Rhetoric and Response: The Cultural Impact of Rachel Carson's *Silent Spring*

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Rachel Carson's 1962 *Silent Spring* is one of the most famous books of the twentieth century and one of the most politically and culturally influential in American history. Often compared to the nineteenth century anti-slavery novel *Uncle Tom's Cabin,* which strengthened support for abolition, *Silent Spring* contributed to a new cultural understanding of the human place in the natural world as well as policies to clean up the environment.[1] Rachel Carson therefore deserves credit for being the godmother of the Environmental Protection Agency, the ban on DDT and other pesticides, Earth Day, the 1972 Federal Insecticide, Fungicide, and Rodenticide Act, and indeed of "Environmentalism" as a philosophy and political movement.

Due to her pivotal political and cultural role, the historiography on Rachel Carson and her work is both broad and deep.[2] The dominant interpretation in these works is that Carson and *Silent Spring* were monumentally influential, despite the onslaught of criticism from the chemical industry and groups within the government. On the face of it, there seems little new to say about Carson or her book. And, yet, there are apparent contradictions between the narrative about the effects of *Silent Spring* and environmental developments in the past forty-five years. DDT and other potent pesticides have been banned, but overall reliance on pesticides increased after 1962, with farm use doubling by 1994.[3] Why did American farmers, corporations, regulators, and consumers continue down one environmental road and not another? Of course there are different answers to this complex question. Political scientist Christopher Bosso, for example, argues that political and economic imperatives encouraged the trend.[4] Whatever the pressures that helped shape agricultural choices in the late 20th century, continuing reliance on pesticides begs the question of whether or not most Americans understood the broader implications of Carson's study. Moreover, it prompts the counterintuitive question of not why was the impact of *Silent Spring* so great, but why was it *so limited*?

The most revolutionary aspect of Rachel Carson's argument was her challenge to readers to understand that they were part of the "balance of nature," and that the delicate interweaving of life on earth was under assault from the arrogant assumption that humans could manipulate the natural world. In particular, she turned her attention to the cavalier use of pesticides, heedless of any consequences. Carson's framework was not completely new. Indeed, others had raised these questions as part of a backlash against the technocratic confidence of the early Cold War.[5] Carson's synthesis, though, was uniquely accessible, and served as a cultural touchstone. The subsequent wide acceptance

of the balance-of-nature formulation was borne out in the birth of environmentalism and in more than a generation of reform. This impact was *not* limited, but great and fundamental.

If we ask, though, whether Carson achieved all that she intended or whether the embrace of a balance-of-nature ideal determined the direction of environmental politics and the scale of pesticide use, the answer would have to be *no*. The following discussion will examine why we can read the impact of *Silent Spring* as *both* a triumph and a disappointment, and focus on the two key reasons for this seeming contradiction. First, the rhetorical strategies used by Carson, as well as her supporters, opponents, and the press highlighted the conservative aspects of her argument and thus made those aspects a safer fallback position from overly radical change. Second, the pesticide status quo was powerful enough to adapt to and co-opt critiques, but still withstand their challenges. Ultimately, then, this is a story of frustration and why the political and economic reality following *Silent Spring* did not match its philosophical ideal.

In order to understand the explosive impact of *Silent Spring*, it is important to consider the social and political context in which it was published. The introduction of the pesticide DDT toward the end of World War II had been greeted as a miracle, saving troops and civilians from the ravages of typhus, malaria, and lice. Once the war was over, many farmers, policymakers, and ordinary Americans looked to the new classes of synthetic chemical pesticides (chlorinated hydrocarbons and organophosphates) as the saviors of postwar agriculture.[6] Along with the introduction of new farm technologies, widespread rural electrification, and new fertilizers, chemical pesticides boosted yields greatly, while the press helped to stoke popular appreciation of this transformation.[7]

Yet, by the late 1950s, the honeymoon glow with synthetic pesticides was starting to fade. In 1957, the U.S. Department of Agriculture in its supreme confidence in the efficacy of synthetic pesticides launched two massive programs to "eradicate" the imported fire ant in the Southeast and the gypsy moth in the Midwest and Northeast. DDT suspended in oil would be sprayed against the gypsy moth, and granulated dieldrin and heptachlor (more toxic than DDT) would be aerially spread in the South. Soon after the start of the fire ant campaign, large fish kills, and deaths of birds and other wildlife brought protests by farmers and conservationists.[8] Meanwhile, in May 1958 on Long Island, New York, a group of residents led by ornithologist Robert Cushman Murphy brought suit to try and halt spraying against the gypsy moth. These two programs created such a backlash against the existing pesticide regime they were what Bosso dubbed "its eventual Waterloo."[9] Although still limited in scope, there were mounting public and scientific protests in 1957 and 1958 against the broadcast spraying of dangerous poisons and one more event added to the poor publicity for pesticides. Shortly before Thanksgiving in 1959, the carcinogenic herbicide Aminotriazole was found to have been sprayed on cranberry bogs just

before harvest and some sprayed crops had been shipped to market. Wide publicity and fearful public boycotts of cranberries followed the revelations. Readers and the press were thus well primed for Rachel Carson's study three years later.

Discussion of *Silent Spring* must begin with the understanding that its message was discursively constructed not only by Carson, but also by its defenders and critics. The bulk of scholarship on Rachel Carson has sought to explain the complete argument that lies within its covers and the political movement it spawned. Some more recent studies, such as those by Craig Waddell, Gary Kroll, and Priscilla Coit Murphy, have focused on the rhetoric of Rachel Carson's work, whose meaning was established through the media and audience reactions.[10] For example, both Kroll and Murphy highlight the differences of the serialization of Carson's work in the *New Yorker* in June 1962 and the complete book published by Houghton Mifflin three months later. The structure of the argument was different in those venues, as was the intended audience of the urban elite magazine and the nationally published Book-of-the-Month Club selection. (Kroll adds a discussion of how the framing of the argument to viewers of a *CBS Reports* broadcast on Carson in June 1963 differed once again.) Interestingly, the two authors disagree on the meaning of the *New Yorker* serialization: Kroll maintains that the argument was conservative as it focused on pesticide effects on humans not on the centrality of the balance of nature, whereas Murphy argues that since many cautions and sources were left out of the serialization, it could have been read as a radical statement calling for the complete ban of all pesticides. As the following discussion will demonstrate, the conflicting interpretations of these two authors makes sense as we uncover the multiple impacts of *Silent Spring*.

All would agree that press attention to Carson's work on pesticides began in the summer of 1962 with the *New Yorker's* three-part excerpt from the forthcoming book. By the middle of August 1962, numerous editorials, news stories, columns, and letters to the editor had been published referring to or discussing the articles. Three members of congress and one senator had read selections from the articles into the congressional record, while Carson had received more than 400 fan letters. By the official publication date at the end of September, the numbers of news stories, columns, and editorials had grown extensively, and letters to the editor were so numerous that Carson's agent had stopped keeping track of them.[11] The book quickly became a bestseller throughout the country and in England, and remained on the bestseller lists into 1963.[12] It was selected by the Book-of-the-Month club in October 1962, and was soon translated into all languages in the industrialized world.[13] The majority of the press stories first on the *New Yorker* articles and then on the book itself were overwhelmingly positive, even if some were more enthusiastic and some more cautious.

A number of clear themes emerged in the articles and columns about

Silent Spring. Both supporters and critics addressed the question of Rachel Carson's qualifications and approach to the subject. Those who celebrated her analysis called her "a realist," a "trained biologist," "thoroughly scientific," and concluded that there was no doubt about her qualifications.[14] Some reviews or articles noted that Carson thoroughly documented her study. [15] Those who longed for sober judgments wanted it to be clear that they, too, were scientific. As one journalist who gave reserved support for Carson's argument concluded, "I am not an alarmist…But I am concerned [about pesticide use]."[16]

Not surprisingly, critics, especially those from the chemical industry, challenged Carson's qualifications as well as her objectivity. As Carson's editor at Houghton Mifflin Paul Brooks observed, "the industry spent enormous sums to ridicule both the book and its author."[17] Carson was painted as an "alarmist," "hysterical," emotional, and as someone who "just doesn't know what she is talking about."[18] She was described as the antithesis of a scientist. For example, she was dismissed as one who "disregard[ed] the rubrics of evidence."[19] Letters to the editor critical of *Silent Spring* came to similar conclusions about Carson's qualifications.[20] Those who agreed with Carson were sometimes derisively referred to as "disciples," seemingly, having a religious, irrational devotion to the writer.[21]

Supporters of Carson saw the charge that she lacked objectivity as an illegitimate criticism. As good friend and fellow environmentalist Irston Barnes wrote in a September 1962 newspaper column, the facts must speak for themselves; a scientist could not "give two sides to the law of gravity."[22] William Shawn, editor of the *New Yorker,* had earlier told his prospective contributor that she should let her research and argument speak. "After all," he said, "there are some things one doesn't have to be objective and unbiased about – one doesn't condone murder!"[23] Thus, argued her defenders, a fair, scientific consideration of the evidence did not mean that one could not draw conclusions from that evidence.

It is not surprising that critics of *Silent Spring* would want to paint Carson as an unscientific crusader. And it is probable that some of her partisans saw her in a heroic, passionate light. For example, the assistant to the president of the National Audubon Society who wrote to Carson in 1963 congratulating her on the Wildlife Society Award observed that "All beleaguered wildlifers who have been fighting the pesticides battle see in you, I think, a new embodiment of Jeanne d'Arc."[24] This trend increased after 1964. Since her untimely death, the construction of Rachel Carson as an iconic saint was endemic in both the communities of environmental activists and historians.[25]

Carson, though, as well has her agent and publisher, was determined that she not be dismissed as part of an unscientific environmental fringe. Agent Marie Rodell, anticipating attacks on Carson as a "crackpot and subversive," believed that if prior to publication many "highly respectable people…had read

the book and discussed it [it] would be an enormous help." Consequently, Rodell sent out advanced proofs to numerous scientific experts and social leaders, and planned at least one high profile luncheon with Carson presenting her research.[26] The publisher of *Silent Spring*, Houghton Mifflin, was also determined to place the book in the mainstream debate. Advertisements, for example, included extensive endorsements from scientific experts and effusive praise from Supreme Court Justice William O. Douglas who called the book "(t)he most important chronicle in this century for the human race."[27]

Carson, too, wanted to ensure that she was depicted as a sober scientist. For example, in an interview shortly after the book's publication, she told a writer for the *Saturday Review* why she was not inclined to grant many interviews: "I don't want to make this a Carrie Nation crusade. As I see it, my job was to present the facts. Now it's up to the public."[28] In her many responses to critics, Carson kept her arguments moderate and rational. For example in a January 1963 speech, she told her audience that one reason pesticides were undesirable was that they were inefficient. She explained that crop losses to insects before DDT had been ten percent, while after they were twenty-five percent.[29] As scholar Peter McCord observed, Carson "walked a tightrope, trying to appeal to the sentimentality of the public while at the same time maintaining her authority as a rational scientific researcher."[30]

From her background, Carson might be seen as an unlikely crusader.[31] She was born in 1907 outside of Pittsburgh into a poor family of Scots-Irish ancestry. From early on, she spent much time outdoors learning about nature and writing. Following completion of a baccalaureate degree in biology and a Masters degree in zoology, she joined the U.S. Fish and Wildlife Service as a biologist and writer. During her sixteen years of government service, Carson launched her career as a popular science writer. Her success was ensured in 1950 with the smash bestseller *The Sea Around Us*, which became a Book-of-the-Month club selection. Becoming what biographer Linda Lear described as "an overnight literary sensation," Carson captivated readers with her synthetic, poetic tale of the history and life of the sea.[32] Following this success, her 1941 book *Under the Sea Wind* also emerged as a bestseller upon reissue, and she completed her trio of books on the sea with *The Edge of the Sea* in 1955. Thus, by the time of *Silent Spring* in 1962, Carson was a highly respected popular writer, well known to the reading public as well as to naturalists and government scientists.

Although Carson spent the early part of her writing career focusing on the sea, she had long been interested in pesticides and their effects on nature. Upon reading and editing reports on the effects of DDT from biologists in the Fish and Wildlife division in 1945, she proposed an article on the subject to *Reader's Digest* – though she was turned down. Also in 1945, other scientists were speaking out about the dangers of the new miracle pesticide; critical articles on DDT – although drowned out by the loud chorus of pesticide boosters –

appeared in *Harper's*, *The New Yorker*, *Atlantic Monthly*, and *Time*.[33] Carson focused again on the subject of pesticides in 1957 with the controversies over the USDA's fire ant and gypsy moth programmes. She was joined by some in the press and public who decried these ill-considered campaigns, though few questioned the necessity of pesticide use. The real issue, that seems to have piqued public concern at this time was the overly ambitious, expensive, and ineffective government campaigns, which were based on the overuse – often sprayed on wide swaths of land – of persistent chemical pesticides. The Aminotriazole cranberry scandal in 1959 further inflamed public and press alarm about pesticide use. That same year, *Reader's Digest*, which had previously turned down Carson's idea for an article on the dangers of pesticides, published a critical article on the issue.[34]

Rachel Carson became increasingly concerned about pesticide use in general, contracting in 1958 with Houghton Mifflin to write a book on the subject, and committing to a three-part series in the *New Yorker*.[35] Carson, had become a pioneering voice against many pesticide uses, but she was in good company, writing at a time when scientists had discussed the dangers of pesticides, and when the public was sensitized to the controversy. By 1962, the message of *Silent Spring* was not wholly unfamiliar, but the book's comprehensiveness and lyrical presentation gave it a unique power for the general audience. As *Consumer Reports* observed in January 1963,

> There was little that was new in Miss Carson's book. But heretofore, most of the critical material had been scattered through pamphlets, survey reports, speeches by technicians, and scientific and statistical tracts…Until "Silent Spring"…mounting concern…was uneasily contained within the ranks of a particular business-scientific-governmental community.[36]

Most scholars who have written about the impact of *Silent Spring* would not disagree with this assessment, but it has most often been overshadowed by the dominant narrative that Rachel Carson's message was revolutionary and unprecedented, changing ideas about the landscape and the human place in nature.

Unquestionably, Carson's ability to synthesize a vast body of scientific and technical information was impressive. It also led some contemporary observers to grapple with her sex. As historians have discussed in a number of contexts, most contemporaries viewed Carson and her controversial book through a gendered lens. Carson was painted as an emotional woman, romanticizing nature, not truly understanding the reality of the insect threat.[37] As Michael Smith observed, Carson's critics chided her "soft approach" to the natural world as decidedly sentimental and unscientific.[38] Along with her critics, many in the sympathetic press judged Carson's credentials in this way, highlighting her femininity. For example, one article observed in early 1963 that Carson was "a gentle little woman, too shy to answer questions after she talked about

her book." Many other articles commented on Carson's femininity and delicacy.[39]

Although observers might have attempted to use a gendered discourse either to denigrate or at least interpret *Silent Spring*, Rachel Carson's carefully structured argument proved to be more powerful. Her strategy to maintain a moderate voice, both in the text and publicity, paid off. A few months after its publication, one newspaper observed that *Silent Spring* had inaugurated a mainstream public debate over chemical pesticides, whereas not long ago this had taken place only on the fringe (e.g., among organic gardeners, environmentalists, and natural food proponents). The paper dismissed the impact and sobriety of these groups: "They may have preached and screamed, but their voices were small."[40] Another article from a Massachusetts newspaper noted with approval that Carson was part of the mainstream and did not use evidence from environmentalists. She did not, they noted, quote from any "bio-dynamic organizations, the organic gardeners or the natural food associations. Instead her facts are gathered from such sober documents as medical journals, Audubon Society bulletins, fish and game journals, and, of course, the U.S. Department of Agriculture farmers' bulletins."[41]

Carson's sober argument, based on mainstream sources remainedSa passionate. Notwithstanding Carson's public comments, she was of course a crusader, albeit a scientific and thoughtful one. She wrote to her friend Dorothy Freeman in June 1962 with "deep satisfaction" about the news that *Silent Spring* had been selected as Book-of-the-Month for October, which would give the book "an irresistible initial momentum. And the BOM will carry it to farms and hamlets all over the country that don't know what a bookstore looks like – much less the *New Yorker*."[42] She was clearly eager to make sure that the message in *Silent Spring* would influence people's opinions.

Beyond the question of Rachel Carson's scientific credentials and motivations, the most prominent theme in the articles on *Silent Spring* was the reassurance that Carson was not calling for the cessation of all pesticide use. For example, in September 1962, Brooks Atkinson noted in the *New York Times* that "Miss Carson understands that chemical sprays are a permanent part of technology."[43] Similarly, other reviews observed, "she was not advocating the overnight abolition of all chemical pesticides," ..She does not suggest that we suddenly stop using all pesticides (and) she does not suggest that modern pest control be abandoned."[44] Letters to the editor also highlighted the point that *Silent Spring* did not call for the abandonment of all chemical pesticides.[45]

Instead, the most important recommendation in *Silent Spring*, according to the many articles that praised the book, was to curb the "misuse," "indiscriminate," "irresponsible," and "over" use of pesticides.[46] One editorial agreed with Carson's apparent call to curb only the "promiscuous use of pesticides," and further explained that the public agreed: "The growing public demand is…for greater caution, stricter regulation."[47] Most importantly, the press, both

favourable and critical of *Silent Spring,* used the language of Carson's book as well as her own interviews to answer charges against her. For example, one newspaper article quoted Carson asserting "she's rapidly getting tired of explaining for the zillionth time that she does not want to stop the use of all pesticides."[48]

In favorable reviews, the most widely quoted passage from *Silent Spring* highlighted this theme of reasonable moderation in the face of irresponsible excesses:

> It is not my contention that chemical insecticides must never be used. I do contend that we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons largely or wholly ignorant of their potentials for harm. We have subjected enormous numbers of people to contact with these poisons, without their consent and often without their knowledge. If the Bill of Rights contains no guarantee that a citizen shall be secure against lethal poisons distributed whether by private individuals or by public officials, it is surely because our forefathers, despite their considerable wisdom and foresight, could conceive of no such problem.[49]

Moreover, Carson's straightforward charge that individuals deserve to be protected against poison was beyond challenge.

A fourth theme emerged in the public and press reaction to *Silent Spring*: a new environmental outlook. This nascent environmentalism reflected Rachel Carson's own intention. In the *New York Times,* Brooks Atkinson's review of the *New Yorker* articles gave voice to this outlook: "The basic fallacy – or perhaps the original sin – is the assumption that man can control nature. Nature returns with a massive assault from an unexpected quarter….Miss Carson's articles…prove the case for ecology, which is also the case for mankind."[50] Another review simply concluded that "you can't tamper too much with nature and get away with it."[51] Outside of the press, policymakers who supported *Silent Spring* also focused on the idea of respecting nature's own systems. For example, in the dedication of a new wildlife lab devoted to the effects of pesticides on the environment, Secretary of the Interior Stewart Udall told his listeners in April 1963 that Rachel Carson "has reminded us with compelling urgency that Man is part of the balance of nature."[52]

A contrasting fifth theme was interwoven in the press and public debate about *Silent Spring:* the extent to which efficient, modern agriculture was synonymous with the use of pesticides. There were a number of articles that focused on the *necessity* of using pesticides. As a scientist from St Louis observed in South Bend's *Tribune* in the summer of 1963: "Any reduction in the use of chemical weed killers might tip the balance toward starvation for many people."[53] Also that month, a West Virginia newspaper agreed that pesticides were needed in the "never-ending battle against insects, plant diseases, and

rodents."[54] There were also dire predictions in the press; for example, the *Shreveport Times* in September 1962 said, "The human race could wither and die without pesticides – for lack of food."[55] Underlying these assessments was the assumption that the human relationship with insects was a constant battle.[56]

While many observers agreed that pesticides' initial triumph over insects was partly responsible for the dramatic increases in postwar agricultural output, the shrill warnings that starvation loomed if the chemicals were not used seemed unwarranted at a time of unprecedented consumption. It was unlikely that the dire predictions of catastrophe stemmed from actual fears for American survival. *Silent Spring* was published at a time when faith in technology was at its height and confidence in human ability to control nature was solid. Thus, by challenging current pesticide practices, *Silent Spring* appeared to challenge the ideology of progress and modernity of which modern agriculture was one small representative.

Importantly, and perhaps surprisingly, this central theme in the critical press, that pesticides were necessary and emblematic of modernity, did *not* contradict a central theme of the supportive articles that held that Carson was not calling for the banning of all pesticides. Thus, many could embrace *aspects* of Rachel Carson's message and still believe that some pesticide use was necessary. The pivotal cautionary section in Carson's book and the defense she offered in interviews was a moderate fallback position, a contrast to the radical questioning of modern technology and industrial agriculture.

Articles that stressed the centrality of pesticides to modern agriculture closely reflected and quoted extensively from industry or government arguments. A number of scholars, such as Linda Lear and Christopher Bosso, have examined the industry and government responses (especially from the USDA and congressional supporters of the farm bloc) to *Silent Spring*.[57] It is worth reviewing the main themes of those responses in the context of public discussion of the book. Indeed, one of the chief criticisms lodged from the pesticide industry and its government supporters against *Silent Spring* was that modern agriculture *depended* on these newly synthesized chemicals. For example, Thomas Harris of the USDA Pesticide Division was quoted in an Associated Press article from September 1962 charging that Carson "fails to point out the vital need of continuing to use these materials."[58] Similarly, a representative from the chemical company Rohm and Haas pointed out that pesticides were a necessity since a third of productive potential was lost each year due to pests.[59] One prominent opponent, Dr. William Darby, a biochemist from Vanderbilt University, broadened these views. He argued that following the recommendations of Carson would lead to "the end of all human progress."[60] Another criticism from industry that made its way into many articles and reviews on the book was that people confronted worse hazards than pesticides. This point was most commonly made by noting that more people died each year from aspirin and bee stings than from

pesticides.[61]

The most visible critic of *Silent Spring* was industry spokesman Dr. Robert White-Stevens, who was Assistant to the Manager of Research and Development in the agricultural division of American Cyanamide Co. As the representative of the pesticide industry, he was tapped by CBS to debate Carson in a *CBS Reports* programme in April 1963. On the programme, he charged that following Carson's prescriptions would return humans to "the Dark Ages, and the insects and diseases and vermin would once again inherit the earth."[62] Even when he was not warning of a return to the pre-modern past, White-Stevens repeated the basic, though less dramatic corollary argument from the industry that the risks of using chemicals in food production were simply outweighed by the necessity of their use to feed the starving and banish epidemic diseases. Like his colleagues, White-Stevens also relied on the aspirin / pesticide comparison, telling the press in a series of appearances in December 1962 to debunk *Silent Spring* that while eighty-nine people in 1961 had died from the misuse of pesticides, 128 died from aspirin that same year.[63]

Dr. White-Stevens's argument on *CBS Reports* backfired. While Carson was rational, calm, and earnest, White-Stevens appeared abrasive and, in the words of Linda Lear, "wild-eyed." Moreover, as Lear observed, the television show drew a large audience of 10-15 million people, many of whom had not read the book but had heard about the controversy in the media. The programme helped raise environmental awareness dramatically while sowing distrust of the chemical industry and government officials.[64]

A number of scientists and physicians joined with the chemical industry and some in government to criticize Carson's book. The basis of their attack was similar to that of the other critics. First and foremost, they argued that pesticides were necessary and Rachel Carson was raising needless alarm.[65] Some scientists also criticized *Silent Spring*, because it was a synthesis of other scientific studies, but did not provide detailed information about studies and experiments on pesticides. For example, an editorial in the *Archives of Internal Medicine* charged that Carson "quotes all kinds of statistics without giving any indication of how they were collected, the numbers represented, control evidence, standard deviations, and other information a respectable scientist is expected to provide."[66]

Scientists, academics, and industry representatives critical of *Silent Spring* also had an impact on the popular reception to the book. A number of local meetings or lectures hosted an "expert" reviewing the book – often critically, such as when a University of Tennessee zoologist told the Knoxville Science Club that the book was "one-sided" or when an author of gardening books told a local alumni meeting that Carson was wrong on a number of points.[67] Yet, perhaps more significant as an indicator of the grassroots reception of *Silent Spring* were the numerous (and largely female) garden clubs throughout the coun-

try that held meetings to discuss the book.. Based on newspaper accounts, these appearances seemed quite favourable.[68] Moreover, Carson was invited to give a major speech at the national meeting of the Garden Club of America – indicating the respect with which many garden clubs viewed her work.[69] Similarly, local papers carried columns from women librarians commenting on new books and what was popular; these brief items included many mentions of *Silent Spring* and appeared favourable.[70] Historian Adam Rome has argued that women's organizations were essential in the success of *Silent Spring* – a relationship of which Carson was aware. Rome writes that "Carson cultivated a network of women supporters, and women eagerly championed her work."[71]

Despite what Carson said in interviews following the publication of her study, it is difficult for readers today to come away from *Silent Spring* with the impression that the "indiscriminate" use of pesticides was the most serious issue discussed. Naturally, this author makes such an assessment following more than forty-five years of hindsight and accolades to the book as the spark of the modern environmental movement. Yet, an examination of the book supports this conclusion. Carson was cautious at times, especially in the beginning as she eased her readers into the subject: "It is not my contention that chemical pesticides must never be used."[72] Moreover, Carson's tone throughout was not emotional or exaggerated; the language was one of quiet logic with numerous references to scientific research. But Carson's qualifications that she did not seek to ban all chemical pesticides were outweighed by her ingeniously woven tale of widespread poisoning. *Silent Spring's* starting point was the assumption that nature was a harmonious system. Slowly, Carson built a case to demonstrate how people were threatening all aspects of the natural world, which builds to a climax with her central argument: That pesticides posed a threat to humans.

The book opened with the controversial "A Fable for Tomorrow," a vivid description of a hypothetical town and its sick and dying animals, apparently afflicted by a "strange blight." Following the rain of "white granular powder," the birds were silenced and other life poisoned. Yet, Carson concluded, "No witchcraft, no enemy action had silenced the rebirth of new life in this stricken world. The people had done it to themselves."[73] Carson's dramatic scenario was the subject of ridicule from critics, and used as evidence that all of *Silent Spring* was unscientific exaggeration. This prologue also served as the model for Monsanto's parody of the book, "The Desolate Year" (a horrific imagining of a world without pesticides and overrun by bugs, famine, and disease). Nevertheless, the fable of an uninviting future was an effective and compelling way to pull readers into the book.

Carson's discussion of the reality of pesticides began with an overview of their effect on nature, their origins, how they worked, and how they affected insects. She then proceeded to discuss the myriad unintended consequences from the widespread pesticide use in forests, and on farms, roadsides, and subur-

ban lawns. She discussed the dangers of mass spraying and acute consequences, but she was careful not to let readers feel the complacency of their own removal from such circumstances. "Each…recurrent exposure[e]," she reasoned, "no matter how slight, contributes to the progressive buildup of chemicals in our bodies and so to cumulative poisoning." Ordinary Americans found themselves exposed in a variety of situations. She wrote, for example, that "(g)ardening is now firmly linked with the super poisons."[74]

The power of Carson's indictment of pesticides came in part from the thematic structure of the book as well as from the language she used. Before any details about pesticides and how they work, Carson painted a picture of harmonious nature under attack from chemicals, including pesticides. She then introduced chlorinated hydrocarbons and organic phosphates and how they functioned. In turn, she discussed how pesticides impacted each aspect of nature (water, soil, plant life, insects, birds, and fish). The book moved to more direct criticism of the methods (indiscriminate aerial spraying and slow, cumulative poisoning). Only then did she turn to what she had told editor Paul Brooks was her most important theme: The impact of pesticides on humans, at a cellular level and in actual diseases.[75] Her discussion of cancer referred to that with which her readers were already familiar. More than once Carson likened the damage of pesticides to that caused by radiation: "The parallel between chemicals and radiation is exact and inescapable." Carson argued that some pesticides had been demonstrated to cause genetic mutations, disrupt reproduction, interact dangerously with other chemicals, and lead to malignancies. Carson concluded that in this area, society must err on the side of caution; and since scientists did not yet understand chemical interactions within people, there was no such thing as a "safe" level of human contact when it came to carcinogens.[76] The book returned to the big picture of pesticides in nature with two chapters on species imbalance and insect resistance.

The impact of the thematic progression was also enhanced by Carson's language, most pithily illustrated in her chapter titles. The introduction of pesticides and their properties ("Elixirs of Death") was contrasted with the majesty of nature ("Earth's Green Mantle") under attack from human arrogance ("Needless Havoc" and "Indiscriminately from the Skies") and their deadly poisons ("Beyond the Dreams of the Borgias"). Throughout the book, the popular science writer, whose studies of the sea had risen to the top of the bestseller lists in the 1950s, used poetic language to elicit wonderment at nature and shock at its desecration. Moreover, her carefully chosen words echoed through many of the reviews, challenging her critics. For example, while some criticized her as emotional and unscientific, Carson turned the tables, describing the proponents of pesticides as irrational: "The *crusade* to create a chemically-sterile, insect-free world seems to have engendered a *fanatic zeal* on the part of many specialists and most of the so-called control agencies." She dismissed the enthusiastic suburban

embrace of pesticides as "the *fad* of gardening by poisons" dictated by shallow mores prizing a weed-free lawn. She indicated that the average suburbanite was manipulated by slick advertising ("Lulled by the soft sell and the hidden persuader") and unaware of the dangers that lurk on his or her lawn. In her discussion of the campaign to save elm trees from disease, she exposed the unrealistic assumptions at work: "The illusion that salvation of the elms lies at the end of a spray nozzle is a dangerous will-o'-the-wisp." In addition, those dedicated to pesticides appeared childish in Carson's account: "The chemical weed killers are a bright new toy…they give a giddy sense of power over nature to those who wield them." Finally, she indicated that it was the proponents of pesticides who were unscientific, not their critics:

> 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.[77]

Through her language, Carson raised broad philosophical and moral questions about Americans' views of nature and humanity. She questioned whether people could continue to think of themselves as "civilized" when they knowingly inflicted widespread suffering on countless creatures such as birds dying torturous deaths from pesticide poisoning. Moreover, in her insistence on rethinking the human place in the "balance of nature," she challenged the economic system that distorted that balance. She observed that "[This] is…an era dominated by industry, 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-truths."[78]

Carson ended her study by laying out viable alternatives to chemical pesticides, but, at the same time, she moderated the strong condemnations that characterized most of the book. There was no discussion of organic agriculture, no reference back to her brief mention of the pitfalls of "single-crop farming" made in chapter two. Indeed, the alternatives that she discussed were modern and scientific – sterilization techniques and microbial diseases – to be perfected in the laboratory.[79] Carson seemed so determined to avoid being dismissed as a crackpot organic or natural food advocate that she carefully avoided direct questioning of modern, corporate agriculture.

Thus, there was a puzzling disjuncture between the main thrust of the book and its conclusion, as well as the parts of the argument that were highlighted in the favourable articles about it. The reasons for this are not certain, but the evidence indicates that those who supported the book wanted to emphasize

that this was not a radical statement by extremists. Whatever the reasons, there were real consequences to this public filter about the meaning of *Silent Spring*. Most importantly, if newspaper articles and columns and Carson *herself* focused on the misuse, indiscriminate, irresponsible, and over use of pesticides, it followed that there *was* a correct, discriminating, responsible, and prudent use of pesticides. These rhetorical formulations, then, were highly significant in shaping the public and political reception to *Silent Spring*. By carving out a moderate, sober position, Carson, along with her publisher and agent, helped to unintentionally circumscribe the impact of the book.

Yet, there was no denying that the way in which Carson framed her argument was also its strength. As Linda Lear has observed:

> One of Carson's greatest achievements as a public figure was in sensing how much she could reveal of the dangers of pesticides without alarming the public unduly and in calculating just how much the public could absorb. There was much she knew that she chose not to say. Yet she left a clear trail of evidence for scientists and reformers who followed her, whose times, she hoped, would permit freer disclosure.[80]

The strategy was necessary though, in the end, frustrating: If *Silent Spring* had been perceived as too radical or fringe (for example, denouncing all pesticide use and endorsing organic agriculture), it would have been dismissed by the public, the industry, and politicians. But by holding to a moderate position, Carson ensured a public debate and invited reform of the worst abuses *and* a continuation of an agricultural industry wedded to the use of chemical pesticides.

The most concrete results of *Silent Spring* demonstrated this dual effect. Most immediately President Kennedy's Scientific Advisory Commission was formed and issued its report in May 1963 on the dangers from the misuse of pesticides.[81] The underlying assumption of the report was that pesticides were a necessity in modern agriculture, and that there were always hazards with material progress. The carefully phrased report laid out both the impressive successes of pesticides in increasing agricultural output and protecting people from diseases as well as the toxic effects of pesticides in the environment. While the report stressed the dangers to wildlife and humans from pesticide contamination, it also assured readers that current federal programs regulated the introduction of new pesticides and screened foods to ensure that residues remained low. For the most part, the report failed to challenge assumptions about modern agriculture and the "struggle for survival" in which humans were engaged, though it did in places deliver a clear condemnation of the status quo. For example, the panel concluded that "although eradication of a pest population is a laudable goal, it is seldom realistic." Another example was the panel's recommendation that some hazardous compounds should be banned from use if less harmful alternatives were available. Finally, the report recommended that "elimination of the use of persistent toxic chemicals should be the goal."

The most important goals of the report were to recommend how federal policies should change to address the dangers of pesticides. The president's commission called for more study into the effects of pesticides and more regulation of their use. Specifically, the report called for better collaboration between the Departments of Agriculture, Interior, and Health, Education, and Welfare. It emphasized that registrations of pesticides that had an impact on human health should be left to the Department of Health, Education, and Welfare, while registration decisions that affected fish and wildlife should include the Secretary of the Interior. The report ended with a plea for moderation: "The government should present this information to the public in a way that will make it aware of the dangers while recognizing the value of pesticides."

Many in the press at the time and others subsequently argued that the president's commission report "amounted to an official endorsement of Rachel Carson's position."[82] Houghton Mifflin was quick to assert that the advisory commission "vindicate(d)" *Silent Spring*. They used this in its advertisements, which concluded in the spring of 1963 that if the public was to understand the soon-to-be-proposed legislation on pesticides, "you owe it to yourself" to read the book.[83] Similarly, in summarizing the report, most of articles in the press emphasized that the committee experts endorsed modern pesticides but called for further research into their effects and more curbs on their use. For example, they noted that "pesticides are useful and important to man, judiciously applied, but may be harmful in overuse or misuse."[84] Moreover, almost every article cited Carson and *Silent Spring* as the impetus for the work of the president's commission.

For her part, Rachel Carson gave interviews praising the report, calling it "strong and objective" as well as a "vindication of my principal contentions." Nevertheless, Carson cautioned Americans that the "report is not in itself a solution of the pesticide problem; it is rather a blueprint for a solution."[85] In addition to Carson, others pointed out that for the report to have an impact, it needed to be backed up with strong action. Joseph Alsop observed in his column that Americans were addicted to pesticides and that one government report would not cause people to give up their use. He observed that "the something done needs to be considerably sterner than the report of the President's scientific advisers, which had the approximate power of an old lady's moral lecture to a confirmed drunk."[86]

Alsop focused on a different aspect of the PSAC report and *Silent Spring* than did most other commentators – or historians since. The report *did* overlap with Carson's argument in clear ways and helped to bring broad political acceptance for *Silent Spring*, but it also strongly emphasized a theme that Carson had carefully avoided: The benefits of modern agriculture and pesticides. Paul Brooks, though, along with Carson, and a number of journalists recognized the value of a stamp of approval from the President's Science Advisory Committee,

so they paid attention to one aspect of the report and ignored another. This reframing of *Silent Spring* made it more moderate and less of a challenge to the status quo.

Along with the formation of the presidential commission, others in Washington swung into action. The Secretary of the Interior Stewart Udall became a champion of *Silent Spring*, and by spring 1963, dedicated a new government laboratory to wildlife pesticide research, invoking Carson's name and work in the dedication ceremony: "A great woman has awakened the Nation by her forceful account of the dangers around us." He observed that the department's Maryland lab "marks the beginnings of a new national awareness of the present and potential danger" of pesticides.[87]

Congressional hearings on pesticides and proposed legislation were scheduled by a number of committees in 1963, including the Natural Resources and Power Subcommittee of the House Committee on Government Operations, the Senate Commerce Committee, and the Reorganization and International Organizations Subcommittee of the Senate Committee on Government Operations. This last subcommittee was chaired by Senator Abraham Ribicoff, a former Secretary of Health, Education, and Welfare who became a very public supporter of Carson and critic of government policies regarding pesticides. Indeed, during the week of Carson's testimony, Ribicoff engaged in a public battle with the Department of Agriculture over "protest registrations" of pesticides.[88] This was the practice by which pesticide companies were allowed to sell pesticides even if the USDA had refused to register them for use. Ribicoff blasted the department for refusing to disclose the names of the products that were being sold under protest. The USDA relented, releasing the names of the seven pesticides currently marketed "under protest" as newspaper stories described the "shocking loophole" that Senator Ribicoff's proposed law sought to plug.[89]

Carson's testimony before the Ribicoff committee on 4 June 1963 was in some ways triumphant, as Linda Lear describes it: "This was the moment she had hoped for; one final chance to translate her vision into policy, to make a difference, to change the way people looked at the natural world, to stop the warfare against it."[90] Carson focused her testimony on several key themes and made recommendations to the committee for government action. She emphasized that while environmental contamination was widespread and remote from points of pesticide applications, the effects of such pollution could not be fully understood until scientists better understood the reactions among different pollutants and chemicals in the environment.

Her two main recommendations called for the strict control of aerial spraying, to be used only when absolutely necessary, and for the great reduction and eventual elimination of *persistent* pesticides. She made additional recommendations including protection for property owners against unwanted spraying,

more medical research and education about the effects of pesticides, restriction of pesticide sales to those who could understand their hazards, involvement of the Departments of Health, Education, and Welfare and Interior in decisions about pesticide registration, approval only of pesticides that did not duplicate the functions of another chemical, and, finally, support for non-chemical methods of pest control. Thus, Carson reiterated arguments from her book and maintained a moderate tone throughout. One *Newsweek* article observed that her charges against pesticides "seemed toned down, but her substance was the same: 'Before automatically reaching for the spray gun…we must begin to take account of the hazards'."[91] Her two *key* recommendations were strategically chosen: they were ones around which there was already a growing consensus, and one had already been made by the president's commission. They were the most modest and moderate of proposals.

Coverage of Carson's testimony emphasized that she was not calling for the elimination of pesticides. "Restraint is what she preached," summarized one article.[92] The press made it clear that the senators were listening to Carson. The day after her testimony, articles led with the decision of the subcommittee to investigate the possible link between leukemia, hepatitis, and cancer in children and pesticides.

Moreover, articles on Carson's testimony also covered Ribicoff's standoff with the USDA, indicating that senators were on the same side as the author of *Silent Spring*.[93] Other members of congress jumped on the anti-USDA bandwagon. Representative John Dingell, for example, testified before the Senate Commerce Committee in favor of anti-pesticide legislation. He criticized the USDA for what he termed its "public-be-damned attitude" on pesticides.[94] The press was also not immune to an anti-USDA tone. One paper took the opportunity to remind readers of an exposé it had published the previous year finding that many government scientists said privately that not enough research had been done into pesticide dangers, but that they were unwilling to publicly criticize the USDA. *Newsday* concluded that only 75 of 250 chemicals in pesticides had been tested for long-term effects on wildlife, while none had been tested for effects on humans, although the agriculture department had "been enthusiastically promoting the use of pesticides for 17 years."[95]

Within two days of her testimony before the Ribicoff committee, Carson testified before the Senate Committee on Commerce on two pending pieces of pesticide legislation. She reiterated some of her points from 4 June with additional recommendations.[96] The bills in question had been introduced by Senator Maurine Neuberger of Oregon who joined forces with Senator Ribicoff to call for more research into long-term effects of pesticide exposure on humans.[97] Neuberger's legislation would increase the ability of the Secretary of the Interior to research pesticides and require the USDA to consult with the Fish and Wildlife Service before any large new spraying programs were

approved. In addition, Carson called for the formation of an independent, cabinet level department, staffed by scientific experts without ties to industry or other governmental agencies to be the final arbiter when there were conflicts in pesticide control policy.

Not everyone in Washington was a fan of Carson. In addition to the harsh disagreements from the Department of Agriculture, criticism also came from within congress, especially the farm bloc. Most outspoken was Representative Jamie Whitten of Mississippi, chair of the House Appropriations Subcommittee on Agriculture.[98] In response to *Silent Spring,* his committee released "The Whitten Report" and in 1966 published a book stridently defending the necessity of pesticides, entitled *That We May Live.* He concluded that Carson had manipulated public fears and did not understand that people had always been engaged in a struggle with nature. Pesticides, the report argued, were "new weapons in an ancient war."[99] In addition, he argued that under current rules, the government carefully tested and regulated pesticides for safety. From his powerful position, Whitten had a strong relationship with the agriculture industry. He based his report on research from the USDA and three pesticide manufacturers subsidized its printing.[100]

While official Washington and the national media paid close attention to the hearings on Capitol Hill, the chemical and agricultural industries assessed the damage. Industry magazine *Farm Chemicals* opined in its July 1963 issue that "(t)here have been few quiet moments for the pesticide industry since the release of the report of the President's Science Advisory Committee. No less than three separate hearings involving pesticides are now being conducted by Congress."[101] The article observed that Secretary of Agriculture Orville Freeman, appearing before the Ribicoff committee, strongly defended pesticides and criticized the report from the president's science advisors. A month earlier, the same trade journal explained to its readers the flaws of the report from the president's advisory committee, and asked "(w)hy so much havoc when no *emergency exists*?"[102] The industry also highlighted the testimony of other defenders, including biochemist William Darby and the chief of toxicology at the Public Health Service Wayland Hayes.[103] For his part, Hayes belittled the idea that storage of DDT in human bodies was necessarily harmful. Reflecting industry sentiment, he argued that, "there is no conclusive evidence that pesticides, old or new, are a cause of any disease except poisoning."

Following Rachel Carson's testimony on Capitol Hill (and that of other experts), the proposed legislation – albeit of limited impact - was passed. For example, legislation was passed requiring that there be consultation between the Fish and Wildlife Service and state wildlife agencies before any spraying could take place, requiring better labeling on pesticides and ensuring that the Secretary of the Interior evaluate chemicals for use as pesticides. The passage of the Ribbicoff-Pearson bill in 1963 was perhaps the strongest initial legislative step

taken. It eliminated protest registrations, under which manufacturers had been able to produce and market chemical pesticides even when the USDA was not willing to grant it a registration.[104] Following Carson, supporters of actual and proposed legislation hewed to a moderate path, asserting that they were not calling for the abandonment of modern agriculture. Senator Neuberger said that without pesticides, the world's growing population could not be supported. Senator Hubert Humphrey, on Ribicoff's subcommittee, added that "(n)o one in a position of responsibility…has suggested that all chemical poisons be taken off the market."[105] Nevertheless, cautious though politicians were, legislation was passed beginning in 1963 to start to address the worst effects of pesticide use. And as Christopher Bosso's study of pesticides and politics demonstrates, this was only the beginning of years of wrangling and debating on Capitol Hill over the power to control pesticide use.[106] States passed their own legislation as well. By the spring of 1963, more than three-dozen bills had already been introduced in legislatures around the country.[107]

By the time of Rachel Carson's death in April 1964, newspapers wrote of her "vindication" and the "fitting memorial" for her work found in evidence about the dangers of pesticides in the environment and the public reversal in the position of Secretary of Agriculture Freeman. New evidence was published attributing massive fish kills in the Mississippi (ten million fish over the previous four years) and elsewhere to pesticide contamination, and uncovering contamination of canned oysters and shrimp. Referring to the ridicule that Carson faced from chemical companies, agricultural interests, and those in government allied with them, one paper concluded in the week after Carson's death that "(a)t the highest levels of the federal government, the mockery has ceased altogether."[108] While Secretary of Interior Udall told Senator Ribicoff's subcommittee that month that there should be a federal law prohibiting the use of DDT, Endrin, Dieldrin, Aldrin, and Lindane completely, most dramatic was the testimony of Secretary Freeman before the same gathering. Just one day after Rachel Carson's death, Freeman told senators that the nation must quickly find alternatives to toxic pesticides, a "crash program" to control pests. Freeman affirmed that depending on what the subcommittee uncovered, he was prepared to cancel registrations of various pesticides and implement stricter policing of the industry.

Interestingly, the coverage of Freeman's testimony and the whole pesticide issue remained linked to Carson herself. One article on the secretary's appearance was subtitled "The Rachel Carson Cause."[109] Continued senate hearings and Carson's "vindication" may have led some to be overly optimistic about progress in solving pesticide pollution, despite evidence to the contrary. Celebration of Rachel Carson's memory and acknowledgement that the overuse of poisons was dangerous does not mean that anything was changed in practice. Honouring (and circumscribing) the work of a dead pioneer was appealing and certainly easier than changing the direction of American agriculture.

One 1964 editorial observed that "(t)he use of potentially deadly sprays had steadily fallen off, and the birds seem more abundant than ever."[110] Yet there was scant evidence that total pesticide sales had fallen off in response to *Silent Spring*. The *Wall Street Journal* observed that in 1962, pesticide sales increased over sixteen percent from 1961 (to $345 million), and in the spring of 1963, sales were up over the same time in 1962.[111] As the trade journal *Farm Chemicals* predicted when federal hearings first began in spring 1963, "(t)he pesticide industry as been plagued with these problems in the past. Consensus [sic] is that the industry will ride out the storm."[112] Historian Thomas Dunlap indicates that *Farm Chemicals* might have been correct. He writes:

> Neither Silent Spring nor the subsequent public controversy over Carson's charges changed pesticides use and regulation in any signifi cant way. Although the USDA curtailed the massive spraying cam paigns that had caused so much public and scientific opposition, farm ers and government agencies continued to use DDT. Even when it was replaced, its successors were not the nonchemical controls Carson had recommended—and which the National Research Council had called the methods of choice—but other chemicals, sometimes more toxic than DDT.[113]

Criticisms of *Silent Spring* and its author were enduring. As recently as 2007, for example, Republican Senator Tom Coburn decried the legacy of "Carson's junk science claims about DDT." Yet the book resonated throughout the public culture in the early 1960s and contributed to a new way of thinking about pesticides and the environment.[114] It is important to note that while Rachel Carson's book may have been revolutionary in many ways, it was, nonetheless, a cultural touchstone, awakening anxieties and concerns that had been brewing for a number of years. As one editorial in the *Shreveport Times* noted:

> Pesticides have been controversial at least since 1957. The *Silent Spring* only serves to escalate into a full scale battle what has for years been a running guerilla warfare between conservationists – anglers, hunters and bird watchers – on the one side and the chemicals industry, the Plant Pest Control Division of the U.S. Department of Agriculture, and some farmers on the other.[115]

Another article on the pending 1963 report of the president's commission observed that the "(d)angers [of pesticides] had been noted, or suspected, by scientists for many years."[116]

Rachel Carson also noted that criticisms of pesticide use had been spreading in the years before her book was published. She observed that readers' letters in newspapers indicated many people had begun to notice the impact of pesticides on birds: "Citizens are not only becoming aroused and indignant but…often they show a keener understanding of the dangers and inconsistencies of spraying than do the officials who order it done."[117] Carson cited the unpop-

ular campaigns against the gypsy moth and the fire ant as helping to increase criticism of pesticide programs: "A good many people now have misgivings about the aerial distribution of lethal chemicals over millions of acres, and two mass-spraying campaigns undertaken in the late 1950's have done much to increase these doubts."[118] As is true with so many cultural documents that crowd our history books as the turning points of an age, works such as *Silent Spring* often draw their power from the simmering debates and changing discourses already widespread throughout the culture.

Carson sought to channel the simmering debate, to prod people into asking skeptical questions instead of avoiding them. As she told a California audience in October 1963 in her last speech, "We behave not like the people guided by scientific knowledge, but more like the proverbial bad housekeeper who sweeps dirt under the rug in the hope of getting it out of sight." Most importantly, her ambitions went beyond pesticides themselves. She sought to change how people viewed nature, to end "the assumption that the rivers, the atmosphere, and the sea are vast enough to contain whatever we pour into them."[119]

After 1962, the lasting impact of Rachel Carson's book was clear. *Silent Spring* and its author became the reference point for a variety of environmental initiatives and discussions. In a very real way, *Silent Spring* inaugurated a different understanding about pesticides and a new consciousness about the environment. To highlight Carson's careful balance between extreme positions in no way lessens the political and cultural impact of *Silent Spring*, nor does it raise questions regarding the sincerity of Carson's commitment to educate the public about the human role in the balance of nature. Yet, in the initial responses to *Silent Spring* and the rhetorical strategies used by Carson and others to defend the book, we find insights into the continued American reliance on pesticides. By stressing that she was not attacking all pesticide uses and the modern agricultural system of which they were a part, Carson and her defenders allowed the majority of Americans to embrace the existing system while calling for the elimination of extreme abuses. It's possible that in 1962 the only way to begin a dialogue about overuse of persistent, dangerous pesticides was through the moderate, measured arguments of *Silent Spring* and its supporters. But we are nevertheless left with the uncomfortable conclusion that the status quo remained entrenched though moderated, and the political and environmental effect of the beautifully written, rigorously argued, pioneering book might not have lived up to the goals of its author.

Notes

[1] Linda Lear, *Rachel Carson: Witness for Nature* (New York: Henry Holt and Company 1997), 454; H. Patricia Hynes, *The Recurring Silent Spring* (New York: Pergamon Press 1989), 1-2. Such comparisons were also made in the press. For example of the comparison, see, "CBS Reports: The Silent Spring of Rachel Carson," broadcast 3 April 1963, folder 1330, box 75, Series I, Rachel Carson Papers YCAL 46, Beinecke Library, Yale University. Also, see Elmer Roessner, "Rachel Carson's New Book Already Affecting Business," *News* (Patterson NJ), 3 October 1962, folder 1147, box 64 and Erwin Knoll, "Silent Spring Spurs Proposals for Chemical Curbs," *Advance* (Staten Island, NY), 12 April 1963, folder 1152, box 65, Series I, Carson Papers. [These and many of the press articles cited below were taken from the Carson Papers. Folder and box citations are included.]

[2] Along with Linda Lear, *Rachel Carson*, and H. Patricia Hynes, *The Recurring Silent Spring*, see also: Mark Hamilton Lytle, *The Gentle Subversive: Rachel Carson, Silent Spring, and the Rise of the Environmental Movement* (Oxford: Oxford University Press 2007); Craig Waddell, Ed., *And No Birds Sing: Rhetorical Analyses of Rachel Carson's Silent Spring* (Carbondale, Illinois: Southern Illinois University Press 2000); Gary Kroll, "The "Silent Springs" of Rachel Carson: Mass Media and the Origins of Modern Environmentalism," *Public Understanding of Science 10* (2001): 403-420; Priscilla Coit Murphy, *What a Book Can Do: The Publication and Reception of Silent Spring* (Amherst: University of Massachusetts Press 2005); Peter McCord, "Divergences on the Left: The Environmentalisms of Rachel Carson and Murray Bookchin," *Left History 13*.1 (Spring/Summer 2008): 14-34; Paul Brooks, *The House of Life: Rachel Carson at Work* (Boston: Houghton Mifflin, 1972); Mary McCay, *Rachel Carson* (New York: Twayne Publishers, 1993); Carol Gartner, *Rachel Carson* (New York: Ungar, 1983); Michael B. Smith, "'Silence, Miss Carson!' Science, Gender, and the Reception of *Silent Spring*," *Feminist Studies, 27*.3 (Fall 2001): 733-752; and Maril Hazlett, "Voices from the *Spring: Silent Spring* and the Ecological Turn in American Health," in Virginia Scharff, Ed., *Seeing Nature Through Gender* (Lawrence: University Press of Kansas 2003).

[3] Craig Waddell, "The Reception of Silent Spring," in Waddell, Ed., *And No Birds Sing,* 8. A note on terms: Throughout this article I will use the more general term pesticides, which includes not only insecticides, but also herbicides, rodenticides, nematicides, and fungicides.

[4] For decades, federal farm policies based on acreage restrictions and subsidies led to commodity overproduction and falling prices, causing farmers to search ever more diligently for ways to increase efficiencies and cut costs. The use of farm chemicals and strategies such as "no-till" agriculture (relying on heavy herbicide use) responded to these imperatives and kept commodity prices low. Christopher Bosso, *Pesticides and Politics: The Life Cycle of a Public Issue* (Pittsburgh: University of Pittsburgh Press, 1987), 236-237.

[5] See for example, Samuel P, Hays, *Environmental Politics Since 1945* (Pittsburgh: University of Pittsburgh Press 2000); Robert van den Bosch, *The Pesticide Conspiracy* (Garden City: Doubleday, 1978); John Perkins, *Insects, Experts, and the Insecticide Crisis: The Quest for New Pest Management Strategies* (New York: Plenum Press 1982); Thomas Dunlap, *DDT: Scientists, Citizens, and Public Policy* (Princeton: Princeton University Press 1981).

[6] See for example, Edmund Russell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge: Cambridge University Press, 2001), 123-129; Bosso, 30-32; Dunlap,61-63.

[7] Many articles celebrated the great output of modern American farms. For

example, James Reston, "Iowa Celebrates Its 100th Birthday," *New York Times*, 5 July 1946, 6, "Another Bumper Harvest," *New York Times Magazine*, 26 June 1949, 8-9, and "Bigger: Crops and Farm Problem," *U.S. News and World Report*, 19 August 1949, 16.

[8] Pete Daniel discusses the USDA response to the fire ant criticism, *Lost Revolutions: The South in the 1950s* (Chapel Hill: University of North Carolina Press, 2000), 78-84.

[9] Bosso, 81.

[10] Craig Waddell, "The Reception of Silent Spring," in Waddell (ed.) *And No Birds Sing*; Kroll, "The "Silent Springs" of Rachel Carson; Priscilla Coit Murphy, *What a Book Can Do.*

[11] Memos Marie Rodell 17 August 1962 and 27 September 1962, folder 1075, List of Newspaper and Magazine reviews 1962, box 61, Series I, Carson Papers.

[12] Folders of bestseller lists, 1283-1287, boxes 72 and 73, Series I, Carson Papers.

[13] Hynes, 2.

[14] Brooks Atkinson, "Rachel Carson's Articles on the Danger of Chemical Sprays Prove Effective," *New York Times*, 11 September 1962, folder 1076; Miles Smith, "Strong Indictment," *News-Sun*, (Waukegan IL), 17 November 1962, folder 1077; Irston Barnes, "No Repeal for Law of Gravity," *Post and Times Herald*, 30 September 1962, folder 1078; Katherine Cushman, "How War on Insects Endangers Human Life," *The Detroit News*, 23 September 1962, folder 1080. All box 61, Series I, Carson Papers.

[15] Atkinson, 11 September 1962; Cushman, "How the War on Insects Endangers Human Life."

[16] Roy Attaway, "An Unpleasant Thought," *News-Courier* (Charleston SC), 28 October 1962, folder 1076, Series I, Carson Papers.

[17] Paul Brooks, *Speaking for Nature* (San Francisco: Sierra Club Books, 1980), 284-285.

[18] C. Roy Boutard, "A World Where No Birds Sing," *Berkshire Eagle* (Pittsfield, MA), 29 Sept 62, folder 1078, box 61; Whitney Bolton, "New York Today," *Reporter* (Washington, PA), 28 November 1962, folder 1078, box 61; Joseph Ator, "Scientist Disputes Pesticide Danger: Blames Furor on Chemical Users Neglect of Instructions," *Daily Tribune* (Chicago, IL), 20 December 1962, folder 1115, box 63. All Series I, Carson Papers.

[19] I.L. Baldwin, "Chemicals and Pests," *Science*, 28 September 1962, folder 1078; William B. Bean, MD, "The Noise of Silent Spring" editorial in the *Archives of Internal Medicine*, September 1963, folder 1079. Both box 61, Series I, Carson Papers.

[20] See letters in folder 1255 Responses (Letters to the Editor), box 71, Series I, Carson Papers.

[21] Leland DuVall, "Biological Bug War Comes Into Its Own," *Gazette* (Little Rock, AR), 10 April 1963, folder 1129, box 64, Series I, Carson Papers.

[22] Barnes, "No Repeal for Law of Gravity."

[23] Rachel Carson (RC) to Dorothy Freeman (DF) 12 June 1958 in Martha Freeman (ed.), *Always Rachel: The Letters of Rachel Carson and Dorothy Freeman, 1952-1964* (Boston: Beacon Press, 1995), 257.

[24] Charles Callison, Asst. to the President National Audubon Society to RC 14 March 1963, folder 1493, National Audubon Society 1962-3, box 85, Series I, Carson Papers.

[25] Linda Lear, "Afterword: Searching for Rachel Carson," in Waddell, Ed.,, 205-218.

[26] Lear, *Rachel Carson,* 400.
[27] Ad full page on back section of *New York* Times, late November 1962, folder 1324, publicity, box 75, Series I, Carson Papers.
[28] John Barkham, "Among Books and Authors," *Saturday Review*, 29 September 1962, folder 1078, box 61, Series I, Carson Papers.
[29] Linda Lear,, *Lost Woods: The Discovered Writings of Rachel Carson* (Boston: Beacon Press, 1998), 213.
[30] McCord, "Divergences on the Left," 19.
[31] Carson's background is taken from Lear, *Rachel Carson*; Brooks, *The House of Life*; Mary McCay, *Rachel Carson*; Carol Gartner, *Rachel Carson.*
[32] Lear, *Rachel Carson,* 206.
[33] See Brooks, 230-231, Lear, *Rachel Carson*, 118-120, and Gartner, 19.

[34] David Wade Chambers, *Worm in the Bud: Case Study of the Pesticide Controversy* (Victoria, Australia: Deakin University Press, 1984), 42.

[35] Lear, *Rachel Carson,* 313; McCay, 65.
[36] "Pesticides: Attack and Counterattack," *Consumer Reports* January 1963, folder 1305, box 74, Series I, Carson Papers.
[37] See for example, Michael B. Smith, "'Silence, Miss Carson!' Also, Hynes; Lear, "Afterword,"; and Maril Hazlett, "Voices from the *Spring*."
[38] Smith, "Silence," 739-740.
[39] Cyrene Dear, "Author Questions Pesticide Programs," *Advance* (Elizabeth City, NC), 18 February 1963, folder 1129, box 64; other examples are "Critic of Pesticides: Rachel Louise Carson," *New York Times* 5 June 1963, folder 1291, box 73 and Frances Lewine, "Rachel Carson, 'No Crusader', *Observer* (Charlotte, NC), 6 June 1963, folder 1290, box 73, Series I, Carson Papers.
[40] "Rachel Carson's Book On Use of Killer Chemicals As Pesticides Stirs Argument" *Gazette and Daily* (York, PA), 30 March 63, folder 1116, box 63.
[41] Boutard, "A World Where No Birds Sing," 29 September 1962.
[42] RC to DF, 13 June 1962, Freeman (ed.), 407.
[43]Atkinson, "Rachel Carson's Articles on the Danger of Chemical Sprays Prove Effective."
[44] Barkham, "Among Books and Authors"; Boutard, "A World Where No Birds Sing"; Robert Cowen, "Miss Carson's 'Silent Spring' – What the Battle is About," *Christian Science Monitor*, 27 September 1962, folder 1080, box 61, Series I, Carson Papers.
[45] See sample letters in folder 1251 Responses (Letters to Editors), box 71, Series I, Carson Papers.
[46] For example, Joseph Alsop, "After Rachel Carson," *New York Herald Tribune*, May 1963, folder 1113, box 63; Atkinson, "Rachel Carson's Articles on the Dangers of Chemical Sprays Prove Effective"; Barkham, "Among Books and Authors"; Hank Andrews, "Outdoors: Insecticide Use Threatens to Close Hunting Areas," *Press and News* (Cleveland, OH), 24 May 1963, folder 1114, box 63. All in Series I, Carson Papers.
[47] Uncle Dudley (editorial), "The Poison Sprays," *Evening Globe* (Boston, MA), 4 April 1963, folder 1129, box 64, Series I, Carson Papers.
[48] "Rachel Carson's Book on Use of Killer Chemicals As Pesticides Stirs Argument."
[49] Rachel Carson, *Silent Spring* (New York: Fawcett World Library [paperback reprint of Houghton Mifflin], 1962), 22.
[50] Atkinson, "Rachel Carson's Articles on the Dangers of Chemical Sprays Prove

Effective."
[51] William O. Dobler, "Spring Storm in Fall," *Star* (Lincoln, NE), 1 October 1962, folder 1129, box 64, Series I, Carson Papers.
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[54] Ovid Martin, "Expert Gives Assurance on Test of Pesticides," *Union-Bulletin* (Walla Walla, WV), 4 August 1963, folder 1116, box 63, Series I, Carson Papers.
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[57] See for example, Linda Lear, "Bombshell in Beltsville: The USDA and the Challenge of 'Silent Spring'," *Agricultural History 66*.2 (Spring 1992): 151-170, and Bosso, *Pesticides and Politics*. Also, Lear, *Rachel Carson*.
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[62] Television adaptation, "CBS Reports: The Silent Spring of Rachel Carson," broadcast 3 April 1963, folder 1330, box 75, Series I, Carson Papers.
[63] "Rachel Carson May Debate with Pesticide Expert," *News* (Ann Arbor, MI), 12 December 1962, folder 1116, box 63, Series I, Carson Papers.
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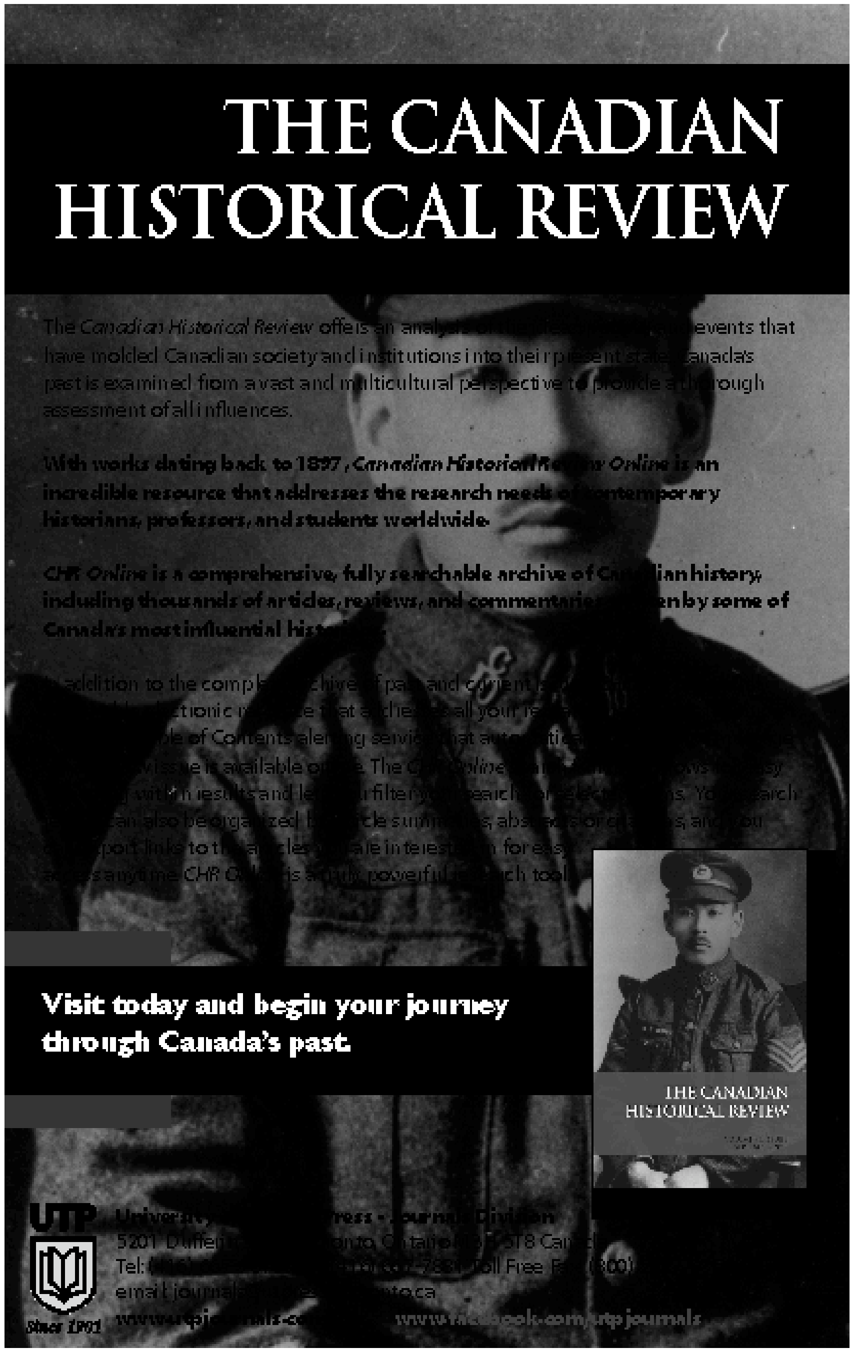
[66] William B. Bean, MD, "The Noise of Silent Spring," (editorial), *Archives of Internal Medicine* September 1963, 112:3, 62-65, folder 1079, box 61, Series I, Carson Papers.
[67] Pat Fields, "UT Professor Calls New Book 'One-Sided'," *Journal* (Knoxville, TN), 2 February 1963 and Sidney Eaton Boyle, "County Wellesley Club Told 'Silent Spring' Is in Error," *Times* (Mt. Kisco, NY) 20 June 1963, folder 1319, box 74, Series I, Carson Papers.
[68] For examples, see folder 1317 and 1318, box 74, Series I, Carson Papers.
[69] Lear, *Rachel Carson,* 440.
[70] For examples, see folder 1312, box 74, Series I, Carson Papers. For more on

how gendered discourse helped shape the debate over *Silent Spring,* see Hazlett, "Voices From the *Spring*."
[71] Adam Rome, " 'Give Earth a Chance': The Environmental Movement and the Sixties," *The Journal of American History 90*.2 (September 2003): 525-554.
[72] Carson, 22.
[73] *Ibid.*, 13, 14.
[74] *Ibid.*, 157, 159.
[75] Quoted in Lear, *Rachel Carson*, 357.
[76] Carson, 186, 206.
[77] *Ibid.*, 22, 160 and 161 [italics added], 157, 107, 69, 260-61.
[78] Quoted in Smith, "Silence," 748.
[79] John Perkins discusses how in the 1970s entomologists who embraced such technological solutions were really going in a different direction from the bulk of Rachel Carson's work. Those who took up her mantle in the 1970s, he argues, articulated a vision of working in harmony with nature through "Integrated Pest Management." See *Insects, Experts, and the Insecticide Crisis*, 184-195.
[80] Lear, "Afterword: Searching for Rachel Carson," 216.
[81] President's Science Advisory Committee, Life Sciences Panel, "The Use of Pesticides," 15 May 1963, folder 1322, box 74, Series I, Carson Papers.
[82] Brooks, 285.
[83] Ad by Houghton Mifflin May 1963, and in NYTBR 14 July 1963, folder 1324, box 75, Series I, Carson Papers.
[84] Josephine Ripley, "U.S. Pesticide Report," *Christian Science Monitor* 16 May 1963, folder 1293, box 73, Series I, Carson Papers.
[85] Rachel Carson, "Public Should Awaken to Danger of Widespread Use of Pesticides," (Herald Tribune News Service) *Vindicator* (Youngstown, OH), 20 May 1963, folder 1288, box 73, Series I, Carson Papers.
[86] Joseph Alsop, "After Rachel Carson," *New York Herald-Tribune*, 24 May 1963, folder 1113, box 63, and Joseph Alsop, "Giving Up Bug Poisons is Like Quitting Rum," *Virginia Pilot* (Norfolk, VA), 26 May 1963, folder 1292, box 73, Series I, Carson Papers.
[87] RC to Stewart Udall 3 May 1963, folder 1516 Udall, Stewart 1963, box 86; also, "Pesticides Harm While Helping US, Udall Says," *Star* (Orlando, FL), 25 April 1963, folder 1296, box 73, Series I, Carson Papers.
[88] Statement by Senator Abraham Ribicoff on the Senate floor, 6 June 1963 and Insertion on Page 2 of statement, folder 1298, box 73, Series I, Carson Papers.
[89] For example, see Neal Sanford, "Pesticide Hearings Crowded," *Christian Science Monitor* 7 June 1963; "Sen. Ribicoff Denounces Pesticide Secrecy Deal," *Caller* (Corpus Christi, TX), 7 June 1963; John Troan, "Pest-Killers on Market Without Okay of U.S.," *Pittsburgh Press*, 7 June 1963, folder 1289, box 73, Series I, Carson Papers.
[90] Lear, *Rachel Carson*, 3-4; Statement of Rachel Carson before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, 4 June 1963, folder 1294, box 73, Series I, Carson Papers.
[91] "Pests and Poisons," *Newsweek* 17 June 1963, folder 1288, box 73, Series I, Carson Papers.
[92] "Curb Asked on Chemicals," *Pittsburgh Press*, 7 June 1963; see also, "Senators Order Pesticide Probe," *Courier Journal* (Louisville, KY), 5 June 1963, folder 1289, box 73, Series I, Carson Papers.
[93] For example, "Senators Order Pesticide Probe," *Courier Journal* (Louisville, KY), 5 June 1963, folder 1289; and "Ribicoff Raps Silence on Pesticides,"

Chicago Sun-Times, 5 June 1963, folder 1290, box 73, Series I, Carson Papers.
[94] "No One's Come Up With a Cure for Bureaucratic Blight Disease," *New York Herald Tribune*, 7 June 1963, folder 1288, box 73, Series I, Carson Papers.
[95] "Senator Backs Author's Fight on Pesticides," *Newsday* (Garden City, NY), 7 June 1963, folder 1290, box 73, Series I, Carson Papers.
[96] Statement of Rachel Carson before the Senate Committee on Commerce, 6 June 1963, folder 1301, box 74, Series I, Carson Papers.
[97] "Senator Backs Author's Fight on Pesticides."
[98] Whitten's power in agricultural appropriations was so great from the 1940s to the 1980s that Christopher Bosso referred to him as the "seemingly permanent chair of the subcommittee." Bosso, 67.
[99] Quoted in Hynes, 120-122.
[100] Chambers, 214.
[101] "Aerial Applicators Under Attack," *Farm Chemicals* July 1963, folder 1297, box 73, Series I, Carson Papers.
[102] "Pesticide Industry Braces Itself as Public Hearings Begin," *Farm Chemicals,* June 1963, folder 1297, box 73, Series I, Carson Papers.
[103] "Proposed Ban on Persistent Pesticides," *Chemical and Engineering News*. 29 July 1963, folder 1308, box 74, Series I, Carson Papers.
[104] Bosso, 125; Dunlap, 124.
[105] "'Silent Spring' Spurs Proposals for Chemical Curbs," *Advance* (Staten Island, NY), 12 April 1963, folder 1288, box 73, Series I, Carson Papers.
[106] Bosso, *op. cit*.
[107] "'Silent Spring' Spurs Proposals for Chemical Curbs," *Advance* (Staten Island, NY), 12 April 1963, folder 1288, box 73, Series I, Carson Papers.
[108] "Miss Carson, Vindicated," *Richmond News Leader*, 25 April 1964. Examples of other celebrations of Carson: "Fitting Memorial," *The Daily Banner* (Cambridge, MD), 25 April 1964 and "Monument for Rachel," *Record* (Troy, NY), 17 April 1964, both in folder 1304, box 74, Series I, Carson Papers.
[109] "Freeman on Pesticides: Time for Crash Program," *New York Herald Tribune*, 16 April 1964, folder 1297, box 73, Series I, Carson Papers.
[110] "Singing Spring," *Telegram* (Herkimer, NY), 28 April 1964, folder 1310, box 74, Series I, Carson Papers.
[111] Roger May, "Charge That Chemicals Harm Humans, Nature Fails to Hamper Sales," *Wall Street Journal*, 3 April 1963, folder 1296, box 73, Series I, Carson Papers.
[112] "Pesticide Industry Braces Itself."
[113] Dunlap, 129.
[114] Carl Pope, "Trashing Rachel Carson: The Pesticide Lobby Still Wants Revenge," *Sierra* September/October 2007, 6. Meanwhile, in 2004, some public health activists charged that *Silent Spring* and the consequent ban on DDT was responsible for the deaths of African children due to malaria. Lytle, 222-223.
[115] (Shreveport, LA), 26 September 1962, folder 1147, box 64, Series I, Carson Papers.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