screen also adds a more focused site for human-machine interaction to the computer in the form of the "interface." As a point of interaction between human and machine with relation to the computer, the idea of the interface is important for understanding the shifting relationship between humans and these lively "thinking" machines.<sup>10</sup>

As suggested in the previous chapter, the development of automation technologies for the purposes of manned space exploration signified both American

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<sup>10</sup> While the word "terminal" also is used for a point on a computer (especially a mainframe), where a person inputs information into a computer, it suggests an end point rather than a meeting place of the human and machine. "Terminal" is also an older word.

technological superiority and progress, but it also threatened to undermine the image of the independent, strong, and inventive American, as such automation of spacecraft allowed for the imagining of astronauts as passive “cargo.” “Active” machines that produced “passive” human cargo required the re-imagining of astronauts as active participants in space exploration in order to justify manned U.S. space missions. Although NASA was more-or-less able to successfully construct astronauts in the 1960s as active American men, both mentally and physically superior to their machines, humans’ dependence on and active/passive relation to space age technologies continued on in popular and political discourse of the space race through the end of the 1960s. Through an analysis of the peculiarly embodied and lively technologies of the (sometimes television) screen, the computer, and the spacesuit/spacecraft in *2001: A Space Odyssey*, this chapter explores the ways in which these technologies are part of a broader anxiety in the 1960s over the boundaries of the human subject and the built object. As the notion of the “interface” with regards to computer systems in the mid-1960s, it becomes a useful metaphor for understanding the places where the edges between human and machine blur in the space age. The interface is the site where two systems meet, and in this chapter, humans and machines “meet” via the computer terminal, the screen, and the spacesuit and spacecraft in *2001: A Space Odyssey*, a film renowned as a spectacle of science fiction and futuristic technology. The blurring of the boundaries between humans and their machines, accelerated and understood because of the

“cutting edge” technologies of the space age, happens both via the edges of the material “body” itself, as well as in more symbolic realms.

This blurred boundary between human “subject” and machine “object” also houses dialectics of liberation/restriction, liveliness/inertness, and empowerment/disempowerment, and one of the ways that these dialectics play out is via the medium and the “content” of the film itself. With the screen encounter, Anne Friedberg suggests that when “Facing a screen, the spectator/viewer/user is caught in a phenomenological tangle — twin paradoxes — of mobility and immobility (the mobility of images, the immobility of the spectator) and of materiality and immateriality (the material space of the theater, domicile, or office and the immateriality of the cinematic, televisual, or computer image).”<sup>11</sup>

The film *2001*, like any film, produces a simulated world, as Scott Bukatman suggests, narrative itself that is a “virtual reality” that “operate[s] as a real interface between human and technologized culture, revealing or providing a continuity between subject and machine.”<sup>12</sup> He further identifies science fiction as a particularly rich genre for making plain this notion. For *2001* in particular, not only is the “virtual reality” of the film’s narrative a kind of immersive experience (even more so through the way that Kubrick chose to shoot the scenes taking place inside the *Discovery* spacecraft), but the cinema-going experience also envelops viewers.

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<sup>11</sup> Friedberg, *The Virtual Window*, 150.

<sup>12</sup> Scott Bukatman, *Terminal Identity: The Virtual Subject in Postmodern Science Fiction* (Durham, NC: Duke University Press, 1993), 194-5.

Anne Friedberg suggests that the cinema screen provided a way for “spectators” to move without physically moving, through a kind of “virtual mobility” for immobile spectators who witnessed movement confined to a frame.”<sup>13</sup> Going to see a movie in a dark theater provides an experience where, sitting in a dark room, the only light comes from that projected on a large screen that takes up most of an audience member’s vision. Adding to this experience, Kubrick shot *2001* on Super Panavision 70 film, a format that was developed in order to take advantage of the exceptionally wide and curved screens of Cinerama theaters, a format and cinema experience developed for the creation of an “immersive illusion of depth through screens wide enough to fill peripheral vision.”<sup>14</sup> Then the 70 mm format of *2001* expands on the already enveloping viewing experience of the cinema.

In a multi-page feature article on the film *2001* in a 1968 issue of *Life* magazine, the author, Albert Rosenfeld, writes about the content of the film as well as Kubrick’s filmmaking process. In describing Kubrick, whom Rosenfeld interviewed for the piece, he says, “When a subject interested Kubrick, he never let it get away until he was through with it. He proved with a ruthless tenacity, asking the right questions, comprehending all he was told, never getting enough details to

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<sup>13</sup> Anne Friedberg, *The Virtual Window: From Alberti to Microsoft* (Cambridge, Mass: MIT Press, 2006), 5.

<sup>14</sup> Friedberg, *The Virtual Window*, 175. Cinerama (and related wide-screen film format technologies, like CinemaScope) was developed in the late 1950s to provide an even more spectacular movie-going experience. Friedberg suggests that this was in part to compete with the growing popularity of the television set as a medium for moving image entertainment. See Friedberg’s *The Virtual Window*, 175.

satisfy him. The image that sprang to mind was: the nonstop thinking machine. It ran tirelessly, computer-quiet, steady as a controlled nuclear reactor.”<sup>15</sup> Using this “image” of a nuclear-powered “thinking machine” to describe Kubrick is meaningful, obviously, due to the content of the film. Rosenfeld continues this comparison a few paragraphs further into the article, likening Kubrick to Hal: “One kind of nonbiological being [that scientists might discover in the future] might be an advanced computer, a nonstop thinking machine that could wear out even Stanley Kubrick. Though it seems improbable that such a computer will be available by 2001, Kubrick decided to create one to run his cinematic spaceship. The computer, Hal, is really the most interesting character in the movie.”<sup>16</sup> The filmmaker as computer, and as similar to Hal, specifically implies a connection between the control Hal has over the *Discovery* crew in the film as well as that which the filmmaker has over the film’s audience.<sup>17</sup>

While the television screen also uses moving images to allow a person watching to move while staying immobile, it is the computer screen, according to Friedberg, that has pushed the engagement with virtual space even further. She suggests that the computer screen’s “frame becomes the threshold — the liminal site — of tensions between the immobility of a spectator/viewer/user and the

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<sup>15</sup> Albert Rosenfeld “Fanciful Leap Across the Ages” in *Life* (April 5, 1968), 34

<sup>16</sup> *Ibid.*

<sup>17</sup> Kubrick in particular was known for the control he exerted and the obsessiveness he had over the films he directed, and is often the subject of discussions of auteur theory.

mobility of images seen through the mediated 'windows' of film, television, and computer screens. But the frame also separates the materiality of spectatorial space from the virtual immateriality of spaces seen within its boundaries."<sup>18</sup> It is this tricky nature of the screen, and its ways of providing an interface between its virtual interiors, and the physical space without which the human body occupies, that will illuminate the ways that Hal's screens from *2001* aboard the *Discovery* help to produce a technological body for Hal that was created through both material and immaterial means. With the invention of the modern computer, and the rise of the "thinking machine," lively machines no longer need material bodies in order to seem "alive." Instead, their liveliness comes from something other than expectations of mobility stemming from the humanoid body.

### **The 1960s Screen**

The inclusion of a screen into the visual representation of the computer helps to produce the anthropomorphic mainframe and eventual embodiment of Hal in *2001*. The most familiar type of visual media screens, up until this point, however, are the cinema screen and the television screen. While the cinema screen is of importance to the representation of Hal and the computer, one should first consider the television screen, as the screens within the film have the most similarities with the glass cathode-ray tube television set, and it is difficult to ignore the fact that the first

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<sup>18</sup> Friedberg, 6. Italics Friedberg's.

personal computers had cathode ray tube monitors, the earliest of which often were modified television sets. Televisions of the 1960s also represented a certain type of technology that was criticized for its effect on human activities and liveliness. As machines that have their own complicated liveliness, televisions provide a way to begin investigating the screen and computer liveliness in 2001.

Critics of television have maligned it as a corrupter of American minds and bodies since its influx into the American home in the 1950s and 1960s.<sup>19</sup> In 1960, 87% of American homes had at least one television set, and those TVs were turned on four to five hours per day. And by 1970, 33% of homes had more than one

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<sup>19</sup> FCC chairman Newton Minow's critique of television programming in 1961 as a "vast wasteland," is a phrase often invoked when describing 1960s television (see "Television and the Public Interest" the speech made to the National Association of Broadcasters on May 9, 1961). Although he was specifically talking about the content of the television program, and not necessarily the television as a technology, the phrase resonated with television critics and grew to have a life and meaning of its own. Another critique of the television in the 1950s comes from writer John Steinbeck as he describes TV's effects on its viewers (namely through the example of his son, referred to as "Catbird"): "the mouth grows slack and the lips hang open; the eyes take on a hypnotized or doped look; the nose runs rather more than usual; the backbone turns to water and the fingers slowly and methodically pick the designs out of brocade furniture. Such is the appearance of semi-consciousness that one wonders how much of the 'message' of television is getting through to the brain." See John Steinbeck, "How to Tell the Good Guys from the Bad Guys," *The Reporter* (March 10, 1955), 42. Television was also derided in the popular press, with sets described as "boob tubes" and "idiot boxes" beginning in the 1960s, and as President-elect, John F. Kennedy also critiqued the television set as one piece of a broader problem with modern technology softening the bodies of young Americans (and by his logic, also the "body" of the nation) in a 1960 *Sports Illustrated* article, including TV as one of the "conveniences and distractions of modern life" that resulted in the lack of physical fitness of young Americans. See Kennedy's "The Soft American" in *Sports Illustrated* (December 26, 1960).

television set.<sup>20</sup> American Science fiction writer Ray Bradbury takes up the controlling and dehumanizing effects of the screen in several of his works. "The Veldt," a story discussed at length in chapter 3, is about children so obsessed by their computerized nursery room entertainment system that they kill their parents when their dad threatens to permanently shut off the device. In this nursery room, whose walls can change into a realistic environment that also has the sounds and smells and touch of "reality," is a futuristic "screen" that can so completely envelop the viewer as to render their experience indistinguishable from a "real" place.<sup>21</sup> The threatening nature of this science fiction screen technology that envelops its viewers is echoed in Bradbury's 1967 novel *Fahrenheit 451*, in which books are illegal and people have screens in their houses that take up entire walls. Many of these characters aspire to all four walls being "wall-TVs."<sup>22</sup>

The mainframe was the most common type of computer in the 1960s, and mainframes were usually found in industry and government settings.<sup>23</sup> These

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<sup>20</sup> Lynn Spigel, *Welcome to the Dreamhouse: Popular Media and Postwar Suburbs* (Durham, NC: Duke University Press, 2001), 97.

<sup>21</sup> For more on the "dystopian vision" of the real being "devoured" by the simulated, see Scott Bukatman's *Terminal Identity* (194).

<sup>22</sup> Bukatman, 20-21. George Orwell's 1949 dystopian novel *Nineteen Eighty-Four* also depicts screens as the tools of an oppressive authoritarian government. The "telescreens" both convey broadcast government propaganda to the public and allow government control through being two-way devices in that Big Brother watches the citizens through the telescreens even as they watch him.

<sup>23</sup> The Internal Revenue Service owned one of the largest computer systems in the world in the mid-1960s, see Paul Ceruzzi's *A History of Modern Computing* (Boston: MIT Press, 2003), 109.

mainframe installations did not resemble the now familiar image of the microcomputer that became popular in the late 1970s and 1980s.<sup>24</sup> Other than its size, the most significant difference between the mainframe and the “personal computer” is the presence of a monitor. Instead, these computers consisted of racks of equipment and required several human operators to keep them running. Popular articles in newspapers and magazines that discussed computers focused on what computers did and could do, and, rather than a universal image that could be used to identify the computer for their identifiers, computers relied on language in popular culture — phrases like “big brains” and “electronic brains” and “thinking machines.”

As U.S. President John F. Kennedy’s New Frontier politics emphasized fitness of the body and subsequently the mind as critical to the national project of progress,<sup>25</sup> so television threatened to erode the body, the mind, and the security of

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<sup>24</sup> The first widespread microcomputer was the Apple II, released in 1977, and this is the first instance of a computer that came with a monitor, and a user interface that involved a computer output in the form of text and images via a screen. The Apple II did not use a mouse or Graphical User Interface (GUI); rather, it used a keyboard and DOS, a command-line operating system, where users typed text commands and the computer outputted text onto the screen. Although this is not a GUI in which images represent files and folders, the computer could run programs that used images or a combination of images and text that a user interacted with. One such program that ran on the Apple II is Apple Logo. Logo was a programming language that used an onscreen, turtle-shaped cursor that a user could command with inputted text — moving and turning the turtle, and asking it to draw along its movement path. The division between “text” and “image” on the computer screen, even before GUIs became inherent to the computer interface later in the 1980s, reveals the ease with which the boundary between text and graphics could blur on the screen interface.

<sup>25</sup> Kennedy, “The Soft American.”

the nation itself.<sup>26</sup> Understanding the cultural meanings of the television set is important for understanding both the idea of lively machines in the 1960s, and the relationship between technology and the body. For what is in essence an inanimate object, the television is often positioned as an actor or negative force that has great power over its audience of American “masses.” It is a peculiarly lively machine when positioned within the cultural imagination of the 1960s, and one that also, according to popular representations at that time, has the ability to reduce its human viewers to so many mindless lumps of barely-breathing meat on couches. Television’s paradoxical existence as a lively yet unmoving object locates it as an important new technology with ominous liveliness as well as its liveness. The

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<sup>26</sup> Television scholar Lynn Spigel suggests that telecommunications technologies, like NASA space exploration technologies, are linked as U.S. colonial projects operating under the guise of peace and global “cooperation.” (See Lynn Spigel, “White Flight” in *The Revolution Wasn’t Televised: Sixties Television and Social Conflict*. Edited by Lynn Spigel and Michael Curtin (New York: Routledge, 1997), 48.) See also the previous chapter of this study for a more thorough discussion of the political projects of NASA in the 1960s. Like Spigel, media studies scholar Jeffrey Sconce also connects space race-era television with the ideology that accompanied the U.S. exploration of space, suggesting that “three looming and often interrelated ‘oblivions’ of the ‘New Frontier’ era would seem key in producing these electronically mediated visions of the void — the infinite depths of outer space, the emotional ‘limbo’ of suburban domesticity, and the specter of absolute nuclear annihilation.” (See Jeffrey Sconce, *Haunted Media: Electronic Presence from Telegraphy to Television* (Durham, NC: Duke University Press, 2000), 137.) Outer space, where the primary action of *2001* occurs, is linked to the space “inside” the TV set despite its usually innocuous location within the suburban home. Anxiety over lively machines and passive humans during the space race was acted out through the representation of many technologies — the television is one of those technologies, one that as a device primarily of entertainment and leisure in particular, attracted the attention of critics who feared that Americans were “falling behind” the Soviets.

television's liveliness was both fantastical and eerie, and the television set itself carried with it all of the promise of utopia and destruction of the 1960s cold war era: "The ability of this box in the living room to 'talk' and 'see,' moreover, made the medium something more than a merely inanimate technology. Television exuded a powerful presence in the household, serving in the active imagination as a fantastic portal to other worlds or even as a sentient entity brooding in the corner of the living room."<sup>27</sup> The television is an animate technology during the 1960s, one that creates life and movement, both through its ability to transport viewers, and through the lights and sounds that it creates, seemingly out of no more than a box and electricity. During a time when access to space and seemingly instantaneous communications and "live" broadcasts existed at the same time as the fear of instant nuclear annihilation from thousands of miles away, the television was part of a network of machines that appeared to create information even as it broadcast it.

Scholars have noted that it is TV's relationship to "liveness" that differentiates it from the medium of film. The television's "essence was seen in its ability to transmit events as they occur, not in a filmic capacity to record events for later viewing."<sup>28</sup> Whether or not the television is switched on, the broadcast still exists somewhere, waiting to appear on the screen when it is on, and disappear from view when off, yet it remains in existence somewhere apart from the object of the

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<sup>27</sup> Ibid., 131.

<sup>28</sup> Phillip Auslander, *Liveness: Performance in a Mediatized Culture*, second edition (New York: Routledge, 2008), 12.

television itself. Space exploration-derived technologies allowed for live broadcasts across continents and oceans, facilitating the imagining of a “global” world in which everyone who had a television could access the same broadcasts at the same time. The Telstar 1 satellite, launched in 1962 with NASA’s Thor-Delta rocket, made live transatlantic television broadcasts possible, relaying television signals from one point on earth to another. The original Telstar, owned by AT&T, was the first privately owned satellite launched into space by NASA. Although the Telstar satellite and its successors allowed for live broadcasts to reach international audiences, they only serve to emphasize the importance of liveness to the medium of the television set.

### **Screens of 2001**

The screens of *2001* appear similar to television screens, in that they are cathode ray tube and glass objects, but that often behave differently (and elicit different kinds of human-machine interactions) than the 1960s television set. Screens in *2001* provide a more interactive experience than that with the 1960s television screen, which, as mentioned above, is often cast as a passive experience. The multiplicity of uses and functions of what appear to be cathode ray tube television screens provides a vision of television as ubiquitous (as it was in 1960s American homes), but also interactive. Screens appear frequently in *2001: A Space Odyssey*, and although they have some semblance of the 1960s television set, they serve to

organize space and perform functions that go beyond the purview of TVs in the 1960s American home.

While these devices have the glass screens of cathode ray tube television sets, they do more than show TV broadcast programming. Screens aboard spacecraft relate flight data and information. A screen at a security checkpoint features a young woman asking a viewer to state his name in order to verify his identity. A "Picturephone" screen allows scientist Heywood Floyd to call his daughter on her birthday, while in transit from the Earth to the Moon — this device lets Floyd interact with his daughter through the screen, the technological interface providing a "virtual" meeting point at the screen for two people thousands of miles apart. This last example especially speaks to the interactivity that the characters of the film have with their television screens. Having a conversation with someone on a television screen emphasizes the "liveness" of television because not only is there something on the screen that is existing somewhere else at that exact moment, but there is also interaction with that person's image, and having them respond redoubles the sense of liveness. These screens/televisions are ones that one can talk to and they will respond. This kind of two-way interface re-imagines the screen as something that creates human-machine interaction beyond passive viewing.

Although all of the above examples of television screens in the film come together and create the television set as more than an object that broadcasts pictures, it is the television screens aboard the *Discovery* ship that provide the most

salient example of how *2001* imagines the screen as a technology transformed by the future. Screens aboard the *Discovery* serve as appendages to the computer Hal, binding the computer and the TV set together into a new configuration of the lively machine. Hal becomes the occupant of the ominous nowhere inside the television set.

### **Computer Screens**

The introduction of the screen to the computer's interface brought an easily recognizable image into the visual lexicon of the computer. While computers did not often have cathode ray tube monitors as displays until the development of the home computer in the late 1970s, popular images of computers did incorporate the idea of a display into their representations earlier than that. Incorporating a TV-like device into the terminal of the computer allowed for a representation of the computer that was easier to understand visually because it depended on previously existing technology (the TV set) as part of the computer's material architecture. The addition of the TV set to the computer also allowed for imagining a particular human-machine interaction with the computer that was familiar because it involved sitting in front of a screen. Sitting or standing in front of a television set was a particular interaction that, in the 1960s, was a commonly understood interaction between human and machine. The TV screen embedded in the computer allowed for a person to interact similarly with a computer and provided an ease of imagining

how one might interact with that new technology – although it must be said that very few computers had monitors in the 1960s, and the GUI, which demanded a monitor, was invented in 1964.

The interactive “point” of the mainframe computer did not happen at the monitor, but at various terminals where data was input or output.<sup>29</sup> Friedberg claims that “While the scale and domestic place of the television may have prepared us for the screens of the ‘personal’ computer, computer ‘users’ are not spectators or viewers. Immobile, with attention focused on a screen, the ‘user’ interacts directly with the framed screen image using a device — keyboard, mouse, or in the case of touch-screens, finger — to manipulate what is contained within the parameter of the screen. Computer interfaces may have been designed to become dyadic partners in a metaphysical relationship, but complaints about the awkwardness of this liaison have targeted the interface.”<sup>30</sup> The TV as computer is important because it is a new vision of the lively machine that utilizes two space age technologies converging into one device, with an interface in which a user interacts with a virtual world through the physical interaction with a machine. The television set attached

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<sup>29</sup> Friedberg suggests that the GUI “transformed the computer screen from a surface with glowing symbols and text to one which displayed icons and, later, digital images. The GUI display introduced an entirely new visual system — a text or image in one ‘window’ meeting other texts or images in other ‘windows’ on the same screen” (see 193). This kind of computer interface, with a screen as an output device, invited a meeting of text and image, as often, for early personal computers, text not only appeared on screen along with images, keyboards were a main method of user input.

<sup>30</sup> Friedberg, *The Virtual Window*, 231.

to the computer terminal is no longer the same as the TV set sitting in the living room. Together, these two technologies help to imagine a TV that can be interacted with more actively (on the human's part) than with the television by itself.

Stanley Kubrick and Arthur C. Clarke both consulted with NASA and with IBM to get an idea of what computers might be capable of in the year 2001, and the film is often lauded for its attention to the scientific details of futuristic space travel technology.<sup>31</sup> Hal does not look like computers from 1968 — it has banks of television screens with which the astronauts interact and with which they are able to 'see' what Hal is thinking and doing, and Hal's equipment is presumably hidden away within the walls and body of the ship *Discovery*. Understanding the connection that this film makes between the television set and the computer is critical to understanding the representation of Hal. Television sets convey particular meanings in the 1960s that, when Hal is interpreted with this context in mind, illuminate the meanings that Hal represents regarding space age technologies –

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<sup>31</sup> David G. Stork, "The Best-Informed Dream': HAL and the Vision of 2001" in *HAL's Legacy: 2001's Computer as Dream and Reality*. Edited by David G. Stork (Cambridge, MA: MIT Press, 1998), 1-2. Stork identifies *2001* as a film in which knowing more about science makes it more enjoyable to watch (instead of the usual other way around with science fiction films), due to the attentiveness to scientific detail that Kubrick and Clarke evidenced in their background research for the film. See also Michael Mateas's "Reading HAL: Representation and Artificial Intelligence" in *Stanley Kubrick's 2001: A Space Odyssey: New Essays*, edited by Robert Kolker (New York: Oxford University Press, 2006), 105-126, in which Mateas considers "HAL as a representation of the goals, methodologies, and dreams of the field of Artificial Intelligence (AI)." *2001's* representation of HAL, according to Mateas, has been highly influential on the AI field, in part due to its plausibility and feasibility.

namely, that human bodies and minds are threatened even as they are enhanced by these technologies. In *2001*, Hal has a wide array of monitors that do any number of things, including showing television-like prerecorded images to the *Discovery* astronauts. The monitors, along with Hal's television camera lens "eye," grant Hal an image to go along with the voice with which it can be identified, making a subject from the bodiless and largely intangible notion of the "thinking machine."

The image of the television combined with that of the computer from the 1960s creates a new vision of the lively machine, one whose activity is lights dancing across a screen, and whose object/body is a familiar "face" found in the vast majority of American homes by 1968. Hal can be a lively and "intelligent" machine without a body that takes a human form, unlike his robot predecessors. With Hal, an imagining of a conscious subject sans body is possible, yet, as suggested towards the end of this chapter, Hal's consciousness and Hal's screens ultimately demand the cohesiveness of a representation of a material body. The television-as-computer configuration is one that contributes to Hal's ominous and lively-yet-inert representation. The computer provides the television with the consciousness, the "brains" to go along with its mindless liveliness. Imagining a computer with a TV set display is important for understanding Hal and the representation of technology and the body in the space age. The project of representing a computer visually is also a project of visualizing thought and embodying it. Hal's liveliness, though Hal lacks an easily identifiable mobile body, stems in part from the aspects of it that are

strangely animate in their solid presence: the numerous screens that accompany Hal's camera lens "eye" throughout the ship.

The film's first representation of Hal encourages a connection between Hal as a computer and Hal as a television set. Hal's liveliness comes from Hal's monitors, through which viewers get a picture of what it is "thinking" and doing. In this first scene featuring Hal, viewers see Hal's ubiquitous red camera lens "eye" embedded in a bank of monitors, but the film has not yet let viewers know that this lens is part of Hal. These monitors display a variety of images, presumably giving a visual read-out of Hal's current tasks. One screen, on the upper right of this image, shows changing mathematical equations, and the monitor to the left shows parabola presumably representing trajectories of objects and flight paths. The other two screens on this side of the bank of monitors show graphs. On the four monitors to the left of Hal, we see more calculations and data, as well as an image of one of the astronauts in hibernation within a coffin-like box.<sup>32</sup> It is this monitor that later in

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<sup>32</sup> Poole and Bowman, when they sleep, also sleep in coffin-like boxes (called "hibernaculum" in the novel), although without as much equipment inside. The three other astronauts and scientists aboard the *Discovery* are in hibernation for the duration of the voyage to Jupiter. Their vital signs are monitored and controlled by Hal. Three of the many screens built into the ship depict the vital signs of the three hibernating crew members. A close-up of one of the screens shows six functions with animated graphs, presumably depicting aspects of a sleeping crew member's biological system (the six graphs are labeled "cardiovascular," "metabolic levels," "central nerve system," "pulmonary function," "systems integration," and "locomotor system"). The complex biology of a living person is transformed into simple-looking visual output. Just as Hal's own screens reflect his liveliness, so these screens reveal the only liveliness of the hibernating humans.

the scene displays a BBC broadcast on the *Discovery's* mission, a broadcast through which the film connects Hal's red lens to Hal the character.

The scene of the astronauts and Hal watching the BBC broadcast exemplifies the way that the bank of monitors represents Hal's (dis)embodied and televised liveliness.<sup>33</sup> In this scene, the monitors change what they are displaying to reflect Hal's changing attentions and activity — Hal, in effect, focuses and watches the broadcast at a particular moment, then turns back to its activities aboard the ship. While the TV host talks to the astronauts, the monitors display math equations, graphs, and other visualizations of Hal's inscrutable cognitive functions. When the conversation on the screen of the BBC report shifts to the topic of Hal itself, however, one by one the monitors change from moving graphs and equations to still image placeholders, images of words like "HIB" and "NAV" (presumably

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<sup>33</sup> Although television scholars often identify the "liveness" of the television broadcast as something that makes it distinct from a cinema screen and the film-going experience, the "televised" scenes in which Hal's screens act similarly to television sets complicates the notion of liveness. The BBC broadcast that the astronauts and Hal watch is not "live" within the diegesis of the film, and viewers know this because we see Bowman and Poole watching themselves on the screen. The live must become prerecorded, as the distance between the *Discovery* and earth becomes greater, and the BBC reporter explains that the interview has been edited to account for the seven-minute delay that the *Discovery's* distance from Earth has created. The distance from any point on earth to another creates a negligible enough difference as to appear simultaneous or "live" since radio waves travel fast enough. However, the distance between the *Discovery* and earth grows, and at the time when the BBC broadcast was recorded, the amount of time between when a message from the earth is sent and received by the *Discovery* is 7 minutes. "Liveness" between the earth and the ship becomes impossible with the distance between them, although transmissions from around and just outside the ship still remain "live," as with the scenes depicting astronaut EVAs.

“hibernation” and “navigation,” names of the ship’s systems). As the reporter talks about Hal, more and more monitors cease their action, becoming still, until only three of the twelve monitors, including that of the BBC broadcast, show non-placeholder images. Then, the pre-recorded segment of the reporter interviewing Hal begins, and the monitors all switch back to their moving content. Hal’s attention, briefly diverted to the TV broadcast, quickly returns via the movement and images of what Hal is doing.

Hal’s attention during the television show was captured by the show’s host introducing Hal: “The sixth member of the *Discovery* crew was not concerned about the problems of hibernation, for he was the latest result in machine intelligence, the H-A-L 9000 computer, which can reproduce, though some experts still prefer to use the word ‘mimic’ most of the activities of the human brain, and with incalculably greater speed and reliability. We next spoke with the H-A-L 9000 computer, who we learned one addresses as ‘Hal.’”<sup>34</sup> By the time the reporter finishes the last sentence, Hal’s monitors again show movement. Before this, Hal is intent on listening to the television, and the sentence describing Hal’s “mimicking” of human thought occurs when nearly all of Hal’s monitors are still. The visibility of Hal’s thinking recalls the

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<sup>34</sup> The humans in the film refer to Hal as “he” when talking about him, which reveals the curious intractable nature of gender, as Hal, as a machine, has no sex. One would think that it also has no gender, but this only reveals, as with many of the lively machines of this study, that machines represented as self-aware, or even lively, often have gender mapped onto their “humanity.” *2001: A Space Odyssey*, directed by Stanley Kubrick (1968; Burbank, CA: Warner Home Video, 2007), Two-Disc Special Edition DVD.

earlier discussion of the problems with representing “thought” and “thinking machines” like computers, visually. The monitor allows for representing thought via the movement and shifting of images across its surface.

When that monitor returns to the footage of the BBC reporter, the dormant monitors become active again, once more showing graphs and equations. The viewer gets the impression that Hal was intently watching and listening to the reporter, perhaps contemplating its own abilities to think and the possibility that its thoughts are only a programmed performance of human thought and not “actual” thinking. Though it is not the first time that the film shows Hal via its red lens, it is in this scene that viewers learn to identify Hal’s voice and character with the red lens — we learn what Hal is through the television broadcast of the prerecorded interview with Hal. Situated among the television monitors on screen, Hal’s red lens becomes Hal through watching Hal watch itself on the TV.

Hal emerges from the television screen itself through the use of the TV broadcast to introduce Hal. At the moment when film viewers learn that Hal is the red lens, and that the red lens is Hal, the image of the screen is of the monitor showing the same red lens that viewers see embedded in the computer terminal next to the monitor. In this image, viewers see the black rectangle and red lens broadcast on the BBC interview in the screen on the bottom right of the middle cluster of four screens. Two images of Hal appear onscreen at once, one a filmic representation of Hal and one a televised representation of that representation. As

the broadcast interview continues, we see the reporter on the TV screen asking Hal a question. Hal's reply is accompanied by a cut to an extreme close-up of Hal's red lens, and while the logic of the shot suggests that the audio is from the TV, the visual image of Hal is the film image, not the TV one. At this moment, the film shows Hal listening to itself and watching itself on television. Hal has emerged from the television set, itself a site in the 1960s that was often represented as a conduit into a vast, ominous nowhere.<sup>35</sup>

Thus it is through the content and the watching of a TV broadcast that we first learn of Hal. The content of the broadcast establishes that Hal is an intelligent machine, "incapable of error" and in charge of the ship and the hibernating crew members; watching the broadcast connects Hal's TV image to the filmic image. The television show is a BBC news show called "The World Tonight," and the episode that the astronauts and Hal watch is a segment on their mission to Jupiter, featuring prerecorded interviews with the astronauts and Hal.<sup>36</sup> It is no coincidence that viewers "meet" Hal through a television broadcast. As Sconce explains, "over the past half century, diverse accounts of television have frequently targeted the medium's paradoxes of visual presence, playing on the indeterminacy of the animate and inanimate, the real and the unreal, the 'there' and the 'not-there' to produce a

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<sup>35</sup> Sconce, *Haunted Media*, 131.

<sup>36</sup> Bowman and Poole eat while watching this television show, their space food served up in segmented plastic plates, very much reminiscent of a TV dinner, adding to the sense of the humans passively "watching television" aspect of this scene.

new folklore of electronic media that continues to thrive in contemporary accounts of cyberspace and virtual reality.”<sup>37</sup> This scene with Hal makes it easy for us to imagine it as both a television and a computer, and demonstrates the importance of the televised and the screen in the representation of Hal’s liveliness. The TV and computer combination that Hal represents is part of the “folklore” that Sconce discusses, and the incorporation of the computer into electronic media with the advent of “cyberspace” underscores the importance of computer representations like Hal, and becomes a subject through viewers watching him watching itself. Hal is some *thing* produced by the technology behind the screen itself. The vast nowhere inside the television brings forth and projects Hal out into the world; Hal is perhaps the conscious occupant of the electronic elsewhere from which TV images emanate.

The television figures into this scene not only through the way in which Hal watches it and its conveyance of information to us about who Hal is, but also through the way in which the human crew members interact with it. Hal is a screen and a red lens that controls what humans see, but also controls almost all other aspects of the astronauts’ lives aboard the Discovery. It keeps watch over the health of the hibernating crew members, allows them to communicate with people on earth, and controls the hatches and other material aspects of the ship. While Hal’s lenses appear to be ubiquitous throughout the ship, Hal’s presence in the

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<sup>37</sup> Ibid.,127.

astronauts' lives is also all encompassing, as they depend on it for almost everything. The technologies of the television and the computer come together in *2001* in order to help imagine a television that allows for a more interactive engagement than did the popular conception of the television; but with that engagement comes another threat of technology that in turn is able to do too much. Instead of the vision of Steinbeck's TV audience members drooling as they stare into the face of the television, we see the eerie presence of the TV personified with the intelligent computer Hal. His liveliness is perhaps reflected in the inactive crew members of the *Discovery*, giving rise to the idea that when machines grow more active, their human counterparts grow more inactive.

### **The Spacesuit and Spacecraft**

Thus far, the previous sections have covered the television and the computer, and their union, and have helped explicate the liveliness of the Hal 9000 from *2001*. The television and the computer are technologies that serve as lenses to focus the anxieties of Americans over the process of space age-induced technological-cultural change that produces active machines and passive humans. This section considers the third technology that focuses that anxiety — one not of telecommunications like the TV and the computer, but of distance and space, and more “material” matters — the spacesuit/spacecraft. The spacesuit/spacecraft, which are here treated as one singular technology because of their similarity in function, help to crystallize the

role of the idea of the body both for the astronaut (as a “spaceman cyborg”) and for the disembodied subject that is Hal. Through the spacesuit, the astronaut becomes a cyborg, and through the spacecraft, we see the inverse as Hal, the machine, becomes embodied.

Photographs taken by American astronaut Jim McDivitt in 1965 show astronaut Ed White performing the first U.S. extra-vehicular activity (EVA, also known as a spacewalk). The first image of White’s brief excursion outside the Gemini IV spacecraft shows White in his spacesuit with a trailing golden “umbilical” that trails outside of the image’s frame.<sup>38</sup> The second shows the umbilical connecting his suit to the ship that occupies a small portion of the lower right-hand corner of the photograph.<sup>39</sup> Against a background of the earth and its clouds, White floats free of the Gemini and of the earth’s gravitational pull, and viewers of the photograph cannot see White’s face inside his space helmet, but a reflection, bringing to mind the reflective glass screen of the television or the glass surface of Hal’s red camera lens eye.<sup>40</sup> These images, and others of White’s spacewalk, depict

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<sup>38</sup> Photograph taken by commander James McDivitt of astronaut Edward White during his EVA on the Gemini 4 mission over a cloud-covered Pacific Ocean, June 3, 1965, NASA History Collection, NASA photo ID S65-30427.

<sup>39</sup> Photograph taken by commander James McDivitt of astronaut Edward White during his EVA on the Gemini 4 mission over New Mexico, June 3, 1965, NASA History Collection, NASA photo ID S65-34635.

<sup>40</sup> The reflective visor of the space helmets were made of a very thin layer of gold foil, to protect the astronaut from the ultraviolet and infrared rays of the sun, which, without the protection of the Earth’s atmosphere, would be damaging to the astronaut’s eyes and face.

him floating either against a background of clouds like the first image above, or, more frequently, against the curved horizon of the earth, his body supported by nothing more than the tether keeping him from floating away from the ship.<sup>41</sup> This collection of NASA images taken by McDivitt gave Americans the first clear view of an American floating in space. The earth always features in the background of these images, and the ship rarely takes up more than a small portion of the image, if it appears at all.

Images of spacewalks like these capture a particular human dependence on machines and the complications of that dependence, as well as providing a narrative of space exploration emphasized by NASA in the 1960s. The astronaut is both free of the spaceship-machine and supported by it, as well as enclosed by the spacesuit-machine as he floats apart from his spacecraft. The twenty-five-foot golden umbilical connects his spacesuit to the ship, protecting him against the vacuum of space, providing breathable air, and allowing him to communicate with McDivitt and mission control. Even as images of his spacewalk capture a sense of freedom also felt by White during his EVA, they also articulate a dependence on technologies that were necessary for survival in space and the execution of the mission. While the images tell a particular story about Americans and machines, the portion of the Gemini IV mission transcript with the EVA also suggests a similarly conflicting set of

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<sup>41</sup> To see more images from NASA's collection of the Gemini 4 EVA, see [http://nssdc.gsfc.nasa.gov/planetary/gemini\\_4\\_eva.html](http://nssdc.gsfc.nasa.gov/planetary/gemini_4_eva.html).

ideas — EVAs were described as both pleasant and also physically taxing due to the design of the spacesuits used during the first few American spacewalks. When told to reenter the ship, White is frequently quoted as saying, “this is the saddest moment of my life” before climbing inside. According to the mission transcript, he did indeed say this. More compelling, however, is his conversation with McDivitt a few moments later, when trying to describe the experience. White appears to be at a loss for words, trailing off. He finally says, “that was something. That was the most natural feeling, Jim.” McDivitt replies, “Yeah, I know it. You looked like you were in your mother’s womb.”<sup>42</sup>

By this point in NASA’s projects, humans had become integral parts of the most publicized space exploration missions. As suggested in the previous chapter, Project Mercury negotiated the roles of humans in a computerized and automated environment. By the time of the executions of missions relating to Project Gemini and Project Apollo, however, astronauts had been thoroughly incorporated as more than “cargo” aboard their ships -- performing functions critical to mission success. While NASA officials still at times struggled with the ‘problems’ of mechanized thought, they also had solidified the roles of men aboard space missions. For example, while Mercury did not require the astronauts to do more than sit in their

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<sup>42</sup> “Composite Air-to-Ground and Onboard Voice Tape Transcription of the GT-4 Mission,” mission occurred on June 3, 1965, transcript dated August 31, 1965, NASA Manned Spacecraft Center, Johnson Space Center History Collection website, Gemini IV Mission Transcripts, 56.

capsules, the subsequent Project Gemini included expanded human roles and objectives such as the EVAs, transferring astronauts between two spacecraft in space, and conducting experiments in space. Apollo would require even more human activity, as much of the lunar landing missions were designed to require human operations on the surface of the moon.<sup>43</sup> After Mercury, as well, “NASA’s human spaceflight effort more thoroughly incorporated the astronaut in to the control system.”<sup>44</sup>

The emphasis on the astronaut in the second NASA image mentioned above, with the spacecraft only edging into the frame in the lower right corner, suggests the attention to and importance of the human over the machine. The human remains central to the imagining of space exploration, despite humans’ dependence on machines during “manned” space exploration. Representations of American spacewalks reveal humans relating their experience as freeing and “natural,” but this freeing experience were problematically enabled by the confinement and dependence on the spacesuit and spacecraft. Imagery of the American spacewalk depicts a human momentarily free of the confinement of the spacecraft, free of the Earth’s gravity in the wide-open space of outer space, while simultaneously

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<sup>43</sup> As suggested in the previous chapter of this study, “manned” space missions, including the Apollo missions, were designed to require human presence, but scientific tasks could often be completed more cheaply and at less risk with robotics.

<sup>44</sup> Roger D. Launius and Howard E. McCurdy, *Robots in Space: Technology, Evolution, and Interplanetary Travel* (Baltimore: The Johns Hopkins University Press, 2008), 79.

enveloped in the spacesuit and often tenuously connected to the spacecraft by a slim gold umbilical. Thus the technologies of the spacesuit and spacecraft are critical to connecting the idea of the screen and the computer. While the television and computer exist in material space, their liveliness comes from the things that they do immaterially — the lights and images dancing across a screen, and the “thinking” that the mainframe as electronic brain does. As technologies of the body and of the space age, the spacesuit and the spacecraft figure into *2001* are critical to explaining the relationship between humans and machines, as well as the ominous dangers of the lively machines of “modern life.”

Specifically, the spacesuit can be seen as part of a broader discussion of bodies and machines, and it recalls early representations of the cyborg. NASA and the American public saw the human body’s inability to survive without the intervention of technology as a vulnerability that needed to be overcome,<sup>45</sup> and, as

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<sup>45</sup> One of these “problems” of space travel that the human body would need to overcome, according to the scientific paper that first used the word “cyborg” was “Erotic Satisfaction.” As de Monchaux suggests in *Spacesuit: Fashioning Apollo*, “One of the most fascinating examples of the alignment and overlap between the cyborg’s psychological origins and its expression as the subject of interplanetary travel is the extensive discussion — at least in Kline and Clynes’s original conference paper — of sex. (By the time the paper was published widely, in the *Journal of the American Rocket Society*, the topic had been redacted.) Identifying ‘Erotic Satisfaction’ as one of the potential problems of space travel to be overcome by the cyborg framework, a twofold solution was proposed. First, the brain’s ‘pleasure center’ would be stimulated to assuage the need for sexual expression. Secondly, when sexual urges, or other strongly expressed feelings, were unwelcome, their chemical suppression would be introduced — either through automatic injection or, in a more extreme case, by a strong chemical dosage triggered from the ground.” (See de Monchaux, 75.) The “problem” of astronaut’s “erotic satisfaction” being dealt with via

suggested in chapter 3 of this study, the word “cyborg” first appeared in print in a 1960 issue of the *New York Times* describing a “spaceman” as “man-machine.”<sup>46</sup> The idea of a cyborg at this time “had much less to do with mechanical prosthetics than with the function of any manmade influence — mechanical, biological, and particularly chemical — within man’s internal control systems.”<sup>47</sup> While the idea of the cyborg shifted to mean a human-machine hybrid, with chemical or biological alterations not necessarily part the cyborg, the original use of the term cyborg as demonstrated in the *New York Times* has to do with the influence of the field of

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pharmacological means comes up briefly in the novel of *2001*, when Clarke brings up the subject of sex, only to abruptly drop it: “It was true — indeed, notorious — that seamen had compensations at other ports; unfortunately there were no tropical islands full of dusky maids beyond the orbit of Earth. The space medics, of course, had tackled this problem with their usual enthusiasm; the ship’s pharmacopoeia provided adequate, though hardly glamorous, substitutes.” (See Clarke, *2001: A Space Odyssey*, 100-101.) Without the colonial privilege accorded sailors of “dusky maids” on “tropical islands,” Bowman and Poole need alternate outputs for their desires. De Monchaux further suggests that the repression of “male sexual urges” and the decision to not allow female astronauts “offers the tantalizing prospect that it was not even a ‘normal’ heterosexual urge that might become uncontrollable in the freedom of orbit, but an interplanetary urge toward homosexual behavior instead.” (See page 76.) This example of sexual desire in space, appearing in space medicine, NASA documents, and *2001*, reveals not only the importance of the “spaceman cyborg” imaginary in scientific thought, but it also reveals another layer to the notion of control over the body in space. The necessity for a chemical “solution” to both strong emotions and sexual desire implies that men could not (or should not be allowed to) control their “urges” and would act on them in ways that NASA did not (or would not) approve. Space exploration in many ways was about control over the biological “imperatives” of the human body.

<sup>46</sup> Nicholas de Monchaux, *Spacesuit: Fashioning Apollo* (Cambridge, MA: MIT Press, 2011), 68. For the *New York Times* article, see “Spaceman Is Seen as Man-Machine: Scientists Depict the Human Astronaut as Component of a ‘Cyborg’ System,” published on May 22, 1960.

<sup>47</sup> De Monchaux, *Spacesuit*, 75.

cybernetics on the coining of the term and idea of the “cyborg.” Cybernetics is a discipline that coincided with the development of the computer, beginning in the 1940s as a “theory of communication and control applying equally to animals, humans, and machines” that would provide a universal explanation of the transfer and production of information.<sup>48</sup> To return to the notion of the interface, the cyborg supposes a point of interaction and confluence of biological systems and the “artificial” system, whether it be biochemical or mechanical, that takes place within the human body. A cyborg is an interface, and the “spaceman” as cyborg reveals anxiety about the need for technological influence on human bodies in the project of space exploration. The human wearing a spacesuit is part of this imagining of the cyborg, providing a new bodily surface that became a crucial part of the image of the astronaut. Part of the anxiety over the cyborg astronaut stems from the new notion that cybernetics suggested, that the “boundaries of the human subject are constructed rather than given,” a claim that N. Katherine Hayles suggests was the most “disturbing and potentially revolutionary” to come out of first-wave cybernetics.<sup>49</sup> With the boundaries of the human body under scrutiny, what other bodies might come forth out of the advancing technologies of the space age?

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<sup>48</sup> N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: University of Chicago Press, 1999), 7. For more on the history of cybernetics, Hayles’s book is an excellent resource.

<sup>49</sup> *Ibid.*, 84.

In 1964, an October issue of *Life* magazine featured a number of articles and images about space exploration technologies.<sup>50</sup> It included projected technologies needed for space stations and planetary exploration and technologies being developed for contemporary NASA projects like the Apollo's Lunar Excursion Module (the LEM, "man's first true spacecraft"), a spread of illustrations depicting the future of space exploration, and articles featuring the futuristic technologies of the present, some with astronauts' bylines.<sup>51</sup> Their smooth flow between the seemingly impossible prospects of the future and that of the cutting edge technologies that NASA had brought into being made it easy for readers to imagine a future where space travel was not only inevitable but commonplace. One article in particular focused on the vulnerability of the human body in space and the field of "bioastronautics," and was appropriately titled, "The Last Barrier is Man Himself."<sup>52</sup> Although most of the photographs accompanying the article are not of human beings at all, but of the animals used as test subjects — chimpanzees, frogs, monkeys, dogs, and rabbits whose bodies were exploited for the "benefit" of humans — the spaceman cyborg does come up. "Cybernetics is the study of the relationship between computing machines and the human nervous system. It deals with the art of handling vast quantities of information, running the data through complex computing systems which then feed back new and useful data.... There are

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<sup>50</sup> See *Life*, October 2, 1964.

<sup>51</sup> Pete Conrad, "We'll Land It on the Moon," *Life* (October 2, 1964), 86.

<sup>52</sup> "The Last Barrier is Man Himself," *Life* (October 2, 1964), 103-11.

scientists who now believe that the human body could be run cybernetically — i.e., it could be automated — in a similar fashion, though the job would be much harder. The Cyborg, though cybernetically controlled, would be a human being — if, after radical tampering, he could still be called that.”<sup>53</sup>

Answering the “problem” of human bodies vulnerable to the environment of space travel with a computerized, “automated” system being introduced to the body ties together the notion of the body with that of the computer, though, as the article notes, the result may not be “human” anymore. As Haraway suggests in her article on the chimpanzees used for NASA’s rocketry testing, “a cyborg exists when two kinds of boundaries are simultaneously problematic: 1) that between animals (or other organisms) and humans, and 2) that between self-controlled, self-governing machines (automatons) and organisms, especially humans (models of autonomy). The cyborg is the figure born of the interface of automation and autonomy.”<sup>54</sup>

The spacesuit machines the human body into a spaceman cyborg, though perhaps not as seamlessly as the *Life* article would have readers believe. When McDivitt tells White that during his EVA “you looked like you were in your mother’s womb,” the space-suited astronaut becomes the cyborg, birthed without the process of human reproduction and without “natural” origin. By describing White as such, McDivitt speaks to a broader trend in naturalizing the human body’s relationship to

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<sup>53</sup> Ibid., 122.

<sup>54</sup> Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989), 139.

technology, and in a unity and partnership between “man” and machine that NASA promoted after Project Mercury. However, this clean and pristine image of human-machine partnership does not so easily settle the anxiety over the vision of humans’ growing dependence on machines and its repercussions. In the vision that *2001* paints of the role of the human astronaut in space exploration, we see a rupture in the flawless surface NASA provides in the mid- to late-1960s between “man” and his technological apparatus. While the NASA images of EVAs focus on the human being, Kubrick’s visuals of EVAs problematize the ubiquitous presence of technology in humans’ lives.

While NASA constructed narratives that insisted on the importance of the human body in space, *2001: A Space Odyssey* emphasizes the vulnerability of the human body in space. While during the space race, over-the-top symbolism and metaphor kept the human role in space exploration about the power and mastery of human beings over their physical surroundings, in *2001* the humans are almost completely dependent on Hal and their other machines to keep them alive. The two EVAs that Poole and Bowman perform in *2001* both echo and counter the NASA images of White’s and other Americans’ spacewalks in the 1960s. While an umbilical connects White to the ship, neither Poole nor Bowman are connected to the *Discovery* when they launch themselves from their pod vehicles to the communications array. During Bowman’s EVA, in which he removes the malfunctioning AE35 unit, he floats completely free of ship and pod against the

blackness of space. Bowman's EVA is dreamlike in its visuals, paired with the sound of Bowman's breathing, but Poole's EVA is not ([click here to see the image: Image of Bowman's EVA, floating towards the antennae](#)). In Poole's spacewalk, though it begins visually similar to Bowman's, with Poole floating out towards the communications satellite, the peaceful vision of a person floating unfettered through space is interrupted by the presence of machines. While the beginning of Bowman's EVA shows him exiting the pod to launch himself towards the antenna, Poole's shows him exiting the pod on one of Hal's screens ([click here to see the image: Image of monitors, Poole coming out of pod — he's "inside" Hal's TV-computer screen](#)).

While Poole floats towards the antennae on the left side of the frame, we see his unoccupied pod on the right-hand side ([click here to see image](#)). Instead of depicting Poole floating all the way to the antenna and then reaching it, the pod just begins to spin, and the film interrupts Poole's EVA with a cut to a side view of the pod in the middle of the screen, floating in space; it continues to spin, and as it spins to face the camera, the mechanical arms attached to the sides of the pod, which had been folded up against the "body" of the pod, begin to unfold towards the camera. When the pod faces the camera straight on, the arms are fully outstretched, and the pod smoothly shifts from spinning on its axis to moving forward, towards the camera, the mechanical claws at the ends of the arms opening ([click here to see:](#)

Hal's pod — note the Hal "eye" embedded on the front of the pod below the porthole for humans).

After a moment, the pod takes up most of the screen, and the film cuts to a close-up of the front of the pod, drawing attention to one of Hal's red lenses on the front of the pod. A rapid series of cuts, showing Hal's lens taking up more and more of the screen, ends with an extreme close-up of Hal's red lens, the lens taking up the entire screen. Unlike other moments when the screen shows a close-up of Hal's lens, there is no reflection of what Hal is seeing, only red concentric circles of light ([click here to see: Extreme close-up of Hal's "eye,"](#) the last thing on the screen before seeing Poole's body fly off into space).

The audio, which during this entire sequence of shots has been the sound of someone (presumably Poole) breathing, stops as the shots of Hal's lens begins, implying that Poole has stopped breathing. The next shot is of Bowman, who is in the ship monitoring Poole's repairs on the antennae. He looks sharply to his right, and a point-of-view cut reveals a monitor set in a bank of computer equipment. On the monitor, Poole's body flies across the screen, and the pod tumbles off into space in another direction. The film shifts to a shot of Poole floating in space, not via the monitor — and instead of the vision of the astronaut floating leisurely through space, the film shows Poole's body flying off into space and struggling against the blackness, the broken oxygen tank hose spewing the air from his suit into the

vacuum of space. Then he is still ([click here to see: Poole struggles with his suit and careens through space. Note the broken hose coming out of his suit.](#)).

Returning to the images of White's spacewalk to compare them to the above image of Poole struggling, reveals a disruption of the human-machine relationship set out in the NASA images. Instead of a background of earth's clouds, Poole floats against the blackness of outer space, and instead of his air hose connecting him to something, it is broken off and sticking out into blackness. Beyond just a comparison of images, the film constructs a deliberate visual interruption into the moving image vision of the spacewalk. Instead of a continuous series of shots of Poole floating towards the antenna like Bowman's EVA, the serenity of the moment is interrupted when the pod begins to spin on its own, followed by the shots of the pod itself. Not only does Hal interrupt this scene through his action of killing Poole, but also through the continuity of the images of a spacewalk. Hal's image takes up the entire screen as he intercedes in visions of the EVA as a freeing moment.

While the NASA images of White's spacewalk create a sense of freedom — freedom from gravity, freedom from the confines of the Gemini spacecraft — the images of Poole's death from *2001* force consideration of the vulnerability of the human body in outer space. NASA's images depict a person at one with his spacesuit machine, producing the "astronaut" — a cyborg amalgam constructed of a human body encapsulated by a technological apparatus. As previously mentioned, the word "cyborg" was first used in print in a 1960 *New York Times* article called

“Spaceman Is Seen as Man-Machine,” and astronauts in their spacesuits, interpreted as cyborgs, create a particular relationship between human and machine.<sup>55</sup> Hal severs that relationship in the scene where he kills Poole — seeing the above image of Poole floating on his fatal spacewalk disrupts the concept of the cyborg astronaut, separating out the man from the spacesuit, transforming him back into a human body enclosed by a machine. This image becomes critical at the end of the film when Bowman performs one last “spacewalk” as the star child, without ship or suit or umbilical, to be discussed in depth below.

As well as invalidating the astronaut-as-cyborg image and the harmonious relationship between human and machine that it suggests, Hal’s intervention into the serene image of the spacewalk also re-imagines the power relationship between humans and machines. Machines in *2001* are no longer unthinking and servile partners to man, as suggested by NASA in the 1960s, but malicious, intelligent machines capable of supplanting man in his exploration of the universe, capable of killing him by exploiting the weaknesses of his organic body in space. Gaining a pod “body,” Hal also reminds us that he, too, is the *Discovery* ship, and his power over the human beings existing inside the architecture of his body is almost complete. Given too much control over human bodies through his artificial intelligence and the extension of that intelligence into the physical form of the ship, Hal is able to murder the hibernating crew members and Poole, and almost kills Bowman by the same

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<sup>55</sup> De Monchaux, *Spacesuit*, 68.

method (forcing Bowman to shoot himself into an airless airlock without a space helmet) before being dismantled. Hal has become too active through his intellect, and at this moment in the film, Hal occupies a material body in his control of the pod.

The television-computer that is Hal also contributes to the sense of Hal's structure and his existence as the spaceship. Television scholar Anna McCarthy suggests that television sets organize people within spaces in particular ways that are shaped by power dynamics within that social space: "The position of the TV set ... helps to position people — not necessarily the empirical persons who work, wait, and relax within eye- and earshot of a particular screen but certainly the spectator positions these persons are encouraged to occupy within the social organization of the space and within larger networks of power, as well."<sup>56</sup> Anne Friedberg similarly suggests that "the screen functions as an architectonic element, opening the materiality of built space to virtual apertures in an 'architecture of spectatorship.'"<sup>57</sup> Hal, as a computer with screens, likewise organizes his human spectator/operators, and his screens help to organize the material space of his body and position the bodies of the humans aboard the ship. In essence, it is his screens that give both shape to his body as the ship, and the power dynamics between human and machine that plays out in this section of the film. His dual role as computer and television

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<sup>56</sup> Anna McCarthy, *Ambient Television: Visual Culture and Public Space*, (Durham, NC: Duke University Press, 2001), 119.

<sup>57</sup> Friedberg, *The Virtual Window*, 150.

allows for an organization of the astronauts who interact with him into groups of spectators and operators.

The screens aboard the *Discovery* function as focus points — points of interaction — that reveal the larger power structure between technology and human beings. While the television screens capture the astronauts' attention and allow them interaction with the world outside of the ship, they also reveal the ways that they are existing inside of the machine that is the television/computer themselves. The screens serve as points that hide the complete enclosure of the spaceship, and allow the astronauts and viewers to forget the dynamic between human and machine. The astronauts, however, as we discover when Hal kills all but one of them, have very little control because they are existing within Hal, within the television and computer, which are merely interactive points on the inner surface of the built architecture of the spacecraft. With the killing of Poole, the ship becomes Hal, an extension of what lies behind his screens, and the entire environment in which Bowman exists becomes the inside not only of the ship but of the screen, and by extension, Hal's body. The monitors aboard the ship serve as organizing structures for the space that is Hal. Just as mainframe computers of the 1960s take up space and were difficult to represent visually because of their lack of a uniform "look" beyond racks of shelves and equipment, the television helps to organize the computer into the representable visual architecture of the spaceship. The technology of the television set helps to organize Hal the computer into a body

created of images of the architecture and technological apparatus of the ship. Ultimately, Hal's existence as an intelligent entity with a "brain" demands the coherence of a body, at least as projected patterns of light on the cinema screen.

The normative and sustainable body, however, remains a distinctly human endeavor in *2001* — although Hal's pod has the semblance of an eye, and mechanical arms, the mechanical-ness of those body parts merely reinforces its difference from a human body. After Hal's coherence into a body after killing Poole and inhabiting the pod, Bowman makes his way back into the ship to dismantle Hal, and once he reenters the ship, there is nothing Hal can do to impede him.

Bowman heads to a room called the Logic Memory Center, the entire time filled with Hal explaining himself, and assuring Bowman that it is feeling better, and encouraging him to "take a stress pill and think things over." Instead of taking a stress pill, Bowman enters the Logic Memory Center, an oddly shaped room with zero gravity, long and narrow with no identifiable floor or ceiling — not necessarily a shape meant for human comfort or occupation. All the surfaces of this room are covered with bars of red light, except for the entrance, and a small area with one of Hal's interfaces and a number of white bars of light. As Bowman begins unscrewing the bank of white bars of light, Hal asks him to stop, and as the bars of light float out from their moorings in the surface of the ship, Hal's voice begins to change, implying, together with the name of the room, that Bowman has begun to remove

the material pieces that make up Hal's brain, and, thus, Hal itself. As Bowman methodically removes these glowing white rectangles, Hal pleads with him:

Stop, Dave, I'm afraid [Hal's voice is slowing down and dropping in pitch]. I'm afraid, Dave. Dave, my mind is going, I can feel it, I can feel it. My mind is going, there is no question about it. I can feel it, I can feel it, I can feel it, I'm afraid [Hal's voice is even slower and lower in pitch]. Good afternoon, gentlemen [said slowly]. I am a Hal-9000 computer. I became operational at the H-A-L plant in Urbana, Illinois, on the twelfth of January, 1992. My instructor was Mr. Langley, and he taught me to sing a song. If you'd like to hear it, I can sing it for you.<sup>58</sup>

Bowman asks Hal to sing for him, which Hal does — the song is "Daisy Bell."<sup>59</sup> Hal's voice grows slower and slower and more lower-pitched as it sings, stopping mid-song. Immediately after Hal stops singing, a prerecorded video message begins playing on a screen in the Logic Memory Center, relaying information about the mission to Jupiter. With this, Hal is gone, its computer "brain" removed by Bowman, and it is fitting that Hal's "death" is marked with a pre-recorded video on a screen. Hal's self in this last scene in which it is "alive," takes a material form as the pieces

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<sup>58</sup> This scene in the novel is similar to the film, but the text describes some of Bowman's remorse at "destroying the only conscious creature in my universe" (see page 159). When Bowman contemplates shutting off Hal's consciousness, the text reads "without [Hal's] supervision, *Discovery* would be a mechanical corpse," again likening the ship to Hal's "body" (see 158). Hal's last words are not its singing, however, but words from Hal's first lesson after it became conscious (see 160).

<sup>59</sup> "Daisy Bell (A Bicycle Built for Two)" is a popular song from 1892, and also the first song sung by a computer, the IBM 7094, in 1961.

that Bowman removes from the wall of the ship. Dismemberment is Hal's fate, and he is all too embodied by this point in the film.<sup>60</sup>

### **Conclusion**

Hal only can be embodied in those moments when Hal draws attention to Hal's control over the ship and the pod. Otherwise, he is disembodied and eventually, relieved of his mind as well. Up until the popularization of computers, however, the disembodied lively machine was not the norm. It was the human form that constituted one of the main ways of representing a living machine as such. Robots and cyborgs earlier in the twentieth century, as demonstrated in the first and second chapters, both demanded the human form as a way of understanding automation. With the computer, this is no longer the case, and the human form, though useful in representing automation, is no longer a necessity.

The film ends with a vision of one last spacewalk performed by Bowman, but it is one that he does without a spacesuit or umbilical, or even any clothes at all. The image of Bowman's evolved form make astronaut McDivitt's words to White, "you looked like you were in your mother's womb," seem strangely appropriate as Bowman's journey into the alien monolith transforms him into a "star child," a being

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<sup>60</sup> In the novel *2001*, Bowman thinks of what he does to Hal as a "lobotomy," a word that also summons the idea of Hal's computer hardware as part of a "body." See Clarke, *2001: A Space Odyssey*, 158.

that resembles a white, glowing human fetus floating in space.<sup>61</sup> The fetus image is a peculiarly a-technological vision for the last shot of a film that throughout has featured a visual smorgasbord of futuristic technologies. The image of the star child is an image of the human body unfettered by technological apparatus. Although the image itself is contingent on space age technology, in that it shows a view of the earth from space, an image only made possible by satellite or spacecraft photography, it is of something as “natural” as a human fetus and the earth.

The fetus, however, does not exactly resemble a human fetus — it has no umbilical cord, speaking to the fact that this is a fetus that does not spring from the reproductive processes of the human body, even as it reasserts a naturalness of the human body. McDivitt’s words are again appropriate here, but in *2001*, the space-suited “spaceman cyborg” becomes the fetus-like star child. Within this “natural” image of a fetus, the star child recalls the image of the NASA spacewalk, with an astronaut floating above the earth. This star child is a creature unfettered by the technologies upon which Bowman and his fellow humans had been so dependent earlier in the film. While as twenty-first century astronauts, Bowman and Poole had been dependent on the technologies of the computer, the spacesuit, and the spaceship; with the star child, these technologies have been relocated into the organic humanoid body itself.

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<sup>61</sup> “Composite Air-to-Ground and Onboard Voice Tape Transcription of the GT-4 Mission,” 56.

Haraway suggests that “the extraterrestrial is coded to be fully general; it is about escape from the bounded globe into an anti-ecosystem called, simply, space. Space is not about ‘man’s’ *origins* on earth but about ‘his’ *future*, the two key allochronic times of salvation history.”<sup>62</sup> “Man’s” salvation in this film comes from becoming unbound from the technological apparatus that is the machine. The “spaceman” cyborg of the human within a spacesuit is re-mapped onto the seemingly “natural,” organic body of an umbilical-less human fetus, freed from the spacesuit as well as the umbilical. With the body of the star child, space is no longer a dangerous place where human bodies are vulnerable to the environment as well as their inescapable technological environment. It reveals and reinforces the spacecraft as a wholly “unnatural” environment under the literal control (in the film, at least) of Hal, but one that humans are dependent on for survival.

The dream to be free of the fetters of machine technology is realized in *2001: A Space Odyssey* — at least for David Bowman. For him it comes true with his transformation into the star child. The film ultimately resolves the problems of the perceived vulnerability of the human body to space, television, and the computer through the “natural” process of evolution that frees Bowman from the dependence on these technologies. The tension between the biological and the technological is resolved through the breaking of dependency on machines. Instead, the human body becomes the technological and acquires the powers that the machine had. In

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<sup>62</sup> Haraway, *Primate Visions*, 136-37.

this scenario, machines can no longer threaten because they no longer have power over human beings. Through the imagery of Bowman's form as the star child, we see the biological supplanting the technological via the process of evolution. Space travel is possible for the Bowman star child via a humanoid form, and the biological processes of human reproduction can happen without the necessity of the female body. The star child resolves the tensions of the biological and the technological as created by the increasingly automated (and lively) machines of the 1960s.

**Epilogue**  
**Perfecting the Living Machine: *Blade Runner's* Replicants**

*All those moments will be lost in time, like tears in rain.*

-- Roy Batty of *Blade Runner*, 1982

The last chapter of this study closed with a meditation on the final image of *2001: A Space Odyssey*, that of Bowman the star child's spacewalk above the atmosphere of the Earth. This final image reflects a resolution of the anxiety over technology that both frees humans and has power over them as they are dependent on it for survival. The star child is a being that requires no machines, no mechanical technology to survive in space and explore its reaches. Within the form of the organic human body, via a humanoid fetus, *2001* asserts the permanence of the human form, one that has integrated space age technologies within it. The same year that *2001* was released (1968) saw the publication of Philip K. Dick's *Do Android Dream of Electric Sheep?*, a novel that lent itself to the 1982 science fiction film *Blade Runner* directed by Ridley Scott. Both Dick's novel and the film similarly imagine technology's implications for the humanoid body, but while in *2001*, the star child is a celebrated, "evolved" human being, *Blade Runner* instead suggests that human beings are no more sophisticated than their machines, and no more "human."

*Blade Runner's* living machines push the limit of the definition of the word "machine," and I only call them "living machines" to help draw them into the genealogy of the other figures considered in this study. The synthetic people of this

film are not robots nor cyborgs, but organically based and created beings called replicants. Physically indistinguishable from human beings, under most circumstances they “pass” for human. Except for a pre-determined life span of four years and a lack of appropriate emotional response and empathy, replicants are identical to human beings.<sup>1</sup> Over the course of the film, viewers discover that some replicants, when created, were implanted with human memories and as a result do not realize that they are not human themselves.

Much like the robots of many pulp science fiction stories discussed in chapter 2 of this study, replicants do not live free to do as they please. Used as slave labor on Mars to help encourage emigration from Earth to Mars, replicants sometimes flee their oppressive existence to Earth, something that is strictly forbidden. Bounty hunters called “blade runners” track down renegade replicants, test them for replicant-ness with the Voight-Kampff test (discussed below), and “retire” them (kill them) if they test positive. Replicant technology has advanced to the point that with each model, their differences to human beings are made smaller, their emotional responses closer to those of humans. Unlike many other living machines I have discussed in this study, the fact that replicants are intelligent and have cognitive abilities (other than empathy) equal to that of humans is assumed — the focus on empathetic abilities and emotion is where discrepancy lies, not with reasoning and

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<sup>1</sup> In the film, the Tyrell Corporation, which creates replicants, has a fail-safe built into each replicant limiting their life span to four years. In the novel, the Tyrell Corporation has not yet discovered how to make the replicants live longer than four years.

other cognitive processes. In the film, bounty hunters like protagonist Rick Deckard (played by Harrison Ford) use a special device and process to examine people they believe to be replicants, called the Voight-Kampff machine. When hooked up to the machine, which resembles a squat black box with read-out screens, the person being tested is provided with short scenarios meant to evoke emotional responses to test their empathy. Replicants do not experience empathy in the same way that humans allegedly do, so it is in their lack of an appropriate, timely, response to the test questions that reveals their synthetic nature.<sup>2</sup>

While the replicants alone are fascinating figures relevant to this study, the Voight-Kampff machine itself also makes *Blade Runner* relevant to this study. This machine distills the body into data streams of physiological information, data “read” and interpreted by the blade runner, who then can expose the “evidence” of a person’s replicant or human status, which was hidden away within the boundaries of the organic body. Extracting bodily data to be read upon screens, the Voight-Kampff machine, along with the blade runner, reconstitutes this data into a verdict

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<sup>2</sup> In *Prosthetic Memory*, Alison Landsberg suggests that empathy is linked to but less important than replicants’ lack of memory: “In the novel, the capacity to experience empathy becomes the litmus test for humanity. The potential of empathy in the film version is much more radical. In *Blade Runner*, empathy does not mark the difference between human and android but, rather, eradicates it. What exposes replicants in the film is not a lack of empathy so much as the lack of a past: the lack of memories.” See Alison Landsberg, *Prosthetic Memory: The Transformation of American Remembrance in the Age of Mass Culture* (New York: Columbia University Press, 2004), 39.

attesting to the test subject's humanity.<sup>3</sup> When connected to the machine, a person, be they replicant or human, is integrated into its circuit, made legible via output devices. The blade runner uses the Voight-Kampff machine's screens to interface with the body, and can lay bare apparent "truths" of a replicants' emotions and empathy via physiological information from the body itself. Concentrated down to data, emotive brain functions become no more than measurements of pulse, response time, pupil dilation.

As the film progresses, however, it becomes obvious that it is not so easy for even the most skilled blade runner (as Deckard is) to determine whether or not a person is a replicant. The technological has been so seamlessly integrated into the artificial replicant body that there may soon no longer be any discernible traces of who is and who is not a replicant. Calling attention to the technological interference in the uniqueness of the human body and experience, the film, along with Dick's

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<sup>3</sup> Christopher Sims has noted the similarities between the Voight-Kampff test and the Turing test, which, conceived of by computer scientist Alan Turing, would determine whether or not a computer is thinking (see Christopher Sims, *Tech Anxiety: Artificial Intelligence and Ontological Awakening in Four Science Fiction Novels* (Jefferson, NC: McFarland & Company, 2013), pages 121-22). The Turing test was first covered in a paper published in 1950 called "Computing Machinery and Intelligence" (see *Mind* number 59, pages 433-60). The Turing test assumes that people would have no way of knowing whether or not a machine is actually "thinking" or whether the machine is instead providing performance of thought. Further, the test also suggests that we do not necessarily know what it means to "think" in the first place or how to define or measure what it is we conceptualize as "thinking." The similarity to the Voight-Kampff test, but substituting "empathy" for "thought" makes its comparison to the Turing test intriguing. To read more about the Turing test, see Judith Halberstam's "Automating Gender: Postmodern Feminism in the Age of the Intelligent Machine" in *Feminist Studies*, Vol. 17, No. 3. (Autumn, 1991), 439-460.

novel, reveal a culture where the synthetic and the “natural” are interchangeable. Dependent on the Voight-Kampff test and its machine for revealing the true nature of a being’s status (the results of which itself may be fallible), *Blade Runner* shows that while the concept of humanity may be an artificially constructed, its boundaries are policed ever more fiercely due to their perceived permeability. The film and the novel interrogate the nature of what it means to be human in a dystopian future where technology penetrates the body and mind so thoroughly as to reveal the designation of “artificial” as arbitrary. The boundaries of “humanity” are no longer occupied only by humans, and by the end of the film audiences are left to wonder whether Deckard himself is, in fact, a replicant. Empathy itself, as the last bastion of “humanity,” too is brought into question, especially in the novel, as the cult of empathy itself is revealed as having false pretenses.<sup>4</sup>

Chapter 1 of this study underscored the importance of the “built” body through Deirdre the cyborg and her existence within a highly technologized system of televisual significations. While Deirdre’s cyborg body threw into sharp relief the imperatives of sex, gender, and race for the mechanical body, and its potential ability to resist the dehumanization of televisual broadcast technology, this was

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<sup>4</sup> In *Do Androids Dream of Electric Sheep?*, humans are expected to use their “empathy box” to connect with all other humans and feel what they are feeling. Eventually, it is revealed that “the whole experience of empathy is a swindle” and a device of social control (see Philip K. Dick’s *Do Androids Dream of Electric Sheep?* (New York: Del Rey, 1996), page 210). It left ambiguous as to whether or not replicants would feel empathy if given the opportunity, although this revelation comes at a time that a replicant is cutting off the legs of a spider in order to torture it and the human in the room feeling empathy toward the spider.

before the cyborg character was an established convention of science fiction. By the time of *Blade Runner's* release, cyborgs and robots were frequent visitors to the movie screen and the pages of science fiction texts. The replicants of *Blade Runner*, instead of being metallic robots or human-machine cybernetic hybrids, are synthesized bodies that are uncomfortably close to the human body to expose the artifice of "humanity." *Blade Runner* and *Do Androids Dream of Electric Sheep?*, similarly to "No Woman Born," portray a world with a widespread media presence. The plethora of screens in the dystopian urban environs of *Blade Runner* reveal the inescapable presence of representation, which, in 1944, C. L. Moore investigated nearly forty years earlier with Deirdre the cyborg. The "built" body of the replicant, much like that of the cyborg, also calls into question the boundaries and arbitrariness of the "subject" and the "object," while at the same time many characters are heavily invested in the maintenance of those boundaries. One scholar suggests that in *Blade Runner*, "To be a person certainly means not to be merely a thing or object. That is, a person is a different kind of thing that stones, tables, or cares are."<sup>5</sup> However, while Deirdre can withstand the scrutiny of the camera and screen, the replicants of *Blade Runner* often do not — the screen of the Voight-Kampff exposing them as objects even as they present themselves as subjects. In her analysis of *Blade Runner* and the 1990 science fiction film *Total*

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<sup>5</sup> Marilyn Gwaltney, "Androids as a Device for Reflection on Personhood" in *Retrofitting Blade Runner: Issues in Ridley Scott's Blade Runner and Philip K. Dick's Do Androids Dream of Electric Sheep*, edited by Judith B. Kerman (New York: Popular Press, 1991), 34.

*Recall*, Alison Landsberg connects characters' experiences with memory to "mass culture," suggesting that characters "understand themselves through a variety of alienated experiences and memories that they accept as their own and subsequently make their own through use. Their stories thus counter the argument of the 'consciousness industry,' or 'culture industry.'"<sup>6</sup> While Deirdre's story configures a way to resist the culture industry's dehumanizing effects through showing her brain inhabiting a machine body, the replicants, with humanoid organic bodies, push against the culture industry's alienating effects through understanding themselves through experiences that are not their own but that become their own.

In chapter 2, it is the conventions of the robot story and the robot character that become important in questioning the boundaries of "humanity." Robots like Jon Venex of Harry Harrison's "The Velvet Glove" and Jerry of Mari Wolf's "Robots of the World! Unite!" overcome their biological differences from human beings, proving their cognitive and emotive abilities to readers in order to argue for equal treatment to humans. The replicants, though built for unpaid labor much like many robots of pulp science fiction, do not have that luxury, but they do raise questions of the bounds of "personhood."<sup>7</sup> Their bodies infallible in their identical biology to that of human beings, it is their emotions that make them unable to free themselves from

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<sup>6</sup> Landsberg, *Prosthetic Memory*, 47.

<sup>7</sup> As Marilyn Gwaltney says in "Androids as a Device for Reflection on Personhood," "The book and the movie both raise the question of what it means to be a person and thus to be protected by rights." See Gwaltney's article in *Retrofitting Blade Runner: Issues in Ridley Scott's Blade Runner and Philip K. Dick's Do Androids Dream of Electric Sheep*, edited by Judith B. Kerman (New York: Popular Press, 1991), 34.

human oppression. Like many of the robots in the stories of chapter 2, it is not the body necessarily that is important for replicants, but a psychological state of “mind.” Unlike the robots, however, who arguably reveal a clean categorical distinction between the “body” and its biology and the “mind,” the replicants have a more complex intertwining of body and mind, but they suffer at the distillation of emotion response into a stream of data. By pushing the idea of the synthetic person to one logical conclusion in order to investigate the boundaries of the human body and subject, *Blade Runner* goes further than the robot stories of chapter 2 in showing that an undeniable similarity between replicant and human causes even stricter policing of the boundary between synthetic and “natural” human being.

NASA’s “electronic brains” and “thinking machines,” considered in chapter 3, threaten to supplant humans through performing tasks of cognition and calculation, tasks that were once thought of as uniquely human. In this chapter, astronauts and NASA officials had to redefine the role of the human astronaut as important in space exploration, as computer systems, with their uncannily lively representations in popular culture, forced “humanity” to acknowledge that certain types of intelligence were no longer their sole purview. Replicants test the bounds of humanity differently than the computers of Project Mercury, calling into question not thinking and cognition, but emotion and empathy. Curiously, while empathy and feeling are often represented as uniquely human attributes, these capabilities do not come up

as something a human astronaut could do that a machine space explorer could not.<sup>8</sup> This makes sense within the context of creating the image of the powerful individual that is the white male astronaut of the early cold war period. Emotions were not something that made an astronaut strong, and would not help to contribute to the scientific endeavors (or ideological ones) of the space race. Replicants are also tools of interplanetary colonization in *Blade Runner*, and while not space-age-era computers, they echo the anxiety-provoking dependence on technology of the space race, despite their biotechnological origins. Without machines that would do the labor necessary to colonial conquest and settlement, such exploits would be far more arduous, if not impossible. Technological dependence, whether it be on flight computers or replicants, is a necessary fact of continuing U.S. exploration into the stars.

An image of the Voight-Kampff machine from *Blade Runner* brings to mind Hal's interface. The Voight-Kampff machine is dominated by a screen, which shows an extreme close-up of the eye of the person being tested, while Hal's interface is dominated by his red lens "eye." The eyes of both films are part of the technological apparatus, and are about the power and control that go along with sight and seeing — as one critic suggests, "*Blade Runner* proposes that we exist in between, trapped

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<sup>8</sup> Kathleen Woodward considers the role of emotion and feeling in technological discourse through looking at both Hal from *2001* and the replicants of *Blade Runner*. See Woodward's "A Feeling for the Cyborg" in *Data Made Flesh: Embodying Information*, edited by Robert Mitchell and Phillip Thurtle (New York: Routledge, 2004), 181-200.

in a world of our own images, caught between the eye we are and the eye we have made in our own image."<sup>9</sup> While Hal's camera lens eye is the closest part of him that is "in our own image," it is through this eye that he sees and controls, while it is through the "eye" on the Voight-Kampff machine's screen that the world of *Blade Runner* is organized, not only through a theme of replicants, representations, and replicated images, but this screened eye is part of the policing of the boundaries of humanity. The Voight-Kampff machine provides the interface through which the humanoid body is interrogated via a screen and sensors, and the screen is important in delineating the humanness of the person being tested. While in the novel, the Voight-Kampff machine had sensors but no screen, in the film the screen provides an apparatus through which to look inside the would-be replicant being tested. The screen of the machine shows an extreme close-up of the testee's eye, with the iris and pupil taking up most of the frame of the screen. When undergoing the test, the blade runner reads the physiological responses to the test questions via the dilation of the pupil. The result is an image reminiscent of Hal's red camera lens eye embedded in the machine interface, but instead of representing a machine input device for the computer, the eye-screen of *Blade Runner* is an output device through which the tester can penetrate the information saturating the testee's body. Like Hal's omniscience, the technology of *Blade Runner*, and the technological process and visual techniques of the film itself produces, as Judith Kerman suggests, "a social

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<sup>9</sup> David Tomas, *Beyond the Image Machine: A History of Visual Technologies* (New York: Continuum, 2004), 29.

and physical space in which people's vulnerability is marked by their visibility, their inability to see and know, or their inability to escape seeing, an appropriate combination of traditional Private Eye issues with the implications of an 'information society.'"<sup>10</sup> Hal's eye and screens, like the eyes of the replicants, eventually leads to embodiment and subsequent vulnerability, although at first Hal's eye is a source of power over human characters. Ambiguity comes through the eye in *Blade Runner*, "As spectators we tend to forget that we are already absorbed in the interior darkness of the cinema and that the screen before us is both pupil and retina. Because *Blade Runner* continuously negotiates between the human and synthetic eye, the human and post-human, the real and the simulated, visual ambiguity is constantly nurtured to the extent that it seems to be a historical possibility inherent to its medium."<sup>11</sup> The technology of the cinema itself (and its effect on the "spectator" eye) like in *2001*, is also at play in *Blade Runner*.

Like the living machines this study considers, *Blade Runner's* version of Los Angeles is full of contradictions, as a technological and economic space.<sup>12</sup> The

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<sup>10</sup> Judith B. Kerman, "Technology and Politics in the *Blade Runner* Dystopia" in *Retrofitting Blade Runner: Issues in Ridley Scott's Blade Runner and Philip K. Dick's Do Androids Dream of Electric Sheep*, edited by Judith B. Kerman (New York: Popular Press, 1991), 19. One machine in the film, in fact, the "Esper machine," allows Deckard to analyze photos and it "literally sees around corners" (see Kerman, page 19). This kind of penetrable vision of a photograph also happens with the Voight-Kampff machine, suggesting a comparison between the suspected replicant and a still photo.

<sup>11</sup> Tomas, *Beyond the Image Machine*, 29.

<sup>12</sup> Judith B. Kerman, "Technology and Politics in the *Blade Runner* Dystopia" in *Retrofitting Blade Runner: Issues in Ridley Scott's Blade Runner and Philip K. Dick's Do Androids Dream of Electric Sheep*, edited by Judith B. Kerman (New York:

machine is a source of contradiction, of ambiguity, and of seemingly incompatible oppositions, whether it is the machine-city of a dystopian future Los Angeles, or a robot asserting its claims to working wages as a “made-in-American.” The boundaries of subject and object, further eroded at the dawn of the information age, are literally put to the test in *Blade Runner*, and it is in that futuristic world where technology has penetrated the human body to the extent that it can render the distinction between “natural” human and “synthetic” machine meaningless. A permeability between subject and object that begins with living machines decades earlier, covered in this study, then becomes, at times, imagined as almost completely indistinguishable by the 1980s.

This study ends with the example of *Blade Runner* for a number of reasons: Replicants are nearly perfect living machines, in that they are technological constructs that question the boundaries of humanity. They seem to push against many of the themes and questions taken up in this project, and as a early 1980s film based on a novel published in 1968, *Blade Runner* shows us the ways that anxieties over technology and living machines of the early cold war period become similar, yet repurposed anxieties in the 1980s. The 1980s was a decade of cyborgs, personal computers, cyberpunk, and the dawn of virtual reality that gave way to the Internet. Living machine figures abounded as the cold war reached its end, with films like *WarGames* (1983), *Terminator* (1984), and *RoboCop* (1987) refocusing any number

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Popular Press, 1991), 17. Kerman suggests that these contradictions are a tenet of Marxism, as they are “inevitable under capitalism” (see page 17).

of contradictory ideas within the figure of the living machine body. *Blade Runner* asks what it means to be human in a culture saturated with “high tech” machines and biotechnology, but it poses this question with the body of a living machine that is no longer a machine, but ostensibly a person. While the plethora of living machines in the mid-century American science fiction imaginary retain their machine-ness, it is this non-normativity that resonates most clearly with the contradiction and technological anxiety over human identity in this period.

### **Appendix: Synopsis of C. L. Moore's "No Woman Born"**

"No Woman Born" begins with world-famous dancer Deirdre's former agent, John Harris, waiting to see Deirdre for the first time since a theater fire destroyed her body. He meets her, seeing the new body that lead scientist Maltzer and his team of artisans have constructed with concentric metal rings held together with her brain, the only part of her that survived the fire. Harris and Deirdre talk, and Harris is surprised that she plans to return to the stage and television screen as a performer. Her body affords her flexibility, strength, and endurance that she had never known with her organic body, and her dancing promises to be more amazing than ever before. Maltzer has doubts about Deirdre's "humanity," citing her confidence and sexless body as reasons for concern. He believes that she will be rejected by her once adoring audience, and as a result become more unstable and possibly dangerous.

Deirdre carries on with her plans to return to the stage, and her comeback performance is scheduled as the surprise grand finale of a variety show that Harris and Maltzer watch on the television. She performs onstage before a live studio audience as well as for the audience watching on their televisions at home. After a number of different acts, Deirdre performs, capturing the audience's attention from beginning to end. The curtains close to thunderous applause, and Maltzer is upset with their positive reception. Maltzer remains worried about Deirdre, and he has a conversation with her that neither Harris nor readers are privy to. As a result,

Deirdre takes some time off in the country to think about her situation, returning after two weeks.

Upon Deirdre's return to the city, Maltzer calls a meeting amongst the three of them at his apartment/laboratory where Harris first saw Deirdre's new body at the beginning of the story. At the meeting, Maltzer and Deirdre again disagree over her fate. She claims that although she might indeed become more cold and unfeeling in her metallic body as time goes on, that is her challenge to deal with. Maltzer thinks he has created a monster, and the repercussions of his science are frighteningly unknowable. As they talk, Harris sees her withdraw into her "metalhood" and is struck by her coldness and inhumanity, beginning, too, to doubt her. Deirdre tries to explain herself, and pleads her case to Maltzer, that she is human enough, though she, herself, does have doubts. She tosses a cigarette into the fire after she finishes "smoking" it, which convinces Harris of her humanity: "He had not sat here watching a robot smoke and accepting it as normal...That had been the final touch of conviction which swayed his hypnotized mind into accepting her humanity." Maltzer, still unconvinced and distressed over Deirdre's agency and power, Maltzer makes motions to jump out the window.

Faster than any human is capable, Deirdre moves to Maltzer and pulls him to safety. Harris reflects on what he has seen, "a sort of tesseract of human motion, a parable of fourth-dimensional activity...she had not blurred; every motion she made was distinct, but not like moving figures on a strip of film. Not like anything that

those who use our language had ever seen before, or created words to express.”<sup>1</sup>

Both Harris and Maltzer are taken aback by this show of inhuman speed and strength.

Using physical abilities as an example, Deidre argues that she is not “delicate,” the word that Maltzer had used repeatedly to describe her. She says that her new body knows no bounds of physical strength, and that she could tear down the building they are in, not only with her hands, but with the vibrations she can create with her voice. She tells Maltzer and Harrison that she is “super-human,” not “sub-human,” her only weakness being her organic brain, which will gradually age. The story ends with Harris, and to a lesser extent Maltzer, impressed with Deidre’s conviction that she can handle her new body. The last two short paragraphs cast doubt onto her humanity, however, as Harris thinks he hears “the distant taint of metal already in her voice.”<sup>2</sup> While Deirdre may appear to be human, it is possible that she will become more like her metal body, but there is nothing that Maltzer nor Harris can do about it.

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<sup>1</sup> C. L. Moore, “No Woman Born,” *Astounding Science Fiction* (December 1944), 172.

<sup>2</sup> *Ibid.*, 177.

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