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"SILENCE, MISS CARSON!" SCIENCE, GENDER, AND THE RECEPTION OF *SILENT SPRING*

MICHAEL B. SMITH

The "control of nature" is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man. The concepts and practices of applied entomology for the most part date from that Stone Age of science. It is our alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth.

—Rachel Carson, *Silent Spring*, 262-63

Thus did Rachel Carson conclude her most controversial work, a book that has since been compared with Harriet Beecher Stowe's *Uncle Tom's Cabin* for its capacity to awaken Americans out of ethical and moral somnolence and with Charles Darwin's *On the Origin of Species* for its challenge to the dominant scientific paradigm.¹ Despite being largely a synthesis of studies showing the ecological toll pesticides and other agrichemicals were exacting, *Silent Spring*—first appearing in an abridged serialization in the *New Yorker* in the summer of 1962—and its conclusions came as a shocking revelation to most Americans. Following on the heels of the thalidomide debacle and recent publicity about the danger of nuclear fallout, *Silent Spring* reached an audience already anxious about the brave new world of chemicals and atomic energy.² Carson's invocation of Albert Schweitzer's epitaph to humanity in the introduction to her book—"Man has lost the capacity to foresee and to forestall. He will end by destroying the earth."—powerfully primed readers for her account of how illusory humanity's control of nature really was, a most dangerous kind of self-deception. And readers responded. The mailbox at the *New Yorker* received a deluge of letters in support of Carson, as did the mailrooms on

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Capitol Hill and the White House. Carson's broadside against the petrochemical industry, the United States Department of Agriculture, and research universities, and the public support it generated posed a grave and immediate threat to the economic interests and institutional integrity of these entities. Collectively they mounted a frantic public relations campaign to denounce Carson and her collaborators, bringing to bear all the nefarious machinery of the public relations industry.³

The history of this effort to discredit Carson is already well-covered scholarly terrain.⁴ But although these studies have probed the virulent and ad hominem rhetoric of the attacks against Carson, no one has scrutinized the gendered nature of these criticisms of both Carson as a person and scientist and of her vision for the praxis of science.⁵ The story of how Rachel Carson and her work were received by her mostly male critics is important for both the history of science and the history of women, for this reception illuminates quite starkly the gendered ways Western culture has constructed science. Sandra G. Harding and Evelyn Fox Keller have led the way in identifying and offering correctives to the androcentrism inherent in the evolution of Western science and the effect this has had on women practitioners of science in Western culture. The criticism of Rachel Carson's work as a scientist serves as an important case study for exploring the very cultural dynamics philosophers of science such as Harding and Keller have been urging scholars to address.⁶ Moreover, through her use of metaphors about a balance of nature—precisely the language that so incensed many of her critics—Carson crafted a vision of nature that would resonate well with the philosophy of ecofeminism that began to develop a decade after *Silent Spring* was published.

Through an examination of the avalanche of press coverage that followed the publication of *Silent Spring*, I will argue that Carson posed a threat to her detractors not merely because she had marshaled a scientifically sound indictment of the indiscriminate use of chemicals in the United States and the world. Carson was also threatening because she was a woman, an independent scholar whose sex and lack of institutional ties placed her outside the nexus of the production and application of conventional scientific knowledge. In an insightful observation about the plight of women scientists in the cold war era, Margaret Rossiter describes

how well-trained women scientists "were, to use some military terms of the period, 'camouflaged' as housewives, mothers, and 'other' and 'stockpiled' in cities and college towns across America . . . ready but uncalled for the big emergency that never came."⁷

Carson, in a sense, called herself to address a big emergency. Her scientific credentials included a master's degree in marine biology from Johns Hopkins University and considerable work toward a Ph.D. Her family's financial circumstances in the Great Depression obliged Carson to abandon her doctoral work in favor of a job with the Fish and Wildlife Service. Despite her degree, her well-respected research for a government agency, and two best-selling books on ocean biology in the 1950s, she was attacked by critics of *Silent Spring* for both her science and her training.⁸

The gendered language used to discredit Carson was really quite extraordinary, as we shall see. In order to assess why *Silent Spring*—considered apart from its author—proved to be such a provocative book, I will also examine some of the rhetorical flourishes Carson employed. As the epigraph to this article illustrates, Carson had a vision of the world as an organic system, a living organism that insofar as humans needed to exploit it required a delicate balancing act, a tenderness, if you will. As Carolyn Merchant and others have pointed out, the scientific revolution of the sixteenth and seventeenth centuries reordered the human perception of the natural world in mechanistic terms. "The world we have lost was organic," Merchant begins *The Death of Nature: Women, Ecology, and the Scientific Revolution*, her pioneering work on the shift in attitudes toward nature in early modern Europe. Merchant's organic model of relations between humans and nature included the perception of nature as a living, *feminine* organism requiring a special kind of stewardship, one that demanded full reciprocity in human-nature interactions. For Merchant, the most problematic result of the scientific revolution was the fundamental reconstruction of nature as a machine comprised of discrete, comprehensible, controllable bits. Male scientists came to conceive of nature as an unpredictable harridan in need of constraint and mastery, and the notion of nature as a partner eroded. The quest to dominate a female nature paralleled and reinforced the cultural trend toward the increased subordination of women in society.⁹

This, indeed, is the position ecofeminists have staked out in the cultural debates over ecological consciousness: as the "lost world"

of a more reciprocal relationship between humans and nature and between women and men has succumbed to various forms of domination by men and male-constructed science, women and nature have suffered together. By positing that women are innately more connected to the natural world (retaining the construction of nature as female) and instinctively conceptualize the world in organic terms, ecofeminists have argued that reestablishing the old notions of reciprocity is a task that should fall predominately to women. Although the tacit assumption that women are biologically (rather than merely culturally) ordained to be better stewards of nature remains a controversial tenet of ecofeminism, the ecofeminist critique of culture helps us see that the roots of the oppression of women are more than economic.¹⁰ Although the label of ecofeminist would be an anachronistic one for Carson, she clearly evinced a reverence for the natural world that falls under Merchant's rubric of a lost perspective. She also proved to be a catalyst for the then-embryonic environmental movement, a movement that has had a disproportionate number of women as its motive force.¹¹

SILENCING SPRING

In their profoundly disturbing study of the public relations industry, John Stauber and Sheldon Rampton relate the story of how the public relations men for the chemical industry and the Department of Agriculture got wind of Carson's work even before its appearance in the *New Yorker*. By the end of the summer of 1962, when the book version of Carson's study was being prepared for press, the anti-Carson machinery was already moving in high gear. Monsanto published a parody of *Silent Spring* in its in-house magazine that was entitled "The Desolate Year" and described a world overrun by insects.¹² The Velsicol Chemical Corporation attempted to convince Houghton Mifflin not to publish the book at all, linking Carson to "food faddists" and other "fringe" groups. They also invoked the imperatives of the Cold War, contending that an overly credulous and uninformed public might call for the elimination of pesticides and that "our supply of food will be reduced to East-curtain parity." Finally, they threatened a libel suit against Carson's "innuendoes."¹³ None of these attempts to forestall the publication of *Silent Spring* was successful. So the chemi-

cal companies and other entities whose profit margins were threatened by Carson's findings resorted to counterattack through negative book reviews and opinion pieces in major periodicals. These attacks appeared in all forms of periodicals, from trade journals such as *Chemical and Engineering News* to popular news magazines such as *Time* and *U.S. News and World Report* to peer-reviewed science journals such as *Science*. The popularity and appeal of *Silent Spring* developed in spite of this barrage of discrediting assessments. But the rapid disappearance of the issue of pesticides from the national radar screen of public opinion by 1965; the assault on Rachel Carson herself, even in obituaries following her death from breast cancer in 1964; and the cheery "See, there were plenty of birds this spring" rejoinders that appeared in 1963 and 1964 all serve as suggestive, if not conclusive, evidence that the anti-Carson rhetoric did have a chilling effect on the discourse.

For the remainder of this section of the article I will examine the dissenting voices that sought to silence *Silent Spring*. These critics fell roughly into two categories. In the first were those who were members of the scientific community. The writers were almost all men. Almost all of them found the research undertaken by Carson for the book to be suspect; many of them questioned Carson's credentials, calling her an "amateur" or a mere "scientific journalist." Many also dismissed her writing as "emotional" and lacking the kind of cold, rational risk assessment required of modern applied science. Reading the reviews today one even senses some reviewers implicitly drawing a line between the "hard" science of chemistry and the "soft" science of biology. The second category of critics were from the popular press, the defenders of cold war-inflected notions of progress and justified means to ends. These writers also engaged in gendered critiques of what they called Carson's emotionalism and her vision of progress rooted in "sentimentalism" rather than reality. These critiques of *Silent Spring* appeared in magazines whose readership ranged across the spectrum, from *Good Housekeeping* to *Sports Illustrated* to *Life*. To be sure *Silent Spring* received numerous favorable reviews in the popular press. But even some of these reflected the gender biases noted above.

It is not surprising that some of the most vicious attacks on Rachel Carson and *Silent Spring* came from those with the greatest economic stake in the widespread use of chemical pesticides. As noted above, many chemical companies launched anti-Carson

campaigns. But the reviews of *Silent Spring* that appeared in some of the trade journals reflected a hysteria that transcended even that which they accused Carson of. The most sexist, most unbalanced review of *Silent Spring* appeared in *Chemical and Engineering News* in October of 1962, shortly after the publication of the book. William Darby of the Vanderbilt University School of Medicine attacked Carson from the first paragraph of his review, entitled "Silence, Miss Carson!" The title itself (which the journal later admitted was its own creation, not Darby's) expresses the prevailing attitude among many of Carson's critics that she was an uninformed woman who was speaking of that which she knew not. Worse, she was speaking in a man's world, the inner sanctum of masculine science in which, like the sanctuary of a strict Calvinist sect, female silence was expected.¹⁴ Darby began his review by lumping Carson with groups he considered to be antimodern "freaks." *Silent Spring* would appeal to readers such as "the organic gardeners, the anti-fluoride leaguers, the worshippers of 'natural foods,' and those who cling to the philosophy of a vital principle, and pseudo-scientists and faddists," wrote Darby. He then invoked a series of father-figure scientists who supported the use of pesticides and whom Carson supposedly ignored. "It is doubtful that many readers can bear to wade through its high-pitched sequences of anxieties," Darby continued, impugning Carson's critical tone in terms all too reminiscent of sexist critiques of so-called feminine styles of discourse. But, Darby went on, if readers were moved by Carson's pleas and her invocation of Schweitzer and other critics of uncontrolled modernization, their view augured

the end of all human progress, reversion to a passive social state devoid of technology, scientific medicine, agriculture, sanitation, or education. It means disease, epidemics, starvation, misery, and suffering incomparable and intolerable to modern man. Indeed, social, educational, and scientific development is prefaced on the conviction that man's lot will be and is being improved by greater understanding of and thereby increased ability to control or mold those forces responsible for man's suffering, misery, and deprivation.¹⁵

Francis Bacon would have been proud of such a manifesto advocating *man's* role as conqueror, master, and controller of nature. Here we see not a judicious review of a controversial book but a defense of the ideology of modern science and progress against feminine sentimentality, the frightened growl of cornered dogma. Significantly, many readers of *Chemical and Engineering News* objected passionately to Darby's characterization of Carson and *Si-*

lent *Spring* in his review.¹⁶ But Darby was speaking as someone whose power was being undermined.

Another prominent male physician wrote an only slightly less corrosive review for a trade journal with a slightly different orientation, *Nutrition Reviews*. For Frederick J. Stare, Carson's "emotional picture" of a possible disaster disqualified her as a scientist and raised questions about her real commitment to humanity, for "the broad application of a brilliant technology" has allowed humanity to "stave off starvation, disease, and social and political unrest." Carson's interrogation of the application of science was, in Stare's mind, naive at best and unpatriotic at worst. Miss Carson, Stare concluded, was no scientist. Her use of phrases such as "never ending stream of chemicals . . . now pervading the world" and verbs such as "lurks" and "engulf" in reference to chemical residue consigned her to the role of sentimental essayist. Ignoring Carson's distinguished career as a marine biologist, Stare concluded: "In Miss Carson's case, research limited to selective reading, plus the urging of 'friends' with special interests, is certainly no diploma of equivalency for the academic training and experience required for authority."¹⁷

Reviews and essays about *Silent Spring* that appeared in scientific journals did not contain such blatant attacks on Carson's character, although most were no less critical of her conclusions. Reviewer after reviewer—in all genre of periodicals—damned Carson's meddling in "progress," condemned her for proposing "unrealistic" alternatives. I will return to the rhetoric Carson used and why it may have so inflamed those who subscribed to conventional notions of progress in the second part of this article. But it is worth pointing out here that criticisms of Carson's science often alluded to her "soft" approach to a natural world that was humanity's adversary. There can be little doubt her belief that the "battle" with nature was not a zero-sum game, that our relationship with the nonhuman part of nature should not be characterized as a battle at all, threatened an entire sector of the economy whose profits were predicated on an adversarial formulation.

One conceit that Carson employed again and again in *Silent Spring* is "the balance of nature." Such a view of the natural world and the place of humanity in it raised the ire of I.L. Baldwin, among others. In his 1962 review for *Science* Baldwin wrote: "It is certain that modern agriculture and modern public health, in-

deed, modern civilization, could not exist without an unrelenting war against the return of a true balance of nature." Like Darby, Baldwin deployed the assertion that from science had sprung modernity, that alternatives to the existing practice of science were antimodern and would inevitably result in casting humanity back in the cauldron of competition with the rest of the natural world, a nature red in tooth and claw. Besides, Baldwin wrote, "The problem Rachel Carson dramatizes is not a new one"; competent men were working within the dominant scientific paradigm to make necessary corrections. "[Their] reports are not dramatically written, and they were not intended to be best sellers. They are, however, the result of careful study by a wide group of scientists, and they represent balanced judgements in areas in which emotional appeals tend to over-balance sound judgement based on facts."¹⁸ Rachel Carson's science, then, was "unbalanced" and "emotional." Restraint—that is, protecting the status quo—was the most "rational" course. Others criticized Carson in a similar vein. Her use of the image of a "fragile and exquisite songbird dying in paralytic convulsions" was, according to Thomas H. Jukes in *American Scientist*, an unforgivably sentimental tactic for raising awareness about the issue of "possible" pesticide misuse. Jukes condemned those followers of John Muir who want to see his vision of pure nature preserved but would not "adopt his diet of tea and bread crusts," those hypocritical idealists who want to have both modernity and a balance of nature: not possible, he flatly asserted.¹⁹ (I.L. Baldwin had made a similar claim, stating that the elimination or even significant reduction of pesticides would mean a "back-to-the-farm migration for millions.")²⁰

These writers and others were trying to preserve the public's credulity in the ability of science and technology to solve problems both presented by nature and those that developed as unforeseen consequences of applied science. Even one of the more balanced reviews of *Silent Spring* in a scientific magazine had this agenda at its core. "I suspect that the inevitable way to progress for man, as for nature," wrote LaMont C. Cole in *Scientific American*, "is to try new things in an almost haphazard manner, discarding the failures and building upon the successes."²¹ It was just this blind faith Carson was trying to shake. The *New York Times* opined even before her book appeared that "she warns of the dangers of misuse and overuse by a public that has become mesmerized by the

notion that chemists are the possessors of divine wisdom and that nothing but benefit can emerge from their test tubes."²²

That a woman should challenge the mesmerists, that she should try to shake Americans from their complacent trust in their own government and most powerful corporations, dismayed not just the chemical companies and their colleagues in research universities. Her *New Yorker* pieces drew overwhelming praise from readers, but a vocal minority objected to her and her findings strenuously. One writer wrote: "Miss Rachel Carson's reference to the selfishness of insecticide manufacturers probably reflects her Communist sympathies, like a lot of our writers these days. We can live without birds and animals, but, as the current market slump shows, we cannot live without business. As for insects, isn't it just like a woman to be scared to death of a few little bugs! As long as we have the H-bomb everything will be O.K."²³

If letters from cranks had been the extent of the public complaints against Carson in the popular press, one could less confidently assert that gender biases from the culture at large deeply inflected the reception of her work. But when a magazine with the wide readership of *Time* called her findings and writing "patently unsound," "hysterically emphatic," and an "emotional outburst," then the roots of the criticism, the reasons Carson was so threatening, become clear: she was a woman and she was challenging a cornerstone of industrial capitalism with a passion considered unbecoming to a scientist. The *Time* piece also trotted out the familiar criticism about the "balance of nature": "Lovers of wildlife often rhapsodize about the 'balance of nature' that keeps all living creatures in harmony, but scientists realistically point out that the balance of nature was upset thousands of years ago when man's invention of weapons made him the king of the beasts. The balance has never recovered its equilibrium; man is the dominant species on his planet, and as his fields, pastures and cities spread across the land, lesser species are extirpated, pushed into refuge areas, or domesticated."²⁴

The Catholic periodical of record, *America*, also savaged *Silent Spring*, again noting Carson's "emotionalism" and lack of balance.²⁵ The *National Review* called the book "simply a long emotional attack," Carson's approach "emotional and one-sided," an "obscurantist appeal to the emotions." Again invoking the need for "rational" and "scientific" (as opposed to emotional or irra-

tional and sentimental) approach, the review concluded by saying that "[the problem of pesticides] is Burkean, and involves a careful weighing of advantages and disadvantages with due regard to our lack of perfect knowledge."²⁶ *Newsweek* wondered about the critics' view of *Silent Spring* as "innuendo" and having "the quality of gossip."²⁷ "Her extravagant language . . . , her unscientific use of innuendo . . . , her pantheism . . . , and her disregard for the studies of the problem by her fellow scientists in industry, the university, and government service" (mostly men of course) rendered her study completely unreliable, commented another reviewer.²⁸ Even a profile of Carson in *Life* purporting to be a balanced assessment of the woman and her work could not overlook the implications of Carson's sex noting that "for all her gentle mien, Rachel Carson, 55, who is unmarried but not a feminist . . . is a formidable adversary." This phrase suggests that were Carson a feminist she would indeed be a subversive force, for (with a wink to the reader) *Life* subscribers all know what *those* women are like. And yet there is also in these words the implication that Carson's unmarried status is itself an expression of some deficiency, that were she married, none of this controversy would have developed. Presumably she would have instead been practicing home economics and recognizing the overwhelming benefits of pesticide-enhanced agricultural bounty for the kitchen. There is, in fact, no evidence to suggest Carson openly advocated for women's rights, although her own struggle with the scientific establishment served as a feminist statement. By the second page of the profile Carson had morphed into a pesky gadfly, a "good indignant crusader." Finally, the article concluded, like troublesome Mother Nature herself, "Hurricane Rachel" must be endured, becalmed, and then "the real dangers to public health [could] be evaluated, and then controlled by skilled medical men."²⁹

Like many of the articles about Carson and *Silent Spring* the *Life* profile featured photographs of Carson, few of which depicted her in the guise of a professional scientist. There were none of the usual press release photographs of a white-coated notable scientist in the lab looking authoritative or the dauntless field researcher above the volcano's mouth. Instead, Carson was almost always photographed with her cat or sitting in the woods surrounded by children gesturing at the natural wonders of the world. Only occasionally did a photo of her at a microscope appear. By implica-

tion, these photos located Carson in the world of the school marm, not the world of science. She was a teacher—to some a subversive, dangerous one—but not someone who was engaged in meaningful scientific research.³⁰

Even one year after the publication of the book, even after a commission appointed by President Kennedy had sustained many of Carson's conclusions about pesticides, the assault on Carson in print continued. An early collaborator on *Silent Spring*, Edwin Diamond, described how he simply could not work with a woman who let emotion interfere with accuracy and whose final product relied on the same shock techniques and distortions employed by Joseph McCarthy.³¹ The story, "Life-Giving Spray" (featuring the obligatory photograph of Carson as sentimental bird watcher), appeared in the quintessential male magazine, *Sports Illustrated*, and concluded that one year after Carson's frightening indictment wildlife seemed more abundant than ever, and was, in fact, aided by pesticide use.³²

Even the airwaves were filled with vilification of Carson, critiques once again suffused with gendered notions of science and who does "good" science. In a widely distributed speech of January 1963, the president of the Nutrition Foundation, C.G. King, like Frederick Stare and others cited above, condemned Carson as a fellow traveler with all of the fringe elements of society: "Food faddists, health quacks, and special interest groups are promoting her book as if it were scientifically irreproachable and written by a scientist. Neither is true . . . and [Carson] misses the very essence of science in not being objective either in citing the evidence or in its interpretation."³³ The frequently interviewed Robert H. White-Stevens, whose British accent and grandfatherly appearance evidently conferred upon him a trustworthiness unmerited by his intemperate remarks, proved to be the king of anti-Carson sound bites with variations on the following characterization of *Silent Spring*: "Her book is littered with crass assumptions and gross misinterpretations, misquotations, and misunderstandings, clearly calculated to mislead the uninformed. . . . Her book will come to be regarded in time as a gross distortion of the actual facts, essentially unsupported by either scientific experimental evidence or practical experience in the field."³⁴ For these men, whose power in shaping society through expert scientific advice hung on their credibility as both protectors of the public interest

and exemplars of "true" science, Rachel Carson's conclusions and analysis were terrifying. Carson's critics—mostly men, mostly white, mostly affiliated with some bureaucratic institution—recognized the general public's willingness to accept science as it was being practiced as the ultimate authority. They therefore took two approaches to discrediting her, both of which often led the reader to make inferences about how gender inflected her science and both of which sought to shore up the foundations of science that Carson's critique of modernity had shaken. Carson's critics tried to reassure the world that even if some of what Carson alleged was true, the mistakes resulted from misapplication, not misguided science. Science, they argued, was almost solely responsible for the extraordinary standard of living Americans were experiencing by the early 1960s. To heed Carson's warnings would be tantamount to killing the goose that was laying the golden egg. Since the Progressive Era when the federal government had begun regulating society in earnest for the first time, the burgeoning American middle class had been willing to accept safety regulations only to the extent that such regulations did not incur large increases in the price of consumer goods. As was the case with the meatpacking industry in the first decade of the twentieth century following the publication of Upton Sinclair's *The Jungle*, those who stood to profit directly from the heavy use of pesticides responded to *Silent Spring* with the consumer's wallet in mind, thereby striking a putative balance—if it can be called such a thing—between public health safety and affordability. "[Because of pesticides] today's American housewives have the widest choice of fruits and vegetables, and meats and dairy—at prices to fit their budgets," characterizes this rhetoric.³⁵

"THE OTHER ROAD"

Something other than just the specter of bad science piqued the ire of Carson's critics. Although Carson's job in *Silent Spring* was largely that of a synthesizer, her conclusions pointed to the practice of a profoundly different relationship between humans and nature than that which obtained in early 1960s' America. Carson avoided making prescriptions that amounted to a call for the overthrow of the existing order. Her persistent invocation of "balance" and the rhetoric she employed in advocating a change in the

application of science amounted to a subversive act, however. This challenge to the order of things, even when it was not a conscious one, inspired the modern environmental movement and undergirds much of what is now called "ecofeminism." For the remainder of this article I will examine a few passages from *Silent Spring* that illustrate the radical nature of Carson's critique and briefly outline both her legacy and the legacy of the public relations campaign against her.

In his essay on the politics of nature in *Silent Spring*, Yaakov Garb argues that Carson was not really very radical. She was, he contends, content to practice *realpolitik* to a certain degree; that is, she deliberately avoided connecting the injustices of the social environment that to a certain extent preordained the injustices to the natural environment. To argue that capitalism generally, not merely the corporate greed of chemical manufacturers, was responsible for irresponsible science was not, obviously, Carson's agenda. But, as Garb points out, *Our Synthetic Environment*, a book by the anarchist Murray Bookchin (writing pseudonymously as Lewis Herber), published only months before *Silent Spring* and making the same indictment against pesticides using many of the same sources, received little attention. Why? Because Bookchin's polemic viewed pesticides merely as a symptom of an economic system that was pathological to its core. Without social justice, he argued, there could be no environmental justice. He hoped to leverage a popular overthrow of the status quo through his exposé of government and corporate complicity in the poisoning of the environment and people. Bookchin's critique of society was simply unpalatable to even many of those "fringe" groups with whom Carson was speciously associated. Garb sees *Silent Spring* as a far less radical critique of society than Bookchin's. Carson, Garb contends, invoked the "balance of nature" because it at once resonated with an antimodern impulse that resides in many denizens of late-twentieth-century society and because it was sufficiently vague not to be threatening to most of society. He writes:

Terms like "nature," "natural," and the "balance of nature" have great discursive force not in spite of but because of their fuzziness. Their multiple connotations and self-evident (thus unexamined) definition within the community that shares them enable protean versatility. We add great force to any argument by adducing the "natural" to it, so long as no one asks carefully what we mean by the term. If they do, it will often turn out that nature (and its cognates) are not pre-existing, ontologically firm objects or conditions in the natural world, but a reification of human criteria and definitions.³⁶

Whatever the wide-ranging resonance of these terms in the popular consciousness, for Carson they had very specific meanings, anchored in a vision of that world Carolyn Merchant called organic.

I agree that Carson did not explicitly make the same sweeping indictments as Bookchin; however, she offered a vision of science that expressed a reconsideration of the Baconian model that has more or less guided Western science since the seventeenth century. In the first pages of *Silent Spring*—the "Fable for Tomorrow" that so many critics held up as evidence that Carson was a storyteller and nothing more—she evoked a world which, having been treated as a machine more inorganic than vital for so many centuries, has died. "No witchcraft . . . had silenced the rebirth of new life in this stricken world," Carson wrote, "The people had done it themselves."³⁷ The scientists, mostly, had done it, with homeowners and farmers abetting, largely unaware of what they were doing. Time and again Carson refers to man's quest for dominion over nature: his "assaults on the natural world" (16), his "[procession] toward his announced goal of the conquest of nature" (83), his tearing of "the earth's green mantle" (64).

Her working titles for *Silent Spring* demonstrate that she wanted to bring out the theme of man's relentless struggle to subdue nature more than she did. At various stages of the writing process Carson wanted to call her book "Control of Nature" and "Man against the Earth."³⁸ And she indicts the dictatorial nature of science and its star chamber of practitioners who make decisions that effect everyone, destroying a part of the world without consent. Someone had appointed himself God. "Who has made the decision that sets in motion these chains of poisonings, this ever-widening wave of death that spreads out, like ripples when a pebble is dropped into a still pond?" She asked: "Who has decided—who has the *right* to decide—for the countless legions of people who were not consulted that the supreme value is a world without insects, even though it be also a sterile world ungraced by the curving wing of a bird in flight? The decision is that of the authoritarian . . . ; he has made it during a moment of inattention by millions to whom beauty and the ordered world of nature still have a meaning that is deep and imperative" (119). "Man with a spray gun" is a phrase Carson employs to describe the militaristic fervor with which pesticide users have carried out their project to eradicate all insects. This "man with a spray gun" has ignored the bal-

ance of nature, destroying as pests insects which preyed on insects even more destructive to the sculpted environment of humans. There are laws more fundamental than Bacon's and Newton's. Carson argued that "[t]he balance of nature . . . is a complex, precise, and highly integrated system of relationships between living things which cannot safely be ignored any more than the law of gravity can be defied with impunity by a man perched on the edge of a cliff. . . . Man, too, is part of this balance" (218).

Carson was not, of course, the first to argue that humans should attend more carefully to ecological equilibrium. But in a way more pointed than anyone before her she identified the most profound consequence of humanity's tampering with this balance: *humans themselves*. For Carson, one of the most disturbing aspects of the chemical world of the postwar era was how it had compromised future generations. "Chemicals occur in the mother's milk and probably in the tissues of the unborn child" (24), she wrote. We had engaged in an experiment with no control group, Carson worried, a terribly dangerous game. The illusion that human beings, by virtue of their power to manipulate nature, were immune to the diffusion of toxins into the environment was no longer tenable after *Silent Spring*.

CODA

The controversy stirred up by *Silent Spring* continues to this day. A presidential commission and congressional investigation into the dangers posed by pesticides led to stricter guidelines about the testing, labeling, and application of pesticides. The road from *Silent Spring* led directly to the creation of the Environmental Protection Agency. In the years since the publication of *Silent Spring*, other scientists have largely corroborated Carson's assertions about the damage chemical pesticides do to the environment.³⁹ In spite of this, the addiction of the industrialized world and, increasingly, the developing world, to powerful poisons for eradicating the "pests" that feast on the vast acreages of industrial monoculture is as strong as ever. Perhaps even more troubling has been the ever-growing acceptance of genetically engineered agricultural products, many of which are genetically engineered to resist herbicides. The continued complication of agriculture makes the production of food increasingly reliant on corporate in-

terests, whose primary interest, of course, is profit. Although some writers have read Carson as ignoring this element of the pesticide problem, they have overlooked several searing indictments of corporate greed. "[This] is . . . an era dominated by industry," Carson wrote in the second chapter of *Silent Spring*, "in which the right to make a dollar at whatever cost is seldom challenged. When the public protests, confronted with some obvious evidence of damaging results of pesticide applications, it is fed little tranquilizing pills of half truth" (23).

Another kind of opiate for the masses perhaps? Despite the initial uproar over pesticides there was a marked decline of the general public's interest in the issue by 1965.⁴⁰ Environmental activists kept the issue on the table but attention soon shifted to other social problems: student unrest, the Vietnam War, racial tensions. Although chemical pollution of the environment remained (and remains) a very serious problem, the loudest advocates of curtailing the use of pesticides were, ironically, the much disparaged "food faddists," organic gardeners and farmers, and grassroots activists whose own lives had been directly affected by environmental toxins.⁴¹

"Have we fallen into a mesmerized state that makes us accept as inevitable that which is inferior or detrimental, as though having lost the will or the vision to demand that which is good?" (22), Rachel Carson asked in 1962. When her predictions of the power of environmental toxins to alter human germ plasm and in some cases disrupt human reproductive capacities have come true, and yet the general public seems largely unconcerned, one has to wonder about the extent of mesmerism. In *Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival?* Theo Colburn, Dianne Dumanoski, and John Peterson Myers document just how chlorine-based synthetic chemicals cause serious reproductive problems in both animals and humans.⁴² But the book made much less of a splash than *Silent Spring*, in part because the public relations efforts of the chemical industry worked to undermine the credibility of the book even before it reached the bookstores. The stakes were even higher for the industry this time around because Colborn and her collaborators focused on the way environmental toxins victimized women and children, both already represented by powerful activist organizations. "No definitive proof!" cried the chemical industry and agribusiness, and

that seems to have placated all but the most determined critics in the booming 1990s' economy.⁴³

And so it seems we have not learned the moral of Rachel Carson's "Fable for Tomorrow," her story about a world with no bird songs, no edible fish, and poisoned people that opened *Silent Spring*. The alternative science, with its view toward maintaining a balanced relationship between humans and their environment that she and a minority of others have advocated, languishes on the fringe of the scientific and cultural discourse. Sandra Harding has argued that a feminist critique of science must have as its agenda the illumination of both science's progressive and regressive tendencies, of science's inherently political nature, of science as a social process. Only after such exposure might it be possible "to use for liberating ends sciences that are apparently so intimately involved in Western, bourgeois, and masculine projects."⁴⁴ Rachel Carson would not have assessed Western science in so many words, but her indictments in *Silent Spring* most certainly served to illuminate these dimensions of science. Without discarding science's benefits to humanity Carson shook her finger at the careless, regressive path science had taken with regard to pesticides. With its call to action *Silent Spring* was a political statement and its very publication expressed the sentiment that science is a social process.

The indignation that greeted the publication of *Silent Spring* and subsequent critiques of chemical damage to the environment, the campaign that has so successfully painted them as emanations from the radical fringe of society, is not merely about good science versus bad science. The origins of the debate lie with morality, in questions about how to define moral responsibility: moral science versus immoral science. Carson believed that humankind's rigid, impatient attempt to order the natural world constituted an abrogation of moral responsibility to both the human community and the rest of the natural world. "Through all these new, imaginative, and creative approaches to the problem of sharing our earth with other creatures there runs a constant theme" (261), Rachel Carson wrote in *Silent Spring*. And only when we revere all life, develop a science that embraces accommodation rather than conquest, will we evolve beyond that "Neanderthal age of biology," and its attendant equivocating morality.

NOTES

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1. See Linda Lear, "Bombshell in Beltsville: The USDA and the Challenge of *Silent Spring*," *Agricultural History* 66 (spring 1992): 152; and Paul Brooks, *The House of Life: Rachel Carson at Work* (Boston: Houghton Mifflin, 1972), 293, for these comparisons.
2. See Ralph Lutts, "Chemical Fallout: Rachel Carson's *Silent Spring*, Radioactive Fallout, and the Environmental Movement," *Environmental Review* 9 (fall 1985): 211-25.
3. See John Stauber and Sheldon Rampton, *Toxic Waste Is Good for You! Lies, Damn Lies, and the Public Relations Industry* (Monroe, Maine: Common Courage Press, 1995), 123-27.
4. See, for example, Lear's "Bombshell in Beltsville," 151-71, and her *Rachel Carson: Witness for Nature* (New York: Henry Holt, 1997), 396-456; Frank Graham, *Since Silent Spring* (Boston: Houghton Mifflin, 1970), 48-81; and Brooks, 293-307.
5. In this context my use of *ad hominem* is especially apt. *Ad hominem*, literally meaning "to the man," is significant because in many instances, as we shall see, Carson was attacked precisely because she was *not* a man, did not subscribe to a rational "masculine" vision of dominion over nature. Linda Lear's new biography of Carson does address the gender issue (428-41) but in a less systematic way than this article does.
6. Feminist philosophers and historians of science have produced much rich scholarship exploring the cultural construction of Western science. The orientation of this article was heavily influenced by Sandra G. Harding's *The Science Question in Feminism* (Ithaca, N.Y.: Cornell University Press, 1986), and *Whose Science? Whose Knowledge: Thinking from Women's Lives* (Ithaca, N.Y.: Cornell University Press, 1991); and Evelyn Fox Keller's *Reflections on Gender and Science* (New Haven: Yale University Press, 1985). See also Eileen M. Byrne, *Women and Science: The Snark Syndrome* (London: Fulmer Press, 1993), esp. 48-87.
7. Although Carson's position as an independent scholar in 1962 was largely voluntary, she, like hundreds of women like her, had encountered barriers to advancement in both government service and higher education her entire career. See Lear, *Rachel Carson*, 54-198. On the discrimination against women scientists generally in this period and earlier, see Margaret Rossiter, *Women Scientists in America: Before Affirmative Action, 1940-1972* (Baltimore: Johns Hopkins University Press, 1995). The quotation is from xviii.
8. Carson's *The Sea around Us* (1951) and *The Edge of the Sea* (1955) were viewed as the musings of a nature writer rather than emanating from the research of a marine biologist, a reaction which reflects the prevailing attitude among many scientists that popularized science equals watered-down science and that natural history is inferior to physical science.
9. See Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: Harper & Row, 1980).
10. Ecofeminism emerged with the publication of Rosemary Radford Ruether's *New Woman/New Earth: Sexist Ideologies and Human Liberation* (New York: Seabury Press, 1975). For the theoretical foundations of ecofeminism, see Carolyn Merchant, "Ecofeminism and Feminist Theory," in *Reweaving the World: The Emergence of Ecofeminism*, ed. Irene Diamond and Gloria F. Orenstein (San Francisco: Sierra Club Books, 1990). Perhaps the best treatise on ecofeminism is Maria Mies and Vandana Shiva, *Ecofeminism* (Halifax, Nova Scotia: Fernwood, 1993). See also Vera Norwood, *Made from This Earth: American Women and Nature* (Chapel Hill: University of North Carolina Press, 1993), 261-84. The essentialization of women in their stewardship of the environment is hotly

debated even within the feminist community. See, for example, Cecile Jackson, "Radical Environmental Myths: A Gender Perspective," *New Left Review*, no. 210 (March/April 1995): 124-40.

11. For Carson's influence on women in the environmental movement, see Carolyn Merchant, *Earthcare: Women and the Environment* (New York: Routledge, 1995). On the role of women in the environmental movement, see Mary Joy Broton, *Women Pioneers for the Environment* (Boston: Northeastern University Press, 1998).

12. Stauber and Rampton, 123-27.

13. Lewis A. McLean, General Counsel, Volsicol Chemical Corporation to Houghton Mifflin, 2 Aug. 1962, quoted in Graham, 49.

14. In this context, David F. Noble's analysis of the persistence of the clerical "mantel" of science with its roots in the exclusively masculine world of medieval science is illuminating. See his *A World without Women: The Christian Clerical Culture of Western Science* (New York: Knopf, 1992).

15. William Darby, "Silence, Miss Carson!" *Chemical and Engineering News* 40 (1 Oct. 1962): 60, 60-62.

16. See *Chemical and Engineering News*, 40 (22 Oct. 1962): 5, and (5 Nov. 1962): 4-5. Among the comments in letters to the editor: Ellie A. Shneour wrote, "the most irresponsible review that I have ever seen"; Frank A. Meier wrote, "both the title and the review portray an attitude ill becoming a scientist"; and Robert J. Good wrote, "Instead of [a] positive type of response to Miss Carson, *C&EN* and Dr. Darby have reacted like a cigarette company executive when somebody asks if smoking causes lung cancer." This last remark is an ironic and fascinating comparison in light of the recent demise of corporate tobacco. Another trade journal, *Chemical Week*, published a critical report of *Silent Spring* and also received letters supporting Carson. See *Chemical Week* 91 (3 Nov. 1962): 7, and (27 Oct. 1962): 7.

17. Frederick J. Stare, "Some Comments on *Silent Spring*," *Nutrition Reviews* 21 (January 1963): 1, 4.

18. I.L. Baldwin, "Chemicals and Pests," *Science* 137 (28 Sept. 1962): 1043.

19. Thomas H. Jukes, "People and Pesticides," *American Scientist* 51 (September 1963): 355-61.

20. Baldwin, 1043.

21. LaMont C. Cole, *Scientific American*, no. 207 (December 1962): 176.

22. Editorial, *New York Times*, 2 July 1962, 28.

23. "In the Mail," the *New Yorker* 71 (20 and 27 Feb. 1995): 18. As part of its seventieth anniversary issue, the *New Yorker* reprinted a number of letters.

24. "The Price for Progress," *Time* 80 (28 Sept. 1962): 45-48. This article goes on to describe how modern large-scale agriculture was actually part of the problem: the scale and variety of pre-industrial agriculture diminished the damage insects could do. Of interest given the context of this paper: this critique of *Silent Spring* ran in the "science" section of the magazine; immediately following the savaging of the book was a story about the "new heroes of the space program," the "handsome men" of the Apollo program.

25. "Rebuttal to Miss Carson," *America* 107 (27 Oct. 1962): 944.

26. Gordon Tallock, "Of Mites and Men," *National Review* 13 (20 Nov. 1962): 398-99. This was the only review that honored Carson with a "Dr." before her name. Although Carson, for financial reasons, never did complete her doctorate, she did receive several honorary doctorates. Although reviewers used "Miss" in keeping with contemporary stylistic convention, many seemed to use it as an epithet as they gleefully castigated her for not being scientific enough.

27. "Hiss of Doom?" *Newsweek* 60 (6 Aug. 1962): 55.

28. "Every Man His Own Borgia?" *The Economist* 105 (20 Oct. 1962): 248.

29. "The Gentle Storm Center," *Life* 53 (12 Oct. 1962): 105-10.

30. This connection of Carson to children was not limited to photographs. Even in

reviews critical of *Silent Spring*, writers praised her earlier books on the sea for their ability to tap into a childlike sense of wonder. Such descriptions of the ocean, even scrupulously scientific ones, were not threatening, more like bedtime stories than nightmarish social criticism.

31. Edwin Diamond, "The Myth of the 'Pesticide Menace,'" *Saturday Evening Post* 236 (28 Sept. 1963): 16-18. Given the theme of this article, I was acutely sensitive to the depiction of women as I conducted my research. The cover of this issue of the *Saturday Evening Post* featured a picture of Vietnam's Madame Nhu and the headline: "The Ruthless Beauty Who Helped Provoke the Violence." This was the cultural context in which *Silent Spring* was so hotly debated.

32. Virginia Kraft, "Life-Giving Spray," *Sports Illustrated* 19 (18 Nov. 1963): 22-25.

33. C.G. King, quoted in "Silent Spring on the Pacific Slope: A Postscript to Rachel Carson," *Atlantic Monthly* 212 (July 1963): 81.

34. Robert H. White-Stevens, Address to the Synthetic Organic Chemical Manufacturers Association, April 1963, quoted in "Silent Spring on the Pacific Slope," 82. For descriptions of Dr. White-Stevens's behavior during the debates over pesticides and *Silent Spring*, see Lear, *Rachel Carson*, 437-40.

35. "If You Didn't Have Poison Sprays," *U.S. News and World Report* 54 (3 June 1963): 74-75.

36. See Yaakov Garb, "The Politics of Nature in Rachel Carson's *Silent Spring*," in *Minding Nature: The Philosophers of Ecology*, ed. David Macauley (New York: Guilford Press, 1996), 238, 229-56. Lewis Herber [Murray Bookchin], *Our Synthetic Environment* (New York: Knopf, 1962). There is nothing particularly original about Garb's assertion that nature is a cultural construction. See, for example, William Cronon, ed., *Uncommon Ground: Rethinking the Human Place in Nature* (New York: Norton, 1995).

37. Rachel Carson, *Silent Spring* (New York: Fawcett, 1962), 14. Subsequent references will be cited in parentheses in the text. Carson's exoneration of "witchcraft" in this passage connects her more closely to Carolyn Merchant and other ecofeminists than a casual reading might reveal. Merchant goes to great lengths to show how "witchcraft" was really the persistence of premodern relationships with nature. The persecution of "witches" during the fifteenth through seventeenth centuries was part of the attempt to reconstruct nature and eradicate the organic world that existed before the scientific revolution. See *The Death of Nature*, chap. 4.

38. Graham, 21, 25.

39. On *Silent Spring*'s regulatory legacy, see Graham, 266-71; and, especially, H. Patricia Hynes, *The Recurring Silent Spring* (New York: Pergamon Press, 1989). See also Kirkpatrick Sale, *The Green Revolution: The American Environmental Movement, 1962-1992* (New York: Hill & Wang, 1997), 3-28; and Samuel P. Hayes, *Beauty, Health, Permanence: Environmental Politics in the United States, 1955-1985* (New York: Cambridge University Press, 1987), 177-206.

40. One can get a sense of this by perusing the *Reader's Guide to Periodical Literature* and newspaper indexes from 1962 to 1968. The entries under the heading "Pesticides" occupied three columns of copy from 1962 to 1963—by 1965, half a column.

41. See H. Patricia Hynes, "Ellen Swallow, Lois Gibbs, and Rachel Carson: Catalysts of the American Environmental Movement," *Women's International Forum* 8 (1985): 291-98; and Merchant, *Earthcare*, 139-66.

42. See Theo Colburn, Dianne Dumanoski, and John Peterson Myers, *Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival?* (New York: Dutton, 1995).

43. See David Helvar, "Poison Pens," *Sierra* 58 (January/February 1997): 31-37.

44. Harding, *Whose Science? Whose Knowledge?* 1-15.