

Locating the Astronaut Body in Space

by

Rachel Quinn Fischhoff
Class of 2008

A thesis submitted to the
faculty of Wesleyan University
in partial fulfillment of the requirements for the
Degree of Bachelor of Arts
with Departmental Honors in Dance and American Studies

Table of Contents

| | |
|---|----|
| Acknowledgments | |
| Introduction | 1 |
| Chapter 1: The Astronaut Body in Freefall | 5 |
| Chapter 2: The Lunar Stage | 37 |
| Chapter 3: How to Make Two Dances | 59 |
| Conclusion | 77 |
| Selected Primary Sources | 80 |
| Bibliography | 83 |

Acknowledgements

Thank you Rachel Hirsch, Martha Armstrong Gray, Ted Munter and Moses Rifkin for first teaching me to learn all things in all ways.

I would like to thank Nicole Stanton for her unwavering support throughout this process, the faculty of the Dance and American Studies Departments for helping me become the choreographer, dancer, and thinker I am today, and of course my fellow majors, who have never stopped teaching and inspiring me.

To the toothbrush owners and dinner patrons of 43A Home Avenue, thank you.

Kathleen, David, and Martha Fischhoff, thank you for making all things possible.

Introduction

Even a cursory glance at contemporary media shows the vital place astronauts have come to occupy in the national imagination of the United States. Space Camp, located at 1 Tranquility Base in Huntsville, AL offers day and residential programs for children ages 7 to 18. The camp's website also advertises programs designed for corporate groups, educators, and "Special Programs" for the visually impaired and hard of hearing. The space-related work of Hollywood icon Tom Hanks alone includes film (*Apollo 13*), a televised miniseries (*From Earth to the Moon*), an IMAX movie (*Magnificent Desolation: Walking on the Moon 3D*), and the forward to a recent popular science book (Andrew Chaikin's *A Man on the Moon*). Outer space has long been a topic of science fiction literature, comic books, and films. In the years since the earliest Apollo missions of the 1960s, a genre of space themed popular science writing has emerged in children's and adults' literature, accompanied by the proliferation of astronaut biographies. The United States has a long-standing cultural engagement with outer space and astronauts as symbolic figures. However, despite the depth and breadth of this interdisciplinary, multi-media interest, the history of the space program, and astronauts in particular, has been imaginatively isolated from the human form. Astronauts, as human beings, have become symbolically disembodied, buried beneath bulky space suits and hero mythologies.

It is my goal in this work to relocate the body of the astronaut in the history of the National Aeronautics and Space Administration (NASA), to uncover the particular role performance has played in manned space programs, and attempt to understand astronauts as embodied performers. This topic has required an

interdisciplinary examination that, in its breadth and reach, can offer a new understanding of an intensely scrutinized subject matter. My work brings to bear the tools and experiences of performance and dance studies and media studies on historical research.

The first chapter examines how and why human exploration came to replace robotic exploration in space science, using official NASA documents and secondary analyses to understand how the human body was understood and utilized by NASA. This chapter also explores public representations and receptions of astronauts, with a specific focus on the symbolic transformation of astronauts, who emerged in the mid 20th century as national heroes and idealized citizens, yet were ushered into the next millennium as anachronistic reminders of a time gone by. This latter section uses the *New York Times* and *Los Angeles Times* as the primary sources of mass media representation, allowing shifts in the representation of astronaut bodies over time to be isolated from the diverse editorial imperatives of multiple newspapers.

In Chapter 2, I apply knowledge developed in the fields of performance and dance studies to locate the particular power of the space program in the historical context in which it emerged, exploring how the astronaut became a powerful figure of U.S. Cold War-era ideologies. The chapter details the role of television as a primary mode of performance transmission in the Apollo years, ending with a close reading of televised broadcasts from the Apollo 11 moon landing as nationalist performances.

The third chapter is concerned with the role of movement as a learning process and knowledge producing practice and details the role of dance making in this project. I discuss how and why the dances were generated, and how themes of

space and gravity shaped the work. The chapter also looks at dance production as a mode of social organization. Finally, the third chapter calls attention to the methods of art making employed by theater theorist and director Augusto Boal and post-modern choreographer Trisha Brown, and how their ideas informed my own process.

This work is not a complete history of the US space program. Its scientific, cultural and political imperatives are already well documented and analyzed.¹ Nor is my focus on the astronaut body an attempt to discursively isolate the human “body” from the human “mind.” When Thomas Hanna attempted to define his use of the word *soma*, he described it as the name one would give to “Me, the bodily being.”² Not a mere combination of the body and mind, or body and spirit, *soma* assumes that human experience defies isolation and is always at once physical and immaterial. My own interest in the bodies of astronauts stems from the focus on human kinetics in dance studies and practices. It is also a response to what I see as an ignored, erased and forgotten element of the space program.

¹ Courtney G. Brooks, James M. Grimwood and Loyd S. Swenson, Jr.’s *Chariots for Apollo: A History of Manned Lunar Spacecraft*, (Washington, D.C.: National Aeronautics and Space Administration, 1979) offers an institutional history of the engineering developments that preceded the first lunar landing. In *Dark Side of the Moon: The Magnificent Madness of the American Lunar Quest* (New York: New York University Press, 2006) Gerard J. Degroot suggests that the enforcement of strict deadlines under the Kennedy administration adversely affected the quality and scientific trajectory of early manned space flight programs. John M. Logsdon’s *The Decision to Go to the Moon: Project Apollo and the National Interest*, (Cambridge: MIT Press, 1970) provides a close analysis of the context within which President Kennedy developed his ambitious plan to send an American to the moon. In *Space and the American Imagination*. (Washington, D.C.: Smithsonian Institution Press, 1997) Howard E. McCurdy traces the history spaceflight as a trope in American popular culture.

² Thomas Hanna, *Bodies in Revolt* (New York: Dell Publishing Co., Inc., 1970), 35

Throughout the work, I refer to NASA's development of "manned" space missions. I use this gendered terminology in order to avoid the implication of a transhistorical language, and because it most accurately describes the initial goals of the program, namely to see an American man in space. I also refer to an "American public" and "popular representations" of astronaut bodies. With this terminology, I do not mean to imply a universalized American subject, or single mode and level of engagement with NASA within the United States. Rather, I hope to identify broad trends in the reception of astronaut bodies as figures of national identity and to discuss the imagined nation created through mass media portrayals of the federal space programs. The scope of this study does not allow for a complete analysis of the multiple, intersecting gendered, raced and classed conceptions of the U.S. evident in NASA's work or the public's receptions thereof, nor does it fully engage with a post-colonial reading of space exploration in the context of American expansionism, past and present.

This work has raised as many questions as it has answered. I hope, however, that by locating and exploring moments of embodied performance in the history of the American astronaut, I have accessed a new point of entry into these questions and created space for the development of new inquiries into the history of one of the most potent and lasting figures in the American cultural landscape.

Chapter 1: The Astronaut Body in Free Fall

Manned space travel, as a national imperative, was not motivated by scientific necessity alone. Rather, the ability of the body to enter the public sphere as a story-telling and meaning-making device shaped the goals for space exploration put forth President John F. Kennedy and others. In this chapter, I explore the creation, ascent and descent of the astronaut body in public discourse. The topic itself implies my belief that there is something lost, the physical body, in current analyses of the U.S. space program. While the astronaut is defined by embodied actions – the dislocating labor of space travel - the bodies of astronauts have been erased, hidden and forgotten in discussions of NASA's development over the latter half of the 20th century and the beginnings of the 21st.

In an attempt to re-center the body of the astronaut in the history of NASA's work, I trace representations of astronaut bodies, in both official NASA literature and in popular media, specifically the *New York Times* and the *Los Angeles Times*. This narrative of representation begins with a NASA-derived vision of the scientific, mechanical, and masculine astronaut body. This became, in public representations, the perfect(able) hero body of the 1950s and 1960s, exemplified by John Glenn. In the 1980s, the placement of high school educator Christa McAuliffe on a NASA mission crew foregrounded discussions of civilian participation in space programs. The disaster that followed highlighted astronauts' mortality, forever altering the hero model of John Glenn. In the 1990s, Mars rovers exemplified an official move away from manned spaceflight. New technologies provided the means for a re-valorization of citizen observers as participants in the space program. Within a half century, the

astronaut body was named, exalted and finally discarded. I end with the story of former astronaut Lisa Marie Nowak. With Glenn, Nowak bookends the representational “descent” of the astronaut body from glorified embodiment of national heroism to an anachronistic, suspicious, untrustworthy symbol of personal and institutional failures.

In his “Special Message to the Congress on Urgent National Needs,” President John F. Kennedy famously said,

I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth. ¹

In one sentence, Kennedy transformed what had been the stuff of fantasy into a key component of the national agenda. At the same time, he reiterated a conception of the U.S. as a nation of unified interest. John W. Jordan has commented on this moment as an early marker of Kennedy’s “rhetorical ability to translate complex technological matters into meaningful public discourse.”² Through Kennedy’s careful words, and through the invocation of the human form, he turned an obscure field of science into a matter of national intrigue. Following this proclamation, NASA scientists began the rapid process of gauging and managing the feasibility and dangers of Kennedy’s command.

Paradoxically, the process identified by Jordan – through which Kennedy crafted popular discourse from opaque technologies – also operated in reverse. The body of the citizen, already laden with symbolic meanings, became, through scientific

¹ John W. Jordan, “Kennedy’s Romantic Moon and Its Rhetorical Legacy for Space Exploration.” *Rhetoric & Public Affairs* 6.2 (2003): 1.

² *Ibid*, 2

study, a “complex technological matter.” For the aeronautical engineers, lunar geologists, and medical doctors charged with carrying out Kennedy’s ambitious plan, the human body was simultaneously an object central to their success, and a fragile obstacle standing in the way of that success. Kennedy had conceptually invoked the body for its symbolic power, but for NASA scientists the body’s worth lay in its utility, its ability to accomplish tasks and further scientific inquiry. NASA researchers thus posited the body as an impassive object within the physical universe, an instrument of experimentation like any other.

In a 1966 NASA sponsored study, *Bioenergetics of Space Suits for Lunar Exploration*, Emanuel M. Roth reported the effects of wearing prototypic space suits on human energy expenditure. The study attempted to anticipate the effects of the moon’s gravity on the efficiency of human movements, most notably walking. Roth’s description of the act of walking gives a clear insight into the frame with which NASA scientists viewed and studied the human body and its actions. Roth writes,

The act of walking along a horizontal plane involves the arms and legs, which are raised or lowered as the trunk is propelled forward in the horizontal plane with a rise or fall of its center of mass. In this form of exercise, little external work is accomplished relative to the expenditure of energy for overcoming gravity, muscle “viscosity,” inertia of limbs, and external wind resistance.³

Roth’s careful attention to the fundamental actions that compose walking dissects a movement that is so normalized in most bodies its components go unnoticed. This implies a potential conceptual divide between the body as it is experienced and the body as it is examined.

³ Emanuel M. Roth. *Bioenergetics of Space Suits for Lunar Exploration*. (Washington DC: National Aeronautics and Space Administration, 1966), 21

In his continued description of the foundational movements of walking, Roth separates the physical body into a collection of parts, each acting independently:

...the human body consists of an upper piece, the trunk and arms, which is balanced on a lower piece on which the propelling force applies...external forces (air resistance) oppose the progression of the upper piece...Therefore, in human locomotion a certain inclination of the body against the limbs forms part of the dynamic scheme, and the degree of inclination varies with the external forces that resist progression.⁴

Here, the human body is measured as a Newtonian body in motion, rather than a somatic body as experienced. Roth's processes of study and measurement deny the idea of an irreducible human wherein body and mind are always present together.

The tests designed to measure the movement limitations of a spacesuit reiterate this conception of the body as a collection of parts. The tests include standing flexion, ventral, dorsal, and lateral head movements, head rotation, and upper leg-extensions.⁵ The efficacy of such tests relies upon a belief in the compartmentalization of the body, and in the utility of such a conception. After Kennedy's pronouncement that the U.S. would send a man to the moon, NASA researchers were forced to abandon robotic exploration. However, through experimental examination, conceptions of the human body intersected with those of machines. NASA literature describes a human body that is impassive and predictable.

Roth's study makes only occasional references to the individual experience of his study subjects. In one rare instance he writes, "It appears that exercise at 20,000 ft (6,090 m) and above is halted by factors other than those operating at sea level.

Subjectively, the overwhelming sensation which brings work to a close is

⁴ Ibid, 54

⁵ Ibid, 93

breathlessness.”⁶ Here, the “subjective” experience of the test subject is placed in presumed opposition to the “objective” physical abilities of the same subject. Roth bifurcates measurable and perceived abilities, though his research shows that perceived inability will arrest work as effectively as an empirically measurable physical limitation.

The physical and medical examinations of early astronauts were arduous and continuous, a practice which, though modified, continues today. In their efforts to “know” astronauts’ bodies through replicable, generalizable testing, NASA researchers enacted Michel Foucault’s contention that examination is intertwined with the creation of the docile body. Examination functions as “a normalizing gaze...It establishes over individuals a visibility through which one differentiates them and judges them.”⁷ Foucault identifies spatial enclosure, the creation of functional sites, control of time, and the “correlation of body and gesture,”⁸ as practices directed toward the creation of the docile, disciplined body. In the case of the astronaut, the creation of space ships, in which every area is devoted to a distinct task, and design of flight plans which dictate the order and length of tasks, mimic the processes identified in *Discipline and Punish*. Like the 18th century soldier described by Foucault, examination contributed to an understanding of the astronaut as “something that can be made; out of formless clay, an inapt body, the machine required can be constructed...”⁹ Rather than amending engineers’ initial reluctance to

⁶ Ibid, 37

⁷ Michel Foucault. *Discipline and Punish: The Birth of the Prison*. Translated by Alan Sheridan. (New York: Vintage Books, 1995), 184.

⁸ Ibid, 141-152

⁹ Ibid, 135

send humans into space, NASA fulfilled Kennedy's objectives by finding, within the human body, the astronaut machine.

In Roth's study, all astronaut bodies are interchangeable. There is little reference to any one particular body. An isolated moment of description is found in Roth's discussion of the metabolic costs of walking in space suits on a treadmill when he writes, "...very healthy, trained men can sustain this work load for a maximum of 2 hours."¹⁰ This is the closest the study comes to identifying ideal test subjects, or imagined astronauts. Roth's disinclination to portray the working bodies in question illustrates the pervasiveness of assumptions and practices dictating who would compose the first class of astronauts. Roth's work appeared after NASA administrators had finished the work of defining the astronaut body through exclusion.

In his historical overview of NASA's Apollo program, William David Compton discusses the uneasy compromises made by the "scientific community" in the service of "the nation."¹¹ One major source of conflict, and compromise, was the diverse qualifications necessary to become an astronaut. As an experimental flight program, NASA administrators and engineers pushed for the recruitment of military test pilots, while the community of natural scientists advocated sending colleagues qualified to carry out complex experiments. In the early years of the Mercury,

¹⁰ Roth, *Bioenergetics of Space Suits for Lunar Exploration*, 101

¹¹ William David Compton. *Where No Man Has Gone Before: A History of Apollo Lunar Exploration Missions*. (Washington DC: National Aeronautics and Space Administration, 1989), ix

Gemini, and Apollo programs¹², piloting experience took precedence. Indeed, all of the “Original Seven” Mercury astronauts were military test pilots.¹³ Later, scientists were admitted to the astronaut corps and given flight training.¹⁴ The original compromise reached by competing constituents within NASA was the idea of the “astronaut-observer,” a pilot given some measure of scientific training,¹⁵ whose hyphenated classification reveals the conflicting goals of the early architects of manned space flight programs.

In these early years, while NASA scientists still conceived of the human body as a problematic replacement for a well-built robot, they were also charged with the fulfillment of the symbolic objectives of manned space flight. It was necessary that the astronaut body represent, visually and imaginatively, the ideal American citizen. The history of the astronaut training program, including how the bodies of those few accepted became objects of study, is a history of NASA officials’ attempts to balance conflicting interests.

Looking back to 1961, it is not surprising that U.S. government officials exclusively chose white men to represent the nation in space. However, at the time, external pressure resulted significant internal debate over the inclusion of women in space flight training. In a review of available literature on the foundational practice of

¹² Mercury, Gemini, and Apollo refer to succeeding phases in the development of manned space flight within the U.S. “The one-man Mercury series of space flights in the early 1960s and the two-man Gemini missions of the mid-60s gave astronauts and engineers the experience and confidence essential for the orderly progressive march to the moon.” L.B. Taylor, *For All Mankind: America’s Space Programs of the 1970s and Beyond* (New York: E.P. Dutton & Co., Inc., 1974), 131.

¹³ Compton, *Where No Man Has Gone Before*, 56

¹⁴ Ibid, 55

¹⁵ Ibid, 57

gendered exclusion in the space program, Maura Phillips Mackowski notes, “Too often gender receives nothing more than a passing nod from authors who assume (and perhaps contribute to) the masculinization or neutering of spaceflight history.”¹⁶

Knowing that women who possessed the same skills demanded of male applicants were routinely denied access to the astronaut corps, it is clear that NASA officials did not passively neuter the program, but explicitly masculinized their venture.

A significant obstacle barring women from spaceflight was the incapacity of the medical community to adequately comprehend women’s health. As Martha Ackman writes in her study of the so-called “Mercury 13,” an experimental group of women briefly engaged in astronaut training and testing, “...the practice of seeing white men as the medical norm was widely accepted and rarely challenged.” When visible, women were viewed by mainstream medicine as “puzzling versions of men.”¹⁷ Therefore, women’s scores in tests designed by the NASA Committee on Life Sciences, the same tests administered to male applicants, were seen as anomalous variations on the reality of men’s health and wellness.¹⁸

Ackman describes the particular interest of Air Force doctors, the first medical practitioners charged with the evaluation and maintenance of astronauts’ health, in remaining ignorant of the female body:

Rejecting any experiment that offered insight into women’s physiology was not a matter of disinterest alone. Discovering that women were stronger and more physically capable than assumed might also challenge the military’s assertion of male strength, bravery, and superiority.¹⁹

¹⁶ Maura Phillips Mackowski, “Manned Spaceflight for Women?” *Technology and Culture* 47 (2006): 170

¹⁷ Martha Ackman. *The Mercury 13*. (New York: Random House, 2003), 63

¹⁸ Ibid, 63

¹⁹ Ibid, 47

The space program grew out of military structures and employed military personnel adapting military chains of command. It also adopted the military's assumption of gender hierarchy.

Ruth Nichols, a pilot and astronaut-hopeful, argued for the inclusion of "lady astronauts" as compliments to male colleagues, not competitors. She expressed a vision of women suited for spaceflight because they were "passive, submissive, patient by birthright."²⁰ Nichols's attempts to valorize women in space were crafted within the confines of gendered social norms. In 1960, a feature in *Look* magazine described the ideal female astronaut of the future: "She would be younger than thirty-five, married, a pilot, and an outstanding athlete who excelled in swimming and skiing rather than masculine sports such as wrestling."²¹ In the proposals imagined by Nichols and *Look*, the best female applicant for the space program would be one who, like her male counterparts, faithfully upheld gendered ideals of American citizenship.

Other pilots, like Jane Hart and Jerrie Cobb, publicly proclaimed their equality to male applicants. In 1962, Hart and Cobb met with Vice President Johnson to discuss the possibility of women in space. Unbeknownst to Hart and Cobb, Johnson had previously written "Let's Stop This Now!" on a proposal to consider women astronauts.²² In response to their arguments, Johnson warned that the appearance of female astronauts would increase pressure to admit people of color into the space

²⁰ Ibid, 46

²¹ Ibid, 58

²² Ibid, photo insert

program.²³ Johnson saw in the alteration of the white Protestant male astronaut prototype a slippery slope he was unwilling to approach.

In fact, it would be decades before dominant conceptions of the ideal American citizen would shift enough to see white women or people of color in the space program. The amendments made to the 1964 Civil Rights Act that “put federal hiring policies under scrutiny”²⁴ contributed to this change. Finally, in 1978, NASA admitted a class of 35 astronauts that included the first African-American, Asian-American, and female astronauts. In June of 1983, Sally Ride became the first American woman in space.²⁵

Thus, while the first class of astronauts, all white men, were chosen in part for their adherence to a limited vision of ideal citizenship, their actions shaped what was to become the astronaut archetype. Well before leaving the Earth’s atmosphere, the “Original Seven,” (L. Gordon Cooper, Jr., Virgil I. (Gus) Grissom, M. Scott Carpenter, Walter M. Schirra, Jr., John H. Glenn, Jr., Alan B. Shepard, Jr., and Donald K. (Deke) Slayton)²⁶ had begun publicly performing the role of the American astronaut. They “immediately became public figures...” and by the end of 1961, “demands on their time for interviews and personal appearances multiplied” making “impossible demands on their heavy training schedule.”²⁷ The astronaut-machine imagined by NASA was abandoned in the public sphere as the celebrity status of the Original Seven grew.

²³ Ibid, 147

²⁴ Ibid, 183

²⁵ Ibid, 184

²⁶ Compton, *Where No Man Has Gone Before*, 56

²⁷ Ibid, 58

In his popular history of the first astronauts, *The Right Stuff*, Thom Wolfe writes that until the first official press conference, the astronauts themselves had not understood the public role they would be expected to perform. In Wolfe's narrative, only John Glenn was prepared to answer reporters' personal questions, prompting the other men to wonder, "What can anybody say as a follow-up to this man and his speeches about the Wife and the Children and the Family and Sunday School and God?"²⁸

Within his first hour as a public figure, Glenn affirmed a popular conception of astronauts as upstanding heads of Protestant nuclear families. Indeed, reporters' questions guided the astronauts into expositions of faith and family. As military personnel, the Original Seven had learned to define bodies through measurable demonstrations of skill and actions proving intelligence or dedication. However, as Glenn's rise to fame illustrates, the astronaut body was to be measured and appreciated in quite different terms. Applauding a test pilot who breaks a speed record and praising an astronaut for attending church represent two very different modes of evaluating action. The first measures consequence, while the second attempts to measure intent. The earliest astronauts were expected to live their lives in keeping with dominant conceptions of American morality. They were expected to embody national, or nationalist, ideals in both action and intent.

On February 20, 1963, John Glenn became the third person and first American to orbit the Earth when he spent just under five hours orbiting the Earth three times. The *New York Times* described Glenn climbing into his craft, the Friendship 7

²⁸ Tom Wolfe, *The Right Stuff* (New York: Bantam Books, 1979), 96

“Tightly clad in a gleaming silver space suit,”²⁹ an image which mixes the reality and fantasy of spaceflight. Spacesuits came to represent “essentially a knight’s armor worn heroically as the individual conducts his noble mission.”³⁰ Also like a knight, Glenn was charged with the defense of honor, in this case the honor of the nation threatened by Soviet achievements in space.

The stated goal of Glenn’s mission was to measure the impact of prolonged weightlessness on the human body. In the process, he also silenced critics of manned space flight. Upon return, Glenn publicly stated that without the presence of a human actor to “offset mechanical failures in the automatic control system” the spacecraft might have been lost, or burned on reentry.³¹ Glenn’s orbit renewed faith in the U.S. space agency’s ability to match and supercede records set by the U.S.S.R. His mission also reasserted the necessity of human actors in successful space exploration.

Glenn quickly became a figure of political, cultural, and scientific significance. Upon his return to Earth, John W. Finney wrote in the *New York Times*,

For the public at large, Colonel Glenn, a Marine Corps pilot, has become a new national hero. To the medical profession, he represents a prize living specimen who can help answer the crucial question of whether man can function under the weightless condition of space flight.³²

²⁹ “News Summary and Index,” *New York Times*, February 21, 1962, 47

³⁰ Roger D. Launius, “Heroes in a Vacuum: The Apollo Astronauts as Cultural Icon.” (paper presented at the 43rd meeting for the American Institute of Aeronautic and Astronautics, Reno, Nevada, January 10-13, 2005).

³¹ John W. Finney, “Glenn Says the Manual Controls In Capsule May Have Saved Him,” *New York Times*, April 7, 1962, 8

³² John W. Finney, “Glenn’s Condition Good; New Flight Set for Spring,” *New York Times*, Feb 22, 1962, 1.

A parade held in Glenn's honor was described by New York City police officers as the largest "spontaneous celebration since V-J and V-E Days."³³ Unlike many other early astronauts, notably Neil Armstrong, Glenn remained in the public eye for decades following his first trip into outer space. As an astronaut, Glenn represented the United States in orbit. Later, for 20 years, he represented the people of Ohio in Senate.

Glenn first entered a senatorial primary just two years after his journey in the Friendship 7, but his campaign ended when a fall left him seriously injured. He ran again, and lost, in 1970. Glenn attempted to begin his political career as soon as his career as an astronaut seemed to end, but his eventual election into office would come more than a decade later.³⁴ At that time, he was described by reporter Christopher Lyndon as "still ruddy and trim but not exactly fresh" at 52 years old.³⁵ Lyndon indirectly references the strength and youth of Glenn's body years earlier when he first rose to national prominence. Even after years spent establishing himself as a political actor, descriptions of Glenn focused on his body. The memory of his previous career remained strong.

During one primary race, Glenn's campaign was focused on "integrity in government."³⁶ He demanded that his Democratic rival, Howard Metzenbaum, make his past tax returns public. Reporters noted the cynical, decidedly post-Watergate tone

³³ "News Summary and Index," 47

³⁴ Albin Krebs, "Glenn Again Hits Senate Trail," *New York Times*, December 11, 1973, 51

³⁵ Christopher Lyndon, "Rematch of Glenn and Metzenbaum in Ohio Primary," *New York Times*, April 21, 1974, 49.

³⁶ William E. Farrell, "Glenn is Elected New Ohio Senator," *New York Times*, November 6, 1974, 39.

of the primary, in which personal integrity overshadowed policy.³⁷ Noting Glenn's squeaky clean public image, one reporter wrote, "After Watergate...to be an Eagle Scout may be enough for victory."³⁸ While the fact that he did spend his childhood spent scouting contributes to Glenn's all-American public persona, he undoubtedly benefited in elections from collective memories of a young man in a "gleaming silver space suit." One opponent's aid admitted, "many more Ohioans knew about Mr. Glenn..."³⁹ The breadth and depth of public knowledge about Glenn separated him from other politicians. He had name recognition, of course, but as the former subject of highly publicized medical experiments, whose picture had been published across the U.S. and the globe, he also had a famous body. John Glenn's image reminded voters of a pre-Watergate Washington and a moment of national triumph.

In 1998, while still serving in the Senate, Glenn once again submitted his body to the scrutiny of NASA doctors and the public they informed when he revised his role as a U.S. astronaut. One reporter noted that at 77, Glenn gave "every sign of approaching these tests with the same studiousness he exhibited toward all the esoteric physical humiliations...that accompanied the first astronaut selections...40 years ago."⁴⁰ In interviews, Glenn adamantly maintained his position that his second mission was motivated exclusively by research interests. He refused to recognize the fact that it was expected to be "the biggest manned-space story in years,"⁴¹ a mission

³⁷ Christopher Lyndon, "Rematch of Glenn and Metzenbaum in Ohio Primary," *New York Times*, April 21, 1974, 49.

³⁸ *Ibid*, 49

³⁹ "Senate Contest in Ohio Heats Up," *New York Times*, September 3, 1974, 16.

⁴⁰ Thomas Mallon, "Space Aged," *New York Times*, June 14, 1998, special section

⁴¹ *Ibid*

of unique importance in reshaping public perceptions of NASA and a possible boon to the agency's popularity.

NASA had undergone significant changes since Glenn's first flight, including the astronaut selection process. Gone were the days of the "the brush-cut, all-Protestant test pilots introduced to the country in 1959,"⁴² amongst whom Glenn had stood out as a media darling. In fact, the crew of Glenn's second flight included a Spanish man and a Japanese woman.⁴³ NASA had become multinational, in practice if not in image. However, excitement over Glenn's renewed participation overshadowed these changes. Instead, the public was reminded, through mass media coverage, of the earliest days of the astronaut corps, a period defined by racial and gender exclusion and Cold War-era nationalism. Publicity surrounding John Glenn and his second flight masked the transformations that had occurred in the intervening decades since he first orbited Earth. Representations of NASA had slipped into stagnating nostalgia.

Some criticized the seemingly obvious political goals of Glenn's new mission. As Glenn and NASA officials shied away from discussing the flight's symbolic importance, observers like Thomas Mann wrote confidently in the *New York Times*, "His trip is undoubtedly a publicity stunt." Mann continued, asking what "toll this flight may take on Glenn's status as a cultural legend." He hypothesized of Glenn's second flight, "His return to space could play out like a lackluster movie sequel,

⁴² Ibid

⁴³ John Noble Wilford, "Pioneer Returns as Crewman in the Shuttle," *New York Times*, October 30, 1998, A1

diminishing memories of the long-ago flight that made him such an icon.”⁴⁴ Few reporters echoed the claim made by NASA officials that Glenn’s flight was inspired only by an interest in space-related geriatric health research.

The announcement of Glenn’s renewed participation in the space program coincided with the announcement that Barbara Morgan, who had been the backup for Christa McAuliffe, the schoolteacher who died in the Challenger accident, would be accepted into the next astronaut training class. One observer noted that by admitting Morgan as a full astronaut, and re-introducing Glenn as a “supercitizen,” NASA had skirted the issue of civilian participation in the space program.⁴⁵

The double announcement cushioned the potentially damaging effects of recalling the Challenger accident by alluding to an earlier, more exciting and more popular era in NASA history. Glenn’s second mission flew in the same space shuttle, Discovery, used in the first spaceflight after the Challenger explosion.⁴⁶ Glenn’s public image offered symbolic redemption for the failures of the Challenger accident. Within seconds of Glenn’s liftoff, the countdown commentator, Lisa Malone said, “Liftoff of Discovery with a crew of six astronaut heroes and one American legend.”⁴⁷ Regardless of the numerous goals involved, Glenn’s second space flight was carefully represented in a way that would benefit NASA’s public image. John Glenn was uniquely able to symbolically correct the wrongs of the recent past by not only alluding to, but also embodying the triumph of an earlier period in U.S. space exploration.

⁴⁴ Mallon

⁴⁵ Mallon

⁴⁶ Mallon

⁴⁷ Wilford, “Pioneer Returns as Crewman in the Shuttle,” A1.

The history of NASA is particularly susceptible to periodization, as its goals seem to change as rapidly as new administrations enter and exit the White House. In 1983, two decades after Glenn's first flight, Ronald Reagan used his executive power to redirect the science of space when he proposed the invention of a "defensive shield to render nuclear weapons obsolete."⁴⁸ The Strategic Defense Initiative Organization, or Star Wars, was a high profile Defense Department project researching and implementing ideas such as space-fed radar, electromagnetic rail guns, new laser technologies, and supercomputers.⁴⁹ While Reagan redirected the attention of the nation skyward, unlike Kennedy, Reagan conceived of an outer space devoid of human bodies. Already, between 1975 and 1981 there had not been any manned missions.⁵⁰ Stars Wars entered national discourse at a time when outer space was already depopulated. Reagan's proposal was in keeping with this new era of space science and exploration that had begun to question the vitality and necessity of astronaut bodies. By 1985, Defense Department space programs were funded twice as much as the total monies awarded to NASA.⁵¹ Star Wars had rendered space both body-less and militarized. The days of space as the playground of the astronaut-explorer had ended.

As visible bodies disappeared from national space programs, so too did public interest. In 1984, President Reagan, perhaps understanding the importance of human

⁴⁸ Wayne Biddle, "'Star Wars' Technology: It's More Than a Fantasy," *New York Times*, March 5, 1985, A1.

⁴⁹ Ibid.

⁵⁰ Malcolm E. Browne, "After 16 Years, Monkeys Are Back in Space," *New York Times*, April 30, 1985, C9

⁵¹ Wayne Biddle, "In the Defense Department's Orbit," *New York Times*, January 27, 1985, E1.

actors in the public's appreciation of NASA, announced a search for an elementary or high school teacher to become the first "citizen passenger" to join a shuttle mission crew,⁵² Thousands of school children responded to the president's call, writing letters in support of their own teachers.

While some recommended sending their teachers to the moon to avoid homework, others considered the opportunity an apt reward for favorite educators. One Californian middle school student wrote in support of her teacher, "She's a good American, Mr. President. She eats apple pie and plays baseball on the weekends. She is a regular Betsy Ross, if you know what I mean."⁵³ While the student's praise seems almost sarcastic in its calculated exaggeration, it suggests that the intention of the Teacher in Space Program was clear enough for a child to understand; like Kennedy before him, President Reagan planned to find an ideal American and send that person into space to represent the nation. The scientific successes of Star Wars would be tempered with the gentler image of a schoolteacher, so rhetorically if not financially praised by politicians, claiming a piece of the military-controlled sky for "ordinary" Americans.

The woman chosen, Christa McAuliffe, was a 37 year old high school teacher born in Boston and working in New Hampshire.⁵⁴ Excitement bloomed around the prospect of seeing McAuliffe alongside her astronaut crewmates. The public image of NASA had changed drastically since the Mercury Seven were introduced in 1959.

⁵² Edward B. Fiske, "Pupils Nominate Teachers for Space," *New York Times*, February 1, 1985, A18.

⁵³ *Ibid*, A18

⁵⁴ William J. Broad, "Teacher is Focus of Space Mission," *New York Times*, January 25, 1986, 11.

John Glenn and his colleagues had been advertised as unusually brave and talented, extraordinary Americans. Conversely, McAuliffe was chosen precisely because she was thought to represent ordinary America. She was chosen as a teacher like any other, a mother and wife like any other. If the public representation of the Mercury Seven had been based on the idea of the nation's best, McAuliffe's public persona proposed a nation full of "bests" in which every citizen might represent the nation on the global stage of outer space. Plans made for McAuliffe to "broadcast two live lessons from space to the nation's schoolchildren"⁵⁵ further encouraged a conception of spaceflight as business as usual, undertaken by ordinary Americans in the service of all, children and adults alike. Mission STS-51-L aboard the Challenger did not fulfill these objectives. Instead, it ended in national tragedy as soon as it began.

The shuttle's lift off was delayed twice due to weather conditions⁵⁶ heightening the public's anticipation to see the first citizen passenger in outer space. NASA reported over 800 requests for press credentials to cover McAuliffe's mission, which represented "a huge surge. In the last several missions the number of reporters at the launching site [had] dwindled."⁵⁷ Finally, on January 28, 1986 at 11:39 a.m., the Challenger left the launch pad. It was a moment witnessed by hundreds of reporters and thousands more television viewers, including an unusually large number of children who had learned about McAuliffe and watched in school.⁵⁸ Within the

⁵⁵ Ibid, 11.

⁵⁶ William J. Broad, "Shuttle Launching Delayed Again Over Weather Fears," *New York Times*, January 27, 1986, A14

⁵⁷ William J. Broad, "Teacher is Focus of Space Mission," 11

⁵⁸ Sara Rimer, "After the Shock, a Need to Share Grief and Loss," *New York Times*, January 29, 1986, A1

first two minutes of flight, the shuttle broke apart in a burst of flame and smoke, resulting in the deaths of all seven crewmembers.

Early newspaper reports were centered on the surprise of the disaster. The U.S. had entered an era in which shuttle flights felt almost routine. Nameless astronauts had taken part in a seemingly perfected exercise without failure for years. One *New Yorker* described her perception of space flight as “almost commonplace...like riding the F train.”⁵⁹ Reagan’s Teacher in Space Project had been designed to reinvigorate public interest in space flight. However, in the days following the disaster, reporting focused not on the program as a whole, or the loss of seven lives, but on the single death of Christa McAuliffe. In death, as in life, McAuliffe provided a point of entry for public engagement with the space program.

One reporter wrote that all Americans “shared their grief over the death of seven astronauts,” but in particular the loss of Christa McAuliffe.”⁶⁰ Astronauts, in general, were no longer objects of public fascination, no longer able to “capture the imagination” of American spectators. Public interest seemed to reject the nameless elite of the astronaut corps in favor of a charmingly comprehensible schoolteacher. One woman interviewed by the *New York Times* said, “She was ordinary people. She was a mother, a working woman. I felt like I was a part of it.”⁶¹ It was not nationalist pride, but democratic principles of popular participation that shaped the post-Challenger public grieving. Another article suggested that the Challenger explosion would take its place in Americans’ shared memory alongside the attack on Pearl

⁵⁹ Ibid, A1

⁶⁰ Ibid, A1

⁶¹ Ibid, A1

Harbor and the Kennedy assassination,⁶² signaling expanded conceptions of ideal Americans driven by representations and receptions of Christa McAuliffe. The death of a schoolteacher from New England was placed alongside the death of military officers and the assassination of a president

As a private citizen and teacher, McAuliffe enacted gendered middle-class ideals of womanhood and citizenship. Her role as an astronaut publicized, rather than created, her ordinary heroism. In the case of Pearl Harbor and Kennedy's death, tragedy was understood as the result of clear, malevolent intent. McAuliffe's death, in contrast, was the result of inadvertent error. The Challenger disaster suggested that threats against American icons were, in their accidental nature, ever present, and perhaps unavoidable. As a shuttle passenger bound for space, McAuliffe took part in a grand performance of American scientific dominance. In death, this global primacy was recast with the vulnerability of everyday life. McAuliffe's death highlighted the mortality, the humanness, of all astronauts.

In response, NASA and the Roger's Commission charged with an investigation of the disaster demanded that the bodies of the deceased remain physically and discursively hidden. Ann Larabee suggests that the 1700 pages of testimony included in the Roger's Commission report represent a "compensation for bodily damage, a healing of technological wounds..."⁶³ in the face of irreversible death. The report does not include any efforts to assess bodily damage. It does not

⁶² John Noble Wilford, "Faith in Technology is Jolted, but There Is No Going Back," *New York Times*, January 7, 2004, A18

⁶³ Ann Larabee, "Remembering the Shuttle, Forgetting the Loom: Interpreting the Challenger Disaster." *Postmodern Culture* 4.3 (1994), http://muse.jhu.edu.ezproxy.wesleyan.edu:7790/journals/postmodern_culture/v004/4.3larabee.html

clearly discuss how, or for how long, the crewmembers died. The widely viewed explosion was strikingly fast. It visually implied a quick, painless death. However, the reality may have been quite different. The crewmembers most likely suffered “relatively long and horrifying deaths.” Larabee suggests,

After the explosion of the homey, domestic world presided over by a teacher and mom, psychologists and grief specialists raced in to erase the spectacle of graphic technological violence and the imagination of Christa McAuliffe’s body. In the discourse of the Challenger disaster, the bodies of the shuttle crew had to remain behind the technological veil, in the interests of continuing manned space flight.⁶⁴

Following Larabee’s analysis, the image of McAuliffe, populist hero, trapped and burning, had to be erased before it destroyed the very same space program she had been employed to re-invigorate.

The Challenger explosion represented the powerful dangers of spaceflight whose horror was amplified through the presence of a “civilian” body. Christa McAuliffe connected the dangers facing astronauts to the bodies of ordinary citizens. While public discussion of death and dying was widespread, the specter of the dead body was hidden, as it threatened “the strictly hygienic myth of the clean machine,”⁶⁵ and thus faith in manned space programs.

Christa McAuliffe became known to the public as a high school teacher, not a citizen-astronaut or astronaut-observer. The other astronauts who perished on January 28, 1986 faded into relative obscurity. Astronauts had lost both cultural and scientific relevance. NASA had, even before the Challenger disaster, returned to debates over the scientific utility of manned space flight. This was a decades old conversation, which had been prematurely cut off by President Kennedy when he demanded to see

⁶⁴ Ibid

⁶⁵ Ibid

an American on the moon. Just one day before the Challenger explosion, an unmanned spacecraft, Voyager 2, “sailed serenely by the planet Uranus” proving “that human intelligence can explore other planets, without the risk and cost of sending humans along.”⁶⁶ The Teacher in Space Project was, in some ways, a final attempt to valorize human space exploration at a time when it was already becoming obsolete.

In 1991, following an analysis of the space agency’s needs and performance, NASA postponed most plans involving large spacecrafts, and human passengers. The agency began focusing on smaller, simpler spacecrafts. The decision was expected to reduce the agency’s budget by billions of dollars.⁶⁷ The new plan gave “higher priority...to small innovative projects that provide frequent access to space” and “lower priority to costly missions, like the Hubble telescope that...had provided ‘scientific leadership and...broad popular appeal.’”⁶⁸ The changes marked a departure from the crowd pleasing, symbolic goals that had shaped the agency’s actions since the 1950s.

In the wake of this decision, newspaper articles began painting NASA’s efforts as both for and by a limited scientific community. Reports mentioned NASA scientists’ thrill over their own successes, without reference to public perceptions.⁶⁹ After the Pathfinder craft landed on Mars on July 4, 1997, John Noble Wilford wrote,

⁶⁶ “The Challenge Beyond Challenger,” *New York Times*, January 31, 1986, A30

⁶⁷ William J Broad, “NASA Moves to End Longtime Reliance on Big Spacecraft,” *New York Times*, September 16, 1991, A1.

⁶⁸ Ibid.

⁶⁹ John Noble Wilford, “Scientists in ‘Awe’ of Color Photos of Mars,” *New York Times*, January 7, 2004, A18.

On the technical, scientific and economic side, the first trip to Mars in 21 years was a success for NASA's new plans for smaller, cheaper, faster unmanned exploration of space. In the matter of symbolism, which has always been as much a part of the conquest of space as science, this sweet, slightly goofy triumph of the nerds seemed light years away from Houston in the Apollo years, when cool militarism reigned among both engineers and astronauts.⁷⁰

What Wilford does not describe explicitly is that the celebration of the Pathfinder's landing represented a massive shift in the ways in which scientific knowledge was embodied within and around NASA. During the Apollo era, astronauts embodied the scientific knowledge and power of the nation through their journeys to outer space and their physical actions in space. While the Pathfinder craft itself was the material evidence of engineering mastery and human labor, the lack of visible human involvement, and movement, was arguably less engaging. The labor, both intellectual and physical, that created the Pathfinder, was masked by the presumed disembodiment of technology.

In the absence of astronaut actors, NASA and the public of space-enthusiasts crafted new modes of human, and sometimes bodily, participation. Valerie Ambrose, a 15-year-old girl from Bridgeport, CT won a NASA contest to name a Mars rover with her essay on Sojourner Truth. She was so inundated with interview requests her mother began refusing them.⁷¹ The public seemed hungry for more information about any human actor involved in the rover programs.

NASA's focus on robots and unmanned spacecrafts took place within a new era of technology use and participation in the U.S. Just three weeks after the rover

⁷⁰ James Gorman, "Mars Mission Separates the Men from the Toys," *New York Times*, July 13, 1997, E2.

⁷¹ "Girl Who Named Mars Rover Stays Down to Earth," *New York Times*, July 14, 1997, B7.

Spirit landed on Mars, 32 million people visited NASA's website to follow the machine's progress.⁷² Some internet users suggested that the website, which enabled visitors to choose what images and angles, from the rover's many photographs, to look at and when, provided a more active observer experience than the 1969 telecasts of Apollo 11.⁷³ The first lunar landing differed markedly from the mission of the Spirit rover, in that Apollo 11 was designed around human participation and movement. However, fan fervor over the rover's progress suggest that the level of perceived participation NASA's website created rivaled that of live televised broadcasts.

The bodies of astronauts Neil Armstrong and Buzz Aldrin had acquired meaning through their physical occupation of space, first a spacecraft and then the lunar landscape. They signified national knowledge and power through a bodily interaction with the moon's surface. In the era of the Mars rovers, new technologies, importantly the Internet, had begun questioning and redefining the conceptions of both space and place that shaped the symbolic codes of Apollo 11. As the Internet became "the primary environment for cultural articulations of all kinds,"⁷⁴ this included the cultural expressions of intellectual and national dominance that have always been central to NASA's self-expression.

In his analysis of technomediation, Sam Han suggests that engaging with the Internet unravels the perceived fixity of location, asking, "...if someone is browsing

⁷² Amy Harmon, "An Eager NASA Is Working To Bring Mars Down to Earth," *New York Times*, January 27, 2004, A1.

⁷³ Ibid

⁷⁴ Sam Han, *Navigating Technomedia: Caught in the Web* (New York: Rowman & Littlefield Publishers, Inc., 2008), 114

the Web, with multiple windows (or tabs) open to different websites, is there a way to track this person's location?"⁷⁵ Han provocatively suggests that "...information is no longer the creator or factor of an environment, but is the environment itself."⁷⁶ While a Mars rover, such as Spirit, was measurably and fixedly on the surface of the planet Mars, the information about said location was transmitted back to Earth. Placed on a freely accessed website, the information-location created by the rover was not limited to single point in space. Rather, in its accessibility, it became everywhere at once, capable of enveloping an unlimited number of bodies.

As Han suggests, "The Internet contests the enclosure-oriented ideal of space..."⁷⁷ Through engagement with the Internet, users are able to define and experience space through participation alone, rather than in conjunction with location. The Mars rover and its expression through the Internet allowed all interested space enthusiasts to take part in the exploration of the Martian landscape. In this moment, the astronaut body loses its exclusive power to suggest and symbolize the national project and performance that is space exploration. The astronaut body becomes an anachronism, a static reminder of outmoded ideas of (outer) space and place.

The most recent classes of astronauts arrive in a cultural moment that denies them the symbolic power of earlier astronauts. The scientific role of the astronauts is under question, as is their ability to create or claim space. They are, even before leaving Earth's gravity, outmoded. In 2007, the public narrative written around one

⁷⁵ Han, 69

⁷⁶ Han, 71

⁷⁷ Han, 77

young astronaut, Lisa Marie Nowak, epitomized a public readiness to dismiss and deride the astronaut, once a powerful national icon.

In February of 2007, astronaut Lisa Marie Nowak made headlines with an attempted attack on Air Force Captain Colleen Shipman, a woman Nowak believed was her romantic rival, competing for the affection of Navy Commander William A. Oefelein, an astronaut pilot.⁷⁸ As Nowak's story unfolded in the popular press, her seemingly irrational decisions were repeatedly explained through a metaphorical language of snaps, cracks, and brittleness.⁷⁹ Questions of mental and emotional health were filtered through a language of materiality.

During a physical confrontation in an Orlando airport parking garage, Nowak sprayed Shipman with pepper spray. Later, police reported Nowak attempted to kidnap Shipman with the intent of killing her.⁸⁰ In Nowak's possession at the time of the altercation was a bag containing "a steel mallet, a 4-inch folding knife, a BB gun, 3 feet of rubber tubing and several garbage bags."⁸¹ However, what captured the attention of reporters and the public was the bizarre preparation that preceded the confrontation.

Shipman contended in court that Nowak had stalked her for two months and that she knew Nowak only as "an acquaintance of my boyfriend." When police searched Nowak's car, parked at a nearby motel she had checked into using a false

⁷⁸ John Johnson, Jr. and Zarembo, Alan "Astronaut Arrested in Kidnap Attempt" *Los Angeles Times*, February 6, 2007, Home Edition, A1.

⁷⁹ Homer Hickam, "What Makes an Astronaut Crack?" *Los Angeles Times*, February 9, 2007, Home Edition, A25.

⁸⁰ Johnson and Zarembo, "Astronaut Arrested in Kidnap Attempt," A1

⁸¹ *Ibid.*

name,⁸² they found a handwritten map to Shipman's home, a love letter directed to Oefelein, and printed email correspondence between Oefelein and Shipman.⁸³ But perhaps most interesting and oft repeated were the early reports that Nowak had driven nearly 1,000 miles from her home in Houston to Orlando wearing a diaper to avoid stopping on the road.⁸⁴

This infantilizing detail of Nowak's ordeal, first revealed in a police report, was reprinted again and again, becoming shorthand for Nowak's presumed insanity. Nowak was described as a woman out of control. Her decision to unusually manage her body was proof of her distance from the rules of proper living. Nowak's story, and this detail in particular, were an embarrassment to a government agency which one journalist noted, "...for nearly five decades has obsessively portrayed its astronauts as paragons of personal integrity."⁸⁵ The specter of Nowak's sexual impropriety, her attack on Shipman and Oefelein's relationship, and allegations that Nowak's previous relationship with Oefelein had led to both parties divorcing, was forgotten in light of the powerful image of a grown woman driving cross-country in a diaper. Nowak's improper control of her body overpowered concerns over improper control over her sexuality or her mind. It was Nowak's body that seemed to unravel the mythology of astronaut morality.

⁸² Lianne Hart, et al. "The Sudden Descent of a Shuttle Astronaut," *Los Angeles Times*, February 7, 2007, Home Edition, A1

⁸³ Johnson and Zarembo, "Astronaut Arrested in Kidnap Attempt," A1

⁸⁴ Lianne Hart, et al., "The Sudden Descent of a Shuttle Astronaut," A1

⁸⁵ Johnson and Zarembo, "Astronaut Arrested in Kidnap Attempt," A1

Following Nowak's arrest, it came to public attention that wearing diapers is standard protocol for shuttle astronauts during launch and reentry.⁸⁶ This was one of many factors that expanded Nowak's story from a narrative of personal failure to an examination of NASA, and its astronaut corps, as a whole, an indictment of an organization some accused of creating the failures, the brittleness, that Nowak embodied.⁸⁷ Almost half a century had passed since NASA put a man on the moon, over a decade since the Challenger disaster, and Americans seemed again ready to begin a serious questioning of the once lauded organization.

A former astronaut training manager, Homer Hickman, wrote an editorial accusing NASA of setting astronauts, like Nowak, on a course bound for failure. He cited the pressures of the job itself, the years of waiting and intense competition to be put on a mission team at all.⁸⁸ Hickman wrote,

Nowak was hired as an astronaut in 1996. It was a decade before she flew into space. During that time, she was passed over again and again. Somewhere along the line during those disappointing years, I think she became brittle. She finally flew, landed and then was sent to the back of the astronaut line again. My guess is that her personal life started to become unglued from the accumulated strain, and she finally cracked.⁸⁹

Hickman's description of Nowak as "brittle" is worth consideration. Brittleness denies both strength and flexibility, the exact characteristics that had been used to defend the proposition that the utility of humans in space exceeded that of machines. He also chose to use metaphors of physical shortcoming, "brittleness," "ungluing,"

⁸⁶ Ibid

⁸⁷ Hickam, "What Makes an Astronaut Crack?" A25

⁸⁸ Ibid

⁸⁹ Ibid

and “cracking” to illustrate Nowak’s psychological downfall, conflating the wellness of the astronaut body and mind.

Hickman described NASA as a “dysfunctional bureaucracy” intent on the practice of “hiring more astronauts than it needs,” which he believed to be partly responsible for Nowak’s actions. Hickman’s assessment of NASA suggested an institution that created an unhealthy psychological environment. He framed NASA as primary context in which Nowak’s transformation, her journey from all-American overachiever to vengeful, insane adulteress took place. Another report described Nowak’s first appearance in court, wearing a prison-issued blue jumpsuit as

a sharp contrast to her television appearance during the July shuttle mission to the International Space Station. She appeared then with her crew mates decked out in a bright-orange space suit, beaming the endless smile that has become part of the public persona of NASA astronauts.⁹⁰

Her life was bifurcated into the era before and after the incident. In an interview with the owner of a restaurant she frequented near Johnson Space Center, she was described as “a brilliant girl. A beautiful girl, normal and nice.”⁹¹ The *Los Angeles Times* even reprinted facts from her online NASA biography where she listed her interests as “running, playing piano and collecting African violets.”⁹²

Her life “before” was described as fulfilling all the expectations of a NASA astronaut, and a proper wife and mother, one who took care of her body through exercise, cared about high culture and horticulture, was exceedingly pleasant, well liked, good at her job, and attractive. Nowak had been the embodiment of multiple

⁹⁰ Lianne Hart, et al., “The Sudden Descent of a Shuttle Astronaut,” A1

⁹¹ Ibid

⁹² Johnson and Zarembo, “Astronaut Arrested in Kidnap Attempt,” A1

modes of success, in and out of the home. When she got into her car and drove away from Houston, it seemed Nowak had driven out of normalcy and into an unknown, and uncontrolled state, described by one reporter as “bizarre and sordid terrain.”⁹³ An article titled “The Sudden Descent of a Shuttle Astronaut,” recalled that her very vocation had been movement, ascent and descent in and out of outer space. In the narrative put forth by newspapers following her arrest, the journey out of Earth’s atmosphere was replaced by a journey out of sanity and out of control.

Editorials lamented the fact that NASA astronauts undergo psychological evaluation only at the time of hiring, and never after.⁹⁴ The uncertainty about the temporal origins of Nowak’s state of mind was presented as unease, the lack of knowledge signifying a lack of control over the mind. After posting bail, Nowak was ordered to wear a GPS monitoring anklet at all times, in order to alert Shipman should Nowak re-enter the state of Florida.⁹⁵ It seemed that if her mind could not be controlled, the state’s efforts would refocus on her body. Months later, Nowak appealed to have the ankle bracelet removed as she awaited trial. She argued “the bracelet was expensive, bulky, uncomfortable and prevented her from exercising, as required of a military officer.” Judge Marc L. Lubert rejected the validity and importance of her claims, but granted the removal of the device. He cited her “good behavior” as the reason.⁹⁶ Lubert’s decision was a further articulation of the interplay

⁹³ Lianne Hart, et al., “The Sudden Descent of a Shuttle Astronaut,” A1

⁹⁴ Frank D. Roylance, “NASA Mental Exam a One-Time Deal,” *Los Angeles Times*, February 7, 2007, Home Edition, A15.

⁹⁵ Lianne Hart, et al., “The Sudden Descent of a Shuttle Astronaut,” A1

⁹⁶ “Ex-Astronaut Gets OK to Lose Anklet.” *Los Angeles Times*, August 31, 2007, Home Edition, A32.

between systems of physical and psychological control that had shaped the public narrative of Nowak's arrest.

More than 4 decades after the body of John Glenn demanded the rapt attention of the nation as he orbited the Earth, embodying American scientific triumph, the body of Lisa Marie Nowak demanded control. Nowak's body came to symbolize a multiplicity of failures. The astronaut body had officially reentered Earth's atmosphere, landing squarely, loudly, and disappointingly on the ground.

NASA continues to explore space, but the agency's work can no longer be effectively read through the astronaut body. While there has never been a clear dichotomy between "civilian" and astronaut populations - indeed, the symbolic power of the astronaut body depends on its ability to represent citizenship - Christa McAuliffe's participation in the space program had further blurred the distinction between ordinary and astronaut bodies. The conceptual descent of the astronaut body coincided with the elevation of the civilian space-enthusiast through new media. Access, both real and imagined, to outer space has been democratized. The astronaut-body no longer implies elite access to scientific knowledge and discovery. New astronauts like Lisa Marie Nowak are represented as symbols of administrative and personal failure, not national triumph. The astronaut body remains a potent storytelling device, yet the story it tells best continues to be that of the Apollo missions. Without reinvention and adaptation, the power of the astronaut body will continue to diminish with each passing year.

Chapter 2: The Lunar Stage

Having re-centered the body in a public discourse of astronauts and space travel, it is useful to consider why the body is a particularly helpful lens through which to view history, and how the fields of performance studies and dance studies can illuminate the structures of power and convention that create strategically staged performance. As John O'Neill contends, "It is a conceit of ours that if society rules us at all it does so in our minds rather than in our bodies."¹ This conventional division of body and mind conceals the totality of embodied experiences. To amend O'Neill's statement, if society rules us at all, it does so in our indivisible somatic selves. The body is experienced, and ruled, in its entirety.

In her text *Bodies That Matter*, Judith Butler offers a re-thinking of the body's materiality through a matrix of normative conditions, primarily categories of sex. She writes that her work is not "meant to dispute the materiality of the body," but rather to establish the normative conditions under which the materiality of the body is framed and formed...² She continues, "In this sense, what constitutes the fixity of the body, its contours, its movements, will be fully material, but materiality will be rethought as the effect of power, as power's most productive effect."³ Unlike O'Neill's premise, in which the physical body is subjected to the effects of power, Butler's conception of materiality suggests that the physical body is created through power. Both theorists

¹ John O'Neill, *Five Bodies: Re-figuring Relationships* (Thousand Oaks: Sage Publications, 2004), 22

² Judith Butler, *Bodies That Matter: On the Discursive Limits of "Sex."* (New York: Routledge, 1993), 17.

³ *Ibid*, 2

demand that any examination of the body be situated in a broader social context from which the form of the body emerges.

The meaning of a single performance, whether it is a concert dance or a step on the moon's surface, is not created exclusively in the time and space of the performance. The symbolic capacity of any embodied performance depends upon the practices of embodied meaning making which precede and follow it. Performance can be understood as rising out of a vast field of materialized meanings and embodied powers. In the collectively composed introduction to *Corporealities*, the book's contributors explain that bodies,

...always gesture towards other fields of meaning, but at the same time instantiate both physical mobility and articulability. Bodies do not only pass meaning along, or pass it along in their uniquely responsive way. They develop choreographies of signs through which they discourse...⁴

Thus, the body is not a vessel to be filled with pre-determined meanings, but operates as a primary mode through which meaning is created and understood. Unlike Butler's work, which relies upon the ability of text to represent and uncover embodied meaning, the contributors to *Corporealities* assume a body that is both object and subject of discourse.

Thus, the symbolic strength of embodied action is uniquely powerful because the body is simultaneously engaged in the creation and interpretation of signs and meanings. O'Neill writes, "We are continuously caught up and engaged in *the embodied look of things*, especially in the look of others and ourselves...Because *society is never a disembodied spectacle*, we engage in social interactions from the

⁴ Susan Leigh Foster, ed. *Corporealities: Dancing Knowledge, Culture, and Power* (New York: Routledge, 1996), xi

very start on the basis of sensory and aesthetic impressions...”⁵ Social interactions are shaped in and by our material realities. The body, as a component of material experience, is exceptional in that it both senses and is sensed. Randy Martin analyzes this duality in the example of dance training, writing, “Dance technique is a situation in which the process of production and its product – the body dancing and the dancing body – are tightly joined...”⁶ His examination can be extended to other moments of intentional movement, such as the movements of astronauts. The product/meaning of walking on the moon can only be accomplished through the production/action of walking on the moon.

This simultaneity of action and meaning is interrupted in the attempt to record and write about the body, wherein the kinetics of the body are halted by static text. Through language, the physical body is presented as a recordable object and “estranged or alienated” from the lived body, “that communicative bodily presence to which we cannot be indifferent, to which we are as sensible in other as in ourselves.”⁷ André Lepecki suggests that the attempt to capture “evanescent dance,” and perhaps all evanescent kinetic moments, “relies on a complex integration of sense-memories, associations, displacements, [and] kinesthetic memories.”⁸ While all dance performance relies on a combination of presence and memory, the textual reckoning of ephemeral movement is even more bound to movement-memories as it exists

⁵ O’Neill, *Five Bodies*, 7

⁶ Randy Martin, *Critical Moves: Dance Studies in Theory and Politics* (Durham: Duke University Press, 1998), 178 [emphasis in original]

⁷ O’Neill, *Five Bodies*, 3

⁸ André Lepecki, “Inscribing Dance” in *Of the Presence of the Body: Essays on Dance and Performance Theory*, ed. André Lepecki (Middletown: Wesleyan University Press, 2004), 125

separated from the moment of embodiment. Writing about the body creates a temporal cleavage as moments of performance and interpretation are conceptually divided. The process of writing can serve to unintentionally deny the interpretive power of movement itself and the complex, often collective, processes of meaning making which take place during moments of performance.

Within dance studies, the absence of the body in the page is often replaced by lengthy descriptions of embodied action. In her defense of description in dance criticism, Deborah Jowitt writes, "... it has always seemed...important to me that we who write about the famously evanescent art of dance ground our responses in the work itself...The point is, in searching for what a dance may mean, not to lose sight of what it is, or appears to be."⁹ Jowitt identifies the paradoxical objective of dance scholarship to create a space for ephemeral, embodied, kinetic danced moments within the confines of the static, permanent, disembodied page.

If text, within scholarship, has seemed inhospitable to the dancing body, it has often simply ignored the bodies of the audience. Randy Martin notes that dance events are created for and by audiences. He suggests that audience presence and participation in acts of performance is a vital component of performance itself, but that,

...unlike dancing, forms of representation rarely make an effort to recognize audience participation...So if writing and documentation cannot recuperate

⁹ Deborah Jowitt, "Beyond Description: Writing beneath the Surface," in *Moving History/Dancing Cultures*, ed. Ann Dils and Ann Cooper Albright (Middletown, Wesleyan University Press, 2001), 7

the traces of participation found in performance, minimally they can recognize the disruptive effects of the work of participation lost to representation.¹⁰

As my own work includes an analysis of movement events and their reception that attempts to uncover the bodies of performers, I must remember what will remain absent: the observer-body.

In current trends of cultural studies, the body has become an object of considerable scrutiny, as has the concept of performance. However, within cultural studies, dominant understandings of the body, its functions and character, lack the physicality explored in dance studies and other studies of embodied practices. As dance scholar Susan Leigh Foster has noted of cultural studies texts,

These writings seldom address the body I know; instead, they move quickly past arms, legs, torso, and head on their way to a theoretical agenda that requires something unknowable or unknown as an initial premise. The body remains mysterious and ephemeral, a convenient receptacle for the new theoretical positions.¹¹

Alternately, the body is discussed as the product of discourses that measure the body, in effect, a body in parts rather than an examination of the body in its entirety as experienced. Foster suggests, through her own work, filling the gaps left by “the synecdochic substitution of the body for a more theoretical topos or its metonymic replacement by a set of measurements,” with analyses focused on the practices which

¹⁰ Randy Martin “Dance Ethnography and the Limits of Representation,” in *Meaning in Motion: New Cultural Studies of Dance*, Jane C. Desmond, ed., (Durham: Duke University Press, 1997), 321.

¹¹ Susan Leigh Foster, “Dancing Bodies,” in *Meaning in Motion: New Cultural Studies of Dance*, ed. Jane C. Desmond (Durham: Duke University Press, 1997), 235.

instruct the body as a means of accessing it's functioning.¹² In this way, her study of the body becomes inextricably linked to a study of embodied action.

In Foster's description and analysis of formal dance education, using a template similar to many ballet and modern technique classes, Foster proposes that dance training creates relationships between multiple bodies, both real and imagined, through the incorporation of practices of watching. Foster's conception of dance training includes observation as a vital component. By including the presence of immaterial, imagined bodies in dance training, Foster's analysis speaks to Butler's questioning of the body's materiality.

Foster's work offers insight into the ways the image of the physical body can be consumed as a collection of values.¹³ For her hypothetical student, "Training...creates two bodies: one, perceived and tangible; the other, aesthetically ideal."¹⁴ The tangible body is physically present. However, as movements in class are directed toward the eventual actualization of the ideal body, it maintains a constant cognitive presence. The ideal, future body is no less experienced than the tangible, present body, though it remains invisible. Foster offers an understanding of the effect exterior, even non-material, bodies exert upon one's perceptions of the physical self.

Of course, there is not one, constant, aesthetically ideal human body or form of

¹² Ibid, 235

¹³ In "Five Premises for a Culturally Sensitive Approach to Dance," in *Moving History/Dancing Cultures*, ed. Ann Dils and Ann Cooper Albright (Middletown, Wesleyan University Press, 2001), Dierdre Sklar offers the methods she developed to conduct a "movement ethnography." These include a process she calls "empathetic kinesthetic perception" whereby, through both mimesis and empathy, one engages with movement practices as pieces of "cultural knowledge" and "ways of knowing." Sklar clarifies and expands upon the idea that the body not only represents but also constitutes cultural value.

¹⁴ Foster, "Dancing Bodies," 237

human movement. One's ideal body will always be shaped by individual and cultural influences and will be temporally specific.

Foster suggests that the tangible, perceived body and the aesthetically ideal body are mediated in dance classes through the creation of "demonstrative bodies." These bodies include the teacher, other class members, and one's own image in the mirror. Foster writes, "...when I look at another student in the class, I see her or his body not as that of a friend or an acquaintance, but as the bodily instantiation of desired or undesired, correct or incorrect, values."¹⁵ Because the demonstrative body exemplifies value through movement, one need not re-create the actions of the demonstrative body in order to participate in the mediation of one's tangible and ideal selves. Rather, this mediation is located in practices of observation. To extend Foster's argument, any watched body could operate as a demonstrative body, mediating the acceptance and adoption of embodied value. The astronaut body was materialized through power. It moved through a conceptual field of embodied cultural meanings, and, through its own movement, furthered and altered value. As a publicly observable body, one can imagine the far-reaching power the astronaut-body might wield in this capacity, contributing to the formation individually and collectively held ideal bodies.

Certainly the ways in which dancers view bodies in motion are not universal, nor are they always similar to the viewing practices of non-dancers. Foster notes that participation in dance training, which focuses on watching and replicating movement "heightens the dancer's kinesthetic awareness of others" and creates an increased

¹⁵ Ibid, 238

“sense of what other persons’ bodily movements feel like,” what could be deemed a stronger sense of kinesthetic empathy.¹⁶ However, as O’Neill stated earlier, the practice of observing other bodies is an integral component of social organization, even while capacities for kinesthetic empathy vary widely.

Implicit in Foster’s conception of the demonstrative body and the purpose of dance class is an optimistic vision of the future. The ideal self is only as powerful as one’s faith in its eventual instantiation. Thus, any practice that aims to instruct the body, including formal dance training or astronaut training, is guided by optimism and futurity. The failures and difficulties of the present body are overshadowed by the imagined successes of the future body. Optimism has also been thought to be a fundamental component of Americans’ national self-conception. William Demastes writes,

Optimism is a defining feature of that thing called “American.” It is implicit in virtually every mythic posture that Americans generate, from the ideas of progressivism and manifest destiny to the all-encompassing notion of the American Dream.¹⁷

Therefore, the American body must be both source and site of optimism. In the body of the astronaut, intangible optimism is materialized. The nationalist optimism of the body politic is re-inscribed on the individual body of the astronaut. What ideological “mythic postures” Demastes mentions become physical postures, arrangements of the body in space.

¹⁶ Ibid, 240

¹⁷ William W. Demastes, introduction to *Interrogating America Through Theatre and Performance*, eds. William W. Demastes and Fischer, Iris Smith (New York: Palgrave Macmillan, 2007), 1

In my suggestion that a moonwalk is a performance of national identity, I imply the pre-existence of the nation itself and a recognizable national identity. As a phenomenon and a lens with which to view culture and history, nationalism is inextricably linked to “processes of modernity and to Western liberal notions of personhood, in particular...individual sovereignty and autonomy...”¹⁸ Therefore, any nationalist performance is always a performance of post-Enlightenment thinking and dominant, Western ideas of political organization. National identity differs from the nation-state itself in that it posits a unity of population, goals, and self-conceptions never achieved in a single state, a false unity that is presented to citizens and non-citizens alike.¹⁹ As a performance of post-Enlightenment, Western ideologies, the lunar landings simultaneously created, enacted, and naturalized U.S. nationalism.

The utility of the human form in a performance of national identity may not be obvious. Within the U.S. context, “The rhetorical linkage of nondominant races, classes, gender and nationalities with ‘the body,’ to physicality instead of mentality, has been well established in scholarship on race and gender.”²⁰ Therefore, the first astronauts, like Neil Armstrong and John Glenn, were carefully chosen for their ability to perform a uniform, dominantly raced, classed, gendered, sexed, and nationalized subject.

¹⁸ Eva Mackey, *The House of Difference: Cultural Politics and National Identity in Canada* quoted in Karen Fricker, “Robert Lepage: Product of Québec?” in *Staging Nationalism: Essays on Theatre and National Identity* (Jefferson: Mcfarland & Company, Inc., Publishers, 2005), 167-185

¹⁹ Jane C. Desmond, “Embodying Difference: Issues in Dance and Cultural Studies,” in *Meaning in Motion: New Cultural Studies of Dance*, ed. Jane C. Desmond (Durham: Duke University Press, 1997), 30

²⁰ Ibid, 30

Judith Butler offers a useful distinction between the “trope by which discourse is described as ‘performing’” and a more traditional “theatrical sense of performance.” She offers the example of drag performance wherein “the hyperbolic status of gender norms seem central.” She continues, “What is ‘performed’ in drag is, or course, *the sign* of gender, a sign that is not the same as the body that it figures, but that cannot be read without it.”²¹ The ability to isolate signs of gender from the gendered bodies those signs represent in drag performance illustrates an important possibility for separation of sign and meaning. In the case of astronauts, the scientific achievement, and the global economic and military dominance of the United States was not enacted, but signified, through the body of the astronaut. The presence of American citizens on the moon created a system of signs for extraterrestrial American-ness. The first moon landing should not be read only as proof of technological triumph, but as the self-conscious assemblage of embodied, kinetic signs that would create the very meaning of triumph.

The meaning of any performance depends upon its reception through the participation of observers. Meanings are not simply offered to and accepted by spectators. Rather, meaning is created in the space between performer and observer, allowing for the existence of receptions, or elements thereof, that undermine performers’ original intents. In Karen Fricker’s discussion of the works of Quebecois playwright Robert Lepage, she finds that the performance of nationalist Quebecois identity inevitably calls attention to it’s lacking: the absence of internationally

²¹ Judith Butler, “Critically Queer” in *Performance Studies*, ed. Erin Striff (Houndsmills: Palgrave Macmillan, 2003), 154 [emphasis in original]

recognized nation-statehood and territorial sovereignty.²² The moonwalk presents a similar challenge to the notion of nationalist performance. Taking place outside the official territory of the United States, in an area whose control was greatly contested, the first moon landing was designed to imply American dominance in space.

However, it inevitably illuminated the limits of national sovereignty in outer space.

An editorial in the *New York Times* on July 21, 1969, the day Neil Armstrong was to become the first man on the moon, called attention to the contested politics of the moon with its title, “Capitalist Moon or Socialist Moon?” Writer Harry Schwartz maintained that as a state-run and federally initiated project, the Apollo 11 moon landing would not signify the triumph of capitalism, as the race to the moon had been “a competition between governments...” Schwartz suggested that the U.N. take control of the moon, in order to prevent transferring earthly ideological rivalries to “the second inhabited world.” Oddly, yet not unusually, when presenting the possibilities of a capitalist or socialist controlled moon, Schwartz uses as referents scenarios presented in science fiction literature.²³ In 1969, many concerns over the future uses and management of the moon posited the development of colonies and industry, a situation of prolonged lunar presence that never materialized. Schwartz and others worried that the mandate within the Space Treaty, signed by the U.S.S.R., the U.S., that “the exploration and use of outer space, including the Moon...shall be

²² Fricker, “Robert Lepage: Product of Québec?” 167

²³ Harry Schwartz, “Capitalist Moon or Socialist Moon?” *New York Times*, July 21, 1969, 16

carried out for the benefit and in the interest of all countries” could not be reconciled within the ideological conflict pervading global politics.²⁴

The Cold War was more than a competition for military or economic superiority. It encompassed the efforts of the U.S. and the U.S.S.R. to “demonstrate national preeminence” through scientific and technological discovery.²⁵ It was within this political climate that NASA’s manned spaceflight programs developed as a performance directed both inward, to U.S. citizens, and outward, to the U.S.S.R. and its allies. Beginning in the late 1940s, Americans had become increasingly aware of the popularity of communism in former ally nations. Communism was described as a “hydra-headed super-enemy,” a constant, invisible threat to American well-being.²⁶

By the 1950s, the threat of communism was thought to be both foreign and domestic. American citizens came under increasing levels of government surveillance and suspicion.²⁷ James Burnham, a critic of foreign policy guided by containment theory said in the early 1950s, “in a profound sense...there is not Soviet border.”²⁸ As such, the Cold War was an unprecedented national engagement, capable of relocation to a moon as yet unmarked by national boundaries, and thus requiring its own symbolic systems. The space program was developed as a source of new symbolic orders. Scott Magelssen suggests that during France’s post-Revolutionary period, performance became a powerful means through which new ideas and

²⁴ Ibid, 16

²⁵ Hugh R. Sloten, “Satellite Communications, Globalization, and the Cold War.” *Technology and Culture* 43 (2002): 316

²⁶ Douglas Field, introduction to *American Cold War Culture*, edited by Douglas Field (Edinburgh: Edinburgh University Press, 2005), 3

²⁷ Ibid, 3

²⁸ Ibid, 3

symbolic codes were transmitted. Performance was utilized to control representation of past events and stabilize new powers.²⁹ It is with this idea in mind that one can understand Cold War-era astronauts as participants in a performance that rationalized and represented contemporary articulations of nationalism and global power.

Unlike the live, staged performances discussed by Foster, Magelssen and others, the performances of astronauts were mediated to all observers, excepting mission crewmates. Two primary means of mass mediation were newspaper descriptions and television broadcasts. The proliferation of articles discussing televised broadcasts of Apollo 11 suggests the level of excitement the planned programming generated. The day after Neil Armstrong stepped on the moon, the *New York Times* re-printed stills taken from television broadcasts of the event,³⁰ further illustrating the way in which the two mediums were co-constructed around the event and operated in tandem to generate and regularize a popular narrative of the lunar landing.

The language of some reporters, both before and after millions of television viewers watched Neil Armstrong walk on the moon, attributes an almost magical power to the medium of television. Jack Gould wrote, “The sustainable steadiness of the pictures from the fast-moving Apollo 11 transmitted to a rotating earth in itself

²⁹ Scott Magelssen, “Celebrating the Revolution While the King Is Still on the Throne: *The Fall of the Bastille* and the Festival of Federation (July 1790),” in *Staging Nationalism: Essays on Theatre and National Identity*, ed. Kiki Gounaridou (Jefferson: Mcfarland & Company, Inc., Publishers, 2005), 40-43

³⁰ “Television Camera Records the Activities of Astronauts on the Landing Area.” *New York Times*, July 21, 1969, 3

appeared something of a technical wonder...³¹ It was not only the content of the images, in this case the interior of Apollo 11, but their transmission that generated awe. Gould's enthusiasm is partially explained through O'Neill's observation:

We look good to ourselves in machines: they are the natural extensions of our narcissistic selves. They magnify us, and at the same time amplify the world we have chosen to create for ourselves – the 'man-made' world. There is no escaping our romance with the machines we have created in order to recreate ourselves.³²

Television magnified the astronauts, rendering their images omnipresent. Televised coverage also served as celebrations of the spacecrafts themselves, the built environment. Transmitting images that represented technological mastery, such as the architecture of a spacecraft, through the relatively new medium of television intensified perceptions of national scientific expertise.

Gould predicted, "...the home screen may be the dominant factor in acquainting the individual with the true magnitude of the current adventure,"³³ and as expected, television was a primary medium through which the activities of Apollo 11 astronauts were relayed to interested observers. In print, television was presented as a uniquely democratizing medium. Gould suggested that all Americans had equal access to "the wonders of science and technology exemplified in the planned landing of Apollo 11 on the moon." So long as one had access to a television, "whether rich or poor, educated or deprived," one could partake in the drama of the first

³¹ Jack Gould, "TV: Apollo Telecast Catches Viewers by Surprise," *New York Times*, July 19, 1969, 51

³² O'Neill, *Five Bodies*, 1

³³ Gould, "TV: Apollo Telecast Catches Viewers by Surprise," 51

moonwalk.³⁴ He boldly continues, “The high point will be the individual’s own realization that through television he was there in heart, tension and excitement at the historic moment.”³⁵

Gould’s belief in the power of television to erase the perception of physical distance between astronauts and viewers was mimicked in his suggestion that televised broadcasts would erase national boundaries and unite politically divided populations on Earth. He wrote that viewers in Europe, Asia and South America had already been united through the experience of watching NASA takeoffs and splashdowns, writing, “The role of television in welding together humans in many lands and many tongues is an integral byproduct of science’s adventure.”³⁶ He notably excludes the U.S.S.R. from this unified human populous, and makes no mention of the effects of Soviet space exploration on articulations of U.S. nationalism. Rather, Gould’s writing demonstrates a unflagging faith in the globally unifying power of both the manned space program and the television broadcast through which it was commonly observed.

Networks programmers within the United States capitalized and expanded on the symbolic power of the first televised moonwalk. ABC, NBC and CBS chose to “pre-empt all regular programming for 30 hours from noon, Sunday July 20, to 6 P.M. the following day.” Filling the hours leading up to the historic broadcast were dramatic readings of *War of the Worlds* and other works of science fiction performed by celebrities like James Earl Jones. ABC commissioned Duke Ellington to compose

³⁴ Jack Gould, “TV Has Involved and Educated Millions in Mysteries of Space,” *New York Times*, July 17, 1969, pg. 40

³⁵ Ibid, 40

³⁶ Ibid, 40

and perform the vaguely named “moon music.” The various programs included “entertainment, films, movie clips, discussion panels and mini-documentaries.”³⁷ Network programmers presented the moonwalk as more than an isolated moment of scientific triumph. Rather, they situated the event within a narrative of national celebration and the actualization of science fiction fantasy. Neil Armstrong’s first steps on the moon were placed within a cultural history that extended far past the beginning of the Space Age.

Richard Dienst has suggested that television produces value “through socializing time –that is, time that has not already been socialized as labor time...” Thus, while the first steps on the moon took mere seconds, and Armstrong and Aldrin remained on the moon for less than three hours, the value of their action was extended through the addition of 30 hours of television time preceding the event. In Dienst’s formulation, “the work of television watching is productive when viewers merely attend, are merely bodily engaged with the passing of images.”³⁸ The idea that television’s force resides in its ability to organize bodies in time raises questions about the ways television watching is experienced as an embodied act.

Writing from an interdisciplinary perspective of dance, performance, and cultural studies, Randy Martin notes that television “presents the prospect of national simultaneity...”³⁹ a possibility that operates powerfully as an ideal, even when unfulfilled. Like attending live performances, surrounded by other audience members,

³⁷ Fred Ferretti, “Apollo 11 TV Coverage to Engage Many Earthlings,” *New York Times*, July 14, 1969, 1.

³⁸ Patricia Ticineto Clough, “Future Matters: Technoscience, Global Politics, and Cultural Criticism,” *Social Text* 80, (2004): 7

³⁹ Martin, *Critical Moves*, 131

television viewing is understood as a shared experience. Television mediated and presented the moon landings to individual observers, while at the same time creating a belief in collectively held knowledge. Recalling Susan Foster's conception of the demonstrative body, television coverage of the Apollo 11 mission provided a shared reference for the creation of viewers' ideal bodies as the television screen became the staging area of astronauts' bodies and the values their bodies had come to symbolize. Of course, the entirety of the Apollo 11 mission was not televised. Select moments from the moon landing itself stand out for their complex, often contradictory, symbolic messaging.

As the first manned space mission to land on the moon, Apollo 11 carried the first of seven lunar plaques attached to the ladder of the lunar module. The text of the plaque contained the contradictory nationalist and universalizing aims that had riddled the space program since its inception. The plaque reads,

Here Men from the Planet Earth
First set foot upon the Moon.
July 1969 AD.
We came in peace for all mankind.

It was signed by President Nixon and the mission's three astronauts, Neil Armstrong, Buzz Aldrin, and Michael Collins. On July 21, television viewers watched and listened as Armstrong read the text aloud.⁴⁰

In the broadcast, the latticed metal leg of the lunar module divides the screen. Aldrin and Armstrong stand to the right of the craft, looking at the plaque. At first they are indistinguishable, rendered identical through the anonymity of their

⁴⁰ Gerald Megason, ed. "One Small Step," (video) Available from: Apollo 11 Video Library, 1995, <<http://www.hq.nasa.gov/alsj/a11/a11.v1095224.mov>> (accessed November 15, 2007).

spacesuits. Light bounces off their helmets creating masks of abstracted reflection. In place of eyes, nose, and mouth, the viewer sees the reflection of the lunar module itself replacing the astronauts' faces. Their movements appear stiff, as actions slowly emanate from deep within their uniforms. With their bodies and faces hidden, replaced by images of both spacesuit and spacecraft, Armstrong and Aldrin seem to be feats of engineering themselves. Then, through the static of the sound recording, Armstrong's voice breaks in. His accent is immediately recognizable as American. As he begins to read the plaque, slowly and deliberately, his long pauses, his interjecting "uhs," make Armstrong seem not only deeply human, but also comfortingly flawed. Much of the symbolic power of the lunar landing was derived from the simultaneous performance of the familiar and unfamiliar. Armstrong's reading situated his intimately knowable, American voice within the infinitely unknown lunar landscape.

A question raised by the mission (and transmission) of Apollo 11 was whether or not Americans, like Armstrong and Aldrin, would forever mark the lunar landscape as U.S. territory, or create the possibility for a multinational or universal moon. The performed recitation of the lunar plaque does not answer this question entirely, however, it may illuminate NASA's primary symbolic goals. Through their own signatures, and that of the President, Aldrin and Armstrong had marked the plaque as an American artifact. Though the text identifies the astronauts as "Men from Planet Earth," it also carefully asserts that they, as Americans, were the first to land on the moon. And while the plaque predicts the benefit of "all mankind," this presumption is in keeping with earthbound foreign policy. The Cold War was, perhaps at its core, the assumption of two superpowers that they alone could best serve the needs and desires

of all humanity. Through televised recitation, the text of the plaque was personalized and individualized. American foreign policy objectives were heard from the mouths of the nation's most respected and visible citizens. The plaque's text and recitation display a nationalism concealed within a discourse of universalism.

An analogy may be drawn between the performance of the first moonwalk and the performance and proprietorship of Ancient drama. When Matthias Langhoff, of Germany directed *The Bacchae* in Athens, and was critically derided for his departures from traditional, Greek interpretations, Eleni Várapoulou, a Greek theater critic wrote, "Ancient drama is a cultural treasure without ownership titles. It belongs to the whole world in order to be studied and used by all people, who, depending on their needs, will demolish it and rebuild it, will confront it and clash with it."⁴¹ Her words are easily transferable to the question of the moon's placement in a nationalized world. Like ancient drama, visual and imaginative access to the lunar landscape is ubiquitous and thus resistant to national identity. However, also like ancient drama, which will forever be associated with the now-Greek territory on which it was first penned and performed, the Apollo 11's lunar plaque asserted, for the United States, a primacy of access and an implied territorial claim. Like the colonial practices that preceded and followed it, the lunar landing placed nationally marked bodies in space outside traditional territorial claims, questioning the conflation of national identity and national spaces.

⁴¹ Kiki Gounaridou, introduction to *Staging Nationalism: Essays on Theatre and National Identity*, Kiki Gounaridou ed. (Jefferson: Mcfarland & Company, Inc., Publishers, 2005), 4

The idea of static national space, however, ignores processes by which space is created by movement, rather than simply being moved through. The televised actions of Armstrong and Aldrin created for viewers what were to become archetypal images of the lunar landscape. In one section of the broadcast, Aldrin conducted what was referred to as a mobility experiment, testing the effects of the lunar environment on human motion. Aldrin narrates his actions as he moves across the screen, first with bounding steps and then with a series of “kangaroo hops.” He says, “Alright. You have to be, uh, rather careful, uh, to keep track of where you center of mass is. Sometimes it takes about two or three paces to, uh, to make sure that, uh, you’ve got your feet underneath you.”⁴² Like Armstrong, Aldrin’s voice is both identifiably American and notably casual.

In black and white, Aldrin appears as an ethereal, ghostly figure. As he moves quickly, the image of his body blends into the powdery ground and vacant space behind him. However, though his movements and language seem loose and unpracticed, Aldrin stays carefully within the camera’s frame. The image appears similar to a proscenium stage, carefully demarcated by the edges of the television screen. The lunar “stage” is set with the large, imposing lunar module, disappearing into the space above the top edge, and the stiff American flag, forever caught in an impossible wind. The lunar module looms as a larger than life materialization of scientific labor and discovery. It looks uncannily like the images of science fiction fantasy. The American flag stands as an unmistakable allusion to the long history of

⁴² Gerald Megason, ed. “Mobility and Photography,” (video) Available from: Apollo 11 Video Library, 1995. <http://www.hq.nasa.gov/alsj/a11/a11.v1101315.mov> (accessed November 15, 2007).

colonial travels and land claims on Earth. . It is within this field of distinctly nationalized symbols that Aldrin is watched conducting his personal mobility experiment. Within this frame containing the familiar and the unfamiliar, Aldrin cycles through a series of ordinary movements, simply walking and jumping.

The recognizable nature of his actions calls attention to the unique character of the lunar environment. Unlike the broadcasts of Aldrin and Armstrong collecting geological samples, or measuring solar winds, observers watching Aldrin kangaroo hop across the moon almost certainly recognized his movements. The ordinary nature of the actions isolates the single factor which most significantly and obviously separates the viewer's memories of walking from Aldrin's lunar experience, that of an altered gravity. The shared experience of Earth's gravity on the body allowed viewers to related personally to Aldrin's experience on the moon. One could clearly observe how an environment of reduced gravity turned quick steps into small leaps and slowed Aldrin's descents, cushioning each footfall.

While the self-conscious narration of the personal mobility experiment and the reading of the lunar plaque seem neatly analogous to staged performance, such as the recitation of a monologue, every action of the Apollo 11 crew, and astronauts more generally, can be considered as performances. The manned space program was designed to offer a new language of symbolic imagery illustrating a narrative of U.S. national supremacy both on and off the Earth. The power of these performances was derived, in part, from the positioning of astronauts' bodies as ideal representations of dominant American ideologies. Televised mediation of these performative moments provided opportunities for both individual interpretation and collective observation.

The first moon landing forever altered the imagined possibilities of the human form by placing bodies in a gravitationally distinct environment. The success of the astronauts' performances during the Apollo 11 mission is evidenced by the lasting place the astronaut have taken in a national canon of cultural icons.

Chapter 3: How to Make Two Dances

What follows is the history of 20 minutes. It is the story of the inspiration and creation that led to two dance works, *How to Live on Earth* and *How to Build a New Gravity* presented in 2007 and 2008 at Wesleyan's Senior Thesis Dance Concerts. While I am listed in the programs as the choreographer of both pieces, they were collaborative efforts made with nine dancers, two lighting designers, countless crewmembers and the guidance of my fellow dance majors and dance faculty members. Dance is, by its very nature, collaborative work. Without the presence and participation of audience members, the work could not exist as it did. Here, I have crafted from my own memories and perspective the story of making these dances.

In the creation and performance of *How to Live on Earth*, I began a physical exploration of gravity, collectivity, and the body's ability to move through and define space. This work was made possible through the commitment and creative generosity of six dancers, Greta Hartenstein, Yashan Zhou, Janani Lee, Allyson Hurd, Menherit Goodwyn, and Samantha Sherman.

Beginning the choreographic process, I was not interesting in making a narrative work. I wanted to avoid reliance on a pre-determined storyline. However, I was aware that all bodies tell stories, on and off stage. When watching the movement of astronauts on the surface of the moon, I was struck by the ways in which their bodies served nationalist narratives of scientific discovery and global dominance without the use of mimicry or imitative gesture. I became fascinated with the ways in

which NASA missions became a program of embodied storytelling through the organization of bodies in space.

At the same time, I was discovering the ideas of Augusto Boal in *Theater of the Oppressed*. Boal's text focuses on processes of artistic production and rehearsal, rather than performance. Through my reading of Boal and my examination of astronauts' performances, I became interested in how narratives of production become staged and presented to audiences. My goals for *How to Live on Earth* primarily concerned the dance's creation. For me, the most important moments in the life of *How to Live on Earth* took place in the many weeks that preceded opening night.

Boal writes, "The means of producing a photograph are embodied in the camera, which is relatively easy to handle, but the means of producing theater are made up of man himself, obviously more difficult to manage."¹ The photographer need not consider the needs and desires of the camera, the life story of the camera, or how the camera feels about producing pictures. The director or choreographer, however, must consider the multifaceted personhood of each performer. As a choreographer charged with the organization of bodies in space and time, I strove to maintain an awareness of the social environment I created with and around my dancers throughout our work together.

In Boal's re-telling of the history of theater, tracing the relationship between artistic traditions and social realities, he focuses on the ideologies of Aristotelian drama, Brechtian drama, and finally what he names the poetics of the oppressed. Boal

¹ Augusto Boal, *Theatre of the Oppressed*. Translated by Charles A. and Maria-Odilia Leal McBride. (New York: Theatre Communications Group, 1985), 125

writes that in the first model, “Dramatic action substitutes for real action,” in the second “The spectacle is a preparation for action,” while in the third, “Theater is action!”² Boal describes this transformation as the evolution of models of performance, beginning with a model in which spectators delegate the power of thought and action to dramatic characters. In the Brechtian model, the spectator may think for him or herself, yet remains reliant on the character to act in his or her place. Of the final form, Boal writes, “The *poetics of the oppressed* is essentially the poetics of liberation: the spectator no longer delegates power to the characters either to think or to act in his place. The spectator frees himself; he thinks and acts for himself!”³ Boal’s writing provides methods with which art makers might allow for the emergence of this revolutionary conception of spectatorship.

Revolutionary theater depends upon the erasure of old conventions, in both process and product. The poetics of the oppressed posits egalitarian relationships between actors and directors as well as between performers and audience members. In practice, I believe an egalitarian relationship between a choreographer and a cast of dancers can be achieved through the validation of dancers’ diverse artistic choices, rather than depending on a process that continually re-centers the choreographer’s single vision. I wanted to nurture and maintain dancers’ individual movement choices in order to present their collective artistry. However, I did not completely relinquish my position of power or the traditional dancer-choreography hierarchy in my dance making process. I continued to run rehearsals and make all final compositional

² Ibid, 155

³ Ibid, 155 [emphasis in original]

choices. These decisions certainly limited the effects of my effort to minimize my control over the final piece.

Envisioning the final performance, I hoped each dancer would be able to present her own sense of self on stage, rather than a character of my creation. I believed that fostering and refining each performer's movement preferences and styles would allow her to retain a sense of individuality onstage. The piece's movement vocabulary and phrases were developed collectively, and I asked all dancers to perform all movements, in rehearsal if not in the final performance. I believed this would allow audience members to see a heterogeneous group of movers, each with her own style, united by their shared vocabulary.

Boal writes that the shared or collective interpretation of a character by an ensemble of actors allows performers and spectators to separate the concept of the individual actor from the character, and that practicing collective ensemble interpretations says to an audience, "We, all together, are going to tell a story, what we all think about a subject."⁴ While my choreographic choices - which movement was to be performed solo, in canon, or in unison, where on stage movement was performed, for how long, and by whom - were evident in the final performance, the particularity of each dancer's performance highlighted the fact that a choreographer's control over a dance is inherently limited. Dance performance does not exist outside the body of the dancer. My choreographic impulses were actualized through the cooperation of the dancers. It was in the dancers' bodies that ideas, theirs and mine, were transformed into physicality.

⁴ Ibid, 170

Boal's theatrical goals involve an insistence on transparency, whereby both subject matter and means of production are made apparent to the spectator. This better enables the audience members to become active, thoughtful participants in moments of performance. While Boal's poetics of the oppressed offers a deconstruction of what could be called the ritual of performance, he also offers concrete methods with which to re-imagine the performance of ritualized actions. Boal mentions boxing matches, church services, and public executions as examples of ritual. What these events share is the presence of an audience, and the possibility of repeated, symbolically legible embodied action. Boal implores performers to "[break] down a phenomenon into its parts, dismantling the mechanism so that the parts of that mechanism can be seen independently."⁵ I believe the idea can be applied to dance performance. The movements in *How to Live on Earth* acquired meanings to the dancers through rehearsal and repetition. I employed Boal's techniques in order to breakdown the dance and once again view its parts.

Boal suggests separating in space the performance of movements understood as action and reaction in order to question the notion of causality. He also describes the interruption of ordinary understandings of time as a way to isolate action from its temporal context. Multiplying the visual perspectives of a single action or repeating an action are suggested in order to allow spectators to (re)consider the action's design. Boal discusses the performance of multiple actions simultaneously to allow

⁵ Ibid, 194

audience members the chance to compare and contrast action. Last, Boal suggests “metamorphosing” a single action until it has become something altogether different.⁶

In my own work, I placed these ideas alongside analogous choreographic techniques employed to transform a single movement phrase. The concept of “theme and variation” has guided much of my choreographic production. Altering and transforming movement phrases has been a central focus of my rehearsal processes over the past four years. Through the making of *How to Live on Earth*, I came to understand how this practice serves as more than an aesthetic exercise or experiment.

Boal writes,

Art is a form of knowledge: the artist, therefore, has the obligation of interpreting reality, making it understandable. But if instead of interpreting, he limits himself to reproducing it, he will be failing to comprehend it or to make it comprehensible. And the more reality and art tend to be identical, the more useless will be the latter. The criterion of similarity is the measure of inefficacy.⁷

Therefore, the creation of movement variations serves the dual aims of examining the contours of a movement phrase, as it is understood as a discreet object, while simultaneously questioning the boundaries that define it. Boal asserts that all artistic production is knowledge production. With this in mind, I conceived of my rehearsals as a space in which the knowledge of movement was reinterpreted through the learning process of moving. Movement themes and variations were the products of this effort.

The dancers begin *How to Live on Earth* seated throughout the stage. The phrases they perform had been developed with partners in close proximity and some

⁶ Ibid, 195

⁷ Ibid, 171

included moments of contact, allowing for one dancer's movement to cause a change in her partner's movement. However, in the beginning, and as the phrases reappeared throughout the dance, these partner phrases were altered as performers were positioned far from their partners. This removed the implication of causality between the two partners' phrases. At other moments, the phrases were performed solo. This allowed individual actions within a duet to be viewed independently.

Manipulations of timing were also important in the creation of the piece. Early in the dance, one dancer, Yashan, repeatedly falls to the floor while the other five walk slowly around the stage, seeming to ignore her. The timing of Yashan's movement was dictated by gravity as she experienced, rather than represented, loss of balance. She allowed the pull of Earth's gravity to guide the space and time of her movement giving up control over where and how quickly her body reached the floor. In contrast, the dancers around her meticulously lifted and placed their feet across the stage. While the form of their movement was a simple walk, the motion was separated from its ordinary relationship to time. This dramatically performed counterpoint to a pedestrian movement like walking highlights the role of time in shaping the quality of an action. The simultaneous images of dancers yielding to and managing the effect of gravity on the body calls attention to the relationship between the weightedness and timing of a movement.

Many of the phrases in *How to Live on Earth* were performed more than once throughout the piece, often facing different directions each time. Directional changes allow audience members to share in the multiple profiles and shapes any movement creates in three dimensions. Repetition provides, as Boal suggests, the opportunity for

spectators to reconsider an action's design. I believed repetition was equally important for the dancers as they could reassess, throughout the dance, the feeling of a movement phrase. While the dancers had experienced each phrase numerous times, due to the repetitive nature of the rehearsal process, there is an important distinction between the execution of movement and its performance. As a dancer, I have found that movements feel different in moments of staged performance as compared to rehearsals. The repetition in *How to Live on Earth* allowed each dancer to physically reconsider the performance of phrases on stage and with the presence of audience members.

All six dancers remain on stage for the majority of *How to Live on Earth*, and moments of unison are scattered. The six dancers never perform a single phrase all together in unison. Therefore, in any given moment, there are multiple actions being performed in different areas of the stage. Phrases are juxtaposed to suggest comparison and contrast. Audience members must constantly choose what, and where, to watch. By providing layers of movement information, I assumed audience members to be intellectually participant in their individual experiences of viewing the dance.

My personal notions of participation shaped the creation of *How to Live on Earth*. I attempted to create a rehearsal environment that was conducive to collective participation by honoring the movement choices of individual dancers. Through processes of alteration, dismantling, and re-articulation, I invited the dancers' physical participation into my own process of evaluating and arranging movement. I also hoped that these techniques of variation would allow the cast to participate in

individual and shared (re)interpretations of movement phrases they had created. *How to Live on Earth* was the result of a long period of artistic work, but for most audience members, it lasted only a few minutes. Through compositional choices including time, space, simultaneity, and repetition, I attempted to create a dance work that allowed audience members to be active participants in the performance.

The themes of gravity and weight that ran throughout *How to Live on Earth* were directly taken from my research on the astronaut body, and my focus on collective art making was in part a response to the strictly hierarchical organization of bodies found in NASA. However, the work was also the product of a period of theoretical engagement with performance as a mode of knowledge production. The piece was created as I cultivated a movement vocabulary from the imaginative work of the dancers. In the second semester, as I began work on what was to become *How to Build a New Gravity*, I decided to set clearer aesthetic goals for myself. I decided to exert more direct control over the production of movement. I also decided to introduce abstracted narratives inspired by my text-based research into the production of the piece, rather than waiting to see what stories arose from the work.

One of the realizations that had come out of my movement and text-based research the previous semester was the power of bodies in motion to create and alter perceptions of space. I became particularly interested in the ability of dancers to perform new relationships to gravity and the effect this had on the spaces in which they moved. My interest in gravity led me to the work of post-modern dance

innovator Trisha Brown, and I attempted to incorporate some of the lessons of her work into the production of *How to Build a New Gravity*.

Martha Bremser has suggested that Brown's work "makes the rules of life seem arbitrary" through her rejection of ordinary bodily pathways, and that Brown's expansive imagination posits a world in which "dancers can fall not only down but up or sideways..."⁸ In the late 1960s and early 1970s, Brown explored gravity by constructing specialized apparatuses, such as harnesses, that allowed her dancer's to seemingly defy gravity, as in *Man Walking Down the Side of a Building* (1970), and *Walking on the Wall* (1971).⁹

In the former, audience members watch from a courtyard at ground level as a single male dancer walks down the side of a seven-story building perpendicular to the wall supported by a harness. The work supposes an altered relationship to gravity while faithfully re-staging the ordinary movement of walking. While the dancer, Joseph Schlichter in the original performance, appears to be walking naturally, at times his strides are lengthened as gravity pulls his lifted leg downward, highlighting the muscular effort necessary within the performance to maintain the appearance of an ordinary gait. He keeps his arms still by his sides, in imitation of their usual resting position. However, he cannot relax his arms, and instead must constantly resist the pull of gravity, which would position his arms in front of his body. Similarly, it is

⁸ Martha Bremser, ed. *Fifty Contemporary Choreographers* (New York: Routledge, 1999), 37

⁹ *Ibid*, 38

only through constant muscular tension that the performer's head preserves the appearance of being upright.¹⁰

Walking on the Wall is an expansion of the exploration begun in *Man Walking Down the Side of a Building*. Employing harnesses attached to a track set up along the upper edges of multiple walls, the piece presents six dancers walking laterally across the walls. Like the solo dancer of the earlier piece, the performers in *Walking on the Wall* are constantly battling gravity in their efforts to perform what looks like usual walking. As the dancers move from wall to wall at the corner, they briefly swing between the two planes. It is in these brief moments of suspension that the necessity of the harnessing is most obvious. Part of the work's success depends upon the ability audience members to temporarily forget they are watching a feat of strength and engineering.¹¹

The last of Brown's "equipment dances," *Rummage Sale and Floor of the Forest* (1971) positioned the performance of a work created the previous year, *Floor of the Forest*, above a crowd of rummage sale shoppers. The dance's apparatus is a grid of thick ropes "threaded through the arms and legs of various pieces of clothing." This enables the dancers to move across the space using "a process of repeatedly dressing and undressing."¹² In conjunction with a rummage sale, the work calls attention to the multiple uses of clothing, as objects of functional necessity and joyful consumption. Like earlier equipment pieces, *Floor of the Forest* allows the dancer to

¹⁰ "Man Walking Down the Side of a Building," Trisha Brown: Early Works 1966-1979, DVD. (Houston: Artpix, 2004).

¹¹ "Walking on the Wall," Trisha Brown: Early Works 1966-1979, DVD. (Houston: Artpix, 2004).

¹² Sally Sommer, "Equipment Dances: Trisha Brown," *The Drama Review* 16.3 (1972): 140

experience and sustain a new relationship to the ground. It presents the audience with the fantastical image of a person hanging from a sweater eight feet in the air. Placed next to the activities of the rummage sale, the work incorporated a vast range of movement and uses of the body, from the most pedestrian movements of shopping to the carefully orchestrated balancing of the dancers.

Brown has said of *Rummage Sale and Floor of the Forest*, "...the whole evening was a rummage sale, I was getting rid of my hardware pieces. I don't do works like that any more. I'm working just in movement now."¹³ Indeed, Brown's next work, *Accumulation* (1971), began what she has deemed her Mathematic cycle, exploring "accumulation of gestures, deaccumulation, reaccumulation."¹⁴ These works do not abandon the earlier cycle's exploration. However, the only "apparatus" used is that of the human skeleton. Brown continued to make work that was deeply concerned with gravity and its effects on the body, but she relocated her inquiry into the body itself, making use of its physical organization.

In the summer of 2007, Brown restaged *Floor in the Forest* at Documenta XII in Kassel, Germany. Instead of a rummage sale, the piece was coupled with a unison group performance of *Accumulation*.¹⁵ As its title suggests, the dance is composed of progressively accumulating movement. A single, small gesture grows into a larger gesture which becomes a full-bodied movement, and then another, until the dancer has completed a short phrase to be repeated. The first gesture is a rotation of the arm from the elbow. The arms are held close to the sides of the body, and the hands are

¹³ Sommer, "Equipment Dances," 140

¹⁴ Joyce Morgenroth, *Speaking of Dance: Twelve Contemporary Choreographers on Their Craft*, (New York: Routledge, 2004), 60

¹⁵ Personal video recording, Kassel, Germany, July 15, 2007.

parallel to the floor. Eventually, the dance phrase incorporates swings of the arms and legs. The structural simplicity of the accumulation, coupled with its short length (less than five minutes) obscures the complex explorations it includes. The contrasting tension of the first gesture and release of the leg swings display two different modes of responding to gravity. In the first instance, muscular engagement keeps the elbows bent and lifted, while the ease of the leg swing presents an acceptance of the skeleton's unaltered response to gravitational pulls. *Accumulation* exemplified Brown's ability to pose the same questions about the body in space on the floor as on the side of a building. I began creating *How to Build a New Gravity* with the information I had gained from Brown's explorations of bodies and gravity, as well as the lessons I learned from her varied methods of inquiry.

Brown has said of her creative process, "When I start a new piece, I run down certain issues of composition which bring with them the necessity of a new vocabulary to service the composition."¹⁶ My compositional objectives in the second semester were expansions of the work that had begun with *How to Live on Earth*. In the first semester, I had used the actions of jumping and falling to highlight the body's interactions with gravity. In the second piece I worked with three wonderfully kind and creative dancers, Joella Jones, Mary Claire Abbot and Vladimir Gurewich, to explore how weight sharing could subvert, or reinterpret, the spatial logics gravity imposes on human movements.

We experimented with using the body shapes found in images of astronauts in space shuttles, on spacewalks, and on the surface of the moon as starting points to

¹⁶ Morgenroth, *Speaking of Dance*, 63

generate movement phrases. The photographs captured the human body in unusual positions made possible in a weaker gravitational environment. Replicated by dancers in the rehearsal studio, and later on stage, the shapes seemed odd and out of place. One image of an astronaut drifting outside a space shuttle led to a movement repeated throughout the piece which we called “floating.” In this movement, the dancers sit on the ground and extend their arms and legs upward, moving them slowly through the air. Like Trisha Brown’s equipment pieces, the movement requires dancers to use their musculature to create a false sense of ease as they fight the effect of gravity pulling their limbs to the floor. Through rehearsal and coaching, the dancers began performing “floating” as though they were immune to gravity. By implying an altered relationship to gravity, their movement created a new sense of the stage space.

The piece ends with all three dancers seated on the floor where they perform small gestures with their arms, rise slightly to their knees and return to a seated position. In succession, each stands, performs a short phrase and sits back down. The floor-based vocabulary also includes moments of inversion during which the dancers tip their weight onto their shoulders and arms. This collection of relatively slow, small, solo movement is the last image in *How to Build a New Gravity*. To me, it showcased the subtlety with which the dancers had begun to reorganize the architecture of their bodies in relation to gravity and the ground.

Earlier in the piece, the dancers use their bodies to interrupt gravity’s effects in partner work. The piece begins with Mary Claire and Vladimir spinning and traveling together, alternating who is standing and who is being suspended above the ground. The dancers use circular momentum and their own strength to lift one

another. Next, Joella begins to pull Mary Claire off balance. At the last minute, Vladimir rushes in to catch Mary Claire's body and ease her to the floor. This sequence is repeated again later in the piece. This was inspired by my desire to create altered relations to gravity and to represent the role of collective labor in moving bodies that I had found striking in the history of manned space flight. Vast numbers of people contributed years of research, mostly unseen by the public, before Neil Armstrong could take his first steps on the surface of the moon. With the dancers, I explored ways in which the shared labor of lifting a single body could be staged.

Joella, Mary Claire, and Vladimir each brought their own personal movement histories and trainings to this project. The movement each generated, both alone and collectively, was a testimony to their personal movement styles. As in the creation of the first piece, I sought to nurture and celebrate each dancer's personal movement preferences. Many of the phrases repeated in *How to Build a New Gravity* were set versions of movements generated through individual improvisation. Trisha Brown has said that phrases generated in this manner can lose the "nuanced, elusive aspect"¹⁷ seen in the earliest, improvised iterations. With a cast half the size of the first, I found this phenomenon more striking in the second semester. The three dancers worked closely with one another and formed a sense of community decidedly outside my direction and control. Though the repetitive nature of the rehearsal process will, almost automatically, regularize movement, I also watched as the dancers quickly amended their early interpretations of a phrase in order to match the other dancers. While I was occasionally disappointed to see initial elements of variety disappear, I

¹⁷ Ibid, 61

was also pleased that the dancers felt autonomous enough to communicate with one another without my choreographic mediation. Their unspoken processes of regularization evidenced their confidence in one another and their artistic separation from me.

In both semesters, I was challenged to find a temporal structure that would organize the dances. Neither piece was bounded by narrative, and both were developed independently of their eventual soundscapes. During the creation of *How to Build a New Gravity*, I became increasingly aware of the potential to use space as a mode of temporal structuring. As my text and movement researching grew more clearly connected in the second semester, I imagined the dancers as journeyers, moving through a vast space, striving to find their next placement on the stage. Therefore, a phrase's length could be determined by the length of time the dancer's needed to move from one place to the next. The dance's overall length was limited only by the time necessary for the dancers to adequately explore the stage space.

Throughout the past year, I have asked myself a number of questions about this project. Why did I feel the need to make dances about astronauts? Why did I believe choreography was a useful tool for this particular investigation? The most succinct answer I have been able to find for myself is that any study of the body and of performance will benefit from a methodological incorporation of embodied performance. Trained in dance and dance making, choreography in my mode of entry into the vast field of performance possibilities.

Finally, I found another part of the answer when I returned to Augusto Boal's work. Recounting his experience directing ancient Greek drama in Sao Paulo, Boal recalled that some actors were initially intimidated by the subject matter. The work's success was rooted in the company members' willingness to personalize the text. He writes,

The great majority...felt fascinated by the adventure of understanding that a classic is universal only insofar as it is Brazilian. The 'universal classic,' that only Old Vic or the Comédie can do, does not exist. We too are the 'universe'¹⁸

As a dancer, I too am the universe. There is no question too large or complicated to be answered through the body. And, as Trisha Brown has said, "Do my movement and my thinking have an intimate connection? First of all, I don't think my body doesn't think. My body has a strong voice and it does things that I observe."¹⁹ My effort to locate and explore the body of the astronaut would have been incomplete had I not engaged the question physically. Questions about movement are inadequately answered without movement.

¹⁸ Boal, *Theater of the Oppressed*, 165

¹⁹ Morgenroth, *Speaking of Dance*, 64

Conclusion

On July 27, 1969 *The New York Times* featured two stories recounting reactions to the Apollo 11 moon landing. In tandem, the two articles suggest that only with white stewardship and white funding could the Apollo 11 mission's potential for national unification be fully realized. The first, Thomas A. Johnson's "Blacks and Apollo: Most Couldn't Have Cared Less" was largely composed of interviews with Black Americans. The sites of these interviews, Harlem bars and NAACP offices, geographically marginalize the interview subjects just days after the Apollo 11 mission had marked the moon, more than 200,000 miles from Earth, as an American location. Johnson identifies one unnamed bar patron only through his "stubby fingers" and "laborer's hard hand." He does not provide the conversational context within which the man remarked, "We're earth-bound." Johnson's account suggests that the "we" refers, without nuance, to all Black Americans. In a subsequent interview, Sylvia Drew, an attorney for the NAACP, says of the moon landing,

It proves that white America will do whatever it is committed to doing...If America fails to end discrimination, hunger and malnutrition then we must conclude that America is not committed to ending discrimination, hunger and malnutrition. Walking on the moon proves that we do what we want to as a nation.¹

Drew's analysis of the space program calls attention to the fact that 1969 was a time of international and intra-national transformation and tension. Though Johnson's article publicizes the lack of excitement many Americans felt toward the space program, it does not question the scientific or diplomatic triumph of the first

¹ Johnson, Thomas A., "Blacks and Apollo: Most Couldn't Have Cared Less," *New York Times*, July 27, 1969, E6

moonwalk. Thus, while the *New York Times* was willing to publish the opinions of those less enthusiastic than their own Jack Gould, Johnson's article in no way questions the extraordinary attention the paper had paid to the Apollo program in preceding days and weeks.

On the very same day, a small article buried within the paper titled "Fresh Air Fund Campers Take Part In Program on Lunar Landing" combined journalism and a fund-raising campaign. It described the program's initiative to bring "hundreds of boys and girls from New York City's blighted neighborhoods" to the "wilderness camping center in Dutchess County," where instead of watching the historic moon landing on television, the campers watched videos of previous space missions and used telescopes to examine the moon's surface. The article's last paragraph informed readers that "Tax-deductible gifts to provide such experiences to deprived boys and girls can be sent" to the Fresh Air Fund's offices on West 41st Street.² Below, the paper printed a list of close to 400 previous donors.

Published not one week after Neil Armstrong's first steps on the moon, the articles illustrate how the symbolic value of the manned space program has been, since its inception, simultaneously contested by some observers and ardently defended by supporters. The articles signal the authors' concern over the Apollo missions' ambiguous reception. The Fresh Air Fund is positioned as a mode of controlling reception through the education of poor children of color. Because embodied performances, like those of astronauts, create unique opportunities for personalized engagement with emerging symbolic codes, they are particularly prone

² "Fresh Air Campers Take Part In Program on Lunar Landing," *New York Times*, July 27, 1969, 67

to a multiplicity of interpretations. The striking body of books, television programs, movies and other cultural artifacts related to the Apollo program can be understood as an attempt to narrow and regularize the narrative of Americans in outer space.

By focusing on astronaut bodies, I have attempted to identify an alternative narrative. In my reading of history, manned space flight was by no means unavoidable. Neither was the placement of astronauts within the canon of mythical American hero archetypes inevitable. Both phenomena are the result of concerted efforts to create and popularize an image of the astronaut as the embodiment of national achievement and pride. While astronauts emerged from federally funded research projects, they are perhaps better understood within the field of performance. Their utility has always been, and perhaps always will be, rooted in their ability to perform, through embodied action, symbolic representation of the nation. Finally, as astronauts come to be understood as kinetic bodies in space, so can research into the meaning of the astronaut body be conducted with and through movement.

In the future, as interdisciplinary studies expand and cultural studies' current engagement with the body reaches further toward the physical – the flesh and bones body already at the center of dance practices—movement and embodied learning may become similarly recognized as modes of historical inquiry. The task I have begun in this work is left unfinished. However, I believe it is likely that movement will continue to become better understood as a vital alternative text, and that the movement of the written word be more broadly recognized. When the human form is no longer discursively buried by text-based practices of history, the place of the body in social and cultural histories will no longer necessitate recuperation and uncovering.

As all moments are lived and experienced in the body, so will be all history be written through the body.

Selected Primary Sources

- Biddle, Wayne. "In the Defense Department's Orbit." *New York Times*, January 27, 1985, E1.
- Biddle, Wayne. "'Star Wars' Technology: It's More Than a Fantasy." *New York Times*, March 5, 1985, A1.
- Broad, William J. "NASA Moves to End Longtime Reliance on Big Spacecraft." *New York Times*, September 16, 1991, A1.
- Broad, William J. "Shuttle Launching Delayed Again Over Weather Fears." *New York Times*, January 27, 1986, A14.
- Broad, William J. "Teacher is Focus of Space Mission." *New York Times*, January 5, 1986, 11.
- Brooks, Courtney G., James M. Grimwood, Loyd S. Swenson, Jr., *Chariots for Apollo: A History of Manned Lunar Spacecraft*. Washington, D.C.: National Aeronautics and Space Administration, 1979.
- Brown, Malcolm E. "After 16 Years, Monkeys are Back in Space." *New York Times*, March 5, 1981, A1.
- Compton, William David. *Where No Man Has Gone Before: A History of Apollo Lunar Exploration Missions*. Washington, D.C.: National Aeronautics and Space Administration, 1989.
- "Ex-Astronaut Gets OK to Lose Anklet." *Los Angeles Times*, August 31, 2007, Home Edition, A32.
- Farrell, William E. "Glenn is Elected New Ohio Senator." *New York Times*, November 6, 1974, 39.
- Ferretti, Fred. "Apollo 11 TV Coverage to Engage Many Earthlings." *New York Times*, July 14, 1969, 71.
- Finney, John W. "Glenn's Condition Good; New Flight Set for Spring." *New York Times*, Feb 22, 1962, 1.
- Finney, John W. "Glenn Says the Manual Controls In Capsule May Have Saved Him." *New York Times*, April 7, 1962, 8.
- Fiske, Edward B. "Pupils Nominate Teachers for Space." *New York Times*, February 1, 1985, A18.

“Fresh Air Campers Take Part in Program on Lunar Landing.” *New York Times*, July 27, 1969, 67.

“Girl Who Named Mars Rover Stays Down to Earth.” *New York Times*, July 14, 1997, B7.

Gorman, James. “Mars Mission Separates the Men from the Toys.” *New York Times*, July 13, 1997, E2.

Gould, Jack. “TV: Apollo Telecast Catches Viewers by Surprise.” *New York Times*, July 19, 1969, 51.

Gould, Jack. “TV Has Involved and Educated Millions in Mysteries of Space.” *New York Times*, July 17, 1969, 40.

Harmon, Amy. “An Eager NASA is Bringing Mars Down to Earth.” *New York Times*, January 27, 2004, A1.

Hart, Lianne, John Johnson Jr., Karen Kaplan and Alan Zarembo. “The Sudden Descent of a Shuttle Astronaut.” *Los Angeles Times*, February 7, 2007, Home Edition, A1.

Hickam, Homer. “What Makes an Astronaut Crack?” *Los Angeles Times*, February 9, 2007, Home Edition, A25.

Johnson, John Jr. and Alan Zarembo. “Astronaut Arrested in Kidnap Attempt.” *Los Angeles Times*, February 6, 2007, Home Edition, A1.

Johnson, Thomas A. “Blacks and Apollo: Most Couldn’t Have Cared Less.” *New York Times*, July 27, 1969, E6.

Krebs, Albin. “Glenn Again Hits Senate Trail.” *New York Times*, December 11, 1973, 51.

Lyndon, Christopher. “Rematch of Glenn and Metzenbaum in Ohio Primary,” *New York Times*, April 21, 1974, 49.

Mallon, Thomas. “Space Aged.” *New York Times*, June 14, 1998, special section.

“Man Walking Down the Side of a Building.” Trisha Brown: Early Works 1966-1979, DVD. Houston: Artpix, 2004.

Megason, Gerald ed. “Mobility and Photography.” (video) Available from: Apollo 11 Video Library, 1995. <http://www.hq.nasa.gov/alsj/a11/a11.v1101315.mov> (accessed November 15, 2007).

Megason, Gerald ed. "One Small Step," (video) Available from: Apollo 11 Video Library, 1995, <<http://www.hq.nasa.gov/alsj/a11/a11.v1095224.mov>> (accessed November 15, 2007).

"News Summary and Index." *New York Times*, February 21, 1962, 47.

Personal video recording. Kassel, Germany. July 15, 2007.

Rimer, Sara. "After the Shock, a Need to Share Grief and Loss." *New York Times*, January 29, 1986, A1.

Roth, Emanuel M. *Bioenergetics of Space Suits for Lunar Exploration*. Washington D.C.: National Aeronautics and Space Administration, 1966.

Royslance, Frank D. "NASA Mental Exam a One-Time Deal." *Los Angeles Times*, February 7, 2007, Home Edition, A15.

Schwartz, Harry. "Capitalist Moon or Socialist Moon?" *New York Times*, July 21, 1969, 16.

"Senate Contest in Ohio Heats Up." *New York Times*, September 3, 1974, 16.

"Television Camera Records the Activities of Astronauts on the Landing Area." *New York Times*, July 21, 1969, 3.

"The Challenge Beyond Challenger." *New York Times*, January 31, 1986, A30.

"Walking on the Wall," Trisha Brown: Early Works 1966-1979, DVD. Houston: Artpix, 2004.

Wilford, John Noble. "Faith in Technology is Jolted, but There is No Going Back." *New York Times*, January 7, 2004, A18.

Wilford, John Noble. "Pioneer Returns as Crewman in the Shuttle." *New York Times*, October 30, 1998, A1.

Wilford, John Noble. "Scientists In 'Awe' of Color Photos of Mars." *New York Times*, January 7, 2004, page A18.

Bibliography

- Ackman, Martha. *The Mercury 13*. New York: Random House, 2003.
- Boal, Augusto. *Theatre of the Oppressed*. Translated by Charles A. and Maria-Odilia Leal McBride. New York: Theatre Communications Group, 1985.
- Bremser, Martha, ed. *Fifty Contemporary Choreographers*. New York: Routledge, 1999.
- Butler, Judith. *Bodies That Matter: On the Discursive Limits of "Sex."* New York: Routledge, 1993.
- Butler, Judith. "Critically Queer." In *Performance Studies*, edited by Erin Striff, 152-165. Houndsmills: Palgrave Macmillan, 2003.
- Clough, Patricia Ticineto. "Future Matters: Technoscience, Global Politics and Cultural Criticism," *Social Text* 80 (2004): 1-23.
- Degroot, Gerard J. *Dark Side of the Moon: The Magnificent Madness of the American Lunar Quest*. New York: New York University Press, 2006.
- Demastes, William W. Introduction to *Interrogating America Through Theatre and Performance*, eds. William W. Demastes and Fischer, Iris Smith, New York: Palgrave Macmillan, 2007.
- Demastes, William W. and Irish Smith Fischer, eds. *Interrogating America Through Theatre and Performance*. New York: Palgrave Macmillan, 2007.
- Desmond, Jane C. "Embodying Difference: Issues in Dance and Cultural Studies." In *Meaning in Motion: New Cultural Studies of Dance*, edited by Jane C. Desmond, 29-54. Durham: Duke University Press, 1997.
- Desmond, Jane C., ed. *Meaning in Motion: New Cultural Studies of Dance*. Durham: Duke University Press, 1997.
- Dils, Ann and Ann Cooper Albright, ed. *Moving History/Dancing Cultures*. Middletown: Wesleyan University Press, 2001.
- Field, Douglas, ed. *American Cold War Culture*. Edinburgh: Edinburgh University Press, 2005.
- Field, Douglas. Introduction to *American Cold War Culture*, edited by Douglas Field. Edinburgh: Edinburgh University Press, 2005.

Foster, Susan Leigh. "Choreographies of Gender." In *Performance Studies*, edited by Erin Striff, 166-177. Houndsmills: Palgrave Macmillan, 2003.

Foster, Susan Leigh. *Corporealities: Dancing knowledge, Culture, and Power*. New York: Routledge, 1996.

Foster, Susan Leigh. "Dancing Bodies." In *Meaning in Motion: New Cultural Studies of Dance*, edited by Jane C. Desmond, 235-258. Durham: Duke University Press, 1997.

Foucault, Michel. *Discipline and Punish: The Birth of the Prison*. Translated by Alan Sheridan. New York: Vintage Books, 1995.

Fricker, Karen. "Robert Lepage: Product of Québec?" In *Staging Nationalism: Essays on Theatre and National Identity*, edited by Kiki Gounaridou, 167-185. Jefferson: Mcfarland & Company, Inc., Publishers, 2005.

Gounaridou, Kiki. Introduction to *Staging Nationalism: Essays on Theatre and National Identity*, edited by Kiki Gounaridou, 1-10. Jefferson: Mcfarland & Company, Inc., Publishers, 2005.

Gounaridou, Kiki, ed. *Staging Nationalism: Essays on Theatre and National Identity*. Jefferson, NC: Mcfarland & Company, Inc., Publishers, 2005.

Han, Sam. *Navigating Technomedia: Caught in the Web*. New York: Rowman & Littlefield Publishers, Inc., 2008.

Hanna, Thomas. *Bodies In Revolt*. New York: Dell Publishing Co., Inc., 1970.

Jordan, John W. "Kennedy's Romantic Moon and Its Rhetorical Legacy for Space Exploration," *Rhetoric and Public Affairs* 6.2 (2003): 209-223.

Jowitt, Deborah. "Beyond Description: Writing beneath the Surface." In *Moving History/Dancing Cultures*, edited by Ann Dils and Ann Cooper Albright, 7-11. Middletown: Wesleyan University Press, 2001.

Larabee, Ann. "Remembering the Shuttle, Forgetting the Loom: Interpreting the Challenger Disaster." *Postmodern Culture* 4.3 (1994), http://muse.jhu.edu.ezproxy.wesleyan.edu:7790/journals/postmodern_culture/v004/4.3larabee.html

Launius, Roger D. "Heroes in a Vacuum: The Apollo Astronauts as Cultural Icon." Paper presented at the 43rd meeting for the American Institute of Aeronautic and Astronautics, Reno, Nevada, January 10-13, 2005.

- Lepecki, André. "Inscribing Dance." In *Of the Presence of the Body: Essays on Dance and Performance Theory*, edited by André Lepecki, 124-139. Middletown: Wesleyan University Press, 2004.
- Lepecki, André, ed. *Of the Presence of the Body: Essays on Dance and Performance Theory*. Middletown: Wesleyan University Press, 2004.
- Logsdon, John M. *The Decision to Go to the Moon: Project Apollo and the National Interest*. Cambridge: MIT Press, 1970.
- Mackowski, Maura Phillips. "Manned Spaceflight for Women?" *Technology and Culture* 47 (2006): 170-174.
- Magelssen, Scott. "Celebrating the Revolution While the King Is Still on the Throne: *The Fall of the Bastille* and the Festival of Federation (July 1790)," in *Staging Nationalism: Essays on Theatre and National Identity*, edited by Kiki Gounaridou, 32-47. Jefferson: Mcfarland & Company, Inc., Publishers, 2005.
- Martin, Randy. *Critical Moves: Dance Studies in Theory and Politics*. Durham: Duke University Press, 1998.
- Martin, Randy. "Dance Ethnography and the Limits of Representation." In *Meaning in Motion: New Cultural Studies of Dance*, Jane C. Desmond, ed., Durham: Duke University Press, 1997.
- McCurdy, Howard E. *Space and the American Imagination*. Washington, D.C.: Smithsonian Institution Press, 1997.
- Morgenroth, Joyce. *Speaking of Dace: Twelve Contemporary Choreographers on Their Craft*. New York: Routledge, 2004.
- O'Neill, John. *Five Bodies: Re-figuring Relationships*. Thousand Oaks: Sage Publications, 2004.
- Sklar, Deirdre. "Five Premises for a Culturally Sensitive Approach to Dance," in *Moving History/Dancing Cultures*, edited by Ann Dils and Ann Cooper Albright, 30-32. Middletown: Wesleyan University Press, 2001.
- Slotten, Hugh R. "Satellite Communications, Globalization, and the Cold War." *Technology and Culture* 43 (2002): 313-350.
- Sommer, Sally. "Equipment Dances: Trisha Brown." *The Drama Review* 16.3 (1972): 135-141.
- Striff, Erin, ed. *Performance Studies*. Houndsmills: Palgrave Macmillan, 2003.

Taylor, L.B., Jr. *For All Mankind: America's Space Programs of the 1970s and Beyond*. New York: E.P. Dutton & Co., Inc., 1974.

Wolfe, Tom. *The Right Stuff*. New York: Bantam Books, 1979.