Galactic Suburbia

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In the preceding chapters of this book I have examined how postwar women writers used SF to examine the impact of new sciences and technologies on women’s work in the home. In this final chapter I explore how such authors helped shape new representations of women’s work in the fields of science and technology as well. For the most part, postwar Americans seemed reluctant to accept women as professional scientists, engineers, and astronauts. This reluctance is clearly conveyed by the character of Dr. Maureen Robinson from the popular early 1960s television series *Lost in Space*. At the beginning of the first episode, Maureen Robinson seems to have it all: in her technocultural position as a space explorer on the generation ship *Jupiter 2*, she is valued as both a biochemist and a mother. Unfortunately, when Dr. Smith destroys the *Jupiter 2*, he also destroys this protofeminist dream. Once the Robinsons are marooned, the show becomes a frontier narrative and characters take on the traditional gender roles of the pioneer family. Before the first episode even ends, Dr. Robinson has already become Mrs. Robinson—a transformation that all the characters including Robinson herself seem to find perfectly natural.

And indeed, this kind of transformation probably did seem per-
fectly natural to many viewers. As feminist Betty Friedan argues, postwar American investment in the ideology of feminine mystique fostered specific ideas about appropriate kinds of work for women. The mystique defined women in terms of their sexual and maternal drives; accordingly, it dictated that women would be most fulfilled by the domestic labor of marriage and motherhood. Although women might make significant contributions to society by pursuing careers outside the home, in doing so they condemned themselves to lives of unmarried loneliness. Thus, the conservative gender ideals of postwar America “spelled out a choice—love, home, and children, or other goals and purposes in life” (183). For Friedan, this choice was a mistaken one because advocates of the feminine mystique never considered the possibility that women, like men, might combine domestic and professional labor throughout their lives.

Although figures such as Maureen Robinson may well have embodied widespread conservative attitudes towards women’s work in science and technology, they were by no means the only ones available to postwar Americans. In the first part of this chapter I briefly review postwar American attitudes toward science, technology, and gender. Historians generally agree that while the decades following World War II constituted a golden age of American science, prevailing convictions about the feminine mystique prevented scientifically and technologically inclined women from reaping the same benefits as their male counterparts. In an era when women's work in the home was seen as the first line of defense against the encroachment of communism onto American soil, women scientists were often represented in the mainstream media as unnatural and unpatriotic.

Yet, women continued to study and practice science and technology in record numbers. Moreover, the advent of the Space Race suggested that America truly needed them to do so. Accordingly, new initiatives such as the National Defense Education Act of 1958 provided scholarships to scientifically inclined boys and girls alike, while new programs such as NASA's short-lived Women in Space Early (WISE) program showcased the technical skills that many American women already possessed. Although these initiatives did not produce results for years, the publicity materials they generated provided mid-century Americans with striking new images of women who seemed to be equally at home in laundry rooms, laboratories, and launch pads.

In the second part of this chapter I show how women in the
postwar SF community incorporated changing ideas about science, technology, and gender into both their science and SF writing. As contributors to major SF magazines such as *Amazing Stories* and *Fantastic Adventures*, authors including June Lurie, Sylvia Jacobs, and Kathleen Downe wrote hundreds of articles on topics ranging from the historic foundations of mythology and superstition to new developments in deep sea diving and atomic energy. Following the conventions established by women science writers of the eighteenth, nineteenth, and early twentieth centuries, these columnists represented themselves as trained educators or scientific wives whose education, close observation skills, and first-hand experience of science and technology empowered them to critically assess the discoveries made by male scientists and engineers. And so these authors claimed places for themselves as essential members of the scientific community.

Fiction writers addressed the issue of women’s scientific authority even more directly. Authors including Marion Zimmer Bradley, Judith Merril, Katharine MacLean, Doris Pitkin Buck, and Anne McCaffrey all wrote stories of scientific discovery and adventure extrapolated from changing ideas about the nature of women’s work in a high-tech world. In such stories, the choice between family and career is more than a mistaken one for women; it is downright deadly because it destroys individual families and undermines human progress as a whole. But these authors also rewrote masculinist myths about science and technology to imagine future worlds where women might combine their professional and personal lives, thereby creating utopian new modes of technoscientific labor. The protagonists of such stories escape the fate of Maureen Robinson. They are not unhappy housewife heroines lost in space but compassionate and consummate professionals who lead their people to the stars.

**Scientist Mothers and Lady Astronauts in the Golden Age of American Science**

The postwar era was a difficult period for American women interested in science and engineering. As science historian Margaret Rossiter explains, American science experienced a “golden age” as cold war anxieties spurred a “period of record growth in almost every aspect of American science that one could count—money spent, persons trained, jobs created, articles published, even Nobel prizes won” (xv). However, women did not share in the gains of this golden age.
Scientists

Although they had been courted by industry, academia, and even the military during the technical manpower shortages of World War II, that courtship came to a sudden end after the war. Over the course of the next two decades, women comprised less than 7 percent of all science and engineering professionals (Rossiter 98). Meanwhile, the number of women receiving science PhDs dropped from a postwar high of 9.35 percent in 1947 to a low of 6.16 percent in 1954 (Rossiter 80). Such trends seemed to confirm what advocates of the feminine mystique had argued all along: women naturally preferred domestic labor in the home to paid work in the laboratory.

Given the prevalence of this belief, it is not surprising that women who pursued professional technoscientific work faced a variety of obstacles in both academia and industry. The GI Bill enabled returning veterans to enroll at the colleges and universities of their choice in unprecedented numbers. In doing so, they displaced female applicants—and eventually female staff and faculty members—in unprecedented numbers as well (Rossiter 27). Women were further marginalized in academia by the reinstatement of the antinepotism rules that had been lifted during wartime. For example, when the award-winning physicist Maria Goeppert Mayer sought academic employment after World War II, the University of Chicago granted her husband a tenured position in chemistry but insisted it could not offer Mayer an equivalent position. Instead, officials created the new category of “volunteer professor” for her at the university’s Institute for Nuclear Studies. Although this enabled Mayer to continue what would become her Nobel Prize–winning research, it did not provide her with a salary or any of the other formal benefits that her husband and other male colleagues enjoyed (Rose 154).

Women scientists and engineers faced even greater challenges outside academia. As one woman succinctly put it, “when I graduated, industry informed me that they were not interested in hiring a woman engineer” (qtd. in Mack 156). Of course, women could secure industrial employment if they were willing to take on low-paying, low-prestige jobs as librarians, editors, and research assistants where they provided “the largely invisible and highly feminized infrastructure”

1. For further discussion of changing ideas about women’s work during and immediately after World War II, see the opening chapters of Kathleen Broome Williams’s Improbable Warriors: Women Scientists and the U.S. Navy in World War II and Margaret Rossiter’s Women Scientists in America Before Affirmative Action, 1940–1972, as well as the concluding chapters of Jenny Wosk’s Women and the Machine: Representations from the Spinning Wheel to the Electronic Age.
that supported the work of their more highly paid male colleagues (Rossiter 29). In this respect, women were considered valuable members of the postwar scientific community. However, the labor for which they were most prized was that which most closely resembled women’s traditional work in the home.

Even women in customarily feminine scientific professions lost authority to their male counterparts after World War II. For example, as home economics expanded to include new theories of childcare management, the women who created this field at the turn of the century—including Lillian Gilbreth, whose work inspired the Hollywood films *Cheaper by the Dozen* and *Belles on Their Toes*—found themselves eclipsed in the public eye by male experts such as Dr. Benjamin Spock. Moreover, male university administrators often cited the fact that “old” women such as Gilbreth still dominated home economics as clear evidence that such disciplines were outdated. As these women reached retirement age, administrators “seized upon the opportunity to reshape this formerly female bastion into the somewhat more gender neutral subjects of ‘nutritional sciences,’ ‘human development,’ or ‘human ecology,’” replacing female deans and faculty with men who received higher salaries, better laboratories, and greater publishing opportunities (Rossiter 184). Similar transformations occurred across the country at the hundreds of teachers’ colleges, junior colleges, and women’s colleges that had previously trained and hired significant numbers of female scientists and technicians. As a result, masculinization became the preeminent sign of modernization for many institutions.

For the most part, postwar Americans seem to have accepted the marginalization of women’s technoscientific labor as a necessary and natural phenomenon. Cultural historian Jenny Wosk notes that even before World War II ended, employers made clear to women that while it was their patriotic duty to take on men’s work during times of national emergency, “they were expected to return to their domestic duties as housewives and mothers after the war” (198). As the war drew to a close, glossy magazines such as *Life* and *The Saturday Evening Post* replaced pictures of women at work with new images of them comfortably ensconced in high-tech homes where they enjoyed “the same kind of efficiency . . . as they have found in the factory or business office” (qtd. in Wosk 227). These images did not challenge women’s technoscientific skills. Rather, they suggested that truly patriotic women would apply those skills wherever they were most needed to preserve the American way of life—and of course, with the advent of the cold war, it seemed that these skills were most desper-
ately needed in the home to prevent the encroachment of communism onto American soil.  

The feminine mystique further reinforced the notion that women were naturally more suited to work in the home than in the laboratory. Most Americans conceded that “old maids” had to work to support themselves, but married women who continued their professional careers into the cold war were criticized for failing to follow their biological drives—and do their duty for America—by bearing children. Public opprobrium was heaped even more thoroughly on women who tried to have both family and career since, as Rossiter puts it, “every reader of Dr. Benjamin Spock knew that a normal child needed the full-time attention of his (or in later editions, her) loving mother” (41). And so the rhetoric of domestic patriotism blended effortlessly with that of the feminine mystique, reinforcing what so many Americans already thought they knew: women might have either family and career, but to sacrifice the former for the latter was unpatriotic and to combine the two was profoundly unnatural.

Scientist mothers were singled out as particularly dangerous to both science and society. Writing for a 1948 issue of *Hygeia* (a popular health magazine featured prominently in many pediatricians’ offices), California housewife and educator Olive Lewis insisted that scientist mothers threatened America in two interrelated ways. As professional women who left their homes for extended periods each day, such women were by definition negligent wives and mothers. And as wives and mothers who were (Lewis assumed) preoccupied by the domestic problems that their absence from home caused, such women were bound to be bad scientists as well, unable to “do much good work of their own and even often upset[ting] other scientists’ experiments” (Rossiter 41). Even as textbook authors continued to celebrate early-twentieth-century scientist mothers such as Marie and Irene Curie, mid-century Americans seemed all too willing to believe that such women were exceptions to the general rule.

Widespread assumptions about the feminine mystique and women’s natural affinity for domestic labor were reflected in the new secondary school curricula devised by proponents of “life adjustment.

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2. For further discussion of mid-century homemakers and cold war domestic patriotism, see Elaine Tyler May’s *Homeward Bound: American Families in the Cold War Era*. For further discussion concerning science-fictional representations of (and challenges to) domestic patriotism, see chapters 2 and 3 of this book.

education.” Kim Tolley explains that teachers and administrators who favored this mode of education were determined to “make schooling more practical and useful” for students by creating courses that would “socialize individuals for their future careers as homemakers, workers, or citizens” (199–200). Accordingly, girls—who presumably would grow up to be homemakers or workers in traditionally feminine fields such as nursing or elementary education—were directed toward basic biology and home economics classes but away from specialized college preparatory courses in chemistry and physics. Textbook authors reinforced this gender stereotyping by juxtaposing images of famous scientific men with those of anonymous homemakers, nurses, and medical technicians and presenting students with photo montages in which “boys built models of machines and made a collection of minerals, whereas the girls raised house plants and applied first aid” (200). Thus, girls were guided toward domestic rather than professional careers before they were even in a position to make a choice—mistaken or not—between the two.

Despite these obstacles, postwar women pursued technoscientific degrees and careers in record numbers. Rossiter notes that the number of women working in scientific and technological fields nearly doubled after the war, and even the most conservative of “available statistics are sufficient to show that there were tens of thousands of women scientists in the United States in the 1950s and 1960s” (96). Women even made gains in the hypermasculine field of engineering, as previously all-male schools like Clemson University and the Georgia Institute of Technology opened their doors to women. The number of women enrolled in undergraduate engineering programs nearly tripled between 1951 and 1957 (rising from 561 to 1,661), while the number of women who received their engineering degrees quadrupled (rising from 37 in 1952–53 to 145 in 1959–60) (Rossiter 55). If these numbers failed to register with the American public, it was no doubt because postwar men engaged in technoscientific endeavors in record numbers as well, causing the overall percentage of female scientists and engineers to remain statistically low.

Scientific women also employed a variety of strategies to ensure their professional success. Many strove to minimize the fact of their gender because they were acutely conscious of their status as lone women in hypermasculine workplaces. As one engineering graph-

4. For further discussion concerning the professionalization and masculinization of engineering at the turn of the century, see Ruth Oldenziel’s Making Technology Masculine: Men, Women, and Machines, 1880–1945.
ics designer from this period remembers, although she was often propositioned at work, "I just ignored it... [Perhaps if women] had been more aware of each other—networked—advances in combating sexual harassment could have occurred sooner" (qtd. in Mack 158–59). Women who were aware of one another did just that, banding together in independent societies to make themselves visible as professional women with specific goals. For example, when Beatrice Hicks founded the Society for Women Engineers (SWE) in 1950, fewer than sixty other women joined her for the first meeting (Kaledin 204). But by 1958, the SWE had over 500 members and had established regular meetings and awards (Mack 156). Much like the professional organizations that feminists created in the first part of the twentieth century, these postwar societies were dedicated to highlighting the accomplishments of women already involved in the technoscientific professions while actively recruiting a new generation to join them.

Still other scientific women sidestepped the twin problems of isolation and discrimination by pursuing types of work that were less attractive to men. Feminist historian Eugenia Kaledin notes that women regularly excelled in "new fields where tradition had not yet solidified," including crystallography, solar energy research, and computer engineering (203–4). Women were also welcome in federal government agencies that dealt with traditionally feminine issues including home economics, women’s labor, and public and child health as well as nonprofit organizations of all types (many of which they created themselves). These agencies and organizations were “frequently characterized by short promotional ladders, flexible work styles, and admittedly low (and in some cases non-existent) salaries.” Nonetheless, they “provided titles and positions, allowed women to accept grants and hire others, and sometimes lived on beyond” the women who worked in them, providing such women with a certain degree of long-term institutional recognition (Rossiter 235).

A few women scientists even rose to national prominence during the cold war. In doing so, they complicated the myth of the feminine mystique. Both of the women who won Nobel Prizes in this period—Gerty Cori, who shared the prize in biochemistry with her husband in 1947, and Maria Goeppert Mayer, who won the prize in physics in 1963—were depicted in the press as good scientists and good mothers.

5. Kohlstedt rightly points out that women scientists sometimes found themselves at distinct disadvantages in even the most open of new fields, as when Rosalind Franklin’s DNA photographs were surreptitiously previewed by James Watson and Frances Crick, who then used Franklin’s imagery to complete their own work on the double helix.
Indeed, newspaper and magazine editors often seemed to emphasize these scientists' gender over their professional accomplishments, as in the *San Diego Evening Tribune* headline about Mayer that read “S.D. Mother Wins Nobel Physics Prize” (Rossiter 330). Although such representations might seem belittling to contemporary readers, in the context of their times they might have provided powerful antidotes to antifeminists' claims that women could not successfully combine their personal and professional lives.⁶

Two of the most popular postwar women scientists even made family and familial metaphors central to their professional work. As a firm believer in the equality of sexes and races, anthropologist Margaret Mead used both her own and other anthropologists' work on human adaptability in other cultures to support equal opportunity legislation in America. Meanwhile, oceanographer Rachel Carson encouraged Americans to rethink their relation to a rapidly vanishing nature in bestselling books such as *The Sea Around Us* (1951) and *Silent Spring* (1962). Significantly enough, both women presented themselves as successfully blending their professional and personal lives. Kaledin explains that as the working mother of one child, “Mead herself seemed to thrive on the kind of adaptation she believed essential to ensure women's contribution to the melting-pot ideal” (205). Meanwhile, Carson regularly cited her own mother as inspiration for her professional work while encouraging her readers to imagine themselves as a family united by their evolutionary debt to “mother sea” and “mother earth” (Kaledin 206). Rather than allowing their domestic commitments to undermine their scientific work, Mead and Carson demonstrated that women could enjoy rich personal lives while advancing the state of human knowledge.⁷

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6. For further discussion concerning the ambivalent representation of women scientists in particular and women professionals in general at this time, see Marcel C. Lafollette's "Eyes on the Stars: Images of Women Scientists in Popular Magazines" and Joanne Meyerowitz's "Beyond the Feminine Mystique: A Reassessment of Postwar Mass Culture, 1946–1958." Lafollette argues that mass media representations of scientist mothers played into the feminine mystique because they created false expectations that only a few rare superwomen could manage work and family with any semblance of success. By way of contrast, Meyerowitz argues that such representations alleviated postwar anxieties about working women precisely because they proved that women could pursue professional careers and retain their femininity. Although such representations certainly preserved cold war gender ideals, they challenged the popular belief that women must choose between work and family, and that they would naturally choose the latter over the former.

7. Kaledin notes that when Carson first published her critique of the pesticide and herbicide industries in *Silent Spring*, her detractors immediately invoked the feminine mystique to dismiss her as a hysterical old maid (206). Significantly, these accusations
But perhaps the most significant event that provided new opportunities for women in science and technology was the advent of the Space Race. From the very start of the cold war, a few scientific institutions and government agencies warned that the United States would eventually find itself at a grave disadvantage if it failed to follow the Soviet Union’s lead in training men and women alike for technoscientific careers. As early as 1951 *The Bulletin of Atomic Scientists* and *Newsweek* magazine both proposed that America could avoid future technical manpower shortages by drawing on “scientific womanpower.” *Bulletin* editor Eugene Rabinowitch even argued that the federal government should create new fellowships for women interested in studying science and engineering (Rossiter 52). The 1957 National Manpower Council report *Womanpower* made similar claims, arguing that since the number of working women continued to rise despite back-to-the-home movements, schools should provide women with better academic counseling and flexible study programs while industry should consider part-time work and daycare programs (Rossiter 59).

The surprise launch of the Soviet satellite *Sputnik* in October 1957—months in advance of its American counterpart—seemed to confirm the need for American scientific womanpower. It also provided the occasion for the most extensive legislation directed at women in science to date: the 1958 National Defense Education Act (NDEA). Asserting that “the Nation requires the fullest development of the mental resources and technical skills of its young men and women,” the NDEA provided fellowships for all students who showed promise in mathematics, science, foreign languages, and other defense-related areas of research (qtd. in Rossiter 63). Although the NDEA was not designed to counteract gender discrimination in either academia or industry, this turned out to be one of its long-term effects. Between 1963 and 1973 (when the act was dismantled), American women accounted for 22.54 percent of all NDEA scholarship holders (Rossiter 76). As women flooded the nation’s top university programs, they became increasingly less willing to accept the economic and sexual discrimination that their foremothers had experienced. Inspired by the revitalized feminist movement on the 1960s, many female NDEA recipients went on to become scientific innovators and reformers.\(^8\)

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\(^8\) For further discussion concerning the relations of the NDEA to second-wave feminism and disciplinary reform in the sciences and engineering, see Kohlstedt’s...
Chapter Four

Changing attitudes toward women in science were perhaps most evident in the creation of NASA's Women in Space Early (WISE) program. Shortly after the Sputnik launch, hydrogen bomb inventor Edward Teller testified to Congress that America should try to regain the lead in the Space Race by sending astronauts into space as soon as possible—and that those astronauts should be women because “they weigh less and have more sense” (qtd. in Kevles 7). By 1959 scientific teams from the United States, Canada, and Great Britain had all run tests showing that women functioned better than men in cramped spaces and endured loneliness better for longer periods of time—two criteria that were thought to be central to the well-being of humans in space. Little wonder that NASA began contracting civilian scientists to run similar tests for them while journalists and laypeople alike began wondering, “Why not a woman?”

Unfortunately, the WISE program only lasted a few brief years. Initially NASA officials allowed Dr. Randolph Lovelace (who oversaw performance tests for the male Mercury 7 astronauts) to administer WISE from his private clinic in New Mexico. Inspired by his work with female aviators during World War II, Lovelace invited award-winning civilian test pilot Jerrie Cobb and twelve other similarly qualified women to New Mexico for the battery of exams that would enable them to participate in WISE. When the Russians again scooped their American counterparts in April 1960 by making Yuri Gagarin the first man in space, however, NASA officially ended WISE and redoubled its efforts to get the Mercury 7 men into space as soon as possible. At this point, Cobb herself took over, renaming her colleagues the Fellow Lady Astronaut Trainees (FLATs) and attempting to enlist everyone from rocket scientist Werner von Braun to Vice President Lyndon Johnson in her cause. Although Cobb’s efforts earned her an appointment as special consultant to NASA and even got the FLATs a hearing in the 1962 Special Subcommittee on the Selection of Astronauts, the government refused to resume training women for space at that time, citing everything from the need for further testing to the feminine mystique itself as grounds for its decision (Kevles 16).

9. The phrase “Why not a woman?” is from Kathleen Downe’s 1955 article for Authentic Science Fiction Monthly, which I discuss in the following section of this chapter.

10. Kevles succinctly relates the history of WISE and the FLATs as a prelude to the larger story of women in space in the twentieth century. For another excellent history in this vein, see Pamela Frei’s Space for Women: A History of Women with the Right Stuff. For studies that focus exclusively on the history of WISE and the FLATs, see especially...
Although Lovelace and Cobb never got the FLATs into space, they provided a generation of Americans with powerful new images of women’s work in a high-tech world. In February 1960 *Look* magazine ran a cover article on Betty Skelton, a three-time national aerobatic champion who trained with NASA’s male astronauts (Nolen 92). Six months later, *Life* magazine published an equally extensive article on Cobb (Freni 53). Not surprisingly, these first female astronauts were always carefully photographed in accordance with postwar standards of feminine beauty. But otherwise they were depicted much like their male counterparts, spinning in centrifuges, floating in buoyancy tanks, and proudly looking off into the distant horizon as they climbed into their jets. Suddenly, it seemed the future was wide open and that women might someday be at home everywhere from the laundry room to the launch pad.

*Why Not a Woman? Engendering Authority in Women’s Science Fiction Magazine Science Writing*

Women involved with the postwar SF community certainly thought this was the case, and a number of them demonstrated their own technoscientific authority in the science columns they wrote for prominent SF magazines. As such, these authors can be seen as participating in a centuries-old tradition of Anglophone women’s science popularization. Science historians Barbara T. Gates and Ann B. Shteir explain that this tradition began with the Enlightenment, when women first participated in the scientific community as audience members. With the publication of Eliza Haywood’s *The Female Spectator* in 1744, women began to write about science for one another. As the century progressed and femininity was defined increasingly in terms of maternal and familial labor, women writers “crossed the threshold into direct expositions of science by writing introductory books for children and parents” (7). By the end of the nineteenth century, children regularly received natural history education at school rather than in the home. Accordingly, women science writers—who were “more well-informed, original and creative popularizers” than ever—started to write for adults (16). In doing so, they began to rival male scientists for audiences.

Martha Ackmann’s *The Mercury 13: The Untold Story of Thirteen American Women and the Dream of Space Flight* and Stephanie Nolen’s *Promised the Moon: The Untold Story of the First Women in the Space Race*. 
Chapter Four

Over the course of this period, women created distinctly feminine modes of scientific authority. Eighteenth- and nineteenth-century thinkers generally assumed that although women were not intellectually equipped to grapple with the mysteries of the physical sciences, they were both better observers of nature and more inherently moral than their male counterparts. Accordingly, women had a specific place in the scientific community: they were ideally suited to study natural history and explain its relation to natural theology to children and other women in the home. Eighteenth-century women capitalized on this belief by writing science books that revolved around the figure of “the Scientific Mother” who explores the grounds outside her home with her children so they may better understand the wonders of nature and the wonders of God. Thus, the Scientific Mother (and the author herself) became “an exemplar of female knowledge and intellectual authority” for children and adults alike (Gates and Shteir 9).

As science professionalized in the nineteenth century, women writers exchanged the persona of the Scientific Mother for that of “the trained educator.” As someone with either a formal science education of her own or an informal one derived from domestic life with a male scientist, the educator was uniquely qualified to “carefully explain new views of the physical and natural world to women, children, and the working classes” (Gates and Shteir 10). Much like the Scientific Mother, the trained educator provided readers with both scientific and moral lessons drawn from daily activities in the home. However, this latter figure derived authority not just from her role as a clear-sighted, morally pure mother but also from her personal and professional connections to the greater scientific community.11

In the late nineteenth and early twentieth centuries women writ-

11. As women developed more sophisticated writing personas, they also expanded the repertoire of narrative strategies by which they conveyed their authority. Authors who used the figure of the Scientific Mother to teach science generally employed the familiar format of letters and conversations to create “a pedagogy of interpersonal connection [and] a teaching climate that modeled a new style of family practice” (Gates and Shteir 9). Meanwhile, those who wrote from the position of the trained educator gravitated toward the more formal narrative form of the scientific dialogue, which established women as scientific authorities who translated professional jargon into the vernacular. Eventually women writers replaced the scientific conservation with the journey narrative, in which the educator and her young companion exchanged the comforts of home for the intellectual stimulation of travel. Gates and Shteir suggest that the journey was a particularly compelling narrative form because it preserved the spirit of cooperative learning that characterized earlier kinds of women’s science writing while demonstrating that women—like men—could garner scientific authority by “becoming pioneers and going beyond British borders” to present readers with “new vantage points” on science and society alike (13).
Scientists developed distinctly feminist modes of scientific authority. At the turn of the century American suffragette Eliza Burt Gamble and her British counterpart, Arabella Buckley, both wrote evolutionary narratives that challenged Darwin by emphasizing the traditionally feminine qualities of cooperation and altruism over the traditionally masculine qualities of competition and control. Furthermore, as Susan Merrill Squier demonstrates in her work on modernist women’s science writing, the varieties of feminist science writing that flourished in this period reflected the range of feminist viewpoints themselves. For example, Charlotte Haldane and Naomi Mitchison—women who were related to one another by marriage and further connected by a mutual interest in improving women’s lives—had wildly divergent views on gender and science. Haldane espoused an essentialist feminism that valorized women’s roles as mothers and affirmed the workings of normal science. In contrast, Mitchison advocated a “proto-postmodern” feminism that celebrated “the multiplicity of women’s biological and social possibilities” while challenging readers to “expand [their] notions of both scientific practice and scientists” (“Conflicting Scientific Feminisms” 181). Much like their predecessors, these feminist authors assumed that women were uniquely qualified to translate science to laypeople. However, they did so by connecting science to political rather than moral insight.

Women were also instrumental in the development of what would become the twentieth century’s premier mode of science writing: science journalism. Media historian James C. Foust explains that when E. W. Scripps established the first professional science news service in 1921, he did so with the intent of giving scientists “an interpreter who can translate their language into plain United States that the people can understand” (qtd. in Foust 59). Accordingly, he encouraged his Science Service writers to strike a balance between “romance and scientific fact” by beginning with sensational headlines and then following through with clear explanations of scientific theories and developments that readers could connect to their daily lives (61). Given the similarities between Scripps’s goals for science journalism and the methods employed by popular women science writers, it is no surprise that from the outset Science Service employed a number

12. Some early feminist science writers directly challenged scientific authorities in their writing. For further discussion, see especially Rosemary Jann’s “Revising the Descent of Woman: Eliza Burt Gamble” and Barbara Gates’s “Revisioning Darwin with Sympathy: Arabella Buckley,” both available in Barbara Gates and Ann Shteir’s edited anthology, Natural Eloquence: Women Reinscribe Nature.
of women who would go on to become prominent science journalists. These journalists included medical writer Jane Stafford, who founded the National Association of Science Writers in 1945 and served as president of the Women's National Press Club from 1949 to 1950, and psychology writer Marjorie Van de Water, whose groundbreaking work on the psychology of war appeared in science journals, in mainstream newspapers, and on the popular radio program "Adventures in Science" throughout the 1940s and 1950s (Tressider n.p.).

After World War II, women science writers updated the literary conventions established by their predecessors to address contemporary issues. The most famous author to do so was Rachel Carson. Between 1941 and 1955 Carson published three books about the sea that are, as Rebecca Raglon notes, classic examples of nature writing in which Carson joyfully demonstrates the interconnectedness of all life to "mother sea" by "mingling . . . romantic rapture with an unmediated or scientific viewpoint" (197). Much like eighteenth- and nineteenth-century women writers, Carson established her scientific authority by deploying her naturally keen observation skills and scientific training within a quasidomestic setting (figured as the entire family of Earth). And much like late-nineteenth- and early-twentieth-century feminist authors, she used her science writing to impart secular rather than moral lessons. In particular, Carson encouraged readers to study nature so they might better appreciate the complexity of the world of which they were an intimate part.

Carson's growing concern about the destruction of nature led her to develop a new kind of science writing: what M. Jimmie Killingsworth and Jacqueline S. Palmer call "the apocalyptic nature narrative." In her international best seller *Silent Spring* (1962) Carson challenges American faith in scientific progress by synthesizing technical journal reports, anecdotal evidence, and expert correspondence to help readers understand how unregulated pesticide and herbicide use might herald the end of nature and, by extension, humanity itself. In tune with the temper of her times, Carson underscores the urgency of this situation by using "the imagery of nuclear disaster explicitly in [her] critique of the 'chemical death bombs' and 'biocides' of the

13. Other women correspondents for the Science Service included Frances Denmore, one of the first ethnologists to study American Indian music; Emma Reh, an archeological journalist who wrote extensively about Mexican history and culture; and Marjorie MacDill Breit, who wrote about "topics that ranged from zoology and entomology to toys and bottled milk" for Science Service (Tressider n.p.). For further discussion, see Mary Tressider's "Women and Science at Science Service."
industries [she] condemns” (186). But the solution she proposes is one that hearkens back to the history of women’s scientific practice, as she encourages readers to scrutinize their own backyards for signs of impending ecological disaster (Raglon 207). It is only by taking matters into their own, naturally capable hands, Carson suggests, that laypeople will be able to save themselves and create more egalitarian and ecologically sound forms of community.15

Although Carson may be the most famous postwar woman science writer, she was hardly the only one. In the decades following World War II scores of other women established their own technoscientific authority in the science pages of SF magazines.16 Indeed, two of the most prominent magazines from this period, Amazing Stories and its sister publication, Fantastic Adventures, featured regular contributions by female science writers including June Lurie, Mildred Murdoch, and Rita Glanzman.17 Meanwhile, dozens of other magazines (including both established periodicals such as Astounding Science Fiction and new ones such as Slant) regularly included science essays, editorials, and letters by women such as Bernice J. Peterson, Alma McCormick, and Kathleen Downe. While a few SF science popularizers such Lurie and Sylvia Jacobs also wrote science fiction, most devoted themselves to nonfiction prose. Much like their fiction-writing counterparts, the women who wrote science nonfiction for the mid-century SF community comprised a discrete group of authors who employed specific narrative strategies to authoritatively comment on a diverse range of scientific and social topics.18

14. For further discussion of cold war imagery in Carson’s nature writing, see Craig Waddell’s excellent anthology And No Birds Sing: Rhetorical Analyses of Rachel Carson’s Silent Spring.

15. Readers might note that Carson’s prescription for saving the earth from ecological disaster parallels those arguments employed by mid-century peace and civil rights activists as described in chapter 3 of this book.


17. Both Amazing Stories and Fantastic Adventures (which merged with Fantastic in 1954) were owned by Ziff-Davis Publishing at this time, and both were edited by Raymond A. Palmer (1939–49); Howard Browne (1950–56); Paul W. Fairman (1956–58); and Cele Goldsmith Lalli (1958–65). This may explain why these two SF magazines featured regular science columnists, many of whom wrote for both publications. For more details, see Miller and Contento’s Locus Science Fiction, Fantasy, and Weird Magazine Index (1890–2001).

18. Lafollette contends that that women science journalists, much like women scientists, were largely marginalized throughout the first half of the twentieth century. Fewer than 10 percent of all the popular science articles published between 1910 and 1955 were written by women, and those that were focused on traditionally soft or feminine
Women who wrote about science for *Amazing* and *Fantastic Adventures* generally followed the formula established by science journalists just a few decades earlier. Lurie, a prolific author who published over one hundred science articles between 1946 and 1953, was particularly skilled at this mode of writing. For example, “Icy Cold-War” (1950) reviews the difficulties that passenger ships and freighters encounter in the North Atlantic; “Artificial Universe” (1950) describes how scientists at Notre Dame have created sterile chambers to better study germs; and “Bacteria with Brains!” (1951) explains the process by which some bacteria produce sulfur. While Lurie’s headlines were often even more sensational than the titles of the SF stories they accompanied, her columns were just the opposite. Consider, for example, this description of the sterile chamber created by Notre Dame scientists: “This startling innovation in biological technique is made possible by constructing a large metal chamber sealed and gasketed thoroughly against the contamination of the outside air. It resembles in some respects one of those huge cylindrical chambers used in the decompression of deep-sea divers. Entry to it is through an airlock. Built along side it and connecting with it is a second chamber—a half sterile room that serves as a preparation tank” (“Bacteria with Brains!” n.p.). Much like her counterparts at E. W. Scripps’s Science Service, Lurie writes in “plain United States,” providing readers with a concise description of the scientific invention under consideration—the sterile chamber—and comparing it to something with which readers might have more familiarity: the deep sea decompression chamber. In this respect, Lurie’s science writing fulfills the ideals embraced by both Scripps and *Amazing* founder Hugo Gernsback: that authors who wrote about science and technology should balance romance and fact in such a way as to inspire a sense of wonder in readers.19

SF science writers also induced this sense of wonder by celebrating scientific progress and technocratic ideals. These ideals were areas of inquiry. As Lafollette puts it, “In over 3300 magazine issues published over this 45 year period, no woman, either scientist or journalist, was listed as the author of an article on mathematics, astronomy, archaeology, or paleontology, despite the fact that women were actively engaged in research in these fields. Women tended to write about research in the social or biological sciences” (264). Of course, his study only examined mainstream magazines such as *Atlantic Monthly*, *Collier’s*, and *The Saturday Evening Post*. As I demonstrate in this chapter, women accounted for a much higher percentage of science journalists featured in SF magazines, and the articles they published there explored new developments in both the hard and soft sciences.

19. For an excellent discussion of Gernsback’s ideas about instilling a sense of wonder in SF readers and the impact of those ideas on the development of SF as a literary genre, see Gary Westfahl’s *The Mechanics of Wonder: The Creation of the Idea of Science Fiction*. 
particularly central to Mildred Murdoch's science history articles, which often addressed the changing relations of mythology, superstition, and scientific explanation over time. In “Superstition of the Sea” (1947), Murdoch sympathetically notes, “it is not strange in ages past there were a great number and variety of superstitions rampant among men who roamed the seas. The wonder is that anyone would venture out of sight of land at all” (23). She then points out that “some of the superstitions engendered by the fears of long ago remain to this day [but] many of them have faded away as ignorance and surmise have given way to knowledge” (23). As evidence of this, Murdoch goes on to explain how ancient tales about fearsome beings that ruled the north derived from limited understandings of Iceland's geysers and volcanoes, while legends about sirens, mermaids, and the Flying Dutchman grew from misunderstandings of St. Elmo's fire. Although Murdoch encourages readers to celebrate those ancient sailors “who dared to venture into a realm so beset with perils and terror and uncertainty,” she also makes clear that many of these dangers have been drastically reduced—if not banished altogether—by the scientific explanations that replaced maritime superstition.

Of course, women science popularizers were not always so serious. If anything, they seem to have been acutely aware that they were writing to both instruct and entertain their audiences who were, presumably, adolescent males just beginning to take an interest in all things biological as well as mechanical. For example, in “Machines Make the Money” (1952), Rita Glanzman carefully describes how automatic machinery—including the still relatively novel computer—might eventually transform office work. Like other science writers, she explains how these new technologies have already changed daily life (by streamlining sorting processes at the U.S. Post Office) and even cites cyberneticist Norbert Weiner on the benefits of using machines to release people from “boring routine tasks” (93). In conclusion, however, Glanzman breaks with the sober format of scientific journalism to cheerfully assure readers that “there is only one exception to this general rule: the beautiful secretary can't be replaced by the machine—not because she can work as well, but because . . .” (93). As postwar science popularizers like Glanzman developed worldly authorial voices, they seemed to have evolved well past their literary predecessors.

But mid-century SF magazines also regularly featured letters and columns by women who employed the narrative strategies of earlier women science writers to establish feminine modes of scientific
authority. Such authority is implicit in the title of Bernice J. Peterson’s “What Man Can Imagine . . . [A] Cure for Infantile Paralysis?” (1946), which relates how one woman—the author’s grandmother—may have found such a cure. Peterson writes that her grandmother, a practical nurse, once observed a poor child with infantile paralysis play daily in dried manure until “in a few weeks, to my grandmother’s amazement, the girl grew stronger and stronger. Then she was walking and later running. She was completely cured and not a cripple” (152).

Like any good scientist, Peterson’s grandmother responds to this unusual event by developing a hypothesis (that sunshine triggered a restorative chemical in the dried manure), and then testing it on a paralyzed chicken and, when he contracts infantile paralysis, on her own grandson. Much to her grandmother’s satisfaction, both animal and child are restored to health—a fact that leads Peterson to “hope [and] pray . . . that medical science will just try this cure” (153). Peterson invokes the authority of the trained educator in complex ways, attributing a distinctly feminine scientific expertise to her grandmother who, in her role as a nurse, uses both close observation and scientific reason to solve the mysteries of the world around her. Meanwhile, Peterson herself takes on the literary task of the trained educator, explaining her grandmother’s discovery to readers in a clear, approachable manner while politely challenging the predominantly male medical community to account for and build upon this unique female discovery.

Other women science writers challenged masculine authority more directly. In “Hold That Helium!” (1955), Sylvia Jacobs rebukes rocket scientist and SF author Willy Ley for using outdated diving analogies in his depictions of space exploration and synthetic atmospheres: “In all due humility, I must first explain that I do not by any means profess to be an authority on space problems in general. . . . But when these specialists draw analogies from diving theory to practice, when, for instance, they compare the orientation and propulsion methods of a weightless spaceman with those of a diver at near-neutral buoyancy, they get beyond their depth. In fact, they come way, way down to my level! . . . [The problem is that] science-fictioneers are living back in 1921, with a preconceived and since thoroughly disproved theory” (135). After explaining how the oxygen-helium environments usually depicted in SF would actually kill space explorers, Jacobs cites a number of Navy and civilian diving manuals and draws examples from her own experience as a diver to illustrate how SF authors might extrapolate from the current state of diving knowledge to depict space
exploration more accurately.

Much like Peterson, Jacobs takes on the persona of the trained educator to establish herself as part of the scientific community. By citing a range of scientific authorities in combination with descriptions of her own diving experience, Jacobs positions herself as a force to be reckoned with, one who, much like her nineteenth-century predecessors, impresses readers with “self as well as science” (Gates and Shteir 12). At the same time, she is careful not to disrupt traditional gender roles too greatly, balancing her more aggressive pronouncements about male authors and scientists with deprecating asides in which she describes herself as “a very un-athletic and fortyish female” and an author whose “name carries no weight at all” (143, 146). Finally, Jacobs concludes that authors such as Ley should be forgiven for their fictional errors because “not many writers of science fiction are the wives of divers” (149). Thus, Jacobs minimizes the extent of her own diving experience and completely erases the fact that, as a published SF author in her own right, her name might well carry weight for *Astounding* readers. 20 Instead, she opts for the more traditional persona of the scientist's wife. While this narrative choice might seem to undercut Jacobs's authority in a male-dominated community, it preserves another central tenet of SF: that anyone with reasonable intelligence and experience can participate in scientific dialogue—even a housewife.

Still other women writers used their authority as educators to chastise male authors for failures of social extrapolation. In “A Chat with the Editor” (1954), Alma McCormick takes Philip K. Dick to task for writing stories that assume humans and mutants would naturally attempt to eliminate one another to ensure the survival of their own species. “Now really!” an indignant McCormick writes, “I'm a teacher . . . of exceptional children. This semester they are mentally retarded children, as far below the abilities of normal children as *homo sapiens* would be to *homo superior*. They cannot and never will be able to take care of themselves, but we carefully teach them all they can learn. . . . We don't, and never expect the rest of the world to, compete with them. They're certainly not being ‘cold-decked' from the start” (2). The problem for McCormick is clear. While Dick extrapolates from scientific theories about evolutionary biology to create dramatic stories, he fails to account for social reality—in this case,

20. Prior to the publication of “Hold That Helium!” in 1955, Sylvia Jacobs had published one novella, two novelettes, and two short stories in SF magazines including *Astounding, Galaxy, Universe,* and *Vortex Science Fiction.*
the way that humans have already transcended biology by creating institutional support systems for people with different intellectual abilities. As such, Dick creates xenophobic fantasies that fail to fulfill one of the primary dictates of postwar SF: that authors should put a truly human face on science and technology.

McCormick also draws upon her experience as an educator to challenge scientific theory itself. Although she clearly enjoys all aspects of her work, McCormick reserves her most glowing praise for intellectually gifted children who can be "a bit difficult to handle" but who are "a joy to teach" because they learn quickly and inspire "merely average children . . . to catch fire from them and do better work on their own" (3). This leads McCormack to conclude that “[f]rom my experience with the superior child, and from the kudos our world hands such men as Einstein, Oppenheimer, etc., I think we would merely be more impressed and even happier with a truly new race, a truly superior race. Rather than Cro Magnon killing off all the Neanderthal, isn't it possible that their taking over was a matter of natural selection plus absorption? If mutants arrived, it seems more likely to me that homo sapiens would be absorbed gradually. . . . And those of us who lived a full lifetime (as perhaps the Neanderthal did) would live it admiring and accepting the leadership of the superior race" (3). Thus, McCormick does more than simply invoke the harmonious mixed-intelligence classroom to contest science-fictional notions of human-mutant intolerance. Additionally—and perhaps more surprisingly—she uses it to rethink the entire concept of interspecies competition and human evolution. In this respect, she echoes early feminist science writers Arabella Buckley and Eliza Burt Gamble.

Postwar SF science columnists updated the work of their predecessors by replacing religious sentiment with social and political didacticism. In fact, regular contributors such as Lurie and Glanzman rarely missed an opportunity to do so. Lurie's staunch patriotism is particularly apparent in “Red Atoms” (1950): “The international aspects of science are beautifully—if unfortunately—shown by the recent Russian development of the atomic bomb. . . . It will probably be a long time before we know the details of the Russian undertaking, perhaps never, and it will be fascinating to see how they did the trick. Anyone who has read the Smythe report knows what a job it was, to build the first atomic bomb. Presumably, the Russians, with the advance knowledge, had less difficulty. Furthermore, they didn't work with the handicap of not knowing whether or not it could be done. We did” (127). Lurie's words seem carefully chosen to direct readers' attention away the ter-
rifying implications of a bilateral nuclear arms race and toward the heroic skill of the American scientists who developed nuclear weapons first. This enables her to preserve the technophilic ideals central to the SF community to which both she and her audience belong. Moreover, by shifting pronouns from “they” to “we,” Lurie invites readers to envision themselves as proud members of the American scientific community, ones who might someday (if they are young readers) grow up to become democratic cold warriors themselves.

In a very different vein, Glanzman’s science writing shows how some scientific discoveries might lead to more enlightened social relations. More than just startling scientific fact, Glanzman’s “The Bantus with the Brains” (1951) is a surprisingly sophisticated and slyly humorous plea for racial tolerance. Citing a series of anthropological studies on indigenous Australian and African people, Glanzman admonishes readers not to assume that “so-called ‘primitive’ peoples” are unintelligent simply because they do not have the same formal education or cultural experiences as Americans and Europeans. Quite the contrary, she insists, “intelligence is a common denominator among all human beings, be they Hottentots or Eskimos—or the product of our finest universities” (55). Glanzman then notes that some indigenous peoples seem to be even smarter than their Western counterparts: “It has been reported that the [Bantus of South Africa], for example, will demonstrate the utmost impatience with the white man’s conversation because it is so slow! Very often, before the speech is completed, the Bushman will already have grasped the intent of the speaker” (55).

Glanzman’s call for better intercultural understanding on the part of Americans was particularly timely as it coincided with the U.S. ascendancy to a position of world leadership. It was also timely in another, more immediate way. The 1950s marked the beginning of a new era for American civil rights activists, as legal decisions such as Brown v. Board of Education paved the way for increased racial integration. And so Glanzman’s essay anticipates the pleas for better interracial understanding that would become central to political activists on the domestic front as well.

Glanzman’s writing often reflected her fine sense of audience, and “Bantus with the Brains” is no exception. After demonstrating the unscientific nature of racism, she concludes in a manner that is guar-

21. As I discuss in chapter 3 of this book, pleas for better interracial and intercultural understanding were central to many of the encounter with the alien other stories that postwar women SF authors published at this time.
anteed to capture the attention of even the most politically apathetic reader: “The point of the whole matter is, of course, that some day men may come into contact with a far stranger species whose minds may operate on levels far beyond our own. Most scientists and writers on interplanetary travel assume an anthropocentric view of things, suggesting that the existence of intelligent life elsewhere—whatever the form—is hardly to be expected. This is surely not a sound supposition. The outward manifestations of their culture do not necessarily reflect the intelligence or military potential of an alien race” (55). Like the women science popularizers who came before her, Glanzman makes new scientific findings relevant to her audience by connecting them to readers' daily lives—or in this case, readers' everyday interest in SF. In doing so, she playfully echoes and updates the moralizing that marked earlier modes of women's science writing. Rather than leading readers to better understand the wonders of nature so they will better understand the wonders of God, Glanzman encourages readers to better understand the wonders of humanity so they may be better prepared to someday deal with the wonders of the larger universe.

And finally, a few women even used SF magazines as forums in which to revise common-sense assumptions about science, technology, and gender. Perhaps the most powerful example of this is Kathleen's Downe's “Why Not a Woman?” (1955). (See figure 6.) Downe begins her essay with the declaration: “there is no reason why a woman should not be the first person to pilot a space ship,” because the history of emancipation shows “it doesn’t matter two hoots whether the brain has a male or female body” (101). However, she continues, bodies do matter when it comes to space exploration—and this is precisely why women should be the first space pilots: their light bodies would need fewer resources and their quick reaction times (which, she notes, are often mistakenly dismissed as mere “intuition”) would enable them to manipulate ship instruments more easily than men. Moreover, women possess a physical toughness that would be a real asset in the event of space emergency because “it is a well known fact that women can stand far more severe pain for longer periods of time than men. . . . Their fortitude is perhaps more striking since it is generally not, as is often the case with men, occasioned by discipline and military training” (102). Thus, Downe anticipates the arguments put forward by Richard Lovelace and other sympathetic NASA officials by nearly half a decade concerning the scientific and cultural reasons why women should lead humanity into space.
Scientists

173

Much like Lurie and Glanzman, Downe seems well aware of her audience and its needs. Accordingly, she shifts to a much lighter tone in the final paragraphs of her article, suggesting that when men claim space is too dangerous for women, they do so because “they desire to win all the glory” for themselves (102). But of course this will never happen because “[w]omen, being the perverse creatures they are, will twist their menfolk round their little fingers so that when the time comes for the first piloted ship to blast off, if the person with the right brain and the right weight, possessing all the other necessary qualities, happens to be a woman, then a woman will be the first ‘man on the moon!’” (102). Although this last-minute retreat to gender stereotyping might be unsettling to contemporary readers, in the context of Downe’s historical moment it may well have been a strategic move that enabled her to convey her argument in a manner that would be familiar to SF readers. As Justine Larbalestier explains in *The Battle of the Sexes in Science Fiction*, male and female fans alike have always used SF magazine letters, pages, and open forums to engage in heated...
debates over the necessary relations of gender, science, and SF (104). By invoking the battle of the sexes in her own article, Downe demonstrates her familiarity with this discourse community as well as her authority to speak to it. And she may have even convinced a few readers that women’s participation in space exploration was desirable as well.

**Daughters of Earth: Imagining Scientific Utopia in Postwar Women’s Science Fiction**

While postwar women science popularizers updated the narrative strategies of their literary predecessors to claim a traditional kind of feminine scientific authority within the SF community, SF authors imagined that women might stake out other kinds of scientific authority for themselves on a global and sometimes even intergalactic scale. As such, the tales they wrote about fantastic women who solve medical mysteries, design space ships, and colonize strange new worlds pay tribute to women scientists of their own historical moment. Given that authors including Marion Zimmer Bradley, Judith Merril, Katherine MacLean, Doris Pitkin Buck, and Anne McCaffrey were among the first to extrapolate from postwar American scientific, social, and gendered relations, it is not surprising that their stories tend to engage the rhetoric of the feminine mystique and follow one of two broad narrative trajectories. They either warn about the disasters that will ensue if women are forced to choose between home and career, or they celebrate the magnificent discoveries that will emerge when women combine family and science as their individual natures dictate.

As such, these stories anticipate one of the central concerns of feminist SF as it took shape in the 1960s and 1970s. Robin Roberts explains:

Even through [many new scientific narratives] are narratives about women, women usually do not write these stories. Women cannot control scientific narratives because, although they are frequently its subject, they are largely excluded from the practice of science. Through feminist science fiction, however, women can write narra-

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22. For discussion of the similarities between postwar women’s science writing and science fiction, see Dianne Newell’s “Judith Merril and Rachel Carson: Reflections on Their ‘Potent Fictions’ of Science.”
tives about science. With its imaginative possibilities, science fiction provides women opportunities denied them in the real world. In their revisions of traditional myths, feminist writers can use science fiction to create the feminist fairy tales that are needed to counteract the misogynistic stories of our culture. (A New Species 6)

Although the situation described by Roberts may, thirty years after the revival of American feminism, seem more pressing than ever before, is not unique to the current moment. Many contemporary sciences and scientific narratives first emerged in the wake of World War II, and postwar women writers were quick to intervene into them. In an era when the feminine mystique was regularly invoked to justify the marginalization of women in scientific and technological professions, such interventions must have felt all the more urgent to progressive women.

Furthermore, although many postwar women authors either did not have access to or chose not to employ the language of feminism in their storytelling, they nonetheless used narrative strategies much like those of their feminist counterparts to evaluate the relations of gender and science. Jane L. Donawerth argues that feminist stories about science and technology usually imagine “women’s participation in science as subjects not objects, revised definitions and discourse of science, inclusion in science of women’s issues, treatment of science as an origin story that has been feminized, a conception of humans’ relation to nature as partnership not domination, and an ideal of science as subjective, relational holistic, and complex” (Frankenstein’s Daughters 2). Engaged as they were in what was essentially a collective project to debunk the feminine mystique, postwar women SF authors regularly employed the strategies identified by Donawerth to propose that progress could occur only when domestic relations were made central to the practice of science and technology itself.

Of course, postwar women’s SF was also very much part of its own historical moment, and women writers enacted their assessments of science, society, and gender by appropriating and revising those myths that were most important to the mid-century SF community. Like other Americans, members of this community were often profoundly ambivalent about cold war sciences and technologies. However, as Brian Stableford notes, “genre-SF writers mostly responded to the widespread popular opinion that technology had got out of hand by putting the blame on machine-users rather than machine-makers, claiming that it was not mad scientists but mad generals and
mad politicians who were the problem . . . scientists were often represented as isolated paragons of sanity locked into a political and military matrix that threatened the destruction of the world” (“Scientists” 1077). Prominent authors including C. M. Kornbluth, Algis Budrys, and Kurt Vonnegut all produced stories that explored what seemed to be the inevitable conflict between scientific interest, military security, and social need, focusing particularly on “the difficulty of making scientific discoveries in such circumstances” (“Scientists” 1077). For these authors, the real problem was not the unilateral impact of dangerous new scientific developments on society but the emergence of a deadly new social matrix that perverted even the most benevolent scientific and technological research.

Postwar women writers refashioned this SF myth to explore the perils faced by women scientists trapped in a distinctly patriarchal social matrix that threatens to thwart their research and destroy their worlds.23 This is particularly apparent in Marion Zimmer Bradley’s “The Wind People” (1959), which illustrates how rigid investment in the feminine mystique combined with an equally rigid adherence to normal science might literally drive the woman scientist mad. “The Wind People” revolves around Dr. Helen Murray, a space officer who becomes pregnant four years into her ship’s ten-year cruise. Convinced that a baby cannot survive hyperdrive, Helen’s captain gives her a choice. She can either do her duty as an officer by euthanizing her son and resuming her place on the ship, or she can follow her instincts as a mother, desert her ship, and raise her child on the uninhabited alien planet that the crew has been mining for nearly a year.

Faced with an extreme version of a choice that would have been familiar to female readers—the choice between work and family—Helen decides to stay on the alien planet with her son, Robin. Captain Merrihew immediately denounces Helen’s choice as “insane,” to which the doctor soberly replies, “even if I’m sane now, I wouldn’t be long if I had to abandon Robin” (16). From the very outset Bradley suggests it is not a mother’s love for her child that is insane but those

23. As I have argued elsewhere, postwar women SF authors also protested vehemently against the proliferation of nuclear weapons and the rise of the security state. However, because they were primarily interested in exploring the effects of nuclear war on laypeople and their families (rather than on scientists and scientific development), they generally used a different SF story type, the nuclear holocaust narrative, to convey their sentiments. For further discussion, see my essays “Unhappy Housewife Heroines, Galactic Suburbia, and Nuclear War: A New History of Midcentury Women’s Science Fiction” and “Stories That Only a Mother Could Write: Midcentury Peace Activism, Maternalist Politics, and Judith Merril’s Early Fiction” as well as chapter 3 of this book.
Scientists

patriarchal social and military orders that tell women they must (in this case literally) sacrifice their children if they wish to retain their status as professional scientists.

Bradley underscores the madness of this situation by demonstrating how the mistaken choice between work and family destroys the family itself. When the ship takes off without Helen and her child, technician Colin Reynolds—Helen’s occasional lover and Robin’s presumed father—commits a spectacularly messy suicide by slitting his throat in freefall, leaving behind no explanation other than “an incoherent note” that Merrihew quickly throws away. Meanwhile, although Helen and Robin physically thrive in the benign atmosphere of their Edenic new world, they, too, encounter tragedy when Robin turns sixteen and tries to initiate sex with Helen. Convinced that “this world has driven us both insane,” Helen fights off her son and rushes out of their cabin to determine how she might resolve this situation.

Figure 7. Original illustration for Marion Zimmer Bradley’s “The Wind People” (1959). The tagline previews the most sensational aspect of this tale: the possibility of incest between mother and son. It also hints at the protagonist’s struggle to rewrite patriarchal origin myths to encompass feminist futures.
Thus Bradley suggests that the mistaken choice between work and family is no choice at all, and that by forcing Helen to leave his ship Merrihew has unwittingly triggered a chain of events destined to end in incest and death (see figure 7).

Toward the end of her story Bradley suggests there might be one way for Helen to escape this madness: since the cultural taboos of Earth have no real bearing on her current situation, she can choose to simply abandon them: “But what now? Robin was sixteen; she was not yet forty. Helen caught at the vanishing memories of society; taboos so deeply rooted that for Helen they were instinctual and impregnable. Yet for Robin nothing existed except this little patch of forest and Helen herself—the only person in his world, more specifically at the moment the only woman in his world. So much, she thought bitterly, for instinct. But have I the right to begin this all over again? Worse; have I the right to deny its existence and when I die, leave Robin alone?”

While Helen is hardly the empowered utopian scientist that Donawerth associates with feminist SF, she does experience a literal and psychological distancing from Earth that prompts her to think about Robin and the world around her in newly “subjective, relational, holistic, and complex” ways. For a brief moment, it seems she might avoid the tragic consequences of the choice between work and family forced on her a decade and a half earlier.

But ultimately, Helen cannot escape the scientific paradigms that have organized her adult life. Although “Merrihew’s men had pronounced the world uninhabited,” readers eventually learn that Helen and Robin actually share their planet with the wind people of the story’s title, an elusive group of beings who are nearly invisible to the human eye (21). Bradley also leads her readers to suspect that Robin’s biological father is a wind person, since the boy sometimes sees and hears the wind people and Helen vaguely remembers making love with a wind man. However, she tries desperately to repress this memory because “Helen thought of herself as a scientist, without room for fantasies, and that was why she called [her encounter with the wind man], fiercely, a dream: a dream born of some undiagnosed conflict within her” (20). Rather than acknowledging that there might be a very real conflict between what Merrihew’s men tell her and what she experiences, Helen clings to the last scraps of her old identity and belief systems, even at the expense of pathologizing herself.

In doing so, Bradley’s protagonist unwittingly assures the complete and utter destruction of her family. Helen lets her shipmates believe that Colin is Robin’s father because she is “too ashamed to
Scientists speak" about her fantastic encounter with the wind man (20). At the same time, she refuses to let the young technician stay planetside with her and the baby. It is precisely this unbearable contradiction, Bradley suggests, that drives Colin to suicide. This same shame also leads Helen to convince Robin that "there are no other people, just us" (22). This, in turn, drives the desperately lonely boy into Helen's arms for both maternal and sexual comfort. If Helen and Robin have been driven mad, it is not because of their world but because Helen refuses to trust her own perceptions of it.

This leads to the death of the woman scientist herself. Just as Helen begins to realize that she might salvage the situation between herself and Robin by abandoning the cultural taboos that have no bearing on their lives, she finds herself standing face to face with the wind person who is probably Robin's father. In conclusion, Bradley writes, "the horror of incest, the son the father the lover suddenly melting into one, overwhelmed [Helen's] reeling brain and she fled insanely to the brink [of the river]... She flung herself down the steep bank, to slip and hurl downward and whirl around in the raging current to spinning oblivion and death" (81). Much as Merrihew predicts at the beginning of the story, Helen finally goes insane. But she does so precisely because Merrihew has forced her to make a choice that destroys her career, undermines her ability to mother, and ultimately claims her life.

Judith Merril's "Dead Center" (1954) also revises the "sane scientist in a mad world" story to critique those patriarchal scientific and social systems that do not take into account lived experience and interpersonal relations. However, Merril goes beyond Bradley to warn that these systems might even thwart the progress engendered by protofeminist modes of scientific practice as well. "Dead Center"—which initially appeared in The Magazine of Fantasy and Science Fiction in 1954 and was the first SF story ever featured in the critically acclaimed Best American Short Stories series—tells the story of Ruth Kruger, a rocket ship engineer married to astronaut Jock Kruger. Driven by their fierce love and intense intellectual respect for one another, Ruth and Jock have (with the help of their equally brilliant design team) catapulted Earth's space program decades ahead of its original schedule.

It is precisely the Krugers' commitment to one another that enables this achievement. As Ruth notes to herself, "when a man knows his wife's faith is unshakeable, he can't help coming back" from even the most dangerous space mission (169). And of course her faith
is unshakeable because Ruth, who was a famous rocket designer long before she married Jock, works closely with her team to oversee every aspect of her ships’ design and construction. In direct contrast to post-war antifeminists such as Olive Lewis who claimed that marriage and motherhood were incompatible with good science, Merril proposes that real progress might well derive from the woman scientist’s ability to incorporate her personal passions into her professional life.

Merril also proposes that without this kind of passion there may be no progress at all. When the Rocket Corps decides to put Jock in charge of the first manned moon landing, they also decide to replace Ruth with Andy Argent, an engineer who claims atmospheric landings as his area of theoretical expertise—even though Ruth has already established her practical expertise with six other rockets. When she is reminded that Rocket Corps funding depends on public goodwill and that the public does not want to know about dissent among scientists, Ruth agrees to the substitution, despite an inner conviction that “something’s wrong” with Argent’s ship (169). Although Ruth tries to dismiss her concern as mere jealousy, she seems to have good reason for it, since Argent turns out to be an autocrat who destroys the camaraderie of the rocket design team. As the lead Rocket Corps publicist diplomatically puts it, “with somebody new—well, you know what a ruckus we had until Sue got used to Argent’s blueprints, and how Ben’s pencil notes used to drive Andy wild” (177). More than mere pettiness, Argent’s rage for order turns out to be downright perilous for everyone involved. Due to a flaw in Argent’s plans (which the demoralized rocket team fails to catch), Jock is thrown off course and forced to use all his fuel to make an emergency landing on the dark side of the moon, where it seems likely that he will die.

But this is only the first half of Merril’s story. Appalled by the prospect of bad publicity that will permanently end space exploration, Earth’s military and corporate leaders join forces to build an unmanned rescue ship, this time wisely putting Ruth in charge. But no one remembers to explain the situation to Ruth and Jock’s young son, Toby, in the whirlwind of activity that ensues. With impeccable childish logic, Toby decides that his father has abandoned him and that his mother will do the same once the new ship is completed:

She’d come back for him, he told himself. The other times, when Daddy went some place—like when they first came here to live, and Daddy went first, then Mommy, and then they came back to get him, and some other time, he didn’t remember just what—but when Daddy
went away, Mommy always went to stay with him, and then they always came to get him too.

It wasn't any different from Mommy going to be with Daddy at a party or something, instead of staying in his room to talk to him when she put him to bed. It didn't feel any worse than that, he told himself.

Only he didn't believe himself. (181–82)

Accordingly, Toby decides to stow away on the ship and confront his parents when he reaches the moon. But the child's weight is just great enough to throw off Ruth's careful calculations and, as a horrified world looks on, the rescue ship explodes while leaving Earth's atmosphere. Thus Merril suggests that a truly viable science must account for both the subjectivity of the scientist and the subjectivity of everyone to whom she is connected. If it does not, both individual lives and human progress as a whole are doomed.

And, as in Bradley's story, so is the woman scientist herself. When Ruth learns that the explosion has killed her son and her husband has died of starvation on the moon, she takes her own life in a fit of grief. The Rocket Corps publicity team manages to salvage the situation by “keeping the sleeping-pill story down to a tiny back-page notice in most of the papers” (185). Moreover, in the final lines of the story we learn that “they made an international shrine of the house, and the garden where the three graves lay. Now they are talking of making an interplanetary shrine of the lonely rocket on the wrong side of the moon” (186). Touching as this might seem, Merril leaves readers with more questions than she answers: if Earth's best rocket designer and pilot are dead—killed, albeit inadvertently, by the man who was supposed to be second best—who exactly will build that interplanetary shrine on the moon? And how will they get there anyway? “They" may talk all they want, Merril implies, but when experienced female scientists such as Ruth Kruger are asked to defer to an untried masculine authority, then the hope that humanity might someday reach the stars becomes an increasingly unlikely dream.

So what is an SF heroine to do if she wants to have both family and career? Postwar women writers offered different answers to this question, but they seem to have been in agreement on one central point: if a woman wants to practice science on her own terms, she must leave the patriarchal workplace and strike out for new territory—whether that territory is in the kitchen or outer space. They also seem to have agreed that the most effective way to tell such stories was to refashion
those cultural myths that depict science and technology as masculine activities. By redefining women’s work to include both scientific and domestic labor and putting that work at the center of their stories, such authors refuted the logic of the feminine mystique. And in imagining that women might have it all—or that they might at least pursue it all—they created some of the first versions of what Roberts describes as “the feminist fairy tales that are needed to counteract the misogynistic stories of our culture.”

For example, Katherine MacLean’s “And Be Merry . . .” (1950) rewrites the relations of science, society, and gender codified in what many scholars and fans consider to be the first SF story: Mary Shelley’s *Frankenstein*. Donawerth explains that Shelley’s text has inspired and frustrated women writers since its publication because it depicts both science and storytelling about science as masculine activities. Because women nonetheless continue to write SF—and to look for themselves in the stories they tell—they “have returned again and again to the complexities of the questions that Shelley raised: making a science that does not exclude women, creating an identity for woman as alien, and finding a voice in a male world” (*Frankenstein’s Daughters* xviii). MacLean does all this in her version of the Frankenstein myth, simply enough, by recasting Victor Frankenstein as a married professional woman.

Much like her literary predecessor, Dr. Helen Berent is a brilliant young scientist who hopes to discover the secrets of life and death, but is convinced she can only do so by rejecting scientific society and its conventions. More specifically, Helen hopes to stop the aging process by identify the endocrines responsible for cellular rejuvenation. As she explains: “That Russian scientist started me on this idea. He gave oldsters a little of their lost elasticity by injections of an antibody that attacked and dissolved some of their old connective tissue and forced a partial replacement. I just wanted to go him one better, and see if I can coax a replacement for every creaking cell in the body. [But] you can see how it would be a drastic process. . . . There is nobody I dare try it on except myself” (83). Fearing censure from her more conservative scientific peers, Helen retreats to the privacy of her home and builds herself a “laboratory kitchen,” complete with a sleeping alcove where she can eat, rest, and work all at once. From the very beginning of her story, MacLean invites comparisons between her protagonist and Shelley’s while insisting on one key difference: Helen may share Victor Frankenstein’s arrogant disregard for the rest of the scientific community, but she is sensible enough to feed and care for herself
while she works. (Victor, as readers may remember, gets so caught up in his work that he forgets to do just that and nearly dies from the resulting illness.)

Helen is also like Victor Frankenstein in that her scientific and social transgressions seem to yield monstrous results. Helen's experiments exceed beyond her wildest dreams and she gives herself the body of a healthy eighteen-year-old. In this respect she is a far cry from the misshapen creature that Victor creates. Her mind, however, is a more complex matter. After spending months uncovering the secrets of life, Helen finds that once she does so she cannot stop thinking about death. “There is something wrong,” she worries. “I have to be very critical. People are too careless. I never realized that before, but they are” (41).

Eventually Helen's obsession with the many ways that her new body might be damaged or destroyed lands her in Bellevue State Hospital. As the hospital's psychiatric resident puts it, “she's afraid all right. Even afraid of me! Says I have germs. Says I'm incompetent. It's a symptom of some other fear of course. . . . It's not rational” (42). Like Victor's creature, Helen becomes alien to her own society. Once again, however, MacLean departs from her source material. While the humans who fear and loathe Frankenstein's creature do so irrationally, MacLean suggests that Helen has every right to fear those doctors who dismiss the story of her scientific breakthrough as mere imagination and instead try to silence her with a “cure” of psychoanalysis, drugs, and shock therapy.

At this point, MacLean fully departs from the Frankenstein myth. In Shelley's novel Victor is truly alone, rejecting the company of both other scientists and his own family. In fact, Shelley suggests that her protagonist's problems ultimately stem from this lack of family. Victor has no mother to provide moral guidance, and he refuses to share his work with his fiancée, Elizabeth. Helen, however, has a domestic partner who serves as both moral compass and scientific confidante: her husband, archeologist Alec Berent. In the experimental records she leaves for her husband, Helen details the success of her experiment and concludes that

[it is hard to be practical, darling. My imagination keeps galloping off in all directions. Did you know that your hair is getting thin in back? Another two years with that crew cut and you would have begun to look like a monk.

I know, I know, you'll tell me it is not fair for you to be a juvenile
when everyone else is gray, but what is fair? To be fair at all everyone will have to have the treatment available free, for nothing. And I mean everyone. We can leave it to an economist to worry out how.

It would be good for the race I think. It may even help evolution. Regeneration would remove environmental handicaps, old scars of bad raising, and give every man a body as good as his genes. . . . And look at cultural evolution! For the first time we humans will be able to use our one talent, learning, the way it should be used, the way it was meant to be used from the very beginning. (39)

In direct contrast to Victor Frankenstein, who believes he can create “a new species that would bless me as its creator and source,” Helen dreams of transforming her entire race into gods (Shelley 49). Moreover, it is precisely her love for another person that leads her to those unorthodox practices that will best enable her to achieve this dream.

Helen further differs from Victor in that she has the admiration of at least one other scientist: her husband, Alec. “Besides being your wife,” Helen writes to Alec as a way of explaining why she decides to stay home and pursue her own research while he is away on a dig, “I am an endocrinologist, and an expert. If you can cheerfully expose me to cliffs, swamps, man-eating tigers and malarial mosquitoes, all in the name of Archeology, I have an even better right to stick hypodermics in myself in the name of Endocrinology” (32). Although Alec is never fully convinced that Helen should play with needles in such a cavalier fashion, he respects her fiercely independent mind, roundly chastising the Bellevue psychiatrist for failing to acknowledge Helen as a scientific colleague and knocking him unconscious when he continues to treat her like a madwoman. Thus, MacLean uses the trope of marriage as a microcosm through which to imagine a new kind of scientific community that respects both women’s voices and their scientific practices.

Finally, MacLean uses the love affair between the Berents to show that the practice of alternative science does not necessarily have to end in monstrosity and madness. Alec believes that Helen has discovered the secret of eternal life for the simple reason that he knows that she is “just too rational” to have made it up (42). Accordingly, he determines that the best way to bring Helen back to her senses is to appeal to her intellect. And sure enough, when Alec points out that her work in cell regeneration might produce cancerous mutations, Helen immediately puts her own fears aside and begins to outline
the next step in her research, asking Alec to “work it out on a slide rule for me, Hon” (44). Delighted to realize that “Helen was back,” Alec seems more than ready to comply—but not before giving her a wildly romantic kiss (45). Because MacLean ends with this image, rather than explaining how the Berents will get out of Bellevue and convince the scientific community of Helen’s discovery, the moral of her story might seem open to debate. And yet this final image of the vindicated female scientist and her devoted husband, replete as it is with connotations of fertility and generation, suggests that Helen will escape the tragic fate of Victor Frankenstein and realize her dream of leading humanity toward godhood.

While MacLean looks to the private sphere of domestic relations as the basis for a new and more egalitarian kind of scientific community, Doris Pitkin Buck suggests that women can practice science successfully only by abandoning their homes and husbands. This is particularly apparent in Buck’s short story “Birth of a Gardner” (1961), which rewrites Nathaniel Hawthorne’s 1843 classic, “The Birthmark.” Brian Attebery explains that SF scholars have long been interested in Hawthorne as a precursor to modern SF because, much like Mary Shelley, he “was usually careful to ground [his] plots in the science of his day” (23). “The Birthmark” is of particular interest to feminist SF scholars because it treats science in a specifically gendered manner. Hawthorne’s story revolves around the brilliant scientist Aylmer and his wife, Georgiana. Georgiana possesses a tiny, hand-shaped birthmark on her left cheek that most men find enchanting but that Aylmer perceives as the single imperfection marring his wife’s beauty. Dedicated to proving his control over nature, Aylmer vows to eradicate Georgiana’s birthmark at any cost. Eventually the scientist attains his goal, but only by sacrificing his wife’s self-confidence and her life. Thus, Hawthorne’s story crystallizes a set of themes that would become central to much later SF, including “men’s reduction of women to physical appearance; their denial of their own bodily existence and projection onto women of the body’s imperfections, and the male scientist’s resentment of and subversion of a nature perceived as powerfully female” (24).

These themes are central to the first part of Buck’s story. “Birth of a Gardner” relates the tale of Payne, a physicist “famous in two hemispheres for his work on anti-matter,” who vows to rid his wife, Rosalie (whom he nicknames Lee), of what he perceives as her only flaw: an abiding interest in physics (50). A small-minded man who cannot think past the logic of the feminine mystique, Payne tells
himself, “a woman with Lee's hair didn't have to be intellectual. After all, she had a green thumb” (50). Events come to a head when, after months of silently enduring her husband's mockery, Lee marshals the courage to tell Payne that she has developed a theory concerning the existence of mirror worlds based on his ideas about matter and antimatter. Infuriated by what he perceives as sheer idiocy, Payne silences his wife with a curt “Darling, you bore me”—a response that he comes to regret when Lee retreats to their bedroom and dies of a brain aneurysm in the middle of the night (54). Much like Aylmer, who sees Georgiana's birthmark as an affront to his expert control over nature, Payne sees Lee's interest in physics as an affront to his own area of expert knowledge. And in both cases the male scientist ends up sacrificing his wife to prove this expertise.

But this is where the similarities between the two stories end. Much of the tragedy from Hawthorne's tale derives from the fact that Georgiana eventually surpasses her husband in scientific expertise and recognizes that his experiments are bound to kill her. Convinced by Aylmer that death is preferable to imperfect beauty, however, she gives in to Aylmer's tinkering and becomes “the victim not only of her husband's ambitions but also of her own acquiescence” (Attebery 24). In contrast, Lee recognizes her own scientific expertise and uses it to actively challenge her husband. Not only does Lee believe that the existence of matter and antimatter points to the existence of worlds and antiworlds, but also she also believes that once an individual understands the physical principles behind various kinds of matter he or she can change the course of events in one world and even call another into being. Moreover, Lee believes she has already done this, telling an astonished Payne, “I evoked you” (51). She further warns her husband that if he continues to ridicule her she will evoke a world where she is free of him: “I find myself adding detail to detail, the way I used to [when I first evoked you], and sort of beaming it out—somewhere. . . . Aren't we ever going to be married, really married?” (53). Thus, Buck's heroine bravely asserts her own scientific voice and agency in a patriarchal world. As such, she anticipates the kind of bold scientific heroine that Donawerth and Roberts attribute to later feminist SF.

Buck further reclaims Hawthorne for her own purposes by “writing beyond the ending” of his original story, as literary critic Rachel Blau DuPlessis puts it. Given Lee's warning to Payne, it should come as no surprise to readers that Lee is not actually dead—or, more precisely, that she is only dead in Payne's world. Soon after he buries
his wife, Payne begins to catch glimpses of Lee furiously reading and writing. Although he tries to dismiss these sightings as hallucinations, he is finally forced to admit that what he sees is the life Lee has created for herself in another (clearly better) world: “The closed volume was on her knee. Its name, Payne noted, was lettered in gold, clear and legible: On the Validity of Thought Patterns as Determined by Their Elegance. Payne blinked. Automatically, he checked the author’s name and read below the title, Rosalie Payne” (57). Thus, Payne learns that Lee was right all along about both the existence of alternate worlds and her own scientific authority. Buck further underscores this point by subtly shifting her protagonist’s name: although she is clearly married and retains her husband’s surname in both worlds, in the mirror world where she is a recognized scientific expert, she abandons the patriarchal diminutive “Lee” and reclaims the proper (and decidedly feminine) ”Rosalie” for herself. Much like MacLean, Buck insists that there might someday be times and places where women can practice science and earn the admiration of men who support them in this practice.

Whether or not the relations of science, society, and gender might change in our own world, however, seems open for debate in Buck’s story. Throughout the first half of the story Payne spends a great deal of time and energy trying to steer Lee away from the traditionally masculine pursuit of scientific knowledge and toward the more traditionally feminine pursuit of gardening, telling her that “if you would be happy for an hour, get drunk . . . and happy for life, plant a garden” (51). When he first sees the mirror-world Rosalie, he tries to capture her attention by taking over her neglected garden, vowing, “if you come back a second time, this place will be in shape for you” (59). When Payne finally acknowledges that Rosalie (like Lee) prefers science to gardening, he decides to show her copies of his own latest work. But this is the mirror world and so, inevitably, Rosalie dismisses Payne with his own favorite putdown: “Darling, you bore me.” In retaliation, Payne considers taking his own life but ultimately concludes, “He could, he would be happy in spite of everything. Savagely he resolved that tomorrow he would spend the whole day bedding the garden down for winter” (59). So what are readers to make of this resolution? On the one hand, it seems to be one more instance of Payne’s childish egotism: if he cannot best his wife in scientific matters, he will give them up altogether. On the other hand, Buck crafts her tale in such a way that readers might surmise Payne has been displacing his own desire for a more nurturing mode of labor onto Lee all along,
and that in the end he is learning to embrace this desire. In this case, readers might conclude that scientific and social change is possible in the here and now.

In contrast, Judith Merril’s “Daughters of Earth” (1952) directly asserts that women (and men) must leave Earth if they are ever to truly effect scientific and social change. This is clear from the opening lines of Merril’s story, which boldly revises the origin story of Judeo-Christian culture:

Martha begat Joan, and Joan begat Ariadne. Ariadne lived and died at home on Pluto, but her daughter, Emma, took the long trip out to the distant planet of an alien sun.

Emma begat Leah, and Leah begat Carla, who was the first to make her bridal voyage through sub-space, a long journey faster than the speed of light itself.

Six women in direct descent—some brave, some beautiful, some brilliant: smug or simple, willful or compliant, all different, all daughters of Earth, though half of them never set foot on the Old Planet. (97)

By rewriting the patriarchal genealogies of the Old Testament and the Torah, Merril proposes a radical break from history: while earthly civilizations of the past may have been founded by men, both the greater universe and the future as a whole belong to their daughters.

Merril also appropriates one of the classic origin stories of SF for her own purposes: the space story. As Stableford explains, “it is natural that SF should be symbolized by the theme of space flight, in that it is primarily concerned with transcending imaginative boundaries, with breaking free of the gravitational force which holds consciousness to a traditional core of belief and expectancy” (“Space Flight” 1135). In Merril’s hands, this theme serves to symbolize freedom from the gravitational force of patriarchy. Joan, for example, leaves Earth for Pluto because “in the normal course of things, [she] would have taken her degree . . . and gone to work as a biophysicist until she found a husband. The prospect appalled her” (103). Similarly, Emma volunteers for the first mission from Pluto to Uller because her stepfather, Joe Prell, is an Earthman who loves her dearly but believes that Emma is “too direct, too determined, too intellectual, [and] too strong” to be a proper lady like her mother, Ariadne (112). Thus, Merril literally conflates repressive patriarchal thinking with Earth and the past, insisting that the further women are from “the Old Planet,” the freer
they will be to shape their lives as they see fit.

Merril further underscores this point by opposing her Earth-born men to their offworld counterparts. For example, readers learn that when Emma's Martian husband first sets foot on Uller, "he wanted to shout; he wanted to run; he wanted to kiss the ground under his feet, embrace the man next to him. He wanted to get Emma and pull her out of the ship" (119). Rather than simply bask in the glory of being the first human to step foot on Uller, Ken longs to share the experience with his wife. Later, when Carla leaves for Niflheim, it is her Uller-born father, Louis, who "was there first, folding the slender girl in a wide embrace [and] laughing proudly into her eyes" (164). And so the sons of Earth turn out to be just as different from their fathers as the daughters of Earth are from their mothers.

Merril also suggests that new and more egalitarian modes of social relations will result in new and more holistic modes of scientific practice. This is particularly true for those of her protagonists whose personal lives serve as professional inspiration. Joan's initial work on Pluto is largely theoretical, but after her husband is killed in a domed city construction accident she devises a terraforming process that will ensure no other family suffers this tragedy (108). Later, when an Uller native accidentally kills Emma's husband, she rejects the retaliatory attitude of the other colonists and devotes her life to initiating real communication with the silicone-based creatures. Eventually Emma succeeds in this task, and when her granddaughter Carla leaves for Niflheim, she does so "in profitable comradeship with the Ullerns" (159). The further removed Merril's heroines are from their planet of origin, the more able they are to think of themselves in new ways: not just as rugged individuals who must bend nature to their wills, but as intelligent, sympathetic beings enmeshed in complex webs of life that must be preserved at all costs. As such, they practice a utopian mode of science much like that which MacLean and Buck ascribe to their own protagonists. Indeed, Merril takes this scientific practice a step further than her literary peers by imagining how it might enable women to make new connections not just with their families and societies but with entirely new species as well.

Finally, in "The Ship Who Sang" (1966), Anne McCaffrey appropriates the genre of the *bildungsroman*, or "novel of development," to imagine new futures for scientifically and technologically inclined women. Like other stories in this genre, "The Ship Who Sang" follows the adventures of a gifted child who grows, learns, and changes in the process of finding his or her place in society. The child in this case is
Helva, a “shell person” born with a brilliant mind but severe physical disabilities. Like other children with this condition, she is raised by scientists who enclose her in a mechanical life support system and then provide her with extensive intellectual, social, and aesthetic training before implanting her into the spaceship that she will run in tandem with human pilots or “brawn” for the next several centuries. As McCaffrey explains at the very beginning of the story, brainships are elite members of this future society, and so as a shell person Helva is assured “a rewarding, rich, and unusual life, a far cry from what she would have faced as an ordinary, ‘normal’ being” (2). Thus, McCaffrey uses the classic Western narrative of human development to explore not just how children become useful adult members of society, but how humans might become useful members of an exciting new posthuman society as well.

However, McCaffrey does not simply reiterate the narrative trajectory of the bildungsroman. Like MacLean, Buck, and Merril before her, she strategically revises her chosen story form to create a feminist fairytale. While the classic novel of development generally revolves around boys who become men by engaging in intergenerational conflict and competition, McCaffrey frames the tale of Helva's development with scenes of intergenerational harmony and friendship. At the beginning of “The Ship Who Sang” Helva defuses the potential hostility of unmodified human adult visitors to her school with grace, wit, and a charmingly innocent pity for “you people [who] don't have adjustable vision” (4). In doing so, she transforms her potential enemies into staunch allies for all shell children. And at the end of McCaffrey's tale, Helva recovers from the shock of losing Jennan, her first human pilot (and first adult love) with the help of Silvia, a much older ship who reminds her that she is not alone in her grief: “Central's very worried, and so, daughter, are your sister ships. I asked to be your escort [because I] don't want to lose you” (23). As is appropriate to her status as a posthuman cyborg with intimate connections to both the organic and technological worlds, Helva comes into her own as an adult not by isolating or alienating herself from others but by forging and maintaining connections with them.

But “The Ship Who Sang” is also a strategically revised version of the feminine bildungsroman. In Unbecoming Women: British Women Writers and the Novel of Development, Susan Fraiman explains that stories about the development of female characters historically have been marked by extreme anxiety about sex: “in fact, the female protagonist’s progress is generally contingent on . . . preventing ‘things'
from happening to her. Her paradoxical task is to see the world while avoiding the world’s gaze" (7). While McCaffrey’s shell people do not engage in the act of physical sex per se, their lives are highly eroticized ones marked by conventionally gendered milestones. Helva may be “born a thing,” but when she is implanted in her own ship as a teenager she enjoys a cybernetic version of the traditional sweet sixteen party in which “unusually fine-looking, intelligent, well-coordinated and adjusted young men” gather “to do each other dirt [and] get possession of her” (1, 9).

Eventually Helva chooses Jennan as her first partner in what both brainships and their brawns describe as “marriage” precisely because he respects both her mind and her physical presence within the core of the ship, and the two are deliriously happy until Jennan’s untimely death. At this point Helva takes on the persona of the grieving widow, stoically supervising the funeral of her beloved pilot/husband while taking comfort in the company of older female ships who have undergone similar experiences. By imagining a future where women like Helva might be able to see the world while being seen by it in gendered terms, McCaffrey provides a powerful antidote to the postwar American assumption that women must chose between career and family and, in turn, between professional and gendered identities. Instead, she suggests that new forms of technoculture might enable women to combine adventure and romance in truly innovative ways.

And indeed, it is precisely Helva’s dual identity as a both technological and gendered subject that enables her to rise to the top of her profession and resolve dilemmas beyond the ken of unmodified (and often male) humans. When Helva and Jennan are sent to evacuate the planet Chloe before its sun goes nova, the nuns who inhabit this world decline to go with them; in fact, the more Jennan pleads with them, the more stubborn they become in their refusal. Helva quickly realizes that the problem is Jennan himself, as the brawn’s flip demeanor and rugged good looks have convinced the nuns that this is just one more trick on the part of men to seduce them back into the material world.

Accordingly, Helva marshals her own unique combination of technological and gendered authority to resolve this crisis, providing the convent’s Mother Superior with detailed information about the dangerous climate changes that are already taking place on Chloe and then assuring her that “under my protection you and your sisters-in-faith may enter safely and be unprofaned by association with a male. I will guard you and take you safely to a place prepared for you”
When the nuns continue to resist evacuation, Helva publicly stops Jennan from dragging them into her hold, noting that it is their choice as free women to do as they please—at which point the nuns overcome their fears and agree to board the brainship. While conventionally heroic men like Jennan might still be the objects of desire for New Women like Helva (and by extension, McCaffrey’s readers), it is the New Woman herself who becomes the true heroine of the future.

Finally, McCaffrey proposes that women who are encouraged to develop their intellectual expertise might develop new modes of art as well. When Helva receives a compliment on her voice as a child, she decides to cultivate her talent as a singer. Accordingly, she turns her formidable mind to the task of analyzing sound reproduction and altering her shell body to mimic the voice of an unmodified human. But, of course, Helva is a modified human—and a brilliant one to boot—so she succeeds beyond her wildest dreams: “She found herself able to sing any role and any song which struck her fancy. It would not have occurred to her that it was curious for a female to sing bass, baritone, tenor, mezzo, soprano, and coloratura as she pleased. It was, to Helva, only a matter of the correct reproduction and diaphragmic control required by the music attempted” (6–7). As with her intellect, Helva’s artistic abilities make her even more attractive to those male pilots who vie to become her partner. For example, when other pilots tease Jennan about Helva’s art, the brawn vows, “if I have to black eyes from here to the Horsehead to keep the snicker out of the title, we’ll be the ship who sings” (15). Much like MacLean and Merril before her, McCaffrey imagines a future in which New Women are accompanied by New Men who love and support them unconditionally, and that the union between these two figures might come to represent the possibility of a whole new society that respects women for their intellectual and aesthetic practices. As such, the story of Helva is the story of all female characters who live in—and all women who write about—galactic suburbia.

Why Not a Woman? Science and Technology as Women’s Work in the Postwar Science Fiction Community

In this chapter I have shown how women in the postwar SF community used both fact and fiction writing to create feminine and even protofeminist modes of scientific and technological authority. Although the decades following World War II marked record growth in almost
every aspect of American science and technology, women were generally relegated to the margins of professional technoscientific labor. This marginalization was justified by the rhetoric of the feminine mystique, which suggested that women must choose between family and career—and that left to their own devices they would naturally choose the former over the latter. Indeed, antifeminist commentators actively insisted that women who tried to have it all were doomed to fail at it all, as the incompatible demands of motherhood and science would necessarily impinge upon one another in ways that endangered both the well-being of the individual scientist's family and the well-being of American science as a whole.

Nonetheless, women continued to study and practice science and technology in growing numbers. Moreover, as cold war tensions exploded with the advent of the Space Race, a small but increasingly vocal number of scientists and politicians began to argue that the United States could only maintain its position as a global leader by recruiting both men and women into technoscientific professions. New ideas about science and technology as women's work were reflected in the National Defense Education Act of 1958, which allocated funds to ensure the intellectual development of boys and girls alike, and the short-lived Women in Space Early program, which provided Americans with new images of women who were both intensely feminine and technologically adept. Slowly but surely, it seemed that American thinking about the relations of gender, science, and society were changing, and that truly patriotic women might use their talents in both the living room and the laboratory.

Women associated with the postwar SF community both anticipated and greatly extended new ideas about science, technology, and women's work in two distinct ways. Science journalists including June Lurie, Sylvia Jacobs, and Kathleen Downe drew upon a centuries-old tradition of women's science popularization to establish their scientific expertise. By taking on the traditionally feminine personas of the trained educator and the scientist's wife, these authors made spaces for themselves as critical and creative members of the scientific community without ever directly challenging the widespread notion that scientific research was an inherently masculine activity. This enabled such authors to critically assess the work of male scientists and writers while conveying their own social, political, and even scientific ideas to readers.

Meanwhile, SF authors including Marion Zimmer Bradley, Katherine MacLean, Doris Pitkin Buck, and Judith Merril all wrote
stories that looked forward to feminist SF in their radical reassessments of science, technology, and women's work. These authors challenged the feminine mystique by telling tales about the personal and cultural tragedies that would occur if women of the future were forced to choose between family and work. These stories make literal Betty Friedan's claim that such choices were mistaken ones that denied the true range of women's talents. Women SF writers also revised the great scientific and social origin stories of Western culture to imagine future worlds where women engage in both scientific and domestic labor. In direct contrast to the superwomen scientists of the mid-century mass media, however, these protofeminist characters do not have to sacrifice all other elements of their lives to keep their personal and professional worlds distinct from one another. Instead, they combine family and work in ways that profitably transform both.

As I have argued in this chapter and throughout this book, women writers turned to SF in significant numbers after World War II because it gave them an ideal source of narratives with which to assess both America's emergent technoculture and their own place within it. By telling stories about gender, science, and society from distinctly feminine perspectives, these authors developed a brave new mode of critical storytelling that would quickly become known as women's SF. So why did this speculative tradition all but disappear with the revival of feminism in the 1960s and the emergence of feminist SF in the 1970s? As I will conclude, women's SF may have disappeared in name, but the thematic concerns and narrative practices that postwar women brought with them to their chosen genre continue to inform SF storytelling today.