Teaching *Silent Spring* in Wisconsin: A Guide for Educators

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READING ACROSS TIME & SPACE

Silent Spring is a work of nonfiction. While its sociocultural and geopolitical contexts are integral to its impact, and to our critical reflections on the text, it is also important to remember that this is a work of literature. While literature can help us teach culture, history, politics and so on, no one text can bear the burden of representing an entire nation, culture, or people. As you teach this text, please keep in mind and emphasize where you can the cultural specificities that make it unique. Doing so in a clear and explicit way will also help you and your students appreciate the text’s ability to speak across time and space. Certain sections of the teaching guide, such as Unit 3, will be especially helpful in this context.

HOW TO USE THIS GUIDE

The material in this guide is intended to provide a variety of options for teaching Rachel Carson’s Silent Spring and its many contexts. We believe that the historical and cultural background is necessary for understanding this work and the questions it provokes, but we encourage you to teach the text thematically as well, tying it into other disciplinary issues and regular features of your core curriculum wherever possible.

READINGS: The recommended readings in the guide are intended for teachers, but some are also accessible to students. These readings provide further background information for instructors as well as a variety of materials that might aid instructors in creating handouts and supplementing class discussion.

POINTS FOR DISCUSSION, ASSIGNMENTS & ACTIVITIES: The recommended points for discussion, assignments and activities provided in this guide are designed to be tailored to the way you teach the text in your own course, as well as your particular time constraints, interests, and goals. The individual units might be taught over one or several days, or over the course of a few weeks. You can mix and match ideas from the various sections to create your own syllabus. Each unit is organized according to themes that include points for lecture and discussion, suggestions for close reading, specific quotes from the text or other readings, as well as in-class activities and assignments that might be used to further discussion. Each section also includes suggested preparatory readings and resources.

CLOSE READING STRATEGIES

The guide assumes that you will have read the entire text, but all units also offer suggestions for specific passages within the text that would benefit from careful and attentive reading, analysis and discussion. During discussion and for assignments, students should be encouraged to support their interpretations with evidence from the text. Close reading lends itself well to both large-group work and small-group discussions, and is an excellent way for students to develop their critical thinking skills as they make connections, use evidence to support their views, and discuss the impact of various literary techniques. For close reading to work successfully, it’s important that the teacher always remind the students to point to the passage, line, or occurrence that supports their position when they’re sharing their ideas. Close reading teaches students the difference between “opinion” or “personal reaction” and “analysis.” It also helps teach students to assess the text on its own merits, and to avoid essentializing the cultural components of the text or stereotyping based on generalizations.
Reading a portion of text out loud as a class or small group, followed by discussion, can be an excellent way to develop close reading skills in the classroom. The guide includes a handout on close reading that we encourage you to use in your classes.

TEACHING TOWARD THE STUDENT CONFERENCE
Your students will come to the University of Wisconsin-Madison on April 9, 2018 to present their work to their peers, listen to lectures from experts on the text, and workshop with faculty, graduate students and undergraduates from the university. At the conference, they will have the opportunity to meet and listen to biologist, author, and cancer survivor Sandra Steingraber. Unit 7 in this guide is explicitly devoted to preparing students for this visit and for the student conference. Prepare them for a successful conference by encouraging them to challenge themselves with projects that provide critical interpretations of the text in unique and complex ways. There is no limit to the type of project they might prepare. Past projects have included essays, painting, sculpture, weaving, culinary projects, photography, film and other multimedia, dramatic performances, song, dance, and more. The only requirement is that the students’ projects must present a critical analysis of the text. Students will be required to write a short summary of their projects, which will be submitted to Aaron Fai (greattexts@humanities.wisc.edu) approximately two weeks before the student conference.

Each school will select one student, or group of students, whose work is exemplary, to present at the plenary session on stage. It’s recommended that the students themselves select (by voting) the “best” project for this presentation, which will be about 5 minutes in length. It is our expectation that these presentations will be polished, rehearsed and timed, and that they will provide an opportunity for your school to feel pride and investment in its participation in the program. All other students are expected to present their work in poster sessions during the conference, and will have the opportunity to stand next to their projects and answer questions about them from other students and conference participants. Every student who attends the conference should present her/his work at the conference.
OBJECTIVE: To provide a broad overview of the post-World War contexts that inform Silent Spring; the relationship between DDT and the science-military-industrial complex; and Rachel Carson’s theorization of natural history and humankind’s geologic footprint.

PREPARATORY & RECOMMENDED READING

UNIT ORGANIZATION
This unit is divided into three sub-sections: “Postwar America,” “DDT: Wartime Hero, Postwar Villain,” and “Natural Histories.” Each of these sub-sections develops points for use in lecture, followed by suggested passages for class discussion and questions for further inquiry. The unit concludes with ideas for in-class activities and student projects.
OPENING QUESTIONS

• What is the United States? What do you know about it? Its literature? What comes to mind when you hear “World War II,” “Cold War,” or “1960s”? What about “DDT,” “atomic bomb,” “industry” or “agriculture”?

• What is environment? How is it the same or different from nature? Or from ecology? Does nature have a history? What is the relationship between natural history and human history? What is the relationship between nature and the global or the planetary?

• What is literature? What is world literature? Does nonfiction count as literature? What about scientific writing? How might reading science as literature change your assumptions about what counts as literature? And why read American literature in a global context? What does it mean to read American literature as world literature?

• What do you think of when you imagine springtime? What things might you see or hear? What does the season of spring represent? What about the phrase “silent spring”? What does it evoke? Is it peaceful? Or ominous? How is it different from the springtime as you imagine it? Why title a book about environment Silent Spring?

POSTWAR AMERICA
First serialized in the New Yorker in 1962, Rachel Carson’s Silent Spring debuted at a moment of unprecedented military and scientific power, environmental destruction, and apocalyptic possibility. Carson’s work as a biologist began alongside the rise of atomic technology and the onset of World War II, and her work on Silent Spring unfolded during the Cold War. Over the course of her career, and perhaps most emphatically in Silent Spring, Carson traced how “the postwar culture of science” that materialized in the wake of the World Wars was symptomatic of humankind’s arrogant orientation toward nature. Linda Lear argues that for Carson “the philosophic root” of the various crises that confronted the United States (and the world) in the postwar years could be traced back to humankind’s naïve belief that it could control nature—to its failure to recognize that human beings constitute only “one of [nature’s] parts” and that “the survival of one part depended upon the health of all” (xvi). But as Carson shows us, the “philosophic root” of the problem was not simply—or at the very least not only—one of species. It was also the unintended product of American nationalism. As Edward O. Wilson puts it: “To a populace whose forebears had within living memory colonized the interior of a vast continent and whose country had never lost a war”—and had very recently won the war to end all wars—“arguments for limit and constraint seemed almost unpatriotic” (358). This was in large part due to the Great Depression and the Great Wars, which continued to exert significant influence “on the postwar American psyche” (Egan 15). The early decades of the twentieth century left American citizens “desperate for a rest—a return to normalcy.…and the promise of a restored individual and national affluence” (Egan 15). World War II “restimulated a long-flagging economy and created an outlet for production” that had only years earlier seemed unattainable (Egan 15). There was a new and unbridled faith in science, technology and industry, which together had won the war against fascism, increased food supplies, pioneered wonder drugs that eradicated deadly disease, and made available new and increasingly affordable conveniences that drastically improved the American quality of life. For the American public in the years immediately following World War II, science was, as Carson puts it, a “magic bullet” that promised to successfully fight “decisive battles in the war against infectious disease” and usher in an era of edenic, widely distributed prosperity (240).
Following World War II, then, the United States was increasingly gripped by “an ethic of limitless progress” (Wilson 358). The United States alone possessed atomic technology, which was put to devastating use in the Japanese cities of Hiroshima and Nagasaki. As J. R. McNeill and Peter Engelke note, nuclear power is unusual in that it, “unlike other forms of energy use...has a birthday: December 2, 1942,” when Italian émigré physicist Enrico Fermi oversaw the first controlled nuclear reaction on the University of Chicago campus in a repurposed squash court (27). What followed was monumental. The United States mobilized this power in World War II to victorious or chilling effect, depending on one’s perspective. Following the war, this power was repurposed and reimagined for more peaceful ends—as a solution for our ceaseless need for energy. This and other military technologies underwent a makeover of sorts in the years following World War II. They were “billed as mid-twentieth century progress” with “legitimate” use in postwar public life (Hynes 7). The “deep-seated technological optimism” of the postwar years was galvanized by the prospect that “human ingenuity”—and “American technologies” originally developed for war—would together “re-create the landscape in ways heretofore unimagined” by “put[ting] nature and its resources to even more effective use” (Egan 16). The advent of the bomb and other wartime technologies in this way produced not only a seismic shift in the war, but also “in the balance of power between men and nature” (Hynes 7) and, by extension, the United States and the rest of the world.

Human war and humankind’s control of nature are in this way inextricable from one another. Carson says as much when she notes with irony that nuclear power made the human species newly capable of dominating the planet and, consequently, producing its own extinction (8). As Edmund Russell suggests, “war and control of nature coevolved: the control of nature expanded the scale of war, and war expanded the scale on which people controlled nature” (2). To put it another way: control of the atom—nature’s building block—arguably won the war. It also consolidated humankind’s power over nature. Carson points to twentieth-century developments in chemistry as another example of this coevolution: “the German government recognized the value” of certain chemicals “as new and devastating weapons in man’s war against his own kind” and, by extension, his war against nature. Some of these chemicals went on to become “deadly nerve gas,” while others “closely allied in structure” were used as pesticides (28). The interrelationship of war and nature is also visible in the postwar population booms. These booms occurred not only because Americans enjoyed new heights of prosperity in the wake of World War II, but also because of the knowledge they had gained as they searched out ever more efficient ways of killing enemies: “Americans got better at saving lives partly because they got better at taking them” (Russell 8). In other words, the war’s outcome depended largely on the health of the troops involved, so even as the United States worked to improve the lethality of its weaponry, it also dedicated substantial energy to preserving human life (albeit selectively). In this way, “[w]ar’s exigencies had legitimated massive public health interventions and taught administrators and health professionals how to deliver vaccines, antibiotics, and sanitation to the masses at modest cost, even in difficult conditions” (McNeill and Engelke 41). While World War II was marked by unprecedented casualties, then, it helped make possible the overall improvement of public health—or what McNeill and Engelke have called, in a Frankensteinian turn of phrase, a “rollback of death” (45).

The United States gained much from mobilizing nature for military purposes. In addition to improving the health of the nation, it emerged from the war with incredible “surpluses” that increased individual and national wealth. Following World War II, the United States developed an “ever-enlarging” and “thriving economy” whose growth culminated in the 1960s, which marked “the longest period of
uninterrupted economic growth” in the nation’s history (Patterson 451-2). It also “commanded fully half of the entire planet’s manufacturing capacity and generated more than half of the world’s electricity.” It “owned two-thirds of the world’s gold stocks and half of all its monetary preserves,” “produced two times more petroleum than the rest of the world combined,” and possessed “a near monopoly” on a range of energy and technology industries (Kennedy 432). Writing for a national audience, Carson documents how Americans were “releasing far more toxins into winds and waterways than they had ever done before” (Purdy 202). Prosperity came at a price: sustaining increasing levels of wealth requires consuming resources in greater and greater amounts. *Silent Spring* is also set against the backdrop of global energy consumption. According to McNeill and Engelke: “Our species has probably used more energy since 1920 than in all of prior human history. In the half century before 1950, global energy use slightly more than doubled. Then, in the next half century, it quintupled from the 1950s level” (9). The carbon footprint of the human species multiplied exponentially. Whereas in 1750 “humankind released perhaps 3 million tons of carbon into the atmosphere” by way of burning fossil fuels, at the end of World War II that figure “had increased more than twenty-fold, to about 1,200 million tons.” After 1945, “humankind embarked upon a fiesta of fossil fuel consumption” (66). Though Carson is focused on pesticides and not fossil fuels in *Silent Spring*, statistics like these situate in stark terms the unsettling realities of the postwar world in which she wrote. This world was marked by an increasingly uneven relationship between humankind and nature—a relationship that, however much it seemed tipped in humankind’s favor might at any moment “boomerang” (Carson’s word) to catastrophic effect (80).

A source of growing terror that affected Americans and non-Americans alike were the implications of weapons like the atomic bomb—and, more broadly, the out-of-kilter relationship between humans and nature—especially in the context of “the uniquely difficult and bipolar world that suddenly arose after World War II” (Patterson 135). Here, James T. Patterson speaks of the Cold War, wherein “two very different societies and cultures found themselves face-to-face in a world of awesome weaponry” (135). “Awesome” in both the magnificent and frightening senses of the word, weapons like the atomic bomb plunged the United States, the Soviet Union, and their respective allies into a new, pervasive, and tenacious culture of fear and paranoia—a culture driven by a clash in worldviews, heightening concerns about security, and a tendency to “believ[e] the worst of the other,” all of which made it difficult “to curb the escalation of tensions” (Patterson 136). The Cold War intensified World War II’s technological and industrial legacies to negative effect. Like the Second World War, the Cold War was characterized by “heroic efforts to mobilize or alter nature for political ends” and solidified the “military-industrial complexes”—the proximity of military, industry, and science—that took shape during the 1930s and 1940s (McNeill and Engelke 160) and its role in building a prosperous economy through technological advances. It was in this context that many of the soaring optimism of World War II transformed into terrors. Whereas Americans initially envisioned the atomic bomb as symbolic of science’s untapped power and potentiality, they re-imagined the bomb in the Cold War years as indicative of science’s endless and unstoppable capacity for destruction. In other words: “If science could create something so destructive of human life as an atomic bomb, what could it not do? (Russell 166). From this perspective, pesticides took on a particularly sinister aspect. One scientist, Orlando Park, speculated prior to the publication of *Silent Spring* “that humans could annihilate themselves equally well with atomic bombs or insecticides” (Russell 166).
How, in the midst of the Cold War, did the United States respond to this new way of viewing scientific advances by way of the military-industrial complex? By doubling down. Russell outlines how “the Cold War repeated the pattern” established during the Great Wars: “Demand for chemicals increased, military and industrial institutions grew closer,” and “the United States added powerful new chemical weapons to its arsenal” (184). In this context, *Silent Spring* mobilized Americans’ growing concerns about nuclear power, the science-military-industrial complex, and potential apocalypse to conservationist ends. Taking advantage of “a resurgent concern with pollution and public health,” Carson sought to make Americans aware of an environmental threat that posed hazards just as great as those of nuclear fallout (Nixon 252). As Ralph Lutts observes: “She was sounding an alarm about a kind of pollution that was invisible to the senses,” that might “accumulate in body tissues” over time, and which “could result in cancer” and other health problems (19). Pollution by pesticide was not a familiar topic of conversation in the average American household prior to the publication of *Silent Spring*, but something equally invisible and deadly was: nuclear fallout. Positing pesticides as “another form” or agent “of fallout,” Carson “took advantage of the deep-seated cluster of social concerns surrounding it in the public’s mind” (Lutts 36). “[U]s[ing] the public’s existing understanding about the hazards of fallout to teach about the similar hazards of chemical poisons,” Carson made a case against the widespread use of pesticides and the proliferation of environmental toxicity that Americans could not ignore (36). The opening chapter of *Silent Spring*, “A Fable for Tomorrow,” is a case in point. As Lutts argues, “[i]t is no accident...that the first pollutant Carson mentioned by name in *Silent Spring* was not a pesticide but strontium 90” (34). Strontium 90, a radioactive isotope and “long-lasting component of fallout,” was all too familiar to Carson’s audience: mobile and accumulative, it served as a useful analog for introducing readers to a story that, though it featured a new character, was one they already knew—all [they] needed was a little reminding” (Lutts 37).

This strategy was remarkably effective. Framed in fallout, *Silent Spring* triggered the postwar environmental movement. Serialized in the *New Yorker*, the text was available to a broad reading audience that included President John F. Kennedy. Compelled to action, President Kennedy tasked the President’s Science Advisory Committee (PSAC) with the job of assessing the validity of the book’s science and claims, the severity of its implications, and its demand for action. As Naomi Oreskes and Eric Conway note, this was “a difficult charge” (221). To complete its task, PSAC had to “contrast the obvious, rapid benefits of pesticide use in disease control and food production with the subtle, long term, poorly understood risks to humans and nature,” to assess “a multitude of acknowledged scientific certainties,” and “to address the difficulties of predicting long-term effects based on the few existing clinical studies” (Oreskes and Conway 221). Despite these difficulties, PSAC came to a definitive judgment: “it was time for immediate action to restrain pesticide use” (Oreskes and Conway 221). *Silent Spring* thus paved the way for a decade of environmentally-minded legal reform. Not only were pesticides subject to new regulation, but Congress passed a series of foundational laws: the Clean Air Act of 1963, the Wilderness Act of 1964, the Clean Water Act of 1965, and the Endangered Species Act of 1966. The Environmental Defense Fund was established in 1967 and the Environmental Protection Agency was established with the signing into law of the 1970 National Environmental Policy Act. The nation also celebrated its first Earth Day in 1970, and further legislation followed: another Clean Air Act (1970), the Federal Water Pollution Control Act of 1972, and a second Endangered Species Act (1973). *Silent Spring* also “provoked debate and laid the groundwork for later environmental legislation” in countries beyond the United States (Hynes 40). The text was translated into numerous languages and distributed widely. During a 1963 “debate on pesticides in the House of Lords, London,” for instance,
“[n]early every speaker mentioned Rachel Carson and her book” (Hynes 40). But though the book triggered decisive action in the short term, its long-term legacies are perhaps less determinate. The “surge of environmentalism receded a bit” in the late 1970s as the environmental movement encountered its own unique challenges, including accusations of elitism and neglect of non-white, non-affluent, non-American audiences (Patterson 728)—a subject taken up in Unit 3. However, whether or not this is the case, the legacy of Rachel Carson’s Silent Spring is one that left an indelible mark on environmental history, activism and law in the United States.

CLOSE READING:
Students might explore the relationship between war and the control of nature by close reading the following passage (see the original text for the unabridged quotation). Ask students to consider how the notion of “total war” that emerged out of World War II might resonate with Carson’s description here of a kind of “total” or all-encompassing, universally devastating war upon nature:

It is not possible to add pesticides to water anywhere without threatening the purity of water everywhere. Seldom if ever does Nature operate in closed and separate compartments, and she has not done so in distributing the earth’s water supply...[Groundwater] travels by unseen waterways until here and there it comes to the surface...Except for what enters streams directly as rain or surface runoff, all the running water of the earth’s surface was at one time groundwater. And so in a very real and frightening sense, pollution of the groundwater is pollution of water everywhere. (42)

Carson’s first mention of a chemical—Strontium 90—occurs in the following passage, which students might use to consider the analogy between atomic fallout and pesticide poisoning in Silent Spring. For further consideration, see the opening chapter of the text, titled “A Fable for Tomorrow”:

The most alarming of all man’s assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible. In this now universal contamination of the environment, chemicals are the sinister and little-recognized partners of radiation in changing the very nature of the world—the very nature of its life. Strontium 90, released through nuclear explosions into the air, comes to earth in rain or drifts down as fallout, lodges in soil, enters into the grass or corn or wheat grown there, and in no time takes up its abode in the bones of a human being, there to remain until his death. Similarly, chemicals sprayed on croplands or forests or gardens lie long in soil, entering into living organisms, passing from one to another in a chain of poisoning and death...As Albert Schweitzer has said, “Man can hardly even recognize the devils of his own creation.” (6)

DISCUSSION QUESTIONS:

- Silent Spring raises difficult questions about unbridled industrial power. What do we make of technologies like nuclear power or insecticides that were developed in wartime? How do we make sense of the contradictions at issue in this history: that, one the one hand, these technologies were made possible by—if they did not also facilitate—the loss of human life? Yet, on the other hand, they inspired new hope for an improved quality of life? How do we assess when the costs of a particular technology outweigh its rewards?
• Carson gestures to at least two different ways of thinking about science and technology: as magic bullets that produce wondrous solutions to big problems and as unchecked powers whose inventions now exceed human control. How did these two notions of science and technology come to exist at the same time? Which events in American and/or world history informed these drastically different views and how do we reconcile them? How might this context help us rethink our present scientific and technological moment? How, for example, do we support and value scientific research or technological innovation while at the same time ensuring they do not become unaccountable to citizens and to the world?

• *Silent Spring* also raises questions about the relationship between human prosperity and environmental protection. How do we balance the welfare of humans with that of nature? Where do they overlap? Are they ever in conflict? Is it possible for environmental reform to have negative consequences for particular human communities? How do we assess these trade-offs without defaulting to the logic of anthropocentrism—the assumption that humans possess higher value than nonhumans? How do we sustain good quality of life while also protecting nature? (Students might focus on the second close reading passage as they discuss.)

**DDT: WARTIME HERO, POSTWAR VILLAIN**

As discussed in the preceding sub-section, war and the control of nature coevolved. Histories of military conflict might in this way be understood as histories of nature or, rather, histories of the relationship between humankind and the nonhuman world. In *Silent Spring*, Carson is broadly concerned with the ironies these intertwined histories make visible: the increasingly certain possibility, for instance, that in its war against nature humankind wages a war against itself, or how during the postwar years military technology was the means by which human beings acquired a better understanding of nature that then fueled, however paradoxically, both the industrialization of the nonhuman world and the mainstream American environmental movement. Carson was struck by the strangeness of the fact that much of what we know about nature emerged as a result of wartime science and technology. Satellites originally developed during World War II facilitated early research into earth systems and climate change; “Americans drilled the first ice core in the late 1950s, for purely military reasons” that nevertheless provided scientists with “useful data”; and sonar “enabled fishers to map the seafloor” and, if used in tandem with other military technologies including “shipboard computers” and “global positioning systems,” to transform commercial fishing into a “highly lethal” enterprise (McNeill and Engelke 74-5 and 93). The Cold War was thus distinguished by the repurposing of instruments and knowledge that “had been developed initially for military purposes” (McNeill and Engelke 93).

Carson was most concerned about one type of chemical technology in particular: DDT and its relatives. *Silent Spring* is in part a history of chemistry and the biography of a chemical. She charts DDT’s inception, recounting how it “was first synthesized by a German chemist in 1874” and, when scientists discovered many decades later that it was an especially effective insecticide, its military use (20). Applied in powder form, DDT helped keep American troops healthy and fighting: it eradicated “numerous pests, including mosquitoes and lice,” and was “used to stop the spread of deadly insect-borne diseases like malaria and typhus” (Oreskes and Conway 226). As that which eradicated insects, DDT represented the hope of securing “the end of insect-borne diseases” (Dunlap 3). For some, it was the harbinger of a new era of national and global health. Thus, like penicillin, DDT was imagined as a magic bullet. It promised the eradication of deadly diseases in the American populace as well as in soldiers fighting to protect that populace overseas. “War,” as Russell observes, “made malaria a
federal—and more specifically—a military threat” (112), but DDT afforded the United States an opportunity to “turn an enemy into an ally” (117). DDT enabled the United States military to weaponize nature for, so long as they could maintain control of this chemical secret to pest and disease control, American troops would remain healthy while their human enemies would be decimated by natural enemies. Nature in this way became an American ally in wartime.

As Russell argues, “chemistry” thus became “the workhorse science” of World War II and DDT became a wartime hero (202). Hailed as “a miracle chemical” (Oreskes and Conway 218), DDT was “credited with saving millions of lives” (Maguire 195). Paul Müller—the Swiss chemist who resynthesized DDT and discovered its insecticidal properties—would go on to win the Nobel Prize for Physiology or Medicine in 1948. Canonized as a wartime hero, DDT “came home in 1945 on a wave of publicity and high hopes”—it was a “technical marvel[i]” that promised to make immense improvements to food supplies and public health in the United States (Dunlap 3). It is no exaggeration to say that in the years immediately following World War II DDT “became a cultural icon” that “inspired poetry” and, later, after its fall from grace, elegiac obituaries. David McCord sings the chemical’s praises in verse in a 1944 issue of the New Yorker, declaring that “DDT means battles won” whether in wartime or in the domestic confines of the American suburban home (qtd. in Russell 129). An obituary for DDT published 25 years later in the New York Times Magazine in response to the state of Michigan’s ban on DDT from agricultural use laments the miracle chemical’s unjust death. The obituary personifies DDT as the “greatest” of war heroes, who died “age 95” following his “murder by author Rachel Carson” and is survived by his brothers in arms: “dieldrin, aldrin, endrin, chlordane, heptachlor, lindane and toxaphene.”

This imaginative and figurative work—the personification of DDT as a hero and lifesaver—paved the way for DDT’s postwar afterlife in big agriculture and the American suburbs. As Oreskes and Conway put it: “Everyone believed DDT was safe” (218). Thus, Carson writes, “the new chemicals come from our laboratories in an endless stream” (7) and “anyone may walk into a store and, without questions being asked, buy substances of far greater death-dealing power than” those strictly controlled “medicinal drug[s]” obtained at a pharmacy (174). The free availability of DDT and other toxic poisons intensified because of the mid-twentieth-century expansion of agriculture. “During the twentieth century,” McNeill and Engelke observe, “the area devoted to cropland and pastures on Earth more than doubled, with roughly half of that occurring after 1950” (88). The expansion of agriculture contributed to substantial losses in biodiversity. “Landscapes already long ago biologically simplified by conversion to farm or pasture grew still more simplified in 1945” as a result of agricultural practices like “monocropping,” or growing the same crop on the same land over and over again without rotation (McNeill and Engelke 88). This meant that, among other things, crops were especially vulnerable to insect predators and that insects, finding themselves with fewer natural predators, posed increasing threats to food supplies. In this context, the production of DDT and other pesticides increased exponentially. “The production of synthetic pesticides in the United States soared from 124,259,000 pounds in 1947 to 637,666,000 pounds in 1960,” which, Carson notes, amounts to “more than a fivefold increase” (17). These insecticides were, as Carson documents extensively, indiscriminate in terms of both their target species and usage. They were intended to target as many pest species as possible—to maximize effectiveness in the field—and as such decimated non-target species in the process. Likewise, the insecticides of which Carson writes were “indiscriminately sprayed on the land,” creating “a depressing record of destruction” that, ultimately, only contributed to the pest control problem by compounding chemical resistance in insect species (85). In addition to being repurposed as an agent of domestic and agricultural security,
DDT was a source of economic wealth and, once again, an instrument of military power. Large amounts of DDT were exported to other nations in the hopes of not only making a profit, but also of “increase[ing] food supplies,” “decreas[ing] diseases” and, by extension, “winning allies in the fight against communism” (Russell 189). Pesticides, then, constituted an important front in the arms race.

If DDT and the war on insects yielded powerful metaphors for American dominance in a postwar world, Carson mobilized those metaphors to very different ends. Tracing the “similarities between insecticide spraying and national defense programs,” Carson’s “search for a framing metaphor led her to war” (Russell 221). Whereas the United States military and agricultural industry used such metaphors to capitalize on Cold War anxieties and to justify sustained militarism, Carson “redirected” fear “away from the Red Peril to the aerosol can of Doom perched on the kitchen shelf” (Nixon xi). Deploying the imagery of war, Carson argued forcefully that the real threat to the United States and to humankind was not Communism but the human species’ capacity to annihilate nature and, in so doing, itself. Central to Carson’s case was the indiscriminate use of DDT and its catastrophic consequences. The preceding subsection outlined the range of legislative outcomes that Silent Spring helped make realizable. One of the most significant was, of course, the 1972 banning of DDT use in the United States. The state of Wisconsin played a key role in the procurement of the ban. In 1968, the Citizens’ Natural Resources Association of Wisconsin, Inc. (CNRA) joined with the Environmental Defense Fund (EDF) to “file[e] a complaint” against DDT “with the Wisconsin Department of Natural Resources” (Dunlap 152). The goal, however surprising, “was not so much to ban DDT in any particular place as to find a public forum and an impartial arbiter before whom to present their scientific evidence and get a judgment” (Dunlap 153). Doing so would pave the way for a ban at the national level. Wisconsin was an ideal place for pursuing this goal because state law allowed “[a]ny Wisconsin citizen” to “ask a government department for a ruling on the applicability of a particular set of facts to any rule enforced by the department” (Dunlap 153). A public hearing would follow. The format of the hearing was especially well suited to the CNRA and EDF’s aims because “[t]here was no concrete issue, no particular use of DDT at stake”—only the question of whether, “according to the water pollution laws of Wisconsin, DDT was a pollutant” (Dunlap 154 and 157). This allowed the CNRA and EDF to “set the terms of discussion, and force the industry to come and defend itself” on conservationists’ “ground” (Dunlap 159).

In this way, scientific experts and concerned citizens in Wisconsin played a formative role in the events leading up to the 1972 national ban on DDT. University of Wisconsin-Madison botany professors Orie Loucks and Hugh H. Itlis helped “establish the ecological part” of the argument against DDT, and “faculty and graduate students” at UW-Madison “arranged a scientific reference service for the EDF” so that those working on the conservationist side of the debate could obtain information to refute opposing testimony in real time (Dunlap 162 and 156). Perhaps most significant, however, was the publicity the hearing garnered. The EDF was known for its “friendly relations with the press” and “it made every effort to give reporters a story and make sure they got it right” (Dunlap 166). The Capital-Times would eventually cover the proceedings of the hearing on a daily basis and “Milwaukee papers also gave good coverage” (Dunlap 166). Soon, the tide began to shift. In November 1968 “the Wisconsin Department of Agriculture and the University of Wisconsin had announced that they would not recommend DDT for the control of Dutch elm disease” and in April of the next year the “Wisconsin Natural Resources Board had announced that it ‘would issue no permits for the use of DDT during the plant growing season’ and would discourage its use during the dormant season” (Dunlap 171 and 177). Over the course of the Wisconsin hearing, the story was picked up by national news outlets like the New York Times. Support
for taking decisive, legislative action grew across the United States, leading up to the 1972 decision. Ultimately, the ban was a “substantial” accomplishment “on both material and symbolic grounds” (Hynes 46-7). It was also an admittedly “partial victory,” for while DDT could no longer be used in the United States, its production and export to foreign countries remained in full swing (Hynes 47). Beyond the borders of the United States, then, the indiscriminate use of insecticides continued. In a world where everything is connected—in a world where “add[ing] pesticides to water anywhere” inevitably “threaten[s] the purity of water everywhere” (Carson 42)—the threat of DDT and its chemical relatives persisted.

**CLOSE READING:**

In the following passage, Carson composes a biography of DDT. Ask students to close read the passage and, as they do so, to make note of the ways Carson interweaves various kinds of histories and knowledges—military, scientific or chemical, physiological—to trace the overlap between and ramifications of wars waged among human beings and humankind’s war against nature.

DDT (short for dichloro-diphenyl-trichloro-ethane) was first synthesized by a German chemist in 1874, but its properties as an insecticide were not discovered until 1939. Almost immediately DDT was hailed as a means of stamping out insect-borne disease and winning the farmers’ war against crop destroyers overnight. The discoverer, Paul Müller of Switzerland, won the Nobel Prize. DDT is now so universally used that in most minds the product takes on the harmless aspect of the familiar. Perhaps the myth of the harmlessness of DDT rests on the fact that one of its first uses was the wartime dusting of many thousands of soldiers, refugees, and prisoners, to combat lice. It is widely believed that since so many people came into extremely intimate contact with DDT and suffered no immediate ill effects the chemical must certainly be innocent of harm. This understandable misconception arises from the fact that...DDT in powder form is not readily absorbed through the skin. Dissolved in oil, as it usually is, DDT is definitely toxic...Once it has entered the body it is stored largely in organs rich in fatty substances...The fatty storage depots act as biological magnifiers, so that an intake of as little as 1/10 of 1 part per million in the diet results in storage of about 10 to 15 parts per million, an increase of one hundredfold or more...a minute quantity can bring about vast changes in the body. (20-1)

Use the following passages to study Carson’s metaphors of war.

As man proceeds toward his announced goal of the conquest of nature, he has written a depressing record of destruction, directed not only against the earth he inhabits but against the life that shares it with him. The history of the recent centuries has its black passages—the slaughter of the buffalo on the western plains, the massacre of the shorebirds by the market gunners, the near-extermination of the egrets for their plumage. Now, to these and others like them, we are adding a new chapter and a new kind of havoc—the direct killing of birds, mammals, fishes, and indeed practically every form of wildlife by chemical insecticides indiscriminately sprayed on the land. (85)

No responsible person contends that insect-borne disease should be ignored. The question that has now urgently presented itself is whether it is either wise or responsible to attack the problem by methods that are rapidly making it worse. The world has heard much of the triumphant war against disease through the control of insect vectors of infection, but it has heard little of the other side of the story—the defeats, the short-lived triumphs that now strongly support the alarming view that the insect enemy has been made actually stronger by our efforts. Even worse, we may have destroyed our very means of fighting. (266)
DISCUSSION QUESTIONS:

- Why was DDT a veritable war hero? Consider DDT’s personification as a wartime magic bullet. What is personification? What does it mean to personify nonhuman objects as actors in human history? How was DDT re-personified or repackaged by Carson and environmental activists? How did Carson’s use of military analogy position DDT as a weapon of mass destruction akin to the atomic bomb? In what ways does DDT’s wartime and postwar history map onto the two notions of science and technology discussed above? Carson discusses many other, equally if not more powerful chemicals in *Silent Spring*. Why was DDT an ideal target? Was it only a matter of time before it fell from grace?

- *Silent Spring* illustrates how humankind’s war against nature is also a war against humankind. According to Carson, what role did nature play in World War II—for example, in the Allied powers against the Axis? How did nature interfere with wartime strategy? How did it become a weapon the United States could harness for military purposes? Does this history surprise you and, if so, why? Does it, for example, complicate the idea that nature is a passive resource over which the human holds absolute power? Students might consider the issue of insect resistance as they answer these questions.

NATURAL HISTORIES

The preceding sub-units provide an overview of *Silent Spring*’s postwar historical contexts. Natural history, as Carson reminds us, is a crucial strand of this narrative. *Silent Spring* is a close reading of landscape, earth systems and evolutionary time. Writing of the “unthinking bludgeoning” of “the sagebrush lands of the West,” for instance, Carson shows her readers how humankind’s “vast campaign” against nature is immortalized in the landscape itself (64). Likening nature to “the pages of an open book,” she reads the landscape to discover “why this land is the way it is, and why we should preserve its integrity” (64). Key to Carson’s understanding of natural history is her insistence that humans—and human history—do not stand apart from but rather are integral to it. “The history of life on earth has,” after all, “been a history of interaction between living things and their surroundings” (5). These living things include human beings. For those who know how to read it, the book of nature tells the story of how humankind alters particular landscapes and, indeed, the entire planet dramatically and perhaps irrevocably, transforming “radiation” into an “unnatural creation of man’s tampering with the atom” and manipulating nature such that it must “make its adjustment” not only to “minerals” but also to “the synthetic creations of man’s inventive mind” (7). Given that *Silent Spring* is an account of “the contamination of man’s total environment” by humankind itself, it is perhaps no surprise that Carson considered alternative, equally chilling, and perhaps more telling titles than *Silent Spring*, including: *Control of Nature, The War against Nature, and Man against the Earth*. These titles demonstrate emphatically how Carson “wanted to bring out the theme of man’s relentless struggle to subdue nature” (Smith 179).

What Carson describes in *Silent Spring* is what some now call the Anthropocene. Many climate scientists use this term to describe Earth’s shift “out of its current geological epoch” as a result of “human activity” (Steffen et al 843). The balance between the human species and the planet has undergone a massive shift: “humankind is now a geological force in its own right” (Steffen et al 843). Whereas the Holocene named “an intergalacial moment” characterized by a “stable” climate—a moment that contains almost “[a]ll of what is conventionally understood as human history”—the Anthropocene
names “human interference in the natural cycling of carbon” (McNeill and Engelke 1 and 65). This interference, facilitated by human-engineered “chemicals and other industrial emissions,” is now a permanent part of the geological rock record (Purdy 1). Pesticides, as Carson demonstrates, are an important part of this story. While Carson does not use the term “the Anthropocene,” we might nevertheless understand her as one of its earliest theorists. *Silent Spring* is deeply concerned with the ways “humanity is implicated in natural history” (Buell 7)—with how the livelihoods of whole species and entire earth systems are caught up in human action and its consequences.

*Silent Spring* makes visible the difficulties of understanding such action and reimagining its consequences—of rerouting the increasingly gloomy planetary future that the Anthropocene would seem to promise. Published in 1962, the book gives support to the idea that the Anthropocene began in the mid-twentieth century, wherein the first atom bomb was detonated, “three-quarters of the human-caused loading of the atmosphere with carbon dioxide took place,” and “the human impact on Earth and the biosphere...escalated” (McNeill and Engelke 4). McNeill and Engelke call this conjoined moment in human and geological history “the Great Acceleration” (4). But others point out that the beginning of the Anthropocene is not so easily established. Christophe Bonneuil and Jean-Baptiste Fressoz offer a range of alternative starting points: the emergence of the species *Homo sapiens* “in Africa 200,000 years ago”; humankind’s first measurable interferences in the natural cycling of carbon, which resulted from “deforestation, rice cultivation and stock-raising” (14); the onset of the industrial revolution (16); or even “the European conquest of America” (15). This is all to say that the natural historical moment in which *Silent Spring* is situated and to which it responds is not so easily mapped. The Anthropocene marks, among other things, the conceptual, historical, and scientific difficulty of pinpointing beginnings and endings, cause and effect. Treating the threat of nuclear fallout not necessarily as a definitive historical starting point for environmental crisis but rather as the most proximate analog for understanding the consequences of humankind’s war upon nature, *Silent Spring* illustrates how we need not choose one beginning over another. Rather, each of these beginnings is an iteration of the same wide-ranging problem: the out-of-kilter relationship between humankind and the nonhuman world it exploits for its own gain (and, ironically, to its eventual extinction). As Carson demonstrates, this problem has a long and variable history that cuts across the human and the nonhuman.

*Silent Spring* in this way takes up a challenge that is central to thinking the Anthropocene: mapping and thinking across different time scales, as well as different relationships to time. Carson’s writing about toxicity highlights disjunctions between the shallows of human time and the depths of evolutionary time. Whereas *Silent Spring* describes natural history as unfolding across deep time—across “hundreds of millions of years” wherein “the life that now inhabits the earth” evolved slowly to achieve a carefully calibrated state of “adjustment” or “balance”—she describes the “modern “world” as possessing “no time” (6). Humans have subjected the Earth to “rapidity of change.” “[T]ime is [an] essential ingredient” to maintaining ecological balance, but the “pace” of humankind is “impetuous and heedless,” undoing the “deliberate pace of nature” and its eons of slow transformation in the blink of an eye (7). Perhaps paradoxically, the “impetuous and heedless” actions of humankind have long-ranging consequences: the potential to outlive not only generations of human beings, but also the human species itself. This is because such actions enact a poisoning of life forms and of the earth that, like nature and its history, is deliberate, accumulative, and slow. “[U]nseen and invisible” (41), the environmental poisoning with which Carson is concerned “lie[s] dormant like a slumbering volcano” in the bodies of human, animal and planet (25). Thus, Rob Nixon argues that Carson tackles an environmental crisis defined by what he
calls “slow time,” or “gradual” and “imperceptible change” (11). Such change is difficult to observe not only because humankind occupies a very tiny portion of geologic history and, thus, possesses a limited capacity to observe slow forms of transformation and violence, but also because many human beings live “in an age of onrushing turbo-capitalism, wherein the present feels more abbreviated than it used to”—wherein we are preoccupied with “technological time-savers” and embrace “a self-justifying, propulsive ethic” (8).

This “propulsive” model of time is not only out of sync with the violence of pesticide toxicity, which unfolds across more protracted time scales, but also helps to erase evidence of such violence. In an age of mass media and 24-hour news cycles, what is notable and noticeable has changed. That which is not immediately visible, or sensational, or headline-worthy is often ignored or altogether erased, meaning stories of environmental pollution and other forms of slow, difficult-to-document, uneventful violence remain largely unseen and unheard. Further complicating this issue is the temporality of electoral politics. Many politicians realize that “the political rewards of their actions will not accrue to them” when it comes to tackling environmental issues (Nixon 9). This is the case not only because environmental issues escape the rhythms of the 24-hour news cycle, but also because the legal action that “targets slow violence” often “cannot deliver dependable electoral results”—such action requires, in other words, more time to be implemented and assessed than permitted by electoral cycles in the United States (Nixon 9). Inevitably, then, “environmental action” is considered “critical yet not urgent,” an attitude that creates a “pileup of deferrable actions deferred” with the familiar excuse of “yes, but not now, not yet” (Nixon 9). This is perhaps why some theorists in the humanities and social sciences argue against thinking the Anthropocene in terms of crisis. As Bonneuil and Fressoz argue, “[t]he term ‘crisis’ denotes a transitory state, while the Anthropocene is a point of no return” (21). “Crisis,” here, is a misnomer. Others suggest that the term “crisis” is appropriate insofar as it stands in stark contrast to the “complacency” that often surrounds environmental disaster (Purdy 5). One of the Anthropocene’s most unsettling characteristics is that it has become “the new normal” or “business as usual” (Purdy 5). As Jedediah Purdy puts it, “whatever is not actively killing you” (5) in an “acute” manner—whatever is “chronic,” slow, invisible, deferrable—will inevitably feel normal (226). Carson tracks precisely this type of ignorance and complacency in Silent Spring, arguing that awareness of “ubiquitous toxicity” requires “an active effort”—for instance: a housewife taking the time to carefully examine the labeling of seemingly safe but potentially poisonous gardening products so as to understand what, exactly, she is putting in the soil and, by extension, her body.

As Silent Spring tracks the disjunctions between geological and human histories, the book shows how time is a central difficulty—perhaps the central difficulty—of understanding the off-kilter relationship between humans and nonhumans. In conflict with and often erased by the workings of other forms of time, environmental toxicity illustrates how time itself has “becom[e] an actor in complicated ways” in attempts to intervene in environmental crisis and restore ecological balance (11). Carson takes up the notion of time as actor most explicitly in her discussions of evolutionary time or, rather, the ways different species possess different relationships to temporal change. Bug time, for instance, is very different than human time. Addressing the “hopeful question” of whether humans, like insects, might develop resistance to pesticides, Carson reminds her readers that “new insect generations arise in a matter of days or weeks,” whereas “[h]uman populations reproduce at the rate of roughly three generations per century” (274). This means that an insect species might develop resistance to a particular pollutant within a span of time that to us seems very short, while such change in human
beings “take[s] hundreds or even thousands of years” (274). Here, as in many other ways, time is not on our side. Carson argues that to restore ecological balance and, by extension, humankind’s future on this planet, human beings must recalibrate their relationship to time—to its multiplicity and its shades of difference, its gradations and disjunctions, its unanticipated self-collisions and strange workings. *Silent Spring* reminds us over and over again that there is much we do not understand about nature and the world in which we live. These unknowns call into question the impulse toward knee-jerk, premature, uninformed action—toward a frenetic relationship to time. Such unknowns demand that human beings instead attend to and occupy the space of slow time, and its seemingly distant but ever-looming and potentially world-shattering futures.

**CLOSE READING**

Students might explore the relationship between human and natural history using the following passage (see the original text for the unabridged quotation, unfolds across pages 5, 6 and 7). Ask students to consider how the temporality of the human species—how its relationship to time—differs from that of the Earth. They might next discuss in what ways human temporality is implicated in environmental crisis:

The history of life on earth has been a history of interaction between living things and their surroundings. To a large extent, the physical form and the habits of the earth’s vegetation and its animal life have been molded by the environment. Considering the whole span of earthly time, the opposite effect, in which life actually modifies its surroundings, has been relatively slight. Only within the moment of time represented by the present century has one species—man—acquired significant power to alter the nature of his world. (5) It took hundreds of millions of years to produce the life that now inhabits the earth—eons of time in which that developing and evolving and diversifying life reached a state of adjustment and balance with its surroundings...Given time—time not in years but in millennia—life adjusts, and a balance has been reached. For time is the essential ingredient; but in the modern world there is no time. (6) The rapidity of change and the speed with which new situations are created follow the impetuous and heedless pace of man rather than the deliberate pace of nature. Radiation is no longer merely the background radiation of rocks...cosmic rays...the sun...; radiation is now the unnatural creation of man’s tampering with the atom. The chemicals to which life is asked to make its adjustment are no longer merely the calcium and silica and copper and all the rest of the minerals washed out of the rocks...they are the synthetic creations of man’s inventive mind, brewed in his laboratories, and having no counterparts in nature. To adjust to these chemicals would require time of the scale that is nature’s; it would require not merely the years of a man’s life but the life of generations. (7)

Use the following passage to explore the concept of slow violence as it relates to environmental toxicity. Students might develop a vocabulary for describing how slow violence works, the observational or representational difficulties it presents, etc.:

The most alarming of all man’s assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible. In this now universal contamination of the environment, chemicals are the sinister and little-recognized partners of radiation in changing the very nature of the world—the very nature of its life. Strontium 90, released through nuclear explosions into the air, comes to earth in rain or drifts down as fallout, lodges in soil, enters into the grass or corn or wheat grown there, and in no time takes up its abode in the bones of a human being, there to remain until his death. Similarly, chemicals sprayed on
croplands or forests or gardens lie long in soil, entering into living organisms, passing from one to another in a chain of poisoning and death. (6)

**DISCUSSION QUESTIONS**

- What is human history? What is natural history? How are they intertwined in *Silent Spring*? In what ways are they different? How does Carson reconstruct these histories? What records does she use? What evidence does she cite? Can we, as Carson argues, read the landscape much like we can the written records of human history? What other stories might we discover there? On which aspects of the landscape should we focus to recover these stories? How is interpreting a text like *Silent Spring* similar to interpreting the story of a landscape? In what ways might your skills as readers of literature transfer over to other modes of reading or other objects of interpretation?
- *Silent Spring* tracks an invisible form of violence that raises questions about temporality, or the experience of time. How might you describe environmental toxicity as imagined in *Silent Spring*? Is it fast or slow? Linear or multidirectional? How does it confuse or obscure the relationship between cause and effect? What difficulties does this form of environmental destruction present to the imagination? How, in other words, does it stretch our capacity to understand? In what ways are these difficulties related to the perception of time, or the coexistence of multiple temporalities?
- Carson describes the American public as not only unaware of but in some cases complacent with widespread environmental pollution. At the same time, she warns against the impulse toward knee-jerk action in response to environmental crisis. How did Carson provoke an awakening in the American public? What aspects of *Silent Spring* effectively shook people awake to the pollution taking place in their own backyards? As we attempt to come to grips with an environmental crisis of our own, what might we learn from *Silent Spring*'s strategy? How do we provoke and sustain interest in environmental issues, and enact systemic change, when it is so easy for people to ignore environmental issues and for legislators to defer action? And how, at the same time, do we ensure we are taking the right action? That we are not falling into the trap of action for action's sake—of rash, uninformed action that might produce unintended consequences?

**ACTIVITIES, ASSIGNMENTS & PROJECT IDEAS:**

- Ask students to write a miniature version of *Silent Spring* focusing on an object at stake in contemporary environmental debates. Possibilities might include environmental pollutants or things damaged by them. For example, oil or seabirds, fossil fuels or coral reefs, etc. Students should make an argument for their chosen object: how it is central to and representative of environmental crisis at present. Through this assignment students will apply their close reading skills to non-traditional texts (i.e. their chosen objects) and gain a better sense of *Silent Spring*'s legacies—of the environmental strides we have made and the work still to be done.
- Have students create a timeline representing the many temporalities at issue in *Silent Spring*. These might include that of natural history or deep time, human history or shallow time, evolutionary time (which varies widely across species), the speed of media coverage or of legislative action (consider how DDT was banned a full ten years after the publication of *Silent
Spring), the relationship between short-term needs and long-term effects, etc. This project will help students develop a sense of the different timescales at issue in environmental crisis, and the challenge of thinking across them.
 UNIT 2 • ECOLOGY, NATURE / CULTURE, AGENCY

OBJECTIVE: To introduce the concept of “ecology”; the concepts of and interrelationships between the human and the nonhuman; and the question of agency as it is imagined in Silent Spring and as it informs philosophical debates about rights and personhood.

PREPARATORY & RECOMMENDED READING
Williams, Raymond. Keywords: A Vocabulary of Culture and Society. Oxford University Press, 1976.

UNIT ORGANIZATION
This unit is divided into three sub-sections: “Ecology,” “The Non/Human,” and “Agency, Politics, Personhood.” Each of these sub-sections develops points for use in lecture, followed by suggested passages for class discussion and questions for further inquiry. The unit concludes with ideas for in-class activities and student projects.

ECOLOGY
Silent Spring took ecology public, distilling complex scientific ideas and relational modes of thinking so that they might be accessible to the average American reader. Carson defined ecology, at its most basic,
as the notion that “in nature nothing exists alone” (51). Rather, all of nature’s life forms and processes together constitute “a web of life” shaped by the “intimate and essential relations” between the ecological whole and its many, many parts (64). The “interwoven strands” of this relational web “lead from microbes to man” (69). *Silent Spring’s* structure internalizes this ecological logic of interconnection. Moving between chapters on groundwater and oceans, soil and vegetation, atmosphere and animal life, the suburbs and human bodies, Carson’s argument is organized such that it makes visible the ecological web with which she is concerned. *Silent Spring* in this way participates in a tradition of studying the natural world that, according to Gregg Mitman, occupies “the borderland between biological and social sciences” (1). As that which explores the “interrelationships between and among individual organisms and their environment,” ecology afforded Carson an ideal lens not only for viewing nature as an interconnected web of life, but also for “bring[ing] biological understanding to problems confronting human society” (Mitman 1). *Silent Spring,* in other words, mobilizes an ecological understanding of the natural world to identify and intervene in potentially devastating problems—including the mismanagement of agricultural lands and resulting widespread toxicity; the slow, irreversible, accumulative poisoning of both human individuals and future generations; the out-of-kilter relationship between humans and nature that might at any moment boomerang catastrophically.

Ecology is first and foremost a science. It names “the inclusive study of organisms in the environment, in contradistinction to the narrower study of organisms in the laboratory” (Keller and Golley 9). It is also distinct from biology insofar as it does not strictly “deal[ ] with the structure and classification of organisms themselves,” but rather with “the investigation of organisms in their natural setting and the operations of natural selection” as they unfold in the environment and across ecosystems (Keller and Golley 9). Unlike many other forms of natural science, ecology puts “emphasis on the primacy of direct observation,” arguing that “discovery of patterns in nature does not necessarily require instruments or machines” (Keller and Golley 11). “Nature can” in fact “be directly experienced” (Keller and Golley 11). Though there are unifying principles that cut across ecological research, ecology has never “achiev[ed] conceptual unity” (Keller and Golley 11). It is “a complex and weakly organized subject that finds its foundations not in logical thought but from patterns of nature observed through cultural filters” (Keller and Golley 16). There are many subdisciplines within the field of ecology, including: animal ecology, marine ecology, macroecology, systems ecology, molecular ecology. Each subdiscipline possesses its own understanding of these patterns and their social dimensions. Thus, Carson’s interest in “the social dimension of ecology” is not the exception to the rule (Mitman 1). It is, rather, characteristic of the field in which she was trained as a scientist. During the Great Depression and, later, World War II, ecologists located in nature models of social organization that emphasized “cooperation,” interdependence, and mutual benefit that might be reparable in the face of total war.

After World War II, however, the valences of this emphasis on “community” changed radically: as “the specter of totalitarianism in the Soviet Union was increasingly seen as a threat to democracy” (Mitman 6), ecological models that emphasized cooperation “resonated too closely with the ideology of totalitarianism” (Mitman 202). “Community” began to look too much like “conformity” and thus “threatened to undermine individual identity” (Mitman 205). Thus, ecological models that emphasized a Darwinian “world of competing groups” and the drive to protect “personal advantage and self-interest” rose to the fore (Mitman 206). Both theories of ecology that circulated during World War II and the postwar years—one predicated upon community and the other upon competition—are visible in *Silent Spring*. This is all to say that Carson was working and writing during a critical moment in the history of
biology wherein scientists were putting their research into conversation with pressing social issues. Science was not produced and did not exist in a bubble. It was deeply engaged in and engaged by sociopolitical questions even as it also generated empirical, verifiable, specialist knowledge about the material world. Like “natural systems” and “the bodies of living things,” ecological science and social studies were (and are) “linked and interpermeable” (Purdy 200). This permeability and its implications for science and for politics is explored in greater depth in Unit 5.

Ecology emphasizes the interrelationships between life forms and natural systems and, in so doing, destabilizes otherwise conventional boundaries. Raymond Williams’s etymological account of the word “ecology” demonstrates precisely this point: crafted from the Greek oikos for “household” and logos for “discourse,” ecology is at its most literal “the systematic study” of “household” or “home”—of “the relations of plants and animals,” the web of which constitutes and gives shape to one’s lived experience in the most intimate (and sometimes invisible) of ways (70). This idea of the ecological as that which is both external and internal, expansive and interpenetrative, informs not only the research of scientists working in the field, but also scholars in the humanities and social sciences who practice ecology as a mode of thought. Here, ecology names a kind of imaginative work: an aesthetic, philosophical, political concern with “ethics,” or “the kind of relationship that human beings ought to have to the natural world” (Clark 152). This way of thinking takes the work of ecological science—the empirical exploration of how “in nature nothing exists alone” (Carson 51)—as a point of departure, exploring whether such knowledge might make available new models for imagining the relationship between humans and nonhumans (Clark 152). Timothy Morton—recently named by The Guardian the philosopher-prophet of the Anthropocene— theorizes what he calls “the ecological thought”: a mode of seeing or imagining the world that “isn’t just about global warming” but also about “society” and the meaning of “coexistence” (2). Ecological thinking goes beyond the boundaries of discipline to encompass not only science but also “art”—it “includes all the ways we imagine how we live together,” whether scientific or aesthetic (Morton 4). For Morton and others working in the humanities, “ecology” is an expansive and variable term that contains within itself many meanings, ways of thinking, and objects of study. In this way, it is very different from scientific ecology, which unfolds across many sub-disciplines, each of which has its own, particular definition for the term. Here, we have an example of how the humanities and the sciences simultaneously overlap and differ with one another. Silent Spring ranges across both approaches to the term “ecology.” On the one hand, the text is founded upon a concept that was very new at the time of Silent Spring’s publication, though it is familiar to us now: ecosystem, or the material and energy flows between life forms and their physical environment. On the other hand, Silent Spring employs “ecology” as broad term for relationalities that give shape to the world and, to borrow Morton’s phrasing, potentially reroute “the ways we imagine how we live together.”

Like Carson, Morton emphasizes that “[n]o man is an island”—that no human being exists in isolation from the many other humans and nonhumans on this planet (8). She also demonstrates how ecological thinking makes visible “a vast, sprawling mesh of interconnection” or “radical intimacy,” to borrow Morton’s phrasing—a web that encompasses and cuts across all beings of all kinds (Morton 8). To think ecologically—to re-imagine the world in terms of such intimacies and to follow through on their speculative, ethical implications—is to take up difficult questions about the relationship between the human and the nonhuman. It is to confront what Jane Bennett describes as “a strange and incomplete commonality” that joins together all things, including oneself (17). Reimagined in ecological terms, you are and are not yourself insofar as you are permeable to and interpenetrated by multitudes of other

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beings and forces. This is precisely what Carson suggests when she describes ecological thinking as “something that takes us out of ourselves, that makes us aware of other life” (162) and our profound interrelationship with it. For Carson, too, ecology is a deeply speculative way of thinking. Ecology makes visible the ways that science and imagination are not necessarily opposed (an idea taken up in more detail in Unit 6). *Silent Spring* is full of imaginative thought. Carson invokes literature—including Greek mythology, the fantasy worlds of Lewis Carroll, and the poetry of Robert Frost—to illustrate her points. She also employs an overtly poetic mode of writing wherein the banality of the small or the familiarity of the everyday takes on a new, vibrant, gorgeous life. Seen through Carson’s eyes, an ordinary “lacewing” is revealed as a beautiful, mysterious, unimaginable confection of “green gauze wings and golden eyes” whose “shy and secretive” ways evolved slowly and even magically from a biological ancestor who “lived in Permian times” (250).

Ecology is not, however, all sunshine and rainbows. An ecological worldview defamiliarizes what is known and reveals not only unexpected and perhaps beautiful kinships, but also previously unimagined hazards. If “all bodies are kin”—if “to harm one section of the web” is to harm another part of it or even “oneself” (Bennett 13)—the possibilities of such kinship are just as terrifying as they are “idyllic or utopian” (Heise 20). Ecological thinking enlarged the scope of uncertainty and menace to the environment and to human life by mapping the consequences of widespread industrialization, overconsumption of resources, and pollution. Many of the ecosystems described in *Silent Spring* are incredibly fragile. Carson writes that “[t]he specialization of some of these” seemingly “minute creatures” is so particular and yet so critical that the disappearance of a single creature might devastate entire ecosystems (55). Showing how the “boundaries among organisms, places, and systems are neither stable nor secure”—documenting the fragility of those ecological interconnections upon which many organisms and ecosystems subsist—*Silent Spring* revealed how “[t]he suburbs were unsafe” and “the body...not secure” (Purdy 41). Conjuring “the apocalyptic specter of a ‘poisoned world’,” Carson demonstrated how the new environmental hazards that emerged in World War II and the postwar years “were vaster by orders of magnitude than the worst environmental prospects of earlier times” (Purdy 200). Disasters as catastrophic as total “systemic failure” suddenly seemed all too realizable (Purdy 200). As Lawrence Buell notes, the ecological “totalization of phenomena” was in this way “readily adaptable to apocalyptic ends by concerned individuals like Carson” (302). Carson deploys precisely this kind of apocalyptic narrative in “A Fable for Tomorrow,” the opening chapter of *Silent Spring*, wherein she gathers together and imagines to terrifying effect “the kinds of risk that are generated by [ecological] connectivity” (Heise 121). Tracing how ecological relationships might be transformed “irreversibly” into “chain[s] of evil” (6)—how “the robins’ fate is linked to the elm trees by way of the earthworms” (107) who move through the DDT-treated soil of the suburban housewife’s vegetable garden—*Silent Spring* made newly visible ecosystems that are as vulnerable and macabre as they are communal and beautiful, as “ominous” as they are “inspiring” (Purdy 200).

CLOSE READING:
The following passage traces the interconnections between soil, plant and animal life, and human agriculture and subsistence. Students might close read it to explore Carson’s core argument that “in nature nothing exists alone” (53):

The thin layer of soil that forms a patchy covering over the continents controls our own existence and that of every other animal of the land. Without soil, land plants as we know them could not grow, and without
plants no animals could survive. Yet if our agriculture-based life depends on the soil, it is equally true that soil depends on life...For soil is in part a creation of life, born of a marvelous interaction of life and nonlife long eons ago. The parent materials were gathered together as volcanoes poured them out in fiery streams, as waters running over the bare rocks of the continents wore away even the hardest granite, and as the chisels of frost and ice split and shattered the rocks. Then living things began to work their creative magic and little by little these inert materials became soil. Lichens, the rocks’ first covering, aided the process of disintegration...and made a lodging place for other life. Mosses took hold in the little pockets of simple soil—soil formed by crumbling bits of lichen, by the husks of minute insect life, by the debris of a fauna beginning its emergence from the sea. Life not only formed the soil, but other living things of incredible abundance and diversity now exist within it; if this were not so the soil would be a dead and sterile thing. By their presence and by their activities the myriad organisms of the soil make it capable of supporting the earth’s green mantle. (53)

Ecology reveals how the concepts of interconnection and interdependence connote not only incredible beauty and kinship, but also death and even apocalypse. Use the following passage to explore Carson’s warning that ecological systems might turn very quickly under humankind’s control from “web[s] of life” into webs of “death” (189):

Water must also be thought of in terms of the chains of life it supports—from the small-as-dust green cells of the drifting plant plankton, through the minute water fleas to the fishes that strain plankton from the water and are in turn eaten by other fishes or by birds, mink, raccoons—in an endless cyclic transfer of materials from life to life. We know that the necessary minerals in the water are so passed from link to link of the food chains. Can we suppose that poisons we introduce into water will not also enter into these cycles of nature? (46)

DISCUSSION QUESTIONS:

- Carson uses the word “ecology” to describe a scientific field of study divided into various subdisciplines and a way of thinking relationality that possesses a social dimension. How would you define these different forms of ecology? What are their objects of inquiry? What forms of knowledge do they produce? What are their implications? How are they different? How are they similar? Do these different uses of ecology tell us anything about the humanities and the sciences? About how they are different or similar—about not only how they diverge but also what they might have in common? What do we make of Carson’s infusion of imagination with science?

- Prior to reading Silent Spring, how might you have defined the concepts of the individual or of self? How does Silent Spring provoke you to reimagine these terms? How, according to Carson, is the self never just the self? If all things are interconnected, how and where do we draw the line between beings? Does Carson suggest that we lose all sense of boundary when we think ecologically? Or is there still a sense of boundary in her work? How does the ecological disruption of boundaries cause you to rethink your assumptions about the relationship between self and other, or the human and the nonhuman, or culture and nature?

- Carson uses the metaphor of the web. What is a web? What does it look like? What is its form? How is different from other common ways of describing ecological interrelationships? For example, the idea of a food chain? What are its strengths? What are its weaknesses? What do we make of the fact that Carson describes the web of life as, on the one hand, all-encompassing and as, on the other, incredibly fragile or precarious?
• In *Silent Spring*, ecological beauty verges quickly into environmental apocalypse. How is Carson’s vision of nature at once idyllic and apocalyptic? At once utopian and dystopian? In what ways do these ideas coexist in *Silent Spring* and for what purpose? Where do we locate the line between them? Can we, according to Carson, come back from apocalypse? What is the relationship between these two ways of thinking and time, or the question of the future?

THE NON/HUMAN

Ecological thinking unsettles the conventional assumptions we might otherwise be inclined to make about nature, the nonhuman, and the human. Insofar as ecological knowledge “takes us out of ourselves” (Carson 162), it also takes nature out of nature and the human out of the human. To put it another way: ecological thinking disrupts the notion that nature and the human exist in hermetically sealed containers; that they are mutually exclusive to and distinct from one another, the former passive to and under the jurisdiction of the latter. According to this line of reasoning, nature is “defined as everything humans are not”—as a “pristine otherness” that stands apart from the human world and its sociopolitical dimensions (Herron 12). The notion that a divide exists between culture and nature, and by extension the human and the nonhuman, has a long history and a complicated politics. John P. Herron observes that “[d]efining concepts of the natural” especially in relationship to the human has sparked not only “philosophical” or abstract “debate” but also “carries a heavy load” with material and political implications (12). Fueling these debates is the sheer complexity of the word “nature.” As scholars have documented extensively, the term is not one we can take for granted. It is multifarious and mobile, having accrued a plurality of meanings and valences that are often contradictory. Williams famously speculates that “[n]ature is perhaps the most complex word in the language” (166). Describing an “essential quality or character of something,” an “inherent force” at work in the world, and at the same time “the material world itself,” “nature” has evolved to take on “precise meanings” that “are variable and at times even opposed” (Williams 166). Amplifying these complexities and contradictions is the extent to which “nature” collapses “multiplicity to a singularity”: it can connote, paradoxically, “a specific singular” (for example, “the nature of something” in particular) *and at the same time* a range of “abstract singulars” (“the nature of all things,” for instance, “the whole material world,” or “a common quality” that cuts across multiplicities) (Williams 166). Etymologically and lexically, the word “nature” is notorious for its refusal to stay put. Already at the level of the sentence—at the level of close reading—we can see what Carson sees: a vast, complex and complicated web of forces and counterforces that together constitute nature in all of its unity and multiplicity.

Historically, however, this sense of interdependence and complexity has not always been acknowledged. Eighteenth- and nineteenth-century philosophy and science, for instance, are largely credited with flattening nature into a mere mechanism comprised of fixed and “discoverable laws” (Williams 168). Casting nature as a knowable “object of observation,” these thinkers helped to consolidate the divide between nature and culture—to position nature as a passive, “static” and “primary” materiality that would reveal itself willingly to humankind: nature’s self-made, dynamic, reasoning Other (Williams 169). The consequences of such thinking reach far beyond questions of science or empirical method. Such thinking enables nature to function as an *a priori* ground for politics—as a seemingly “primary” or pre-established, natural, apolitical justification for human projects that are in fact deeply political. Jedediah Purdy argues that nature is powerful because it possesses “many political meanings and alliances, as diverse as democracy and monarchy and hierarchy and equality” (21). Yet, at the same time, nature is also “the thing without politics, the home of the principles that come before politics” (Purdy 21). Nature
is that which naturalizes politics and then erases evidence of that naturalization—that casts politics as a priori; as pre-given; as the stuff of nature. This is especially true of “American uses of nature,” which “have always been both political and anti-political” (Purdy 45). There is a long history in the United States of “enlisting nature in support of political agendas” to “conceal[]” what would otherwise—without naturalization, without nature’s justification—be seen as expressly political. Nature in this way seems “distinct from the cultural” and yet somehow “remains the source of authority we use to understand, or judge, the quality and authenticity of our society” or our culture (Herron 12). If, as Carson writes, “[t]here is no separating human beings from ecological nature” (42), there is also no separating nature from human beings, culture and politics.

Silent Spring demonstrates how the nature/culture divide is invalidated not only by the entanglement of nature and politics, but also by humankind’s increasing capacity to contaminate the “total environment”—to transform the planet into a hybrid that is part natural, part man-made (Carson 8). It is precisely this idea that has led some to speculate that “[i]n the limited sense of places unaffected by human activity there is no ‘nature’ as such left on the planet” (Clark 6). Perhaps nature, the material entity, is dead. Some scholars lament the environmental consequences of industrialization and yet at the same time celebrate this death, which represents the growing obsolescence of nature as a concept. Arguing that the same kinds of total contamination which are at issue in Silent Spring force humans to acknowledge that “there is no more nature that stands apart from human beings” (3)—that the material world is “part natural, part made” (15)—Purdy speculates that the very idea of nature “is no longer useful” in part because it reinforces “the familiar divide between people and the natural world” that does not exist and perhaps never existed in the first place (2). Nature as a concept cannot exist without its human other: culture. According to this line of thought, the nature/culture divide is engraved in thought and language. We cannot think nature without its opposing binary unit; we cannot understand it as anything other than an “over yonder,” “a reified thing in the distance” (Morton 3) that remains “alien and alienated” (Morton 5) from the human. Thus, Morton argues the concept of nature “fails to serve ecology well” and argues instead for the death of nature or, rather, an ecology without nature. Whether or not Carson would agree with Morton on the question of “nature” as a category, Silent Spring takes emphatic issue with the false divide between nature and culture, demonstrating how it enables and naturalizes a way of thinking and acting whose material consequences are catastrophic.

If in an ecological context the question of nature is up for grabs, so too is that of the human. Whereas nature is conventionally imagined as a static and passive object “over yonder,” humankind is envisioned as its dynamic, active, rational master. This notion of the human as possessive individual maps onto “the now dominant liberal humanist conception of the human self” as “a seemingly pre-given, personal, unique identity, a realm of unshakeable privacy, center of its own world of values, perceptions, beliefs, commitments and feelings” (Clark 65). This idea of the human as a consolidated, bounded, isolable locus of identity and power seems “self-evident to many people,” especially in the context of the Anthropocene (Clark 65). Like the nature/culture divide, this model of the human can be traced most immediately back to the eighteenth century, wherein Enlightenment thinkers from John Locke to Immanuel Kant “emphasized the value of man, the modern subject, as autonomous agent acting consciously on his history and settling social conflicts by dominating nature” (Bonneuil and Fressoz 19).

Close attention to the word “man” indicates how the very concept of humankind was (and continues to be) a specialized one. While it might seem “to describe the whole human race, the human species or mankind,” what the concept of humankind often actually specifies is a selective image of humanity as
predominately white, male, heterosexual, and ableist. Here, humankind’s others include not only nature, but also people of color, women, those who identify as queer, and those whose bodies do not conform to traditional ideas about human physiology. Thus, Williams warns that it is “important to be aware of the implications of the capitalized singular”—Man—and “the abstract Men” (159). These words make visible how the human as a concept invokes “assumptions of universality” that are often false; that exclude or erase important “historical and cultural variation” (159); and that cast particular kinds of humans as something other or less than human. (These ideas will be taken up in greater depth in Units 3 & 4.)

Generally speaking, Carson is deeply skeptical of the category of the human, and the forms of power, domination, and exclusion it might naturalize. In Silent Spring, the conventional model of the human as a privileged locus of power is the driving force behind humankind’s apocalyptic poisoning of the “total environment.” According to Carson, this model of the human—while it has caused real, material problems—is patently false. It is the stuff of fantasy, covering over how humans fail to understand and control huge swathes of the natural world. Organisms as small and seemingly ineffectual as “insects are finding ways to circumvent our chemical attacks on them” (245), Carson writes, while humans “are seldom aware of the protection afforded by natural enemies until it fails” (249). Human beings are also intertwined with the world outside their bodies such that the conventional ways of imagining the human inevitably collapse. However much humans may like to “pretend the contrary,” they exist in “interdependence” and commonality with nature (Carson 189). Ecology is as much internal as it is external to the human. Carson writes: “there is also an ecology of the world within our bodies” wherein “the mysterious and wonderful functioning of the human body” is reconfigured as an ecological process—as the product of a shifting “web” of relationships that “are seldom simple and easily demonstrated” (189). Here, Carson reveals the human as other to itself. She defamiliarizes self-knowledge, such that her readers might reimagine their bodies as simultaneously known and unknown, intimate and alien, individual and collective, bounded and porous. (See Unit 3 for a more detailed exploration of the human body as an ecology.)

Here, we can begin to see how Silent Spring considers, both implicitly and explicitly, the ways in which “[s]eeing yourself from another point of view is the beginning of ethics and politics” (Morton 14). If the human is not singular but “compound,” as Bennett puts it, then “the difference between subjects and objects is minimized” and, by extension, “the shared materiality of all things is elevated” (13). If, in other words, human and nonhuman, as well as culture and nature, are kin, then we as humans must reroute our thinking about and recalibrate our orientation toward those creatures and systems that would seem to stand apart from ourselves.

Carson is also deeply concerned with the question of human responsibility—with humankind’s “incredible potential” and proven capacity to do harm to the environment. As it documents the extent of this responsibility and imagines how humans might take ownership of it, Silent Spring’s documentation of humankind’s destructive capacities and ethical responsibilities begs the question: do we need to preserve the category of the human in order to properly account for and assess such capacities and responsibilities? Silent Spring takes on the challenge of thinking both sides of the human together: of, on the one hand, providing an account of human action and its environmental consequences while at the same time thinking beyond the human to imagine a more ecological, more distributed way of living in and interacting with the environment.
CLOSE READING:
Students might use the following passage to consider the following ideas, which are central to the argument of Silent Spring: that humankind does not exist apart from nature; that ecology encompasses not only nature but also culture, not only animal bodies but also human bodies; and that these ecologies are complex and dynamic—they often exceed the limits of our knowledge and our capacity for control. (See pages 188-189 to read this passage in its unabridged form.)

Man, however much he may like to pretend the contrary, is part of nature. Can he escape a pollution that is now so thoroughly distributed throughout our world? (188) For each of us, as for the robin in Michigan or the salmon in the Miramichi, this is a problem of ecology, of interrelationships, of interdependence...These are matters of record, observable, part of the visible world around us. They reflect the web of life—or death—that scientists know as ecology. But there is also an ecology of the world within our bodies. In this unseen world minute causes produced mighty effects; the effect, moreover, is often seemingly unrelated to the cause, appearing in a part of the body remote from the area where the original injury was sustained...When one is concerned with the mysterious and wonderful functioning of the human body, cause and effect are seldom simple and easily demonstrated relationships. (189)

DISCUSSION QUESTIONS:
• How would you have defined nature prior to reading Silent Spring? Where would you have located it? What color was it? What lived in it? What was not a part of nature? What seemed to be its opposite? How has your thinking changed after reading Silent Spring? Does nature still seem divided from the human or do you now think the two together? Why, according to Carson, is it crucial that we preserve their interconnection?
• The human is both a universalizing and restrictive category. Carson demonstrates the latter in her frequent references to “man” or “mankind.” Does Carson ever suggest that the category of humankind is also exclusionary or selective? Does she ever imagine a particular group of humans as more responsible for environmental crisis than others? Why might it be important to maintain the distinctions between different human communities even as we attempt to come to grips with environmental crises that are man-made? How do we do both?
• Silent Spring imagines a world in which there is arguably no part of nature the human has not touched. Some theorists argue that we should give up the term “nature” altogether—that it obscures how everything everywhere is at least partially man-made, and that its very existence makes it difficult to think beyond the dualism of nature and culture. Does Silent Spring think nature—in the purest sense of the word—exists? Or is everything now made? Does the word “nature” ever present difficulties for Carson? Are there moments where it limits her ability to express an idea, or where you can see her struggling with the inadequacies of the language to which she has access for expressing ideas? Should we stop using the term nature? Is it inadequate for describing and responding to environmental crisis? What word should be its replacement?

AGENCY, POLITICS, PERSONHOOD
Given that Silent Spring works to unsettle the conventional distinctions between the human and the nonhuman, it might come as a surprise that some have characterized Carson’s final work as
anthropocentric, which is the belief that humans are the most significant entities in the world. For example, some scholars speculate that Carson has been overlooked by particular schools of environmental philosophy—such as ecofeminism—because her concerns about “chlorinated hydrocarbons indiscriminately broadcast in the environment” turns again and again to the question of “human health” (Callicott & Back 94). Such accusations seem less than convincing, for Carson pays substantial attention to the suffering and potential extinction of a wide range of nonhuman life forms and the ecosystems of which they are a part. More convincing, however, are critiques of Carson’s anthropocentrism that focus on her advocacy for a managerial relationship between the human and the nonhuman (albeit one in which humans take their cue from nature’s own processes of self-regulation and control). Lisa H. Sideris notes that while “Carson maintained a prima facie respect for ecological relationships,” she nevertheless “did not counsel scientists to refrain from manipulating or controlling life processes” (142). Perhaps one of the most complex aspects of Silent Spring is Carson’s dual and sometimes conflicting discussion of the human manipulation of nature: it is that which got us into trouble in the first place, but it is also that which with some tweaking might prove generative. According to Carson, the difference lies in whether such manipulation remains informed by the fact that humans are part of—not separate from—nature and that all attempts to “manipulate [nature’s] processes to suit our ends” are ultimately focused on maintaining the health of the ecological world on which all life forms depend (Sideris 144). Silent Spring might in this sense be understood as at once anthropocentric and biocentric. Sometimes it makes a plea on behalf of nature that appeals to the “all-pervading assumption that it is only in relation to human beings that anything else has value” (Clark 2). Still, at many other points it undercuts this anthropocentrism by emphasizing that humans are not “atomistic individual[s] engaged in the world as a resource for consumption and self-assertion,” but are instead “a part of a greater living identity” that makes visible “the intrinsic value of all natural life”; that emphasizes “the needs of other species”; and that resituates “[a]ll human actions” in terms of ethical responsibility, or of “what is good for the biosphere as a whole” (Clark 2).

The unsettled relationship between human and nonhuman, as well as between anthropocentrism and biocentrism, is important because it points toward a set of questions about and contradictory possibilities for agency and personhood as imagined in Silent Spring. As discussed in Unit 1, the creation and detonation of the atomic bomb catapulted humankind to new heights of power over one another and over nature. This notion of the human species as a privileged, all-powerful, even omnipotent locus of power catalyzed Carson’s work on Silent Spring and characterizes our present geological moment, which some now call the Anthropocene. But even as Silent Spring acknowledges and outlines the consequences of such power, it takes pains to remind its readers that human beings are not as powerful as they might think—and that we should be careful about overestimating our capacities. “[W]e are seldom aware,” for instance, “of the protection afforded by natural enemies” (Carson 249), or of how “dependent” we are on seemingly insignificant or powerless nonhuman creatures. “Some agricultural crops and many wild plants are partly or wholly dependent on the services of the native pollinating insects” (Carson 73). Without the insects we so often view as pests, in other words, we wouldn’t have food. Carson argues that these forms of “dependence” and, most significantly, the failure of DDT makes visible how the “sign[s] of our power” are also the signs “of our impotence” (Bonneuil and Fressoz xi). Silent Spring reminds its readers of the following the paradox: “the more we understand and the more our power increases, the more our control over nature seems a precarious fantasy” (Purdy 16).
This is because, as Carson puts it, “nature is not a status quo” (246). It is not static, passive and docile, but rather “a complex, precise, and highly integrated system of relationships” that is “fluid, ever shifting, in a constant state of adjustment” (Carson 246).

Silent Spring suggests that this coalescing of “living populations and all their pressures and counterpressures, their surges and recessions”—this web of life that is “on the one hand delicate and destructible, on the other miraculously tough and resilient, and capable of striking back in unexpected ways”—reveals nature as having agency. In other words, nature is capable of acting of its own accord and in ways that routinely elide or altogether exceed human control (Carson 297). Thus, Vera Norwood argues that in Silent Spring readers discover how “[t]he new ecology offered a competing paradigm” that counteracted the idea of “the earth as a passive subject for man’s probing and controlling mind” (169). Carson recasts nature instead as profoundly “active and responsive” (Norwood 169). Silent Spring in this way argues that nature “acts[es] upon us” (Purdy 272). In so doing, the text contends that “what we share with the rest of nature” includes the possession of agency or the capacity for action (Purdy 273). The “strange and incomplete commonality” that ecological thinking recovers points toward alternative, more distributed, and perhaps radical ways of imagining agency that cut across the human and the nonhuman (Bennett 17). Carson makes precisely this point in her many descriptions of living beings and the forces of nature at work in and upon the world. For instance, she describes “earthworms as geologic agents” who “transport soil...in annual amounts running to many tons” (55). Earthworms work slowly but forcefully and in tandem with one another to “add a layer of soil an inch to an inch and a half thick in a ten-year period” and it is this soil which lends support to a vast ecological “community”—“a web of interwoven lives, each in some way related to the others” and each “depend[ent] on the soil” (Carson 56). Worms, like humans, possess extensive geologic power, giving shape to the planet and by extension providing the “vital” material that enables this “community” to “flouris[h]” (Carson 56).

Silent Spring also emphasizes ecological models of agency that, insofar as they take shape through interdependence and interpermeability, are distinctly collective (as opposed to individual). Carson’s vignettes illustrate how “an actor”—whether human or earthworm—“never really acts alone” (Bennett 21). The farmer who sprays his fields with DDT to protect his crops is one part of a collective of actors that includes the plants and insects toward which the spray is directed, the wind that facilitates the spray’s mobility, the water that comes into contact with DDT-treated soil and carries its poisons deeper into the ground, the evolutionary forces that produce resistance in insects, and so on. That Silent Spring notes with frequency the capacity for insects to respond to these pesticidal assaults—to act against humans as they work to control nature—demonstrates that “nature is not so easily molded” (Carson 245). It possesses a capacity to act of its own accord and to its own ends—to fight back. That farmer, insect, and evolutionary processes are joined together, too, shows how agency or action is not necessarily that which is “governed by any central head” (Bennett 24). Silent Spring demonstrates how agency unfolds across and through “confederations” of human and nonhuman actors, some of whom are working with and just as often against one another even as they are also part of the same collective (Bennett 23). As Carson puts it, they are collectives of life forms, forces and systems that are “fluid, ever shifting, in a constant state of adjustment” (246),” comprised of “pressures and counterpressures” that reveal dynamic, complex, metamorphosing landscapes of agency and action (Carson 297). Humans might thus shape the world in formative ways, but nonhumans do so as well and in ways that are just as formative, though they might escape notice. In a powerful and particularly telling passage, Carson figures scores of “dead ground squirrels” as offering up a “mute testimony” to which humans are
obliged to listen and respond (99). Here, the word “testimony” suggests that animals, however still or silent or invisible they might be to the humans who seek to control them, are capable of speech. The courtroom resonance of the word “testimony” might also imply, however subtly or unconsciously, that animals, like murder victims, possess voices and rights that should be recognized under the law. The conflicts among human disempowerment, nonhuman agency and the politics of animal rights is something students might take up as a subject of textual debate.

CLOSE READING:
In the following passage, Carson explores the capacity for nonhuman beings to act as powerful and transformative agents in the world. Students might close read it to explore Carson’s interest in nonhuman and collective forms of agency, how these forms unsettle the conventional notion of the human as possessing a privileged and unmatched capacity for action, and whether this way of thinking about agency offers us new ways of understanding environmental crisis (and how we might respond to it) at present.

Of all the larger inhabitants of the soil, probably none is more important than the earthworm. Over three quarters of a century ago, Charles Darwin published a book titled The Formation of Vegetable Mould, through the Action of Worms, with Observations on Their Habits. In it he gave the world its first understanding of the fundamental role of earthworms as geologic agents for the transport of soil—a picture of surface rocks being gradually covered by fine soil brought up from below by the worms, in annual amounts running to many tons to the acre in most favorable areas. At the same time, quantities of organic matter contained in leaves and grass (as much as 20 pounds to the square yard in six months) are drawn down into the burrows and incorporated in soil. Darwin’s calculations showed that the toil of earthworms might add a layer of soil an inch to an inch and a half thick in a ten-year period…This soil community, then, consists of a web of interwoven lives, each in some way related to the others—the living creatures depending on the soil, but the soil in turn a vital element of the earth only so long as this community within it flourishes. (55-6)

Ask students to use the following passage as they consider how Silent Spring takes up the issues of personhood and animal rights. Students should pay particular attention to the word “testimony,” as well as to Carson’s emphasis on “moral” responsibility and the ramifications of human action as they relate to human personhood.

Incidents like the eastern Illinois spraying raise a question that is not only scientific but moral. The question is whether any civilization can wage relentless war on life without destroying itself, and without losing the right to be called civilized. These insecticides are not selective poisons; they do not single out the one species of which we desire to be ride…These creatures are innocent of any harm to man. Indeed, by their very existence they and their fellows make his life more pleasant. Yet he rewards them with a death that is not only sudden but horrible. Scientific observers at Sheldon described the symptoms of a meadowlark found near death: “Although it lacked muscular coordination and could not fly or stand, it continued to beat its wings and clutch with its toes while lying on its side. Its beak was held open and breathing was labored.” Even more pitiful was the mute testimony of the dead ground squirrels, which “exhibited a characteristic attitude in death. The back was bowed, and the forelegs with the toes of the feet tightly clenched were drawn close to the thorax . . . The head and neck were outstretched and the mouth often contained dirt, suggesting that the dying animal had been biting at the ground.” By acquiescing in an act that can cause such suffering to a living creature, who among us is not diminished a human being? (100)
DISCUSSION QUESTIONS:

- What is anthropocentrism? What are its consequences? What is biocentrism? What are its consequences? In what ways is Silent Spring at once anthropocentric and biocentric? How do we make sense of this paradox? Is it possible for Carson to do both without contradicting her own argument? How might the text’s anthropocentrism speak to a different audience—or a different set of concerns—than the text’s biocentrism and vice versa? And what do we make of Carson’s argument that, on the one hand, humans should not act upon nature and, on the other, that humans can manage nature (albeit in more ethical ways)? Is managerialism a fact of life? Must humans resign themselves to managing nature in some ways in order to secure their health and safety? What guiding principles does Silent Spring tell us to keep in mind to prevent responsible managerialism from becoming irresponsible?

- Silent Spring imagines both humans and nonhumans, individuals and collectives as capable of agency. Was this surprising to you and, if so, why? What do you conventionally imagine as possessing the capacity to act? What do you conventionally imagine as passive or incapable of action? How does Silent Spring upend these traditional ways of thinking? What does it mean to think of populations or ecosystems as actors? How does it change our understanding of related concepts, such as purpose or intent?

- Silent Spring suggests that nature possesses the capacity to act. When, if ever, does imagining nature as capable of action become dangerous? How do we make sense of the following contradictory ideas: that, on the one hand, if nature is capable of action we must give it greater respect and, on the other, if nature is capable of action then it will be fine on its own—that it doesn’t need our help in the form of environmental protections and reforms? How do we keep ourselves from idealizing in an unrealistic way nature’s agency? Does Silent Spring give us any clues?

- Even as it advocates for a more ethical managerialism, Silent Spring also suggests that humans are not as powerful as they might seem. How, according to Carson, are humans limited in their capacity to know and to act? Why is it important that we recognize these limitations? How are humans vulnerable to nonhuman life forms and forces, and why do these vulnerabilities matter? What do they tell us about the human that we might not otherwise be inclined to assume? At the same time, how do we make sure that this notion of the human as limited and vulnerable does not verge into complacency? Or, rather, an excuse for inaction? How do we make sense of and also move beyond the paradox of needing to take a step back from our self-assumptions of power while at the same time not slipping into the misguided notion that we are incapable of redressing environmental crisis—that all is lost and no action can be taken?

ACTIVITIES, ASSIGNMENTS & PROJECT IDEAS:

- Have students map a place that’s familiar to them: their home or school, a favorite park or hangout. Once they’ve created a preliminary blueprint, ask them to identify what portions of the map are “nature” and which are “culture.” They should consider carefully the rationale they will use to draw these distinctions, and keep in mind Carson’s argument that nature, like culture, is found in the most surprising of places. They might think about the materials of which their chosen place is composed or constructed: where they came from, and what other beings,
objects, or places are present in their materiality. They might think about the humans and / or other organisms that frequent these places: what their bodies contain and with what else they might be interconnected. At the end of the assignment, students will have created their own ecological webs that illustrate both the specificity of a given place and its position in a broader network of interconnection.

- Ask students to write a creative nonfiction essay in the style of Carson’s *Silent Spring* and her earlier works on the sea. Students should identify a being, or object, or force in nature—for example: an eel, or a rock, or the wind—and write an essay that captures its nonhuman worldview, its way of experiencing the world. As they craft their essays, students might think carefully about the differences between anthropocentric and biocentric language. They should consider how they will inhabit a nonhuman perspective and the challenges that will inevitably emerge as they attempt to do so. For example, how will they craft a representation of nonhuman experience that doesn’t simply reflect a human perspective? Students might discuss their choices and the difficulties of this task in an addendum to the essay, or they might use the essays as the basis for a classroom debate about whether and how humans can escape their human positionality or the pitfalls of anthropocentrism.

- Have students write an essay about an ecological collective (for example: a man in a boat holding a baited rod with a fish thrashing at the end of the line). Students should identify their chosen collective’s component parts, their interrelationships with one another, how they act individually, and how they interact with one another as a whole. How do these collectives resonate with Carson’s writing about ecology? Are they fluid—do parts come and go—or are they fixed? Are all parts interrelated with one another, or are their constituencies within the assemblage? How do the individual actions of each part influence or complicate the actions of the whole? Are some subsumed by others, or does each possess equal force? Students might also consider how these collectives complicate the very concepts of the human and the nonhuman. And by comparing their essays to one another, they will learn more about the variability of ecosystems within ecology, and about why the science of ecology is comprised of so many subdisciplines.
UNIT 3 • AMERICAN ENVIRONMENTALISM, RACE, INEQUALITY

OBJECTIVE: To provide a broad overview of the mainstream American environmental movement’s concerns, as well as its exclusions; issues of environmental inequality, especially as they affect communities on the basis of race and socioeconomic status; and the unsettled relationship between environmental toxicity and free market economics as imagined in Silent Spring.

PREPARATORY & RECOMMENDED READING
[https://www.theplayerstribune.com/bronson-koenig-wisconsin-basketball-standing-rock/]
Williams, Raymond. Keywords: A Vocabulary of Culture and Society. Oxford University Press, 1976.
UNIT ORGANIZATION
This unit is divided into three sub-sections: “The Anthropocene ‘We’”; “Environmental Empire, Colonial Environmentalism”; and “Poverty, Labor, Economics.” Each of these sub-sections develops points for use in lecture, followed by suggested passages for class discussion and questions for further inquiry. The unit concludes with ideas for in-class activities and student projects.

THE ANTHROPOCENE “WE”
Silent Spring makes frequent reference to the destructive capacity of the human species and its collective responsibility to right environmental wrongs. Carson catalogues “man’s assaults upon the environment” (6); “the contamination of man’s total environment” (8); and citizens’ human rights to “be secure against lethal poisons” (12). The text makes a powerful case for environmental reform by invoking the concept of a unified human species and by mapping an ecological “chain of evil” (6) that spans the entire planet. This sense of human responsibility—of a universal human “we”—is ubiquitous in contemporary environmental and political discourse. It is implicit in the very term “Anthropocene,” which posits geologic change and climatic crisis as human-driven. At the same time, scholars warn against taking the universality of the human for granted. Raymond Williams reminds us that words like man, mankind, humanity and humankind are necessarily “abstract,” flattening or altogether erasing important distinctions that might be made between and among different human communities (159).

Insofar as it employs the “abstract” language of species, Silent Spring makes visible the tension between describing and addressing environmental problems that are most certainly caused by humans while at the same time dispelling the myth of an undifferentiated humanity. The category of “humanity,” in other words, is sometimes more hurtful than helpful because it “ignores vast differences between human groups” (Clark 122).

One reason why such differences matter in the context of environmentalism is because they reveal how particular human beings are more culpable than others—a culpability that the universalizing category of the human threatens to erase. Blanket emphases on the human and the global, for instance, “belie tremendous variation in energy use around the world” (McNeill and Engelke). Whereas “[i]n the early twenty-first century, the average North American used about seventy times as much energy as the average Mozambican,” the “benefits” and consequences of this unequal access to resources and energy were not evenly distributed (McNeill and Engelke 9-10). These inequities—uneven distribution of access, profit and loss—helped to consolidate “the political and economic dominance” of nations like the United States (McNeill and Engelke 10), while other peoples and countries “paid a high price” without reaping any advantage (McNeill and Engelke 19). Scrutinizing Silent Spring’s representation of pesticides as “indiscriminate”—as wreaking evenly distributed havoc everywhere, on everyone and everything—Rob Nixon points out how Carson fails to grapple with the “unevenly universal” consequences of biocide (65). Pesticides “do discriminate,” Nixon argues, “in the unadvertised sense of saddling” particular communities—such as “the local and global poor”—with the brunt of the “risk” (65, emphasis mine).

One of the subtleties of the environmental catastrophes Carson tracks is that while “[w]e are all downwinders now, some” will most certainly be “sooner than others” (Nixon 232).

These distinctions and inequities matter. They possess deeply material consequences for particular communities, and they help us better understand the environmentalism of Silent Spring and the movement it helped trigger. Some scholars argue that Carson obliquely addresses these inequities and their consequences insofar as “she was passionately concerned with the complicity of the military-
industrial complex in disguising toxicity” (xi). She was also deeply critical of what Lawrence Buell calls environmental “doublethink” (293). Privileged Americans were (and are) prone to this “doublethink,” which one of Carson’s historian contemporaries described as “the ‘paradoxical ability’ of the American people ‘to devastate the natural world and at the same time to mourn its passing’” (qtd. in Guha and Martinez-Alier xiii). Ramachandra Guha and Joan Martinez-Alier argue this faux brand of environmentalism is distinctly American. It hinges upon the idea that “[t]he two poles of ‘wilderness’ and ‘civilization’ mutually coexist in an internally coherent whole,” wherein nature and culture exist apart from one another. Those who embrace this consumerist form of environmentalism believe “it is perfectly consistent” for someone “to drive a thousand miles to spend a holiday in a national park”—to “simultaneously enjoy the material benefits of an expanding economy and the aesthetic benefits of unspoilt nature,” even though the former does in fact “spoil” or pollute the latter (Guha and Martinez-Alier 99). Carson critiques this kind of thinking in Silent Spring, showing how her American reading audience is “at once a nature-loving and resource-consuming” one that “lik[e]s being surrounded by greenery but ignore[s its] reliance on toxic substances” (Buell 4). Silent Spring describes its audience in precisely these terms. Carson tailored her message most immediately for white American suburbia, arguing that “suburbanite[s]” are unaware of pollution by pesticide because its unspectacular violence remains relatively invisible: “toxins may sleep long in [the] body” and, meanwhile, “gardener[s] and homeowner[s]” visit stores that sell “death-dealing materials” using “display[s]” that are “homey and cheerful,” the “pickles and olives” situated innocuously alongside “rows upon rows of insecticides” (174). According to Carson, American suburbanites have remained blissfully and perhaps willfully ignorant of their biocidal reality. Silent Spring provided its audience with the knowledge and tools necessary to awake from the dream of a world in which environmental toxicity is neatly contained in the “over yonder” that is nature.

And yet, even as Silent Spring is critical of American suburbia, the text in some ways internalizes the white privilege of the audience it seeks to mobilize. Scholars have noted, for instance, that “the hazards of pesticides could not be separated from the political economy of farm labor” and, in particular, the working conditions of migrant farm workers (Nash 211). But while Carson turns frequently to the figure of the American farmer, and though she did of course “generat[e] massive popular and political attention to the risks of pesticides,” Silent Spring and “the public debate” it catalyzed “focused almost exclusively on organochlorine compounds and the risks to consumers” (Nash 213). We should keep in mind how Carson’s almost exclusive focus on the American consumer—on white, middle-class suburbanites—erases (or at the very least sets aside) the reality that some human communities were and continue to be disproportionately vulnerable to environmental toxicity. When Silent Spring speaks of “man’s assaults upon the environment” (6)—when the text invokes the human as a uniform and universal category—it obscures the ways that these “assaults” are perpetrated by particular groups of human beings and experienced more acutely by others. Attending to Carson’s American suburbanite audience helps us to see the difficulty of tackling environmental problems that are planetary in scope while at the same time avoiding the dangers of imagining the human in homogeneous, monolithic terms.

Keeping a critical eye on Silent Spring’s audience and the broader question of an undifferentiated humanity also helps us to see how ecological thinking can veer into hazardous territory. Guha and Martinez-Alier argue that the “shift from an anthropocentric to biocentric perspective”—a shift that ecology posits as absolutely necessary—can, however unintentionally, possess dire consequences for
particular populations of human beings (93). For instance, the ecologist’s argument that environmentalism “should be guided primarily by the need to preserve biotic integrity rather than by the needs of humans” ignores “fundamental ecological problems,” such as “overconsumption” and “growing militarization” (Guha and Martínez-Alier 95). These problems are most immediately caused by the domination of humans by other humans—they are systemic sociopolitical issues that are symptomatic of global “economic and political structures, and, at a microlevel, the lifestyle choices of individuals” (Guha and Martínez-Alier 95). They are problems that do not necessarily accommodate the “anthropocentric/biocentric distinction,” though their environmental consequences are most certainly profound. Jedediah Purdy notes, too, that ecology sometimes enables “a fiercely misanthropic pessimism about human beings” and often “insist[s], sometimes silently, that some things, some connections count more than others” (206). Efforts to preserve nonhuman life forms and the biotic integrity of ecosystems frequently affect particular human communities in devastating ways. “Treating ‘biotic equality’ as a moral absolute” too often means that “tigers, elephants, whales etc.” are given “more space to flourish and reproduce” at the expense of the marginalized human beings who are “expected to make way for them” (Guha and Martínez-Alier 107). A chilling example of the ways environmentalism is complicit in and can justify such inequality is the forgotten history of the United States’ national park system, which was established by and through the mass eviction of the indigenous peoples who occupied and subsisted on them. Here, we can see how ecological thinking and, by extension, environmental reform sometimes causes and even profits from human suffering—suffering that is selective, rather than universal.

For this reason, however paradoxically, some thinkers have called for a return to humanism or, rather, for the restoration of the human as a point of focus in contemporary environmentalist debates. They argue that humanism makes it possible to keep in view the ways the domination of humans by other humans coincides with the domination of nonhumans by humans, as well as how attempts to preserve nature might actually compound human inequality. Whether or not humanism has a place in environmentalism, there is at the very least consensus that “we have to think ecology and power relations together if we are to understand the formation of social and environmental inequalities” (Bonneuil and Fressoz 36). Ashley Dawson argues, for instance, that “[w]e cannot understand extinction” and other environmental disasters “without an analysis of the exploitation and violence to which postcolonial nations have been subjected” (12)—without addressing how environmental disaster is the product of “a global attack on the commons” by a privileged few who exploit “the planet’s common wealth,” the earth’s “great trove of air, water, plants,” in order to consolidate power and wealth at the expense of “peasant farmers” and other marginalized groups (12–3). We need, in other words, “an alternative ecology” that accounts for how “colonial and capitalist expansion has both accentuated social inequalities and signaled a precipitous fall in ecological wisdom” (Guha and Martínez-Alier 101).

We also need an alternative, more inclusive, more flexible sense of “we” that can account for global environmental crisis in ways that the notion of an undifferentiated humanity does not (Purdy 5). We need a way of naming and accounting for “common responsibility” that brings together “certain questions that we have called ecological and others that we have called humanitarian, questions of conservation and questions of justice” (Purdy 6). While Silent Spring at times internalizes the privilege of its audience, it nevertheless thinks across the environmental and the humanitarian as it encourages readers to question who is in power and who is authorized to speak. A common refrain in Silent Spring
begins with the word “who”: “Who has made the decision that sets in motion these chains of poisonings...?” (127). “Who,” Carson asks, “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” (127)? In moments like these, Carson gestures explicitly toward the intersections between “authoritarian power” and environmental degradation—between regimes of power that come to bear upon both the human and the nonhuman in expansive but also differentiated ways. When Silent Spring questions the authority of the deciding “who,” it unsettles the undifferentiated humanity—the flattened sense of the “we”—it might take for granted elsewhere.

CLOSE READING:
The following passages will help students explore for whom Silent Spring was written. Ask them to consider what we might learn about Carson’s audience by paying close attention to the kinds of persons and spaces represented in the text, as well as the text’s attention to particular concerns and consequences.

So thoroughly has the age of poisons become established that anyone may walk into a store and, without questions being asked, buy substance of far greater death-dealing power than the medicinal drug for which he may be required to sign a “poison book” in the pharmacy next door. A few minutes’ research in any supermarket is enough to alarm the most stouthearted customer—provided, that is, he has even a rudimentary knowledge of the chemicals presented for his choice.

If a huge skull and crossbones were suspended above the insecticide department the customer might at least enter it with the respect normally accorded death-dealing materials. But instead the display is homely and cheerful, and, with the pickles and olives across the aisle and the bath and laundry soaps adjoining, the rows upon rows of insecticides are displayed. Within easy reach of a child’s exploring hand are chemicals in glass containers. If dropped to the floor by a child or careless adult everyone nearby could be splashed with the same chemical that has sent spraymen using it into convulsions. These hazards of course follow the purchaser right into his home. A can of a mothproofing material containing DDD, for example, carries in very fine print the warning that its contents are under pressure and that it may burst if exposed to heat or open flame. A common insecticide for household use, including assorted uses in the kitchen, is chlordane. Yet the Food and Drug Administration’s chief pharmacologist has declared the hazard of living in a house sprayed with chlordane to be “very great.” (174)

Little is done...to warn the gardener or homeowner that he is handling extremely dangerous materials. On the contrary, a constant stream of new gadgets make it easier to use poisons on lawn and garden—and increase the gardener’s contact with them. One may get a jar-type attachment for the garden hose, for example, by which such extremely dangerous chemicals as chlordane or dieldrin are applied as one waters the lawn. Such a device [speaking of a particular hose attachment] is not only a hazard to the person using the hose; it is also a public menace...Considering the number of such devices that are in use, and the scarcity of warnings such as this, do we need to wonder why our public waters are contaminated? (176)

Carson originally considered the title Man against the Earth. With this and the following passage in mind, students should explore the concept of an undifferentiated humanity, especially as it helps or hurts our ability to understand environmental crises, their causation and their consequences. Here, they might focus on Carson’s repeated use of “who,” which highlights problems of representation in the American environmental movement and in legislative reform.
In each of these situations, one turns away to ponder the question: 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? 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 temporarily entrusted with power; 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. (127)

**DISCUSSION QUESTIONS:**

- When you imagine the category of the human—or humankind, or humanity—who do you imagine? What does your imagined idea of the human look like? Does it consist of people that look like you? Or is it representative of humankind in all of its difference? What are its inclusions and exclusions? How does Carson’s vision of humankind resonate with or unsettle yours? In what ways is Carson’s vision of humankind partial or selective? How does *Silent Spring* demonstrate the importance of preserving human difference and of including many voices in environmental debate? Why do these differences matter? How do we make central to the environmental movement a more representative sense of humanity—a more inclusive sense of “we”?

- Ecology imagines relationality in expansive, complex, dynamic ways. But does ecology ever obscure or erase particular relationships or things? Does it exclude even as it includes? Consider Carson’s focus on the American suburbanite. In what ways does *Silent Spring* privilege certain ecological units or relationships over others? How does Carson clarify or complicate the difficulty of re-valuing nonhuman life and environmental health while at the same time ensuring particular human communities are not subject to hardship or sacrifice for the sake of enacting environmental reform?

- *Silent Spring* critiques the doublethink at issue in American environmentalism. How do we make sense of the coexistence of environmentalism and consumerism in the United States? What does it mean to go on a nature excursion—for example, to visit a national park? What public services do national parks provide? What kinds of resource consumption and consumerism do these excursions necessitate? To whom are such excursions accessible? Who possesses the privilege and resources to go on nature excursions, who does not, and why might this matter? How do such excursions, however ironically, contribute to the destruction of the environment? Do the rewards outweigh the costs, or do we need newly ethical models for experiencing and appreciating nature? And how do we square the history of inequality on which national parks are built with their function as a public good?

**ENVIRONMENTAL EMPIRE, COLONIAL ENVIRONMENTALISM**

The previous sub-section discussed how universalistic notions of the human and the ecological emphasis on biocentrism over anthropocentrism can reinforce simplistic understandings of global environmental crisis and exacerbate human inequality. It is important, in this context, to understand how American environmentalism has been complicit in colonial enterprise and in environmental racism. This and the next sub-section together explore how people of color and the poor, both within and outside of the
United States, have been marginalized by the mainstream American environmental movement. Carson gestures to this issue when she acknowledges the intersections between colonial and environmental history in *Silent Spring*. She recounts, for instance, how Australia’s British colonists imported “various species of cactus into Australia” at the end of the eighteenth century, “intending to use them in culturing cochineal insects for dye” (82). But “[h]aving no natural controls in this new territory,” the cacti “spread prodigiously” (83). The “land was so densely covered as to be useless,” a problem that remained unresolved until scientists introduced an insect predator that could bring the cacti under control (83). In the interim, the land remained relatively inhospitable to “settlement and grazing”—a problem that affected not only the colonists, but more importantly the indigenous peoples who lived there originally and depended on the land for subsistence (83).

While stories like these—and, more broadly, the very notion of empire—might seem obsolete, they are still very much alive and well. Thus, Nixon argues that we now live in “an era of resurgent imperialism” wherein the environment has been instrumentalized for imperial purposes (37). In the decades following World War II, “energy use and economic expansion proceeded in lockstep” (McNeill and Engelke 132). Countries that emerged from the Great Wars in positions of political and economic power consumed natural resources at increasing speed and used their clout to “appropriat[e]”—whether peacefully or through the use of force—“productive land around the world for consumption” (Wilson 363). The United States was one of these countries. Consuming a disproportionate amount of energy to consolidate its wealth and power, and appropriating land and resources outside its borders in order to do so, the United States helped to establish what postcolonial theorists like Guha and Martinez-Alier call “[e]xtractive economies” (39). “To extract,” in this context, “means to take out without putting back, and so petroleum and many other natural resources...have been extracted and destroyed” to the detriment of the local communities who depend on them (Guha and Martinez-Alier 40). These “dispossessed” communities are comprised largely of people of color and the global poor (Guha and Martinez-Alier 40). They live in countries that “suffer from a poor structural position in the global economy” as a result of the “legacies of the colonial era, when imperial powers’ investment in their colonies went to little more than extractive enterprises such as plantations and mines” (McNeill and Engelke 149). Empire in this way takes on environmental forms in the twenty-first century. In these imperial “conflicts” marginalized local communities, who “depend very heavily on the natural resources of their own locality,” must fend off “individuals and groups with the social power to capture, transform and use natural resources from a much wider catchment area” (12).

While *Silent Spring* does not address this extractive form of imperial power directly, its concerns about pesticides and environmental toxicity gesture toward a second kind of environmental empire that is just as devastating: the establishment of environmental “sacrifice zones.” During the Great Wars, the United States military, in tandem with “[t]he nuclear weapons industry,” designated what are called “sacrifice zones”: areas for nuclear weapons testing located in rural areas and other nations (McNeill and Engelke 165). They did so to protect white, affluent Americans from “lethal contamination” (McNeill and Engelke 165). The concept of the “sacrifice zone” in this way describes the current and widespread “outsourcing of environmental crisis” (Nixon 22). As global superpowers consolidate their extractive empires and by extension their wealth, they increase their “power to resist natural shocks” and environmental disasters (Purdy 46). “[N]atural catastrophe amplifies existing inequality,” and global environmental crises like widespread toxicity and climate change create “a landscape of artificial drought and plenty” wherein “the already wealthy peoples who have contributed most to the problem
They remain enclaved in “ecological exemption zones”—zones that remain relatively well-protected from environmental disaster, at least for now—while others are locked in “places that will become uninhabitable” (Purdy 47). The former occupy the colonial center of extractive power, while the latter are confined to the increasingly inhospitable periphery it exploits. Perhaps the most insidious part of this arrangement is that those in power can, do and will point to the workings of climate change to rationalize or justify why environmental catastrophe disproportionately affects those at the periphery when they know full well that these catastrophes are not strictly natural: they are created and exacerbated not by the ungovernable and impersonal forces of nature, but by those privileged human beings who exploited nature and other humans alike for their own gain.

But how does this discussion lead us to *Silent Spring*? The answer is, as always, to be found in pesticides. Pesticides and other toxic pollutants illustrate how “sacrifice zones” give shape to landscapes of power not only outside of but also within the United States. Perhaps nowhere are these landscapes more visible than in the designation of dumping zones for the disposal of dangerous chemicals. In one of the first—if not the first—systematic studies of exposure to poisons and other “hazardous wastes,” the United Church of Christ Commission for Racial Justice revealed that “racial and ethnic Americans are far more likely to be unknowing victims of exposure to such substances” (xi). In his foundational study of environmental racism, Robert D. Bullard traces the interconnections between the history of such unequal exposures and the mainstream American environmental movement. One of his most chilling points of discussion: the closing of a chemical plant that produced DDT and its sociopolitical fallout. In Triana, Alabama, “a small all-black town,” the Center for Disease Control (CDC) discovered that residents were “contaminated with the pesticide DDT and the highly toxic industrial chemical PCB (Bullard 19). While the CDC was unable to pinpoint the source of the PCB contamination, they discovered that “the DDT was produced at nearby Redstone Arsenal Army missile base from 1947 to 1971 by Olin Chemical Company” (Bullard 20). As discussed in Unit 1, DDT was banned from use in the United States in 1971. Following the ban, the chemical plant in Triana “was torn down,” but “over 4,000 tons of DDT residue” was “buried in the area and eventually worked its way into Indian Creek, a popular fishing place of the Triana residents” (Bullard 20). This tragic story is significant on two counts. First, it is a reminder that production facilities for toxic chemicals and other hazardous materials are more often than not located in either urban or rural “sacrifice zones” where residents are predominately people of color and / or impoverished. Second, it is a sad example of how even the most well-intended environmental reforms can contribute to or even create environmental injustice. While during its years of operation the chemical plant almost certainly polluted the surrounding environment, and while the DDT ban and the shuttering of chemical plants was an important accomplishment for American environmentalists, the Triana case illustrates how marginalized communities are much more likely than others to become collateral damage in conflicts over environment. This history, like slow violence, is nearly invisible to those of privilege, but that makes it no less significant. It is a history that lurks between the lines of Carson’s *Silent Spring*—that haunts its edges.

None of this is to say that environmental reform is bad or that its risks necessarily outweigh its potential rewards. But what *Silent Spring*’s hauntings do tell us is that environmental movements are strongest when they are intersectional—when they make space for and amplify a wide range of voices and perspectives—and when they approach environmentalism as a humanitarian or social justice issue (as opposed to focusing on the preservation of nature as a pristine and strictly nonhuman “over yonder”).
The mainstream American environmental movement that *Silent Spring* galvanized failed on this count. The United Church of Christ Commission for Racial Justice’s report on racialized sacrifice zones and toxic dumping observes that the movement’s “[e]fforts...have largely ignored the specific concerns of African Americans, Hispanic Americans, Asian Americans, Pacific Islanders and Native Americans” in part because it “has historically been white middle and upper-class in its orientation” (xi). Bullard documents extensively how “[w]hite racism is a factor in the impoverishment of black communities and has made it easier for black residential areas to become dumping grounds for all types of health-threatening toxins and industrial pollution” (9). A favorite axiom of the mainstream American environmental movement—not in my backyard (NIMBY)—is a case in point. The “not-in-my-backyard phenomenon” at best ignores and at worst tacitly accepts the inevitability that “hazardous wastes, garbage dumps, and polluting industries were likely to end up in somebody’s backyard” (Bullard 4-5, emphasis mine). And as Bullard tells us: “More often than not,” these toxic materials usually ended up in the backyards of “poor, powerless, black communities rather than in affluent suburbs” (5). Here, we can see how environmental justice issues are not applicable strictly to the imperial networks and extractive economies through which wealthy countries like the United States exploit and wield power over those who live beyond its borders. Environmental justice is as much an issue at home as it is abroad, “extend[ing] to the plight of poor” and other marginalized communities “who live in rich countries” (McNeill and Engelke 193). Even as it does not explicitly address issues of environmental justice except in the broad context of citizens’ rights, *Silent Spring* posits these issues emphatically as both global and local, external and internal, transnational and American.

It is not only the whiteness but also the particular agendas of the mainstream American environmental movement that explain its neglect of the concerns of people of color in the United States. Laura Pulido argues that whereas American environmentalism emerged from the traditions of “romanticism, transcendentalism, and conservation”—think William Wordsworth, Henry David Thoreau and Theodore Roosevelt, respectively—it has historically remained uninterested with the issues of “subsistence” and “production” which are central to the lives and interests of indigenous, non-white, poor and migrant populations (22). Pulido notes in particular “[a] survey of environmental organizations conducted in the 1970s”—only roughly a decade after the publication of *Silent Spring*—in which “respondents reported opposition to the environmental movement ‘concerning itself with the conservation problems of such special groups as the urban poor and ethnic minorities’” (23). Instead, the mainstream American environmental movement prioritized “wilderness and wildlife preservation, resource conservation, pollution abatement, and population control” (Bullard 1). Central to this agenda is what Buell calls “the pastoral imagination,” which fetishizes landscapes that are pristine in their wildness to the point of artificiality (62). “[l]images of wild and seemingly unsettled landscapes became icons for cultural nationalism or its contestation” in the United States, as well as fodder for imagining nature “as the space of rebirth, freedom, or as...self-creation” (Clark 26). Pastoral idealizations of nature “clear[ed] the scene of complicating features, especially human complications that might inhibit the aesthetic pleasure of privileged solitary communion with nature” (Buell 62). The American environmental movement’s historical emphases on wilderness and conservation, then, are both the product and the instrument of colonial violence. For example, as “[t]he frontier became the site of a destructive one-sided struggle between incompatible conceptions of society, land, religion, food production and property,” colonists displaced and exterminated the land’s indigenous occupants (Clark 26). This history of imperial violence and “aggressive settlement” unfolded alongside “the ‘nationalization’ of some landscapes of the West as American cultural icons, in the form of national parks such as Yosemite or Yellowstone” (Clark 26). In
many ways, the mainstream American environmental movement has perpetuated this ugly history of environmental racism and its legacies.

Phrases like “pastoral imagination” make visible how this history and its legacies unfold on conceptual as well as material registers. Central to this history, in other words, are conflicts between what Nixon describes as “vernacular” and “official landscape[s]” (17). Vernacular landscapes are as much speculative or imaginative as they are material: they are “shaped by the affective, historically textured maps that communities have devised over generations, maps replete with names and routes, maps alive to significant ecological and surface geological features” (Nixon 17). They are “integral to the socioenvironmental dynamics of community” as opposed to being “out there, as a separate nonrenewable resource” (Nixon 17). Vernacular landscapes do not locate value in what can be extracted from the land. They do not understand the land in instrumentalist terms. Instead, they locate value in its collective, aesthetic, cultural significance—its centrality to indigenous identity and intergenerational history, to localized ecosystems and subsistence traditions, to ways of knowing that are spiritual or imaginative and thus do not accommodate empirical, utilitarian, extractivist worldviews. Official landscapes, on the other hand, are “typically oblivious” to vernacular landscapes (Nixon 17). They “writ[e] the land in a bureaucratic, externalizing, and extraction-driven manner that is often pitilessly instrumental” (Nixon 17). Environmental racism in this way dispossesses particular communities not only of their resources, but also of their cultural imaginaries or heritages—it dispossesses them of those ecological, situated, long-historied “webs of accumulated cultural meaning” that are integral to a community’s identity, its sense of place, its history, its ways of life (Nixon 17). Nixon describes this kind of dispossession as “displacement without moving,” wherein communities are “involuntarily moved out of their knowledge,” left “stranded in a place stripped of the very characteristics that made it inhabitable,” relegated to “existing out of place in place,” made “goners with nowhere to go” (19).

The recent conflicts over a proposal to construct portions of the Dakota Access Pipeline in close proximity to the Standing Rock reservation, whose lands are under the jurisdiction of the Hunkpapa Sioux, make visible the threat official landscapes pose to vernacular ones. Bronson Koenig—a member of the Ho-Chunk tribe, former star basketball player and activist athlete at the University of Wisconsin-Madison, and recent signee of the Milwaukee Bucks—demonstrates precisely this point in an editorial reflecting on his experiences at the Standing Rock protests. Koenig writes about how the Hunkpapa are concerned not only about the pipeline’s potential to “endanger the local water supply,” but also the fact that it “will plow through ancient burial grounds” and change irrevocably a landscape that is central to the tribe’s history and culture. The land and its resources are, as Koenig puts it, “our heritage”—an inheritance that extractivist landscapes (like the landscape of the Dakota Access Pipeline) actively destroy. Koenig, like Carson, reminds his readers that to pollute water anywhere is to pollute water everywhere: “Native people aren’t the only ones who are affected by threats to the environment. Clean water is a precious resource. It belongs to all of us, whatever our heritage. We must all protect it.” On the one hand, Silent Spring popularized the science and the language that makes appeals like Koenig’s so powerful. One the other hand, it sparked an environmental movement that largely ignored and sometimes actively participated in the colonial dispossession and environmental racism to which Koenig objects. The environmentalist legacies of Silent Spring are in this way both inspiring and flawed.

CLOSE READING:
Students might use the following passage to consider how the histories of colonization and environmental degradation are intertwined, as well as how particular groups of human beings are more responsible for environmental crises than others.

Another extraordinarily successful and economical example of weed control may be found in Australia. With the colonists’ usual taste for carrying plants or animals into a new country, a Captain Arthur Phillip had brought various species of cactus into Australia about 1787, intending to use them in culturing cochineal insects for dye. Some of the cacti or prickly pears escaped from his gardens and by 1925 about 20 species could be found growing wild. Having no natural controls in this new territory, they spread prodigiously, eventually occupying about 60 million acres. At least half of this land was so densely covered as to be useless. In 1920 Australian entomologists were sent to North and South America to study insect enemies of the prickly pears in their native habitat. After trials of several species, 3 billion eggs of an Argentine moth were released in Australia in 1930. Seven years later the last dense growth of prickly pear had been destroyed and once uninhabitable areas reopened to settlement and grazing. The whole operation had cost less than a penny per acre. (82-3)

Ask students to close read the following passages to explore how different forms of knowing—different ways of viewing and valuing landscapes—collide with one another and, in so doing, give lasting shape to nature.

As man proceeds toward his announced goal of the conquest of nature, he has written a depressing record of destruction, directed not only against the earth he inhabits but against the life that shares it with him. The history of the recent centuries has its black passages—the slaughter of the buffalo on the western plains, the massacre of the shorebirds by the market gunners, the nearextermination of the egrets for their plumage. Now, to these and others like them, we are adding a new chapter and a new kind of havoc—the direct killing of birds, mammals, fishes, and indeed practically every form of wildlife by chemical insecticides indiscriminately sprayed on the land. (85)

One of the most tragic examples of our unthinking bludgeoning of the landscape is to be seen in the sagebrush lands of the West, where a vast campaign is on to destroy the sage and to substitute grasslands. If ever an enterprise needed to be illuminated with a sense of the history and meaning of the landscape, it is this. For here the natural landscape is eloquent of the interplay of forces that have created it. It is spread before us like the pages of an open book in which we can read why this land is what it is, and why we should preserve its integrity. But the pages lie unread. (64)

DISCUSSION QUESTIONS:

• What, according to Silent Spring, is the relationship between environmental history and colonial history, or the history of empire? In what ways are they one and the same? How has nature served as a weapon humans can wield against other humans? In what ways is nature, like particular human communities, a victim of imperial warfare? Why might it be important to think these histories and legacies together? What do we have to gain by doing so, and what drops out of the picture when we do not?

• What is an official landscape? What is a vernacular landscape? Find examples of each in Silent Spring. How do these different ways of thinking the landscape conflict with one another? Where do they locate value in the landscape and from what perspective, or for what purpose? How do they together demonstrate the centrality and power of the imagination in thinking about the environment?
• How does *Silent Spring* demonstrate the need for an intersectional, or more inclusive, environmental movement? What connections does Carson draw between questions of human rights and of animal rights—between humanitarian or social justice issues and environmental concerns? How do we make sense of the fact that, on the one hand, *Silent Spring* brings together humanitarian and environmental issues and, on the other, envisions an audience and a set of environmental concerns that are not representative—that are exclusionary? And how do we make sense of the American environmental movement’s historical resistance to inclusivity? What does an intersectional environmental movement look like? Who would be its audience? What would be its concerns?

**POVERTY, LABOR, ECONOMICS**

*Silent Spring* charts “the sudden rise and prodigious growth of an industry for the production of man-made or synthetic chemicals with insecticidal properties” (16). The text is deeply concerned with and about the relationship between postwar capitalist expansion, increasing industrialization, and environmental toxicity. Describing pesticides as being produced in “an endless stream” that grows exponentially with each passing year (7), Carson demonstrates the difficulty and the necessity of bringing to heel the chemical pollution that is caused by and at the same time fuels “expanded” and expansive “markets” for pesticides and other agricultural materials: “grass seed,” for instance, as well as “machines for cutting and sowing and seeding” (66). *Silent Spring* illustrates how it is not only “the boundaries between conservation” and “colonialism” that are “uncomfortably blurred and uncertain,” but also those between “conservation” and “the depredations of international capitalism” (Clark 121).

Naomi Oreskes and Eric Conway read *Silent Spring* as a warning “that contemporary industrial civilization is not sustainable” (237). *Silent Spring* marked the development of a new awareness in the American environmental movement: the “crucial realization that unrestricted commercial activity was doing damage—real, lasting, pervasive damage” to the planet (Oreskes and Conway 237). Tracking the collusions between military, industry and science, Carson showed how “[t]he natural world was dying, poisoned by the hands of power tied to corporate greed” (T. Williams 21). Thus, *Silent Spring* framed the pesticide “debate” in terms of “a reverence for life versus a reverence for industry” (T. Williams 21).

Reverence for industry grew in the United States following the Great Wars, and it was a particular point of focus for the American environmental movement. As mentioned earlier in this unit and in **Unit 1**, Americans seemed uniquely capable of an environmental doublethink that saw no conflict between “environmentalism” and “the consumer society” that “ran parallel” to it (Guha and Martinez-Alier 18). Having emerged from World War II “with an intact economic base and undamaged cities,” the United States possessed “unmatched” industrial capabilities and consolidated its power “as a creditor rather than a debtor nation” (McNeill and Engelke 130). Whereas many other countries occupied “a poor structural position in the global economy” (McNeill and Engelke 149), the United States “embarked on a long period of unprecedented growth” (McNeill and Engelke 129). These developments improved the lives of many Americans but they also caused new problems because “economic growth require[s] expanding energy outputs”—“more wealth require[s] more energy” to maintain “comfortable levels of consumption” and increasingly luxurious lifestyles (McNeill and Engelke 132 and 133). What resulted was an increasingly unequal relationship between powerful, wealthy, “creditor” nations like the United States and the marginalized, impoverished, “debtor” nations whose exploitation was necessary for maintaining economic prosperity.
Thus, “the gulf between enclaved rich and outcast poor” grew “more pronounced” (Nixon 8). Under industrial capitalism the United States extracted and “decimat[ed]” the resources and landscapes of “poorer nations” for its own gain “by removing the biological foundation of their collective future” (Dawson 89). This extractive economy catapulted the global poor into an ugly cycle where they were forced to “engage in deforestation and other forms of over-exploitation” as they “become increasingly indebted” to creditor nations (Dawson 62). In a futile attempt to resolve that debt and gain firmer footing in the global economy, local communities in debtor nations “harvest[ed] more trees, mine[d] more materials, drill[ed] for more oil, and generally deplete[d] their natural resources at exponentially higher rates” (Dawson 62). This ugly cycle continues today. Ecosystems are destroyed in the process and, alongside them, the futures of human communities. As Guha and Martinez-Alier put it: “Economic time” in postcolonial and economically disadvantaged nations “is quicker than biological time” (40). What this means is “the rate of resource extraction” outstrips that of natural replenishment. Nature cannot keep up with industrial capitalism and, as result, poor communities and debtor nations find themselves in an increasingly disadvantaged and vulnerable position in the global economy. They face gloomy futures in which their landscapes are decimated and there are not enough raw materials upon which to subsist, let alone profit.

These economic inequalities do not remain external to or at a distance from those living in the United States. As Silent Spring illustrates, industrial capitalism is alive and well at home. Perhaps no phenomenon demonstrates this point more strongly than the United Farm Workers’ (UFW) fight for union representation, better workplace conditions and pesticide regulation. This fight transpired alongside and long after the publication and reception of Silent Spring. It was not part of the mainstream American environmental movement’s concerns. The UFW’s struggle thus provides essential context for understanding Carson’s text and the complicated relationship between the American environmental movement and issues of environmental justice. Around the time that Silent Spring was published, the Mexican-American labor rights activist Cesar Chavez gathered farm workers together to discuss the possibility of striking against agribusiness. “Agribusiness,” according to Pulido, “is a set of institutions, businesses, and practices devoted to producing agricultural commodities in a highly industrialized and scientific fashion” (73). Agribusiness—also called big agriculture—depended and continues to depend heavily on chemical controls, such as insecticides, and a cheap, “highly exploited” labor force (Pulido 64). Workers like Chavez “suffered from low wages, harsh working conditions, unsteady employment, and low status, which in turn translated into minimal power” (Pulido 64). The harsh working conditions to which farm workers were subject included close, prolonged exposure to insecticides and other poisonous chemicals. But the “federal government did little to protect workers” and the mainstream American environmental movement largely ignored their concerns, focusing instead on wilderness conservation (Pulido 74). In response, migrant farm workers organized the United Farm Workers labor union. They lobbied against “the capitalist agribusiness structure,” which treated workers as “faceless” and disposable, and which took advantage of workers’ “dismempowered” positionality—the fact that workers were “poor” and “primarily people of color” (O’Loughlin 155 and 156). As Chavez put it: “I’m sure I don’t have to tell you that farm workers are the poorest workers in America” (qtd. in O’Loughlin 156).

It is important to emphasize, here, that we should not and cannot credit Silent Spring with inspiring Chavez and other migrant farm workers to organize against agribusiness and, by extension, the widespread use of pesticides. Farm workers’ concerns predated the publication of Silent Spring,
remained unaccounted for in mainstream American environmental reform, and made audible a non-mainstream environmental movement that was focused explicitly on questions of environmental justice—on how environmental degradation produces and exacerbates inequality on the basis of race, class and gender. What we can say about the relationship between Silent Spring and the UFW is that Carson helped the UFW’s cause insofar as she fomented a new environmental awareness upon which the UFW could capitalize. Carson popularized an ecological worldview in which spaces like the home or “the work place” were reconfigured as “part of” rather than separate or distinct from nature (O’Loughlin 150-1). This worldview also made visible how “[h]ealth, in the face of pesticide use, is an issue that transcends social boundaries and provides a unique space for communication and coalition” (O’Loughlin 149). If to poison water anywhere is to poison water everywhere—if to expose workers to pesticide-treated crops is to expose consumers to pesticide-treated produce—then the UFW’s concerns were one and the same as the American suburbanite’s. When the UFW organized a series of boycotts against pesticide-treated produce, such as grapes, this was their message. The boycott was a particularly effective form of political action because it allowed the UFW “to connect the oppression of farm workers to the health concerns of grape consumers” (O’Loughlin 147), “to unify consumer and laborer’ (O’Loughlin 151), to connect the environmental and health consequences of production to the acts of buying and consuming. Thus, UFW materials promoting the boycott asked questions like: “What Do You and a Farm Worker have in Common?” (qtd. in O’Loughlin 151). The answer: “Exposure to Poisonous Chemicals!” (qtd. in O’Loughlin 151). Silent Spring is often credited with the eventual banning of DDT in the United States, but this is only half the story. It was the UFW who “got the first bans on DDT, DDE, and Dieldrin instituted in UFW-contracted fields” (O’Loughlin 162).

If Silent Spring demanded science become accountable to citizens and not industry (a topic explored at length in Unit 5), the UFW’s efforts to regulate pesticide use demonstrate how the plight of migrant farm workers was compounded by gaps in scientific knowledge. Scholars have shown that the health and environmental concerns of marginalized communities are “least likely to attract sustained scientific inquiry into causes, effects, and potential redress” (Nixon 16). This was the case for migrant farm workers in part because of what science did not yet understand about pesticide exposure. Patricia Hynes notes that “pesticide poisoning was rarely recognized by physicians when they saw it” and thus “often went untreated” (122). Making matters worse was that “there was no requirement that it be reported” (Hynes 122-3). It took practitioners of science some time to fully understand how, “as laboring bodies transformed the orchard through pruning, picking, planting, and spraying, the orchard transformed those same bodies, often in less visible, but no less material ways” (Nash 207). The relatively new field of occupational health, for example, put an “emphasis on discrete boundaries” between bodies and environment, assuming they “were separate entities and that both could be bounded, monitored, and regulated” (Nash 219).

In contrast, the ecological interconnections at issue in Silent Spring made visible how “the bodies of middle-class consumers and farm laborers” alike were “open, porous, and increasingly at risk” (Nash 218). Yet, while both suburbanite and laborer were porous, their vulnerability to risk was unequal. The farm worker’s potential for exposure was much higher than the suburbanite’s as a result of the potential for occupational poisoning. This risk was sometimes intensified by the kinds of questions science asked (or failed to ask). “From 1901 until the 1970s,” according to Linda Nash, concerns about the agricultural consequences of pesticide use “lay primarily with the efficacy of pesticides rather than their effects on human health” (206). When these concerns did focus on human health, they were often concentrated
on the question of “ingestion” or the assumption that chemicals would “enter the body through a well-defined and singular pathway, the mouth” (Nash 215). But farm workers’ “exposures were obviously not confined to a single pathway” (Nash 215). For instance, pesticides might enter the body as readily through the skin as the mouth. Further contributing to the invisibility of farm workers’ vulnerabilities was “a racialized discourse of hygiene” that assumed the “bodies of workers” were “impure or substandard” and which asserted that farmworkers’ lack of education made them susceptible to all kinds of disease” (Nash 216). Here, we can see how the slow violence of DDT—its capacity to remain hidden away in the body and thus invisible, as well as how such slow poisoning obscures the relationship between cause and effect—was more consequential for some communities than for others. Until the UFW organized widespread boycotts that unified worker and consumer, the concerns of marginalized communities remained largely “out of sight out of mind” (Nixon 20). And even after the publication of Silent Spring, people of color and the poor had to fight for representation in the mainstream American environmental movement and politics.

As Silent Spring shows, inequality, economics and environment are in this way deeply intertwined. This continues to be the case: in contemporary political discourse environmental concerns are often juxtaposed with economic ones. Those who stand against environmental regulation, for instance, argue that it burdens the free market, impeding economic growth and limiting consumer choice. At the same time, some believe that the free market might be a champion of environment. If the “solution[s]” to global environmental crises likes pesticide toxicity and “global warming” require “change in our” industrial and “energy technologies,” perhaps the free market is that which “will produce those technologies freely, of their own accord” (Oreskes and Conway 256). Michael Bloomberg, former Mayor of New York City and current business executive, recently argued this point. He believes that environmentally-minded technological change is as good for business as it is for the environment. In addition, he recently announced a new initiative that brings together elected officials, businesses and citizens to ensure the United States meets the emissions reductions to which it had formerly agreed as part of the Paris climate accords. Others, however, disagree with Bloomberg. They argue the precise opposite: that market-driven reform reinforces the problematic doublethink of mainstream American environmentalism—the idea that environmental reform and consumerism can coexist without conflict. These skeptics also question whether the free market’s traditional modes of assessment—such as “cost-benefit analysis”—are capable of fully accounting for and responding effectively to environmental crisis when, for instance, there “is no objective way of pricing” the loss of “biodiversity, climate stability, and wetlands” (Purdy 45). How do we “price” or provide an economic reckoning of an “aesthetically impoverished” world? (Oreskes and Conway 259). If we assess environmental degradation in strictly economic terms—in monetary, numerical form—how do we avoid making “the error of thinking that things that can’t be counted don’t count” (Oreskes Conway 259)? By what means would we be able to recognize the value of “[a] rare flower may be beautiful” if its utility—“its contribution to atmospheric oxygen”—is insignificant (Oreskes and Conway 259)? Silent Spring argues forcefully that the landscape provides essential and definitively aesthetic sources of nourishment, as well as critical forms of cultural heritage whose loss is incredibly consequential but not necessarily countable. Whether free market-environmentalism can account for such heritage is an open question.

And then there is the problem of what economists call externalities. Externalities are losses that occur outside the free market and thus are “not measured by market prices” (Guha and Martinez-Alier 41). In other words, they remain wholly unaccounted for in cost-benefit analysis. A perfect example of
externality is one with which readers of this guide are already familiar: toxic dumping. In this scenario, dangerous chemical waste that is the byproduct of industrial enterprise is “offload[ed] onto others” who do not benefit from such enterprise—in this case, people of color, and the urban and rural poor. Offloading, in other words “impose[s]” industrial waste “on people who did not choose” or benefit from “the good or service” of which it is a byproduct (Oreskes and Conway 237). Offloading thereby permits those who do enjoy the benefits of such goods and services to do so without experiencing or taking responsibility for their environmental hazards (Purdy 17). But what happens when there is no externality or, rather, no capacity to externalize environmental loss? The ecological worldview of Silent Spring illustrates how that which “economic analysis treats as an externality”—that which “is invisible in market transactions”—is in fact the entire “globe that houses all economic activity” (Purdy 18). To put it another way: Silent Spring argues that there is no escaping the globe and its ecological interconnectivity. Understood in environmental terms, the act of offloading, then, is impossible—and the very concept of externality cannot exist—for if to poison water somewhere is to poison water everywhere then what the free market foists onto someone else will eventually come full circle.

Some environmentalists thus argue that not only can the free market not save us from environmental crisis, but also that environmental reform begins with economic regulation. If the free market “must expand at an ever-increasing rate or go into crisis,” and if the globe that contains and fuels the free market is a finite resource, then environmental crisis is economic crisis (Dawson 13). The free market, in other words, risks running out of space for expansion and offloading—processes that are critical to its continued operation. This is why Immanuel Wallerstein warns that soon there will be “no zones into which factories can run away” (81). We are currently coming to grips with the very real “potential exhaustion” not only of resources but also “dumping grounds” (Wallerstein 81). If “purchaser[s] of raw materials” continue to be relatively “uninterested” in the problem of “long-run availability” and “sellers” remain “notoriously ready to subordinate long-run viability to short-run gains,” the global economy risks proliferating environmental degradation and, in the process, producing its own collapse (Wallerstein 81). Insofar as Silent Spring revealed how pollution was as much a global as a local problem—insofar as it made visible ecological networks of interrelation that rendered the concept of offloading an oxymoron and the notion of externality an impossibility—it “acknowledge[d] the soft underbelly of free market capitalism,” or the limits of assessing environmental crisis in economic terms (Oreskes and Conway 237). The text in this way anticipates the unsettled relationship between free market enterprise and environmental protection in our contemporary moment.

CLOSE READING
This and many other passages in Silent Spring highlight how global ecology complicates or even negates the concept of externality or the possibility of offloading. Students might use this passage to consider how ecological models of global life unsettle or compel us to rethink other global systems and networks (such as the free market economy).

The most alarming of all man’s assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible. In this now universal contamination of the environment, chemicals are the sinister and little-recognized partners of radiation in changing the very nature of the world—the very nature of its life. Strontium 90, released through nuclear explosions into the air, comes to earth in rain or drifts down as
fallout, lodges in soil, enters into the grass or corn or wheat grown there, and in no time takes up its abode in the bones of a human being, there to remain until his death. Similarly, chemicals sprayed on croplands or forests or gardens lie long in soil, entering into living organisms, passing from one to another in a chain of poisoning and death...As Albert Schweitzer has said, ‘Man can hardly even recognize the devils of his own creation.’ (6)

Occasionally, Carson takes up the economic language and logic of big industry to further her own arguments for prioritizing environmental protection and curtailing industrialization. Students might consider this rhetorical tactic and its efficacy using the following passages.

The chemical weed killers are a bright new toy. They work in a spectacular way; they give a giddy sense of power over nature to those who wield them...The “agricultural engineers” speak blithely of “chemical plowing” in a world that is urged to beat its plowshares into spray guns. The town fathers of a thousand communities lend willing ears to the chemical salesman and the eager contractors who will rid the roadides of “brush”—for a price. It is cheaper than mowing, they cry. So, perhaps, it appears in the neat rows of figures in the official books; but were the true costs entered, the costs not only in dollars but in the many equally valid debits we shall presently consider, the wholesale broadcasting of chemicals would be seen to be more costly in dollars as well as infinitely damaging to the long-range health of the landscape and to all the varied interests that depend on it. (68-9)

Reports of fish kills...have become so common that the United States Public Health Service has set up an office to collect such reports from the states as an index of water pollution. This is a problem that concerns a great many people. Some 25 million Americans look to fishing as a major source of recreation and another 15 million are at least casual anglers. These people spend three billion dollars annually for licenses, tackle, boats, camping equipment, gasoline, and lodgings. Anything that deprives them of their sport will also reach out and affect a large number of economic interests. The commercial fisheries represent such an interest, and even more importantly, an essential source of food...the invasion of streams, ponds, rivers, and bays by pesticides is now a threat to both recreational and commercial fishing. (139-140)

**DISCUSSION QUESTIONS**

- What are some examples of doublethink in your everyday life? What are some things that your teachers or families tell you that are contradictory? What are things that you tell yourself that are examples of doublethink? In terms of environmental doublethink, how do you think American nostalgia plays into our ability to alter the environment while at the same time venerate it? What other emotions play into our ability to perform doublethink?

- Are there ecological exemption zones in the U.S.? If so, where? Does your city or town seem like such a zone and why? How has the idea of these zones changed with the increasing occurrence of natural disasters, such as hurricanes?

**ACTIVITIES, ASSIGNMENTS & PROJECT IDEAS:**

- Have students map the official landscape versus the vernacular landscape of your city or town. Some groups may focus on food systems, while others on natural areas. Are there food deserts? Are there public parks or areas of conservation? Use digital tools, drawing, photos, etc.
• Have students research the economic and labor pathway of a food of their choosing. For example, a soybean. Where was this product first created and/or genetically modified? Where is it grown and what chemicals are used to treat it? Who works on the farms that grow this product? What is this product also used for? What does society need to invest in terms of labor and land in order to sustain the growth of this food? Who gets access to this food and who does not?

• Have students research the Delano grape strike in California in 1965. Who were the participating unions represented in the strike? What were they protesting and what did this reveal about the ownership of food and land in the agricultural system? What were the rights of the workers versus the rights of the companies that hired them and controlled the land?
OBJECTIVE: To explore how *Silent Spring* invokes gendered conceptions of nature for rhetorical purposes; the ways sexism shaped Carson’s career and the reception of *Silent Spring*, and how Carson drew on 1960s women’s networks to further her cause; and the connections between Carson’s personal battle with breast cancer and the ecological worldview she helped popularize.

PREPARATORY & RECOMMENDED READING


Williams, Raymond. *Keywords: A Vocabulary of Culture and Society*. Oxford University Press, 1976.

UNIT ORGANIZATION
This unit is divided into three sub-sections: “Female Nature & the Ecology of Domesticity”; “Sexism, Science, Activism”; and “The Personal is Political.” Each of these sub-sections develops points for use in lecture, followed by suggested passages for class discussion and questions for further inquiry. The unit concludes with ideas for in-class activities and student projects.

FEMALE NATURE & THE ECOLOGY OF DOMESTICITY
Throughout Silent Spring, Carson uses the words “man” and “mankind” to identify the agent responsible for the environmental destruction to which she objects. These might seem like neutral or straightforward words, but they are not. Readers of Units 2 & 3 will already recognize the anthropocentrism and false promise of an undifferentiated humanity they imply. Such words are used to cordon off particular human communities from the category of the human not only on the basis of race, ethnicity, nationality and socioeconomic status, but also on the basis of sex and gender. That Carson understands “man” or men to be primarily responsible for widespread environmental toxicity is especially apparent when she refers to nature as female: “Nature herself has met many of the problems that now best us, and she has usually solved them in her own successful way. Where man has been intelligent enough to observe and to emulate Nature he, too, is often rewarded with success” (81). Silent Spring is a text that demonstrates the power of the pronoun and of the closest of close readings. Here, words as seemingly commonplace as “mankind” and as trivial as “he” or “her” contain within them entire histories of thinking about environment and possess serious implications. They invoke traditions of imagining nature as the female Other of man and, in so doing, they show how nature’s “many political meanings and alliances” provoke not only questions of race or capital but also of sex (Purdy 21).

To see how the male / female divide maps onto that of culture / nature, let’s first take a closer look at the word “man.” As discussed in Units 2 & 3, “man” designates “the whole human race, the human species or mankind” (Williams 158). It “assume[s]” a “common condition” that might “be expressed in the same singular form” regardless of historical or cultural specificity (Williams 159). It does not take notice, in other words, of the differences between human individuals or communities, or between different places and moments in time, but instead lumps them all into one undifferentiated category. When “man” does take notice of such difference, it is usually to exclude those who do not conform to the white, male, heterosexual norms it connotes. Thus, Raymond Williams notes that “[t]he identity of man (human) with man (male) has persisted in English longer than in most European languages” (158) and contains within it a range of “assumptions” that “are now embedded in the language” (159). It also expresses a particular relationship between humankind and the natural world, emphasizing “human-self-development” or the notion that “Man Makes Himself” (Williams 159). Christophe Bonneuil and Jean-Baptiste Fressoz stress this same point, describing “man” as an “autonomous agent acting consciously on his history and settling social conflicts by dominating nature” (19). This limited notion of the human is one that feminists often trace back to the rise of modern science as an empirical, objective, distant mode of understanding. Maria Mies and Vandana Shiva, for instance, argue that “the fathers of modern science and technology” helped to establish a type of “rationality” that was distinctly “Western” in that it posited the natural world as a passive object that would, under systematic scrutiny, give its secrets up to the white, male, European subject (18). According to Mies and Shiva, “the West’s paradigm of science” and even its very “concept of freedom” garners power from “the subordination of nature to the (male) will” (18). Thus, Janis Birkeland and many others have “explore[d] the links
between androcentrism”—the idea that the world circulates around and exists to satisfy men—“and environmental destruction” (18).

The connection between “man (human) with man (male)” (Williams 158) goes hand in hand with that between women and nature, and it is for this reason that many feminists are concerned with the very same kinds of environmental destruction as Carson is in *Silent Spring*. In her foundational study of the early modern scientific revolution (think Copernicus, Galileo and Sir Isaac Newton) and gendered theories of nature, Carolyn Merchant explores how “[w]omen and nature have an age-old association” (xv). This association “links women’s history with the history of the environment” (xvi). We cannot fully understand the one without taking the other into account and vice versa. Central to this history is the tradition of personifying nature as female. Perhaps the oldest and most “persistent personification” is that of “Nature the goddess” and the corollary conception of “Mother Nature” (Williams 166). These “mythical abstraction[s]” were often juxtaposed “with another singular all-powerful force, namely a monotheistic God” or the sexed and increasingly powerful “force” of Man (Williams 167). In this formulation, God and, later, Man was envisioned as “primary and Nature as his minister or deputy” (Williams 167). Yet, there soon arose a second, terrifying personification of Nature “as an absolute monarch” whose “power of natural forces” exceeded human understanding and control: her actions were “apparently arbitrary or capricious…with inevitable, often destructive effects on men” (Williams 167). Merchant outlines how this new sense of nature as “a disorderly and chaotic realm to be subdued and controlled” took hold alongside the beginnings of science as we now know it today (127). Francis Bacon—a father of modern science and pioneer of the scientific method—“advocat[ed] the control of nature for human benefit” and employed “female imagery” to do so (Merchant 165). At the time of Bacon’s writing, women were being tried and punished in swaths for witchcraft, a crime that symbolized “the violence of nature” insofar as it was believed to have “raised storms, caused illness, destroyed crops, obstructed generation, and killed infants” (Merchant 127). Woman, like nature, was disorderly and in need of management. Bacon’s use of female imagery was rhetorically effective because it drew together the problems of nature and of woman: “The new image of nature as a female to be controlled and dissected through experiment legitimated the exploitation of natural resources” (Merchant 189). The sanctity of Mother Earth gave way to a rationale for the necessary “denudation” and exploitation of nature as a disorderly woman (Merchant 189).

The nature / culture divide (which is discussed in depth in Unit 2) was in this way profoundly consequential. It established and naturalized a link between women and nature that was then employed not only to justify the exploitation of natural resources and nonhuman life, but also to established systems of social inequality. Thus, Michael Smith notes that “[t]he quest to dominate the female nature paralleled and reinforced the cultural trend toward the increased subordination of women in society” (170). Women, like nature, were imagined as the lesser Others of mankind. As objects in need of management and control, they were and often continue to be “depriv[ed]” of autonomy over “their bodies” (Dawson 52). *Silent Spring* shows, for instance, how many people were unknowingly and / or unwillingly exposed to chemical poisons—a problem that affected reproductive organs and processes, and thus impacted the lives of women, in unique ways. For this reason, many feminists “believe that we cannot end the exploitation of nature without ending human oppression, and vice versa” (Birkeland 19). These feminists—often called ecofeminists—believe “that the ideology which authorizes oppressions such as those based on race, class, gender, sexuality, physical abilities, and species is the same ideology which sanctions the oppression of nature” (Gaard 1). They argue, too, that the male / female and nature
/ culture divides have “divided and fragmented knowledge” such that the voices of women, people of color, the poor, non-specialists and others are discounted or altogether silenced (Mies and Shiva 23). These divides are thus marshaled by those in power to “exclud[e] other knowers and other ways of knowing,” who would tell very different stories about the relationship between humankind, nature, and social inequality (Mies and Shiva 23).

For this reason, ecofeminists warn against “the habits of dualistic thought that separate human society from nature” and male from female (Lahar 96). As Stephanie Lahar observes: “Dualistic thinking guides us into polarities in thinking” (109) that are now ingrained in the way we understand “the world around us” and our relationship to it (96). Ecofeminists argue that we must remember and be vigilant in making visible how the dualisms of nature / culture and male / female are constructed—how they are created orders that naturalize the dominance of some and the oppression of others. “[I]t is the resulting imbalance that ecofeminism seeks to redress” and it is by thinking across seemingly distinct histories of oppression—such as those of nature and of women—that we develop a nuanced understanding of that “imbalance” and its “redress” (Birkeland 24). This is precisely what Carson does, however subtly, when she describes the origins of environmental toxicity in masculine terms—as wrought by man or mankind—and the victim of this toxicity—nature—as a woman who possesses other and perhaps more useful ways of knowing and acting. Carson writes: “Nature herself has met many of the problems that now beset us, and she has usually solved them in her own successful way” (81). Thus, Lawrence Buell argues that “[a] subtle but firm critique of homocentrism, more particularly a critique of ‘man,’ runs throughout all [Carson’s] work” (292). He continues: “Woman is rarely, if ever, nature’s adversary in Carson’s work, but ‘man’ often is” (292).

But even as Carson critiques the nature / culture divide and its sexed implications, she invokes it for other rhetorical purposes. As already mentioned briefly, the nature / culture divide helped to naturalize a hierarchical relationship between men and women and, by extension, an essentialist system of social norms. Here, “essentialist” refers to the idea that particular groups of people—such as men and women—possess intrinsically different dispositions and, by extension, social roles. An example: “Because women’s physiological functions of reproduction, nurture, and childrearing are viewed as closer to nature, their social role is lower on the cultural scale than that of the male” (Merchant 144). This was especially true at the time of Carson’s writing, when women were tasked with the responsibilities of homemaking and childcare so that men could pursue careers outside of the home. As Vera Norwood notes: “The middle decades of the twentieth century have been described as some of the most rabidly restrictive in American women’s history” (144). While we tend to imagine women’s rights as making slow but steady progress over the course of the nineteenth and twentieth centuries, it turns out that “the ideological separation of roles” in the 1960s “was perhaps more rigid than that of the mid-nineteenth century” (Norwood 144). While “[m]en dominated the public sphere,” women were confined to the home, “a place of retreat from activity, a static zone in a landscape of endless change” (Norwood 144). Women did, of course, work more than ever before in the decades following the Great Wars, but “their jobs were perceived to be secondary to their role as homemaker” (Norwood 144). Moreover, the professional work that was available to them was decidedly limited: “Most [women] were pigeonholed into such traditional female vocations as teaching, librarianship, and home economics” (Norwood 144). Even as woman scientist working in government, Carson was as much the rule as the exception to it. She was subjected to precisely this kind of sex-segregation. Following World War II, “Carson wanted to ‘get into some work that had more immediate value in relation to the war,'”
but was instead assigned to “wr[i]te a series of pamphlets on proper diet and nutrition in a time of restricted food availability” (Herron 163). To her superiors, this task seemed especially appropriate for a woman natural scientist—it announced itself more readily as women’s work.

If this was women’s work, Carson did the job in a way that transcended these arbitrary limitations. While the topics of food and nutrition were “an extension of domestic sphere responsibilities”—and as such meant that “Carson’s primary project involved teaching Americans, especially housewives, how to use fish as a substitute for rationed meat and poultry” (Herron 163)—she took an ecological approach to her task. In so doing, she refigured “household obligations” as biological and political ones (Herron 164). By “linking food conservation to the war,” Carson drew connections between the domestic sphere and the biological and ecological, as well as to “public service and patriotism” (Herron 164). As she deconstructed the false divides between nature and culture, she took the space of the home and the role of the housewife public. This was work she continued in *Silent Spring*, whose attention to pesticides and their all-pervasive reach illustrates the impossibility of separating out the otherwise seemingly distinct spaces of nature, city, suburb, and home. Thus, Norwood argues that the “brilliance” of *Silent Spring* is that it “reach[es] into the supposed sanctuary of suburban homes” and, in so doing, reimagines the planet as “a shelter where humans live in intimacy with other creatures as members of a household” (151). If nature is to be found in domesticity, then domesticity is to be found in nature. Using “imagery centered on how animals made their homes,” Carson capitalized on “modern women’s ideas about home,” especially how these ideas “fed into their sense of personal responsibility as teachers of a proper reverence for nature” (Norwood 151). She also capitalized on her women readers’ sense of responsibility to the children many of them were raising and to a collective future. Highlighting the “questions of hazards to human reproduction” and tracing accumulative poisonings that move from mother to child, “Carson warned her readers that this new understanding of our shared heritage with all life carries new responsibilities to future generations”—responsibilities that might resonate with and be articulated most forcefully by women (Norwood 156). *Silent Spring* demonstrates how “the impact on women of ecological disasters and deterioration” is so often “harder than on men” (Mies and Shiva). The text in this way subjects the nature / culture and female / male divides to intense critique while at the same time invoking it rhetorically to compel American housewives to decisive action.

**CLOSE READING:**
Using the following passages, close read Carson’s use of pronouns. Students might juxtapose the quotations to explore the gendered valences of the nature / culture divide, as well as whether Carson doles out responsibility for environmental crisis on the basis of gender.

As man proceeds toward his announced goal of the conquest of nature, he has written a depressing record of destruction, directed not only against the earth he inhabits but against the life that shares it with him. The history of the recent centuries has its black passages—the slaughter of the buffalo on the western plains, the massacre of the shorebirds by the market gunners, the nearextermination of the egrets for their plumage. Now, to these and others like them, we are adding a new chapter and a new kind of havoc—the direct killing of birds, mammals, fishes, and indeed practically every form of wildlife by chemical insecticides indiscriminately sprayed on the land. (85)

Nature herself has met many of the problems that now beset us, and she has usually solved them in her own successful way. Where man has been intelligent enough to observe and to emulate Nature he, too, is often rewarded with success. (81)
The passages below showcase Carson’s attention to the concerns of women and housewives. Discuss how these quotations reimagine matters of the home—such as food production and consumption—in ecological terms, and take up the question of how future generations will be affected by environmental toxicity.

To the question ‘But doesn’t the government protect us from such things?’ the answer is, ‘Only to a limited extent.’ The activities of the Food and Drug Administration in the field of consumer protection against pesticides are severely limited by two facts. The first is that it has jurisdiction only over foods shipped in interstate commerce...The second and critically limiting fact is the small number of inspectors on its staff...The system by which the Food and Drug Administration establishes maximum permissible limits of contamination, called ‘tolerances,’ has obvious defects. (181) To establish tolerances is to authorize contamination of public food supplies with poisonous chemicals in order that the farmer and processor may enjoy the benefit of cheaper production—then to penalize the consumer by taxing him to maintain a policing agency to make certain he shall not get a lethal dose. But to do the policing job properly would cost money beyond any legislator’s courage to appropriate, given the present volume and toxicity of agricultural chemicals. So in the end the luckless consumer pays his taxes but gets his poisons regardless. (183) In the kaleidoscope of shifting conditions, what dose of a carcinogen can be ‘safe’ except a zero dose? (239)

It is hard to explain to the children that the birds have been killed off, when they have learned in school that a Federal law protects the birds from killing or capture ‘Will they ever come back?’ they ask, and I do not have the answer. The elms are still dying, and so are the birds. Is anything being done? Can anything be done? Can I do anything? (103)

DISCUSSION QUESTIONS:

- What in nature feels connected to the feminine, and what seems masculine? Do those connections affect how we talk about nature? How might those connections affect the way society makes decisions about our environment?
- How is food political? Have you ever seen someone judge another person for the way that they eat? How is food talked about at home versus in the media versus at school? In what ways has the way food has become politicized today?
- How do you define the word ‘man’? Is it a scientific term, a social term? In your school, do students state their pronoun preferences? What do you think about being able to state and claim your gender identity versus the gender you are perceived to be?

SEXISM, SCIENCE, ACTIVISM

_Silent Spring_ was nothing short of a smash hit when it debuted in June of 1962. First serialized in the _New Yorker_ and published later that year as a book, it was wildly popular. Readers “flooded the offices of the _New Yorker_ and Houghton Mifflin” with letters, Carson was bombarded by requests for “interviews, and invitations for speaking engagements,” it topped the _New York Times_ best-seller list, “[t]he Book-of-the-Month Club chose _Silent Spring_ as its October selection,” and it “drew scientific” as well as popular “acclaim” (Herron 194). The moment in which _Silent Spring_ emerged was a major one for literary and cultural production. Joseph Heller’s _Catch-22_ was published in 1961, and James Baldwin’s _The Fire Next Time_ and Betty Friedan’s _The Feminine Mystique_ in 1963 (Patterson 443-4).
Carson was in good, equally anti-establishment company. But not everyone was thrilled about the content of *Silent Spring*. The text “was subject to criticism on many fronts”: chemical corporations sued her publisher, Houghton Mifflin, for libel, “the Monsanto Corporation published a parody of *Silent Spring* titled the ‘Desolate Year,’” and organizations including the American Medical Association and the Department of Agriculture “attacked *Silent Spring* as unbalanced, incorrect, and misinformed” (Herron 194-5). Such critiques were mounted to protect the interests of science and industry. A closer look reveals they were also unmistakably gendered.

The first sub-section of this unit briefly outlined how the 1960s were a “rabidly restrictive” period “in American women’s history” (Norwood 144). This was most certainly the case for “[w]omen who tried to combine homemaking and career” (Patterson 362). While “[t]he percentage of working-age women who were in the labor force gradually increased in the 1950s” and the 1960s, they nevertheless “remained highly segregated in occupations deemed suitable for their ‘lesser’ talents: as secretaries, waitresses, elementary school teachers, nurses, and other mostly low-paid members of the labor force” (Patterson 368). Moreover, even as the number of women in the professional workforce was on the rise, “[t]he median income of white female full-time workers decreased from 63 percent of the median for males in 1945 to 57 percent in 1973” (Patterson 368). Here, we can see the culture / nature and male / female divides in action. Falsely essentialized as natural-born caretakers, women were expected to prioritize their responsibilities as nurturers in *and* outside of the home—to work within a hierarchy of professional labor in which their contributions were considered lesser than men’s and monetized as such. The same inequities affected women pursuing degrees in higher education. “Of those women who graduated” from college, only “relatively small numbers went on for higher degrees” (Patterson 367). This was “in part because graduate and professional schools had quotas limiting the percentages of women they would admit. A total of 643 women received doctorates in 1950, compared to 5,990 men. Ten years later the numbers were 1,028 for women and 8,800 for men” (Patterson 367). Women faced profound limitations in pursuing a formal education and, later, professional careers that did not conform to the accepted social roles of mother, caretaker, nurturer.

Perhaps nowhere were these limitations more visible than in science, where the “divide” between nature and culture, as well as female and male, “fixed the utility of natural science, determined membership in the ranks of professional science, and colored our perceptions of natural resource use” (Herron 10). If “[i]n postwar America” nature was female, then “science was male” (Lear, “Introduction” xi). This is not to say that women did not make sizable gains in this arena. “Wartime service gave women scientists many ‘firsts’,” but these successes were qualified by “postwar barriers that were erected to limit female participation in science” (Herron 177). Overall, “female scientists were often no better off in 1930 or even 1940 than they were in the first decade of the century” (Herron 162). It is perhaps unsurprising in this context that some of Carson’s faculty advisors discouraged her from majoring in a scientific field of study. At the Pennsylvania College for Women, where she studied as an undergraduate, Carson encountered resistance from faculty, both male and female, who “did not believe that women had the intellect or the physical stamina for careers in science” (Lear, *Rachel Carson* 43). This notion was a “widely shared cultural norm” and demonstrates why “comparatively few women succeeded in moving to the front ranks of science in the 1920s and 1930s”—the historical moment during which Carson was involved in her studies and launched her career (Lear, *Rachel Carson* 43). Had Carson not found a committed, enthusiastic, unwavering mentor in Mary Scott Skinker—an accomplished naturalist and teacher of biology at the Pennsylvania College for Women—she might have bypassed a major in
science and never written *Silent Spring*. Skinker’s mentorship of Carson “fitted a well-regarded strategy among female scientists that had been going on since the late nineteenth century,” wherein [p]ioneering female scientists on the faculties of women’s colleges guided the careers of their brightest students, ensuring their success and grooming their protégées to succeed them” (Lear, *Rachel Carson* 45). Women who had broken through the ranks looked out for and shepherded through their female successors, attempting to change the gendered culture of science from the inside out. This was slow and arduous work. It provoked much resistance.

The field of biology gave Carson more wiggle room than other scientific areas of study allowed. Whereas “hard” sciences such as physics were deeply involved in military and industrial enterprise, well-funded and extremely sex-segregated, “soft” sciences such as biology were more accessible to women. Herron observes that “[b]iology was more accepting of female presence than most sciences, and during the 1930s the number of women in the natural sciences increased” (162). While “professional opportunities remained limited,” women were for the first time permitted to take “civil service exams for entry-level scientific positions” (Herron 162). Carson was one of these women. After graduating from the Pennsylvania College for Women, she took a summer course at the Marine Biological Laboratory (MBL) at Woods Hole in New Bedford, Massachusetts. Woods Hole was somewhat unusual in that “its organizers decided that women would participate in the scientific community both as students and teachers” (Lear, *Rachel Carson* 58). Participants included “leading women scientists” and “[w]omen were members of the original board of trustees” (Lear, *Rachel Carson* 59). At the MBL, “[f]ormal hierarchy was kept at a minimum” (Lear, *Rachel Carson* 59). There, Carson’s interests in biology and zoology flourished. She went on to complete her master’s in zoology at Johns Hopkins University and then sat the civil service exams. Based on her scores, she was hired as a junior aquatic biologist with the U.S. Bureau of Fisheries (though, as Lear notes, “she was qualified for a higher-level appointment”), making her “one of only two women then employed in the bureau at a professional level” (*Rachel Carson* 82). Though Carson ultimately secured a government position, her career fits a pattern in which “female scientists who did excel were still blocked” not only from appointments but also from tasks that were considered “men’s work” (Herron 162). It was because of this pattern of “sex-segregation” that Carson ended up “writing short scripts for a public education radio program on fish biology” prior to her full-time employment with the Bureau of Fisheries. Even after she secured full-time employment, Carson’s duties were largely limited to producing information for a non-specialist audience and to “editing,” as opposed to conducting “fieldwork or laboratory research” like her male peers (Herron 163). This held true for the remainder of her professional scientific career: “even as she moved through the bureaucratic ranks, including promotions to assistant and then associate aquatic biologist, her work assignments remained informational” (Herron 163). It seems no surprise in this context that when Carson first began writing her own “freelance articles” on some of the very same topics at issue in *Silent Spring* she did so under a pen name: R. L. Carson. Her “hop[e]” was “that readers would assume that the writer was male and thus take her science seriously” (Lear “Introduction” xiii). Frustrated by “the challenge she faced as a female biologist,” Carson said herself that she believed her articles “would be more effective . . . if they were presumably written by a man” (qtd. in Herron 177). This was a problem she would encounter again and again in her career not only as a scientist but also as a public science writer, for magazine writing—like science—was a “male-dominated field” (Herron 177).

It seems unsurprising, then, that many readers who disliked *Silent Spring* attempted to tarnish the text by attacking its author’s gender. Scholars have written extensively about “[t]he gendered language used
to discredit Carson,” arguing that it belies how she was “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” (Smith 170 and 169). The chemical industry was one of the first to take up arms in this way. Representatives of the industry argued that Carson’s “arguments were exaggerations born of hysteria at worst and an overly sensitive nature at best”—of an unsettled, capricious, irrational disposition that is supposedly characteristically female (Lear Rachel Carson 430). As Lear puts it: “Reason had been sacrificed to sentiment. Miss Carson had overstepped her place” (Rachel Carson 430). Three of the common accusations leveled against Carson were that her science was bad, her familial and domestic commitments (or lack thereof) questionable, and her emotional appeals the product of a frenetic mind. Sexism pervades all three of these claims. For instance, many men of science found it “unthinkable” that “a woman not only entered their profession but also criticized it” and “responded by appealing to the stereotype of women as incapable of true scientific understanding” (Norwood 169). Others questioned why a woman concerned with the impact of environmental toxicity on women’s bodies and reproductive processes was unmarried and had no children of her own. Many of her critics labeled her a “spinster” who had no business concerning herself with “intergenerational genetic issues” (Nixon 145). “Why,” one critic cried, “is a spinster with no children so concerned about genetics? She is probably a Communist” (Nixon 145). When Life profiled Carson following the publication of Silent Spring, the magazine emphasized that she was “unmarried but not a feminist” (qtd. in Smith 176). Claiming to provide “a balanced assessment of the woman and her work,” the Life profile went on to “impl[y] that Carson’s unmarried status is itself an expression of some deficiency, that were she married none of this controversy would have developed,” that had she “instead been practicing home economics and recognizing the overwhelming benefits of pesticide-enhanced agricultural bounty for the kitchen” Hurricane Rachel—as the magazine called her—would never have wreaked havoc on American bookshelves and industry (Smith 176). Even male reviewers from whom Carson received praise framed their discussion of Silent Spring in sexist terms. Many “speculated about what a woman who could write such a book might look like” (Lear, Rachel Carson 206). A positive review published in the New York Times expressed a desire “to know what a woman looks like who can write about an exacting science with such beauty and precision” and one of Carson’s own “editors, upon meeting Carson after the book was published, remarked, ‘You are such a surprise to me. I thought you would be a very large and forbidding woman’” (Lear Rachel Carson 207).

Carson’s use of pathos—her emotional appeal to readers—was especially controversial, and inspired vehement criticism. Many reviewers “call[ed] her an ‘amateur’ or a mere ‘scientific journalist’,” citing her “emotionalism and her vision of progress rooted in ‘sentimentalism’ rather than reality” as evidence (Smith 172). The consensus was that “she was a woman and she was challenging a cornerstone of industrial capitalism with a passion considered unbecoming to a scientist” (Smith 175). John P. Herron suggests that [b]y highlighting her gender and her emotional connection to the natural world, Carson’s critics tried to lessen the impact of her political message and, more significant, separate her from the professional realm of science” (186-7). But Carson felt no need to defend or deny her “sentimentalism.” For her, it constituted an important, valid, supremely rational response to the destruction she had observed in nature. Writing about the aftermath of the Chernobyl disaster, Mies writes that “[w]omen saw fear and anger as the most rational emotions, as the most powerful energies to be mobilized” (95-6). The same might be said about Carson and pollution by pesticide. Terry Tempest Williams describes Carson’s “spirit” as possessing “a healthy sense of indignation” that “shatter[s] the complacency that
has seeped into our society”—a “sacred rage, a rage grounded in the understanding that all life is intertwined” (25).

It’s worth noting that *Silent Spring* not only expresses such anger, indignation and “sacred rage,” but was inspired by and exists because of other women’s emotional responses to environmental degradation. As Patricia Hynes tells it: “Carson was moved to write *Silent Spring* because of a passionately written letter about one small corner of the world destroyed” (55). This letter—written by Carson’s old friend, Olga Owens Huckins—“expressed one woman's anguish at the destruction of wildlife in her yard” (Norwood 159). In *Silent Spring*, Carson routinely “acknowledged her debt to such women” and, in the process, “included” and elevated “a chorus of women who expressed the same sense of outrage, loss, and call to action as Huckins” (Norwood 159). The text makes emphatically visible how “[w]omen were often the ones who wrote to newspapers and appeared at public hearings asking sensitive questions about wildlife kills and stressing the value of intimate contact with native plants and animals” (Norwood 159). Carson “grant[ed] status to the worries of ordinary citizens, many of whom were women” (Norwood 169). She by extension “empowered people to question the authority of scientific figures in government and industry,” a topic discussed in greater detail in Unit 5 (Norwood 169). Following the publication of *Silent Spring*, Carson turned to women again for help as she attempted to catalyze her readers’ outcry into a movement for change. She called upon “the powerful women’s networks of the 1950s”—upon “women’s clubs and organizations,” including the American Association of University Women and the Garden Club of America—to promote the message of *Silent Spring* and to transform it into “a political agenda arising from the congruencies between human homes and nature’s household” (Norwood 147). Carson recognized that “women were potentially a powerful lobby” precisely because of “their roles as protectors and educators of the next generation” (Norwood 155 and 154). Women were Carson’s strongest supporters in the earliest stages of her career. They would rise to the occasion again following the publication of *Silent Spring*, when they became some of the environmental movement’s greatest champions.

**CLOSE READING:**
Carson was a renegade witness whose critics attempted to discredit her on the basis of gender. A substantial portion of *Silent Spring* is dedicated to legitimizing the experiences of witnesses—many of whom were women—normally excluded from debates about science, environment and industry. Students might use the following passages to explore these aspects of Carson’s intervention and reception.

> The credibility of the witness is of first importance. The professional wildlife biologist on the scene is certainly best qualified to discover and interpret wildlife loss. The entomologist, whose speciality is insects, is not so disqualified by training, and is not psychologically disposed to look for undesirable side effects of his control program. Yet it is the control men in state and federal governments—and of course the chemical manufacturers—who steadfastly deny the facts reported by the biologists and declare they see little evidence of harm to wildlife. (86)

> In a letter written in January 1958, Olga Owens Huckins told me of her own bitter experience of a small world made lifeless, and so brought my attention sharply back to a problem with which I had long been concerned. I then realized I must write this book...I must acknowledge our vast indebtedness to a host of people, many of them unknown to me personally, who have nevertheless made the writing of this book seem worthwhile. These are the people who first spoke out against the reckless and irresponsible
poisoning of the world that man shares with all other creatures, and who are even now fighting the thousands of small battles that in the end will bring victory for sanity and common sense in our accommodation to the world that surrounds us. (viii-ix)

Ask students to close read the following passage—excerpted from a 1954 speech delivered by Carson to Theta Sigma Phi—focusing on the centrality of women’s organizations to Silent Spring and its political aftermath. They might consider, for instance, Carson’s appeal to women on the basis of gender and their common experience of sex-segregation.

I believe it is important for women to realize that the world of today threatens to destroy much of that beauty that has immense power to bring us a healing release from tension. Women have a greater intuitive understanding of such things. They want for their children not only physical health but mental and spiritual health as well. I bring these things to your attention because I think your awareness of them will help, whether you are practicing journalists, or teachers, or librarians, or housewives and mothers. (qtd. in Norwood 152-3)

DISCUSSION QUESTIONS:

• Do any of the criticisms aimed at Carson during Silent Spring’s publication seem valid to you? Is it a sentimental text? An amateur text? An angry text? What in the text makes these criticisms true? How do you think Carson would have responded to these criticisms? How do you respond?
• Consider the use of pathos as a rhetorical strategy in the text. Pathos is the use of emotional appeal, whereas logos is the use of a rational appeal to reason. Is science something you’d think of as requiring an emotional appeal? Does using an emotional appeal undercut the argument of the person presenting the argument? How successful is Carson in using pathos as a way of conveying her argument?
• Consider the use of masculine pen names by women throughout literary and scientific history: Caron’s use of R.L. Carson, Mary Anne Evans’ use of George Eliot, Joanne Rowling’s use of J.K. Rowling and Robert Galbraith. How are we approaching a text differently if we assume the author is male? Is this strategy still relevant today?
• What still hinders female advancement in the sciences today? Are there sciences that seem more feminine? What does it mean to be a hard science versus a soft science? What gender connotations come with those words? Why would biology be considered soft and more appropriate for women?

THE PERSONAL IS ECOLOGICAL IS POLITICAL
Second-wave feminism—born at the same time Carson was working on and published Silent Spring—took up the following statement as a slogan: “The personal is political.” This short declaration gave expression to one of 1960s feminism’s guiding principles: that women’s individual experiences were indicative of and spoke to large-scale sociopolitical structures and systemic patterns of oppression. If Carson was given the opportunity to write her own version of this slogan, it might go something like: “The personal is ecological is political.” While Carson was writing Silent Spring and then stumping for it in public, she waged a “private battle with breast cancer” that she ultimately lost, but which also “made her an icon of women’s health movements and others seeking to draw attention to the links between
cancer and the environment” (Sideris and Moore 1). Deeply personal on the one hand and at the same time highlighting the interpenetration of human bodies and the outside world, Carson’s breast cancer symbolizes the interconnections between individual persons, ecological webs and systems, and the politics of industry and toxicity. It also makes visible how Carson’s attempts to amplify voices that were traditionally silenced would come to possess a sad corollary in her personal life. As Lisa H. Sideris puts it: “As a scientist investigating environmental hazards and as a cancer patient seeking the truth about her disease, she continually struggled with the problem of wresting facts from ‘specialists’” (140). This notion of the specialist as one who cloaks his knowledge in secrecy is discussed in greater depth in Unit 5. However, it is worth mentioning here because it came to bear on the most intimate aspects of Carson’s life in profound ways.

From the mid-1940s Carson battled the looming threat of breast cancer. In 1946 she had a “small cyst” removed from one of her breasts and, in September 1950, she found a larger tumor in the same breast (Lear Rachel Carson 184). Her response was initially unconcerned: “she gave the impression of nonchalance when th[e] larger [tumor] was discovered” and “[h]er search for a surgeon was extraordinarily casual for someone with her knowledge and research skills” (Lear Rachel Carson 184). After having the tumor removed later that same September, Carson “specifically asked her surgeon whether the tissue biopsy showed any evidence of malignancy” (Lear Rachel Carson 185). The surgeon claimed that it did not and advised nothing in the way of further action. The case seemed closed. But this very same pattern was repeated in 1960, when Carson discovered “what she thought were several cysts in her left breast” (Lear Rachel Carson 365). After undergoing a mastectomy of her left breast, she questioned her surgeon—Dr. Fred Sanderson—about whether “the pathology report showed any malignancy” (Lear Rachel Carson 367). Sanderson answered only that her condition “border[ed] on malignancy” and “impli[ed]” the mastectomy had been a precautionary measure” that presumably resolved the issue (Lear Rachel Carson 367). What Carson did not know at the time was that her doctor had willfully misled her about her own health. Sanderson knew that “the tumor had already metastasized” and, inexplicably, “failed to suggest further radiation treatment even as a precautionary measure” (Lear Rachel Carson 368). There are some who speculate Sanderson’s failure to disclose this information to Carson was a result of gendered doctor-patient protocols. In the 1950s and 1960s, doctors did not inform a female patient directly of her condition but would instead communicate this information to her husband. For unmarried women like Carson, there was no such protocol in place. It was also not unusual, especially in cases of breast cancer, for doctors to make decisions—like performing a biopsy and mastectomy “as a single procedure”—“with no inquiry into the patient’s wishes regarding her own body” (Sideris 140). Whatever the case, some Carson scholars are not convinced that Sanderson’s failure to disclose the truth to Carson is explained away by the gendered dynamics of human health in the 1960s. Given this pattern of dishonest treatment happened yet again later that same year, when Carson reported “new symptoms” only to receive the same fraudulent assessment, Lear speculates that “the only available conclusion is that [physicians] consciously intended to hide the truth of her condition as long as possible,” perhaps because they “considered her cancer so far advanced that no treatment would make any difference in her life expectancy” (Lear Rachel Carson 368). Carson was in this way deprived on multiple occasions of knowledge about her own body, but also of opportunities to take decisive action while there was still hope, however little it may have been.

Carson’s experience highlights the incredibly limited autonomy women possessed over their bodies and health in the 1950s and 1960s. Like always, however, Carson took matters into her own hands. She
sought out a second opinion from another doctor, George Crile, who she had “first met during her book tour for *The Sea Around Us*” (Lear *Rachel Carson* 379). After corresponding from afar, Carson eventually traveled to consult with Crile in person at the Cleveland Clinic, where it was “confirmed to Carson that she had cancer and that it had metastasized to other lymph nodes” (Lear *Rachel Carson* 379). Carson would eventually undergo radiation therapy and sterilization. Perhaps surprisingly, she felt empowered: “The truth liberated Rachel to tap into her strength, for now she could react as a scientist as well as a victim” (Lear *Rachel Carson* 379). In her conversations with Crile, Carson criticized those doctors “who did not share [their] ecological understanding of life processes” and approached health problems instead with a “narrow focus that treats a problem in isolation from its context” (Sideris 142). Crile agreed: “the specialist often fails to grasp the importance of specificity...only when the whole system is understood can an appropriate, specific response be generated from within the body” (Sideris 142).

Here, we can see how Carson’s personal experience resonated with her professional and activist interests in ecology and environmental toxicity. An ecological worldview becomes key to understanding problems personal and political: “there was no separation” of human culture or body, of public or private, from nature. As Herron puts it: “the toxins penetrating [Americans’] environment also affected their bodies” (Herron 196). In this way, “Carson approached her disease much as she approached the environmental crisis her work had brought to light” (Sideris 141).

Perhaps surprisingly, she observed with wonder (rather than horror) “the mysterious function of [her] disease and the complex interconnections of the body” it made visible (Sideris 141). Cancer, like nature, possessed its own strange beauty for Carson, because it reveals the inner workings of ecological systems that otherwise remain largely invisible to the human eye. In *Silent Spring* and in her battle with breast cancer, then, Carson “laid the groundwork for a nature-centered as well as human health-centered system of environmental protection” (Hynes 26). This new, human health-centered vision of ecological awareness made room for the voices of women patients and non-specialists—for “other knowers and other ways of knowing” (Shiva 23). Moving away from the polarities of dualistic thought, Carson “emphasize[d]” instead “multiple factors in and relations among different phenomena and events”—a vast ecological web—that disclosed “open and evolving, rather than ‘finished’ explanations” (Lahar 107). In her personal as well as public life, too, she advocated for a shift away from the conventional model of science and health as structured by the imbalanced relationship between a dominant, masterful, presumably male subject and a passive, subjugated, inevitably female object. Carson argued instead for “the principle of subject-subject reciprocity” or the notion that “the research object”—whether it be a breast cancer patient or an insect—should be “regarded as living and endowed with its own dignity/soul/subjectivity” (Mies 52). It is for this reason, perhaps, that though Carson never embraced and even disavowed the label of feminist, many feminists—ecofeminists in particular—have retroactively claimed her as a sister in arms.

CLOSE READING
To explore Carson’s argument that human action created new and dangerous forms of cancer, students should close read the following quotations. They might consider how cancer—like nature—has a history that took a sharp turn in the nineteenth century, when industrial power expanded dramatically. (For unabridged versions of each quotation, see the original text.)

The battle of living things against cancer began so long ago that its origin is lost in time...The environment contained these hostile elements [ultraviolet radiation, radiations from certain rocks, arsenic washed out
of soil and rocks] even before there was life; yet life arose, and over the millions of years it came to exist in infinite numbers and endless variety. Over the eons of unhurried time that is nature’s, life reached an adjustment with destructive forces as selection weeded out the less adaptable and only the most resistant survived…With the advent of man the situation began to change, for man, alone of all forms of life, can create cancer-producing substances, which in medical terminology are carcinogens. (219) Against these carcinogens which his own activities had created man had no protection, for even as his biological heritage has evolved slowly, so it adapts slowly to new conditions. As a result these powerful substances could easily penetrate the inadequate defense of the body. (220)

The history of cancer is long, but our recognition of the agents that produce it has been slow to mature. The first awareness that external or environmental agents could produce malignant change dawned in the mind of a London physician nearly two centuries ago. In 1775 Sir Percivall Pott declared that the scrotal cancer so common among chimney sweeps must be caused by the soot that accumulated on their bodies...For a century or more after Pott’s discovery there seems to have been little further realization that certain of the chemicals in the human environment could cause cancer. True, it had been noticed that skin cancer was prevalent among workers exposed to arsenic fumes in copper smelters and tin foundries...that workers in the cobalt mines in Saxony and in the uranium mines at Joachimsthal in Bohemia were subject to a disease of the lungs, later identified as cancer. But these were phenomena of the pre-industrial era, before the flowering of the industries whose products were to pervade the environment of almost every living thing. The first recognition of malignancies traceable to the age of industry came during the last quarter of the 19th century. About the time that Pasteur was demonstrating the microbial origin of many infectious diseases, others were discovering the chemical origin of cancer. (220) By the end of the 19th century a half-dozen sources of industrial carcinogens were known; the 20th century was to create countless new cancer-causing chemicals and to bring the general population into intimate contact with them (221)

In her personal battle with breast cancer, as in Silent Spring, Carson argued that scientists could only develop an understanding of ecological problems and their solutions if they dropped their conventionally narrow focus on specificities examined in isolation from the broader whole. Students might consider this argument by close reading the following passages, exploring Carson’s suggestion that to focus narrowly on and treat isolated symptoms, rather than large-scale causes, means giving up all hope for a solution.

The discovery that we are, as one investigator phrased it, living in a ‘sea of carcinogens’ is of course dismaying and may easily lead to reactions of despair and defeatism. ‘Isn’t it a hopeless situation?’ is the common reaction. ‘Isn’t it impossible even to attempt to eliminate these cancer-producing agents from our world? Wouldn’t it be better not to waste time trying, but instead to put all our efforts into research to find a cure for cancer?’ (240) Part of the public trust in such an eventual outcome results from the misconception that cancer is a single, though mysterious disease, with a single cause and, hopefully, a single cure. This of course is far from the known truth. Just as environmental cancers are induced by a wide variety of chemical and physical agents, so the malignant condition itself is manifested in many different and biologically distinct ways. (241)

[I]t is a disservice to humanity to hold out the hope that the solution will come suddenly, in a single master stroke. It will come slowly, one step at a time...we are neglecting the golden opportunity to prevent, even while we seek to cure...man has put the vast majority of carcinogens into the environment, and he can, if he wishes, eliminate many of them. (242)
ACTIVITIES, ASSIGNMENTS & PROJECT IDEAS:

• Have students investigate another female scientist. She can be a contemporary of Carson’s, or someone from another time period altogether. The student can present a straight-forward biography of the scientist’s accomplishments and contributions to her field, or the student can write a fictional dialogue between Carson and the scientist-of-choice, debating a contemporary environmental or scientific conflict.

• Have students find an article in a newspaper or magazine and identify different forms of argument. Help students identify pathos versus logos in the text.

• Have students interview someone who is atypically gendered in their work role. For example, a male nurse. Have them ask if their gender affects the way that they do their work.

• Have students consider the way the medical community imposes a paternalistic authority over patients. What is the patient’s right to knowledge versus the need to protect the patient? Share and read a passage from The Immoral Life of Henrietta Lacks.
UNIT 5 • GOOD SCIENCE, BAD SCIENCE, THE PUBLIC INTELLECTUAL

OBJECTIVE: To explore the relationship between science and politics, or fact and value, following World War II and, later, the publication of *Silent Spring*; the rise of junk science and the difficulties it presents for legitimate scientists and the American public; and the emergence of the scientist as public intellectual.

PREPARATORY & RECOMMENDED READING


UNIT ORGANIZATION

This unit is divided into three sub-sections: “Specialist Knowledge & Public Accountability”; “Fact & Value”; and “The Scientist as Public Intellectual.” Each of these sub-sections develops points for use in lecture, followed by suggested passages for class discussion and questions for further inquiry. The unit concludes with ideas for in-class activities and student projects.

SPECIALIST KNOWLEDGE & PUBLIC ACCOUNTABILITY

The early decades of the twentieth century took a significant toll on the American public. Following the Great Depression and then the Great Wars, Americans were “desperate for a rest—a return to
normalcy” (Egan 15). Initially, science and industry came to the rescue. Working in tandem with and fueling an expanding economy, they helped to “restore[e] individual and national affluence” (Egan 15). The rising middle class was increasingly equipped to afford homes and vehicles, and “chemicals...ensured greener lawns, more abundant produce, and cleaner clothes” (Egan 15). It is only by situating the apparent “infallibility of material ingenuity”—of science, technology and industry—in historical context that we can fully understand how such “ingenuity,” however environmentally destructive, came to be “infallible” in the first place (Wilson 358). “[A]rguments for limit and constraint” in postwar America “seemed almost unpatriotic” (Wilson 358). To argue for constraint was to argue against a reprieve and sense of prosperity that many Americans had not enjoyed since the beginning of World War I. It was also to argue against the promise of “progress: the concept that society evolves in a forward progression” or away “from social and natural constraints” (Birkeland 32). Science and industry had made possible the eradication of many deadly diseases and the mass production of new technologies and conveniences. No wonder “Americans seemed unwilling,” at least initially, “to upset or question the economic growth they enjoyed,” and the types of knowledge and resource extraction that growth required (Egan 16).

But the threat of the atomic bomb loomed and many Americans became increasingly concerned about what Michael Egan calls the “‘iron triangle’ of government, industry, and science” (9). It was this “military scientist partnership” that won World War II (Moore 24). But such partnerships made visible how science did not exist in the bubble of the laboratory. Rather, science was visibly involved in political projects, such as wartime “weapons-related research” and “state building” (Moore 24). The growing intimacy between the military, science and industry in World War II also produced radical changes in the way postwar scientific research was undertaken and funded. As “[g]overnment and military leaders—and some scientists—realized the importance of scientific talent and ideas in maintaining atomic and other forms of military supremacy” in the Cold War, the federal funding of science underwent a seismic shift (Moore 4). Available government funds increased “from fifty million dollars in 1939 to nearly fifteen billion dollars in 1970” (Moore 4). While this increase in funding was in many ways promising for scientific research, it also signaled the extent to which “military needs were at the heart of the new funding system” (Moore 26). This mattered a great deal, for if “knowledge reflect[s] the material circumstances of its conception,” then scientific research in the postwar years was “increasingly shaped by an omnipresent military influence” that could dictate which questions were worth asking and which outcomes were most desired (Egan 25). Carson argues precisely this point in Silent Spring when she acknowledges the difficulty of securing environmental reforms when those with interests in staving off such reforms are the very same ones who fund scientific research. “The chemical industry,” she writes, “is perhaps understandably loath to face up to the unpleasant fact of resistance” (272), and so “den[ies] the facts reported by biologists” (86). Much of what Carson laments in Silent Spring is the increasingly lopsided relationship between military and industrial interests and science. As science grew more and more dependent upon federal funding geared toward developing wartime technologies and the like, thinkers like Carson became concerned about science’s capacity to produce uncompromised knowledge. How, Carson asked, could scientists maintain the integrity of their research if doing so would inevitably involve “bit[ing] the hand that literally feeds them” (259)?

These developments had profound consequences for the accessibility of scientific knowledge and the accountability of science to the American public. Whereas in the years immediately following World War II “Americans seemed unwilling to upset or question” the science-military-industrial complex such that
the public became “uninformed, uncoordinated, complacent, and generally unwilling to confront imminent environmental threats” (Egan 16), the looming threat of the atomic bomb and Cold War tensions provoked some “to raise questions about the wisdom and safety of atomic testing and civil defense” (Moore 22). This skepticism also emerged in response to a widening gulf between scientists and members of the general public, or between specialist knowledge and widespread social concerns. The science-military-industrial complex “limited the potential for open, democratic politics and public input” by insisting Americans should leave significant matters—whether industrial, military, technological or environmental—to the experts who were solely capable of understanding them (Egan 9). Citizens were expected to trust in the “power and authority” of the iron triangle and were explicitly “not encouraged to critically examine science”—or the uses to which it was put—“in any way” (Moore 22). Rather, they were “merely to ‘appreciate’” it (Moore 22). Thus, there emerged “dangerous gaps in communication between scientists and laypeople” (Sideris and Moore 1), and a growing “tension between expertise and the public interest” in the late 1950s (Egan 9). In *Silent Spring*, Carson articulates the “profound suspicion of the certified expert whom she” and many other Americans “saw as implicated in the economics of professional capitulation in ways that jeopardized society’s capacity to sustain uncompromised research” (Nixon xi). For this reason, Rob Nixon describes Carson as “an insurrectionary generalist” (as opposed to specialist) who “expos[ed] the dubious funding of partitioned” or expert “knowledge” and amplified the call for scientific research that would be newly accountable to American society. Citizens were beginning to wake up to one of Carson’s gravest warnings: “what the public is asked to accept as ‘safe’ today may turn out tomorrow to be extremely dangerous” (224).

Intense debate and sometimes violent protests followed. “The industrial economy had grown so large, and its effects so pervasive, that a transformed world called out to be recognized” in the years leading up to the publication of *Silent Spring* (Purdy 202). Unsettled by “the cloak of secrecy” that enshrouded scientific knowledge and research, Americans began asking critical questions about the social function of science: “What is science for? and how should it be used?” (Egan 30 and 18). This generated a broader debate about the relationship between scientific fact and social values or politics: “What was the relationship between scientific ideas and moral and political claims? Who was responsible for the negative consequences of scientific ideas and technologies? Should scientists have a special role in democracy? Or was expertise antithetical to democracy?...Was scientific objectivity even possible or desirable? Was military-sponsored scientific research corrupting” science and “universities,” the institutions in which scientific research very often took place? (Moore 23). That government, industry and science were so intimately connected jolted the public into a new awareness: if science is objective or methodical or supremely rational, it is also inevitably political—it is inevitably put to political use and possesses value that is socially constructed. Recognizing this to be true, American citizens called for science “to refocus its energies on serving the public, not on realizing financial or military gain” (Egan 31). Like members of the public, many scientists were also concerned about the proximity of scientific research and military interests. They, too, questioned whether experts had failed “to adequately consider the social ramifications of their work” and some argued “that scientists should be more politically involved in determining how science should be used” (Egan 19 and 30).

These were debates that took place both in secluded laboratories and in congress, in specialist circles and in public. They often coincided with antiwar protests and were highly charged. “Between 1965 and 1970, on at least ten major college campuses and on dozens of smaller campuses, military-supported
research buildings and laboratories were the sites of antiwar protest” (Moore 50). During these protests, citizens “directed their actions against the physical representations of the alliance among universities, scientists, and the military, usually the campus laboratories...and other institutes where military-sponsored research took place” (Moore 50). As many Wisconsinites likely already know, one of these college campuses was the University of Wisconsin-Madison. In 1970 protesters bombed Sterling Hall, which “housed the physics department and the Army Mathematics Research Center” (Moore 52). The bombing triggered a series of protests that occurred over many years and were directed not only at explicitly military organizations, like the United States army and the ROTC, but also “Dow Chemical, the manufacturer of napalm” during the Vietnam War (Moore 52). Like the Sterling Hall bombing, these protests were often violent, reflecting the anger of citizens who believed “science no longer served the social good, but had become an agent of death” (Moore 52). Carson articulated many of these same concerns in Silent Spring. Thus, she argues for “a more high-minded orientation and a deeper insight” into nature and into science’s social responsibilities—qualities which, she writes, “I miss in many researchers” (275). Carson was deeply concerned about the partitioning of specialist knowledge from public debate and its unmooring from broad social concerns. In response, Silent Spring calls for an end “to the sugar coating of unpalatable facts” in hopes of “tranquilizing” growing concern and “public protests” (13). That Carson drew connections between and called for the reconfiguration of science and politics might strike some readers as surprising, given science is often imagined as apolitical—and, indeed, as necessarily so. Carson believed strongly in the social accountability of science and suggested that those who draw an absolute distinction between science and politics are misinformed. These ideas are taken up in the next section of this unit.

CLOSE READING:
The following passages highlight the tension between expert knowledge and public accountability or concern, especially as it relates to economic growth and military-industrial interests. Students might use these passages to explore the contexts surrounding science, industry and government immediately following World War II, the ways military and industrial interests shaped scientific inquiry, and the shift in public sentiment toward science as the Cold War intensified.

There is still very limited awareness of the nature of the threat. This is an era of specialists, each of whom see his own problem and is unaware of or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged. When the public protests...it is fed little tranquilizing pills of half truth. We urgently need an end to these false assurances, to the sugar coating of unpalatable facts. (13)

Over the past decade these problems have cast long shadows, but we have been slow to recognize them. Most of those best fitted to develop natural controls and assist in putting them into effect have been too busy laboring in the more exciting vineyards of chemical control. It was reported in 1960 that only 2 per cent of all the economic entomologists in the country were then working in the field of biological controls. A substantial number of the remaining 98 per cent were engaged in research on chemical insecticides...The major chemical companies are pouring money into the universities to support research on insecticides. (258) Biological-control studies, on the other hand, are never so endowed—for the simple reason that they do not promise anyone the fortunes that are to be made in the chemical industry. These are left to state and federal agencies, where the salaries paid are far less...Can we then expect them [entomologists] to bite the hand that literally feeds them? But knowing their bias, how much credence can we give to their protests that insecticides are harmless? (259)
Silent Spring catalyzed the American public and the environmental movement into action. With the following passages in mind, ask students to discuss this awakening and its relationship to Carson’s questions about the connections between knowledge and power, science and government, specialist and public.

In each of these situations, one turns away to ponder the question: 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?...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 temporarily entrusted with power; 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. (127)

[W]hat the public is asked to accept as ‘safe’ today may turn out tomorrow to be extremely dangerous. (224)

DISCUSSION QUESTIONS:

- What are the institutions that we trust and what are those that we distrust today? What are the checks and balances that keep these institutions from misbehaving? What can citizens do to keep these institutions honest and accountable for their actions?
- What is science for and how should it be used?
- Considering the military-industrial complex, where do we see this kind of collusion today? For example in the medical field, there is a strong connection between science and industry, most publically in the development of pharmaceutical drugs. Who is the blame for the current opioid epidemic—industry or science? How do these forces continue to depend on each other?

FACT & VALUE

Silent Spring raises a series of questions that unsettle our assumptions about science. When we think about science, many of us imagine a man in a white lab coat working away in a laboratory that is hermetically sealed—that stands apart from the social world of value and politics. This notion of science is described by scholars as “positivist.” According to this view, science is solely concerned with that which is observable and empirically verifiable. As Vandana Shiva puts it, imagined as such science is “a universal, value-free system of knowledge which by the logic of its method claims to arrive at objective conclusions” (22). Positivists insist that a division between science and politics exists, and that this division is both logical and necessary. Thus, “[s]ome critics believe that it is not right for public scientists to express their ‘opinions’ in public about management practices and policies,” because such expressions “cross the line between fact and values, or between scientific findings and policy prescriptions” (List 42). Undergirding this argument is the “belief that values and value judgments are not a legitimate constituent of the sciences and scientific practice” (List 43). Carson observes throughout Silent Spring how complex scientific debates with profound social ramifications are often presented “[t]o the public” in “stark black-or-white simplicity”—in terms that removed them from or down played their political implications (114). According to Carson, Americans were faced with solutions that were falsely
reductive and often either-or: “To assume that we must resign ourselves to turning our waterways into rivers of death is to follow the counsel of despair and defeatism” (138). This was compounded by the supposed divide between science and politics—between fact and value—which was exploited to suggest that the terms of ecological debate and the scientific solutions presented by those in power were strictly objective and represented comprehensively the scientific knowledge available.

But such black-and-white renderings of the relationship between science and politics “conceal[ ] the impure relationship between knowledge” and “the sphere of politics” (Mies 46). This teaching guide has surveyed a number of seemingly natural “divides” debunked in *Silent Spring*: that between culture and nature, human and nonhuman, male and female, etc. The supposed divides between science and politics, or fact and value, are also taken up in *Silent Spring*. Carson views these divides—like the others—with extreme skepticism. It was precisely this skepticism that was growing in the late 1950s and early 1960s, when American scientists and citizens alike developed a new and acute awareness of how science and politics had always been and would always be intertwined. The emergence of the iron triangle during World War II and the postwar years—the intertwining of science, industry, and government—made the interrelationship of scientific knowledge and social value impossible to ignore. Perhaps no historical event verified this interrelationship more horrifically than the Holocaust, wherein eugenics scientists attempted to systematically purify the German nation while at the same time conducting insidious experiments on those detained in concentration camps that then contributed a great deal to modern medical knowledge. Examples like this demonstrate how the popular image of the male scientist isolated in his laboratory—“the flat, one-dimensional caricature” of science as concerned with “‘truth’ above all else”—is in many ways a fantasy (Moore 10). They are, as Peter C. List puts it, “value-laden activities” (43). Moreover, to subscribe to “a complete divide of fact and value” or science and culture “is also to enshrine in knowledge a total and uncrossable dualism between the natural world and the human observer” (Clark 150). *Silent Spring* says as much, showing how the “dualism” between culture and nature—between human subjects and their objects of inquiry—naturalizes a hierarchy of value in which nature is viewed as an infinite, unfeeling, passive resource for human exploitation.

*Silent Spring*’s dismantling of the divide between science and politics has fraught implications, and raises difficult questions. On the one hand, the examples of politically-charged science cited above—the military-industrial complex and state-sponsored genocide—demonstrate what happens when this interrelationship goes bad. On the other hand, *Silent Spring* stands testament to the importance—indeed, the necessity—of establishing a direct line of communication between specialists and generalists, or expert knowledge and public debate. That *Silent Spring* emboldened an entire environmental movement demonstrates the critical role scientists play in these conversations and in shaping policy. As List observes: “sometimes, if public environmental and resource scientists do not take ethical stands on at least some environmental issues and become advocates, public environmental decisions could be made that would be unfavorable” (48). Very often scientists “are in the best position to understand the relevant science and the consequences of damaging environmental policies and decisions” (List 49). This is not say that scientists are infallible experts or that policy debates should take place behind closed doors and involved only specialists. What it does suggest, however, is precisely that for which Carson argues so forcefully in *Silent Spring*: a “‘shared decision-making model’” wherein scientists “work cooperatively” with a range of players—“resource managers, politicians, member of interest groups, and the public”—to establish collective “values that support particular land management decisions” (List 47). This is precisely “the role so powerfully exemplified by the life of
Rachel Carson,” who understood “public environmental issues as a shared responsibility and task” that scientists are obligated to share with the public to whom they are accountable (List 47 and 54). It is no coincidence that Carson envisioned the role of the scientist as such. Her chosen field of study—biology—“struggled to find a place within the vast array of government-sponsored war research in the physical sciences” (Herron 144). As a result, biologists “reconfigure[d] their scientific work to better ‘address social and political problems’” (Herron 144). It was biologists like Carson who practiced science with “practical applications, including medicine, public health, agricultural hybrids, food production, and industry” (Herron 145). Biologists also contributed to “contemporary political debates such as immigration restriction, eugenics, and behavioral control,” arguing for instance that the atrocities committed by the Germans in the name of producing a pure, fit, biologically superior nation were the product of “a misreading of evolutionary progress” (Herron 144-5). Carson was from the earliest stages of her career involved in a field of science that possessed “outlets in multiple social, political, and economic arenas,” and which understood itself as responsible to a broader public (Herron 146).

Silent Spring makes visible why scientists’ participation in public policy debates is so important: without contributions from scientists, scientific knowledge might be put to bad use. Often “[s]cientific opinion is mined for its relevancy to the [proposed] decision,” rather than evaluated comprehensively and applied rigorously (List 48). In other words, if scientists are excluded from sociopolitical debate, scientific research is more likely to be interpreted with “preset objectives” or biases in mind, and “very pertinent research...that would otherwise be worthy” of consideration “by well-accepted criteria within relevant scientific disciplines” risks being entirely “eliminate[d]” from discussion (List 49 and 48). Thus, Carson argues that scientists must consider the “social ramifications of their work” and the uses to which it might be put, whether legitimate or illegitimate—and that they represent their concerns about these potentialities in public forums (Egan 19). This is crucial because it is not only in policy debates among elected representatives that science is misrepresented, but also in the special interest lobbies that shape those debates and how they are perceived by citizens. Special interest groups frequently misrepresent science or produce fake science altogether. To do so, they capitalize on a very common misconception about science: namely, that if scientific facts contain gaps or raise further questions they are not facts at all. This strategy emerged just prior to the publication of Silent Spring as debates raged on about the hazards of inhaling cigarette smoke. Naomi Oreskes and Eric Conway thus call it the “Tobacco Strategy” (6). The tobacco industry—and, later, the chemical industry—“realized that you could create the impression of controversy simply by asking questions, even if you actually knew the answers and they didn’t help your case” (Oreskes and Conway 18). By exploiting “the gaps and uncertainties existing in science,” special interest groups “manufacture” doubt to willfully mislead the public into believing that the jury is still out—that there is no scientific consensus when in reality consensus exists (Oreskes and Conway 13). Take, for instance, the following example, with which you’re likely familiar: those who argue against the teaching of evolutionary theory in schools point at the word “theory” as evidence that the idea is based in supposition rather than fact, even though in science a theory—unlike a hypothesis—has undergone rigorous testing and is only designated as such once its truth is established. Such arguments work by “creat[ing] the impression of controversy” where there is none. They then exploit that impression to ensure the status quo remains intact.

Such arguments also work by “fight[ing] science with science” (Oreskes and Conway 13). They are convincing, in other words, because they appear possess scientific validity. In the beginning stages of the fight to regulate smoking, the tobacco industry not only “cherry-pick[ed] data and focus[ed] on...
unexplained or anomalous details” to build their case, but also recruited “a list of experts with scientific credentials” who would be “available to comment on any issue about which” they “needed a negative sound bite” (Oreskes and Conway 18 and 6). This strategy was summarized in a document produced by the tobacco industry called Bad Science: A Resource Book—“a how-to handbook for fact fighters” (Oreskes and Conway 6). When Silent Spring was published, the chemical industry used the same strategy. Industry representatives and scientific experts exploited the uncertainties of science—or, rather, the widespread misconception that scientific knowledge is valid only if contains within it no uncertainty and raises no questions that remain unresolved. They capitalized on what Carson describes as “the prominence that ‘magic bullets’ and ‘wonder drugs’ hold in the layman’s mind”—the idea that complex scientific problems, such as a cure for cancer, possess “a single cause” and equally “single cure” (240 and 241)—so as to convince the American public that any presence of uncertainty in scientific knowledge invalidates its claim upon fact or truth. The chemical industry, like the tobacco industry, realized “that you could use normal scientific uncertainty to undermine the status of actual scientific knowledge” (Oreskes and Conway 34).

Though Silent Spring was received with enthusiasm by many and produced a series of successful environmental reforms, its reception also demonstrates the power of “manufacturing and sustaining a culture of doubt” (Nixon 39), as well as the sometimes acute vulnerability of good science to misrepresentation, and the ability of bad science to masquerade convincingly as fact. Perhaps surprisingly, the text’s reception history and its entanglement with fake facts continues to unfold today. In 2007, for instance, “[t]he Internet [was] flooded with the assertion that Carson was a mass murderer, worse than Hitler” (Oreskes and Conway 216). Her accusers suggested she had “killed more people than the Nazis” and “had blood on her hands posthumously” because she was involved in “the banning of DDT, without which millions of Africans died of malaria” (Oreskes and Conway 216). There continues to exist a campaign against Rachel Carson and the environmental reforms Silent Spring helped put into place. But why? As Oreskes and Conway explain it: “Sometimes reopening an old debate can serve present purposes” (217). By attempting to “convince people that an example of successful government regulation wasn’t, in fact, successful,” proponents of the free market realized “you could strengthen the argument against regulation in general” (Oreskes 217). Those who argue against environmental regulation, in other words, are now pointing to Silent Spring and the consequences of banning DDT as evidence that such regulation does more harm than good. Unit 3 provides a broad overview of the conflicts and debates between capitalist finance and environmental activism. Quite strangely, Carson is now invoked by both sides of that debate. What is crucial, here, is that free marketeers are able to claim Carson because of bad science and the culture of doubt it proliferates. Their arguments overlook the fact that while the use of DDT was banned in the United States, its production and exportation continued—meaning DDT continued to be available and legal in regions where insect-borne disease is especially deadly. Their arguments also ignore an important “lesson” about DDT: that it “alone did not eradicate insect-borne diseases”—in fact, the overspraying and general misuse of DDT created resistant insects, exacerbating the spread of such disease—“and those diseases have been controlled in places with little or no use of DDT” (Oreskes and Conway 226). This “disinformation campaign,” like those of the tobacco and chemical industries, distills scientific complexity into falsely black-and-white terms.

These disinformation campaigns garner power from the mass media and the format of journalistic debate, which exacerbate the misrepresentation of science. In the years prior to the publication of Silent Spring, television rose to the fore. As modern mass media technologies evolved, the government took
steps to ensure that coverage would remain fair and balanced. The 1949 Fairness Doctrine, for instance, mandated that journalists “dedicate airtime to controversial issues of public concern in a balanced manner” (Oreskes and Conway 19). In accordance with the doctrine, broadcast coverage “gave equal weight to both sides” of a debate, “rather than giving accurate weight to both sides” (Oreskes and Conway 19). This created numerous problems when scientific topics were up for discussion. “[S]cience is not about opinion” and yet, in these scenarios, science was very often positioned as one side of a debate that involved differing opinions. The structure of broadcast debates, in other words, positioned scientific problems not as involving questions of evidence or expert knowledge, but rather as subjective and open to interpretation. As Oreskes and Conway suggest: “there are no ‘sides’” in science—“[t]here is simply accepted scientific knowledge” (269). The journalistic format also necessarily meant that very complex scientific questions and problems—such as ecological networks or global environmental toxicity—were lumped together to form a single, uniform, monolithic “side” of a given issue, meaning the immense range and nuance of scientific knowledge that might inform viewers’ thinking was severely flattened out. “Hearing ‘both sides’ of an issue” in this way might “make sense when debating politics in a two-party system,” but does not translate into scientific terms (Orekes and Conway 269). In this way, Silent Spring—its long and varied reception history, in particular—points us toward differing conclusions. On the one hand, the text advocates for and embodies a new pact between science and the public, wherein scientists are accountable to American citizens and laypeople are involved in conversations about the uses of science. At the same time, Silent Spring also conveys the ways in which, “[w]hen every voice is given equal time—and equal weight—the result does not necessarily serve us well” (Oreskes and Conway 240).

So how, in a world in which facts are uncertain—or what some have recently called a post-fact world—do we tell good science from bad? How do we tell valid facts from phony ones? And how do we structure debates involving science and politics so that as many voices as possible are represented while at the same time ensuring the facts are not misrepresented or put to irresponsible use? Silent Spring points us toward a few answers. The task, however unfairly, begins with readers—with you. If special interest groups or the mass media cannot be trusted to sort the good science from the bad—whether because of bias, in the case of the former, or the structure of debate, in the case of the latter—citizens must set aside their assumptions and educate themselves about the actual conditions and production of scientific knowledge. Packed to bursting with different voices—those of concerned citizens and scientists, of judges and politicians, of men and women, of humans and nonhumans—Silent Spring demonstrates how science is a collective, public endeavor. In so doing, it asks readers to set aside the fantasy of the man in the white coat working in a laboratory and to replace it with an image that more accurately represents the ways in which scientific knowledge is formulated. Carson’s extensive citations are a reminder that good science is well researched and thoroughly vetted by a community of expert peers. All legitimate scientific research is subject to review, and “[c]laims that have not gone through that process—or have gone through it and failed—are not scientific” (Oreskes and Conway 32). Silent Spring was itself subject to intense review. Carson sent each chapter out to groups of “scientific experts for comment” (Lear 400). All found the book sound in evidence and impressive in argument, but one—anticipating that “[f]acts w[ould] not stand in the way of some confirmed pest control workers and those who are receiving substantial subsidies from pesticides and manufactures”—scrutinized the text very carefully and Carson revised it in response (Lear 401).
It’s worth noting that, while bad science most certainly does not undergo the same kind of peer review, much of it seems at first glance to be legitimate. Like good science, junk science contains footnotes and would seem to have been vetted by a community of experts. But just as there is much to learn about Carson’s credentials and the integrity of her science by close reading her footnotes, so too does junk science reveal itself as such in its use of citation. If, as Carson warns us, the chemical industry, big agriculture and many other special interest groups are capable of manipulating scientific data to meet a pre-determined agenda, much of the evidence lies in citation. Readers can also sort the bad science from the good by exploring the credentials and legitimacy of a study’s publisher, the funding that made the study possible, etc. Many of the same strategies can be applied to journalistic writing. It seems no coincidence that the unsettling of scientific fact has coincided in our contemporary moment with the delegitimation of independent journalism and the public press. As Silent Spring debunks the divide between science and politics, as well as fact and value, it also tells us we must be more vigilant than ever before in our efforts to protect good science and good journalism—to protect the validity of the fact and the integrity of truth—from those who seek to establish and capitalize on the unmoored politics of a post-fact world. Carson argues that science’s greatest strengths lie in its sense of possibility—in the uncertainties that provoke and inspire new discovery and knowledge—and its responsibility to the public. The reception history of Silent Spring shows how these strengths are also, perhaps ironically, science’s greatest vulnerabilities.

CLOSE READING:
In the passage below, Carson writes about how scientific discovery and knowledge are perceived by non-scientists as compared to how they actually unfold. Students might close read it to explore this disjunction, as well as the ways science is often represented in falsely black-and-white terms.

Despite the prominence that ‘magic bullets’ and ‘wonder drugs’ hold in the layman’s mind, most of the really decisive battles in the war against infectious disease consisted of measures to eliminate disease organisms from the environment. (240) Part of the public trust in such an eventual outcome results from the misconception that cancer is a single, though mysterious disease, with a single cause and, hopefully, a single cure. This of course is far from the known truth. Just as environmental cancers are induced by a wide variety of chemical and physical agents, so the malignant condition itself is manifested in many different and biologically distinct ways. (241) It is a disservice to humanity to hold out the hope that the solution will come suddenly, in a single master stroke. It will come slowly, one step at a time...we are neglecting the golden opportunity to prevent, even while we seek to cure...man has put the vast majority of carcinogens into the environment, and he can, if he wishes, eliminate many of them. (242)

Use the following passage to explore Carson’s argument that scientists should be involved in policy debates, and that science should be accountable to the American public.

The credibility of the witness is of first importance. The professional wildlife biologist on the scene is certainly best qualified to discover and interpret wildlife loss. The entomologist, whose specialty is insects, is not so disqualified by training, and is not psychologically disposed to look for undesirable side effects of his control program. Yet it is the control men in state and federal governments—and of course the chemical manufacturers—who steadfastly deny the facts reported by the biologists and declare they see little evidence of harm to wildlife. (86)

DISCUSSION QUESTIONS:
• Is science political? When should science become political? Can science ever be truly impartial and non-political? Who can or should be involved with decisions that affect the environment? What does each political party have to offer?
• What’s the difference among fact, truth, and theory? How are they used generally? In science? How do you determine accurate versus equal weight? Who gets to decide that?
• When are you able to trust the source of what you are reading? For example, what are the steps you take to trust a history textbook versus a news article reporting on a scientific discovery?

THE SCIENTIST AS PUBLIC INTELLECTUAL

_Silent Spring_ debuted at a moment in which there was fierce debate about the role and responsibilities of scientists, the relationship between fact and value, and the rise of junk science. Carson both built on and fueled these debates. She is an example of how it was not only laypeople but also scientists who participated in them. Thus, Egan describes the postwar years as marking “[t]he rise of the politico-scientists,” who “help[ed] to develop both the intellectual and political wings of the American environmental movement” (18). Many scientists, like members of the American public, had become concerned that science comprised “an elite out of touch with and unbeholden to the public and Congress” and that, as a result, scientific knowledge was more prone than ever before to misuse “because of failure to balance the cold logic of scientific thinking with explicit attention to human values” (Moore 43). In an effort to “make good on the promise of science,” politico-scientists like Carson “made public debates that had previously occurred among scientists in private” (Moore 15). Science became a collective form of knowledge and the uses to which it was put were increasingly subject to wide-ranging debate and oversight. Though many scientists insisted that it would be inappropriate to involve themselves in policy discussions—and that what others made of scientific knowledge was not their moral responsibility—there remained a growing segment of the scientific community that believed scientists were ethically beholden to the American public. These scientists also believed that scientific knowledge would be better for making itself more socially accountable. They surmised that new, less fragmented, more holistic forms of knowledge might emerge if the divides between not only specialist and generalist but also specialist and specialist were dismantled. _Silent Spring_ contends there is no separation between many things that might otherwise seem separate. These things include “natural science” and “social responsibility,” as well as the different fields of study grouped under the heading “natural science” (Herron 195).

Carson in this way made a powerful argument for the cultural value of the public intellectual. Publishing books that knowingly unsettled the boundaries between “partitioned knowledge” and encouraged others to become “insurrectionary generalist[s]” like herself, Carson made widely accessible for the first time an ecological worldview that necessitated a radical reimagining of some of our most basic assumptions about nature and culture, human and nonhuman, knowledge and politics. She did so to provide a broad swathe of the American public with the tools it needed to identify and redress a ballooning environmental crisis that would inevitably affect everyone everywhere. _Silent Spring_ was borne of the recognition that “dissent and open discourse are vital” to democracy, “but these freedoms are not terribly useful if the public lacks the tools necessary to make informed decisions” (Egan 6). Carson fits to a tee the mold of the public intellectual as described by Edward Said, one of the most influential public intellectuals of the twentieth century. _Silent Spring_ bore “witness to persecution and suffering”—much of which had been largely invisible—“and suppli[ed] a dissenting voice in conflicts
with authority” (Said 27). She also “discern[ed] the possibilities for active intervention” and worked to establish “fields of coexistence”—of unobstructed intimacy and exchange—“rather than fields of battle” (Said 35). Whereas the chemical industry and others in positions of power tried their hardest to maintain the status quo by “crush[ing] dissent,” Carson popularized an equally powerful “counterdiscourse that w[ould] not allow conscience to look away or fall asleep” (Said 31 and 35). Key to Carson’s work as a public intellectual was her work as a “go betwee[n]” or “highly motivated translato[r]” (Nixon 27). She possessed what Lisa H. Sideris and Kathleen Dean Moore call “an extraordinary gift for translation” that enabled her to transport expert knowledge across boundaries and synthesize it for an inexpert audience (2). But critically, this exchange went both ways. If Carson made scientific knowledge accessible to generalists, she also took the discerning observations and deepening concerns of generalists seriously. She “grant[ed] status to the worries of ordinary citizens,” demanding that scientists embrace their social contract with the public and take “ordinary” voices seriously (Norwood 169). Carson’s work as a public intellectual reminds us that science is a powerful force of social change. However sealed off or dry or opaque it might sometimes appear, “science is about studying the world as it actually is—rather than as we wish it to be”—and therefore “will always have the potential to unsettle the status quo” (Oreskes and Conway 236).

And unsettle the status quo Silent Spring did. Not only did it catalyze the mainstream American environmental movement, but it also contributed to an increasingly heated debate about the uses and accountability of science. Whereas immediately following World War II the funding mechanisms and debates of science comprised “a closed loop into which the public could not enter,” scientists and members of the public alike began to realize that as long as science was “highly dependent on the state and especially the military” it would remain in a “high-risk situation” (Moore 34). By the mid-1960s, however, things began to change. “[T]here was broad consensus among the public and political leaders that the nation’s scientific program had to move ‘from a politically elitist program to a politically responsive enterprise’” (Moore 34). With the help of Congress, decisive steps were taken to reorient the relationship between science and public. These included “the formation of Project Themis, which provided defense-related research grants to universities that had not previously received them”; “the 1968 congressional authorization of the NSF [National Science Foundation], which required it to fund applied as well as basic research, make the social sciences eligible for funding, and required Congress to approve the NSF budget”; and the funding of “one of the most expensive scientific projects ever undertaken in the United States: the Apollo moon landing program” (Moore 35). The moon landing project was significant because, while NASA was originally established “as a response to cold war concerns, only one of its explicitly stated goals was military benefit” (Moore 35). Projects like the moon landing program produced and disseminated scientific knowledge using public channels of communication and afforded a collective experience for the American public grounded in science. Soon, “NASA’s funding became lavish, outstripping all other agencies except the DOD [Department of Defense]” (Moore 35). Finally, “[t]he 1969 Environmental Policy Act (NEPA)” was another landmark, for “[i]t required citizen participation in the review of projects that might affect the environment, effectively inviting the public to become involved in challenges to the scientific arguments put forth on behalf of companies and government agencies engaged in work that affected nature” (Moore 37). Science was thus rerouted to better account for its social responsibilities. Likewise, citizens were newly empowered to participate in the processes and debates through which scientific knowledge was produced.
But the rise of the scientist as public intellectual and the changes that followed have proven to be something of a double-edged sword. Historians acknowledge that, though these changes produced much good by elevating the role of scientific knowledge in policy debate and increasing its public accountability, these developments simultaneously undercut the integrity of the scientist—at least as perceived by the public. Oreskes and Conway observe how easily a scientist “may be accused of ‘politicizing’ science” if she “jumps into the fray on a politically contested issue” (264). Scientists often find themselves “in a double bind: the demands of objectivity suggest that they should keep aloof from contested issues, but if they don’t get involved no one will know what an objective view of the matter looks like” (Oreskes and Conway 264). Egan argues for this reason that “social activism came at a considerable cost” because “the politico-scientists’ reputation as pure researchers suffered” (Egan 45). They were perceived to have violated the principles ensuring their research is uncompromised by bias or outside influence. As such, the rise of the scientist as public intellectual “helped contribute, ironically, to a weakening of [scientists’] political authority” (Moore 15). Marc Edwards’ fight to expose the water crisis in Flint, Michigan—where drinking water is dangerously polluted—is a case in point. As the New York Times notes: “Edwards’s decision to champion the cause of activists is not one scientists typically make,” because “[s]cientists who transgress th[e] line [between neutral and partisan] tend to have their credibility impugned” (Hohn). But Edwards and many other scientists “believe that, adhered to rigorously, the scientific method provides some protection from bias, political or otherwise” (Hohn). The takeaway is that if a scientist’s takes an activist stance, that stance does not necessarily pose a threat to or call into question the integrity or validity of her research. Furthermore, Edwards has pointed out that while “[h]e would prefer to remain dispassionate...his experiences in...Flint taught him that neutrality carries its own risks” (Hohn). Edwards believes that “the idea of science as a public good is being lost” at present (qtd. in Hohn). It seems the double-bind that Carson faced is back in full force (and perhaps never went away): “Americans are less willing to defer to the authority of scientific experts” because those experts have failed them and, yet, recovering science as an ethical force—a force for “the public good”—requires scientists to take stands that would seem, however falsely, to compromise their neutrality (Hohn). We have in many ways circled back to the years leading up to the publication of Silent Spring. How we will surmount the impasses between science and politics, fact and value, scientist and activist has yet to be decided.

CLOSE READING:
The following passage articulates one of the public intellectual’s critical responsibilities: elevating the voices of those who are excluded from or silenced by those in power—those who protect the status quo. Silent Spring demonstrates how these voices are not only human, but also animal. To explore these ideas, students might focus on Carson’s use of the phrase “mute testimony,” the confluence of the “scientific” and the “moral,” and what these things tell us about Carson’s commitments as a scientist accountable to a public audience.

Incidents like the eastern Illinois spraying raise a question that is not only scientific but moral. The question is whether any civilization can wage relentless war on life without destroying itself, and without losing the right to be called civilized. These insecticides are not selective poisons; they do not single out the one species of which we desire to be ride...These creatures are innocent of any harm to man. Indeed, by their very existence they and their fellows make his life more pleasant. Yet he rewards them with a death that is not only sudden but horrible. Scientific observers at Sheldon described the symptoms of a meadowlark found near death: ‘Although it lacked muscular coordination and could not fly or stand, it
continued to beat its wings and clutch with its toes while lying on its side. Its beak was held open and breathing was labored. ‘Even more pitiful was the mute testimony of the dead ground squirrels, which ‘exhibited a characteristic attitude in death. The back was bowed, and the forelegs with the toes of the feet tightly clenched were drawn close to the thorax . . . The head and neck were outstretched and the mouth often contained dirt, suggesting that the dying animal had been biting at the ground.’ By acquiescing in an act that can cause such suffering to a living creature, who among us is not diminished a human being? (99-100)

ACTIVITIES, ASSIGNMENTS & PROJECT IDEAS:

- Have students do a profile on a governmental agency, corporation, or non-profit that they deem to be publically untrustworthy. What are the goals of this organization and how does it achieve them? Where does it fail in meeting public expectations and what are measures that it has taken to make recompense? If a longer project, students can take opposite sides in a debate over organizations of their choosing: for example, one student representing BP after the oil spill in 2010, and the other representing a federal prosecutor or FEMA.
- Have students pick a recent scientific discovery they heard about in the news and do a presentation on the unreported aspects of the story. For example, the Flint water crisis, or fracking in Wisconsin. Students should evaluate the sources they find, including the identity of the author(s).
- Have students choose and watch a film about a whistleblower (i.e. Michael Clayton, Erin Brockovich, Silkwood, The Constant Gardener, The Insider) and write about the representation of truth and how the media and industry interact in the film.
- Have students build a visual representation of the relationship among knowledge, objectivity, neutrality, and activism. This can take the shape of a flow chart of how these things interact, or a PowerPoint about one particular environmental or health crisis that touches on all of these concepts.
UNIT 6 • LITERATURE AND SCIENCE

OBJECTIVE: To explore the relationship between literature and science; the centrality of apocalypse narratives to the mainstream American environmental movement’s activist strategy; and the infusion of poetry and prose in Silent Spring.

PREPARATORY & RECOMMENDED READING
Williams, Raymond. Keywords: A Vocabulary of Culture and Society. Oxford University Press, 1976.

UNIT ORGANIZATION
This unit is divided into three sub-sections: “Literature & Science”; “Narrating Apocalypse”; and “The Poetry of Prose.” Each of these sub-sections develops points for use in lecture, followed by suggested passages for class discussion and questions for further inquiry. The unit concludes with ideas for in-class activities and student projects.

LITERATURE & SCIENCE
Silent Spring is a work of science. It is also a work of literature. All works of science are works of literature and can be read as such. Scientific texts, like novels or poetry, possess generic and formal characteristics. They, too, are constructed—they are made. Just as close reading literary works reveals many layers of meaning and complexity, the same can be said for scientific texts. This might come as a surprise, given that literature and science are imagined as having little if anything in common. They would seem to represent very different ways of imagining or viewing the world. But science and
literature have not always stood apart from one another. Whereas “[s]cience may now appear to be a very simple” or self-evident “word,” it was once “generally used, often interchangeably with art, to describe a particular body of knowledge or skill”—a trend that continued until the early nineteenth century (R. Williams 216). A look at the entry for “science” in the Oxford English Dictionary lists a number of similar definitions: a general “state or fact of knowing,” a theoretical or conceptual—as opposed to moral or method-based—mode of understanding, a “craft” or “skilled profession.” Each of these definitions might also apply to the word “art,” which designates imaginative and conceptual enterprise, as well as “skill in doing something” (OED). It seems no coincidence that other words we think of as strictly scientific are not. Take “technology,” for instance, whose Greek root—techne—means “art” and whose earliest use described “a discourse or treatise on an art or arts” (OED). It was only in the eighteenth and nineteenth centuries, as the modern scientific method was formalized and the disciplines began to branch off from one another, that “a distinction between art and science” emerged (R. Williams 216). This is all to say that the divide between art and science is by no means natural, preordained, or self-evident. Like the many other divides discussed across this guide, it was fashioned. Thus, while art and science can and do designate ways of knowing and bodies of knowledge that are distinct, they might also overlap in unexpected ways. The interrelationship of art and science suggests, too, that distinctly literary methods of understanding (such as close reading) might be applied to non-literary texts (such as works of science) so as to reveal that which would otherwise remain invisible—to make visible those meanings that escape non-literary ways of knowing.

Reading science as literature in this way allows us to move beyond “the limits of competence” or discipline that Carson so despised (Clark 4). It also deconstructs the otherwise “complete divide of fact and value,” making legible how works of science might endorse or “disguise issues of moral and political contestation” even as they contribute empirical knowledge to the world (Clark 149). As outlined in the preceding units, Silent Spring possesses a deep sense of value—of what is worth preserving or saving and what is not—even as it is also scientifically sound. Reading Silent Spring as a work of science and literature helps us track the ways these different lines of thinking are interwoven in the text. Carson would have endorsed this mode of reading. Her “first ambition was to be a creative writer,” not a scientist (Buell 290). She made a living on intertwining these two parts of herself, which she understood not as dissonant but compatible. Carson announces the interrelationship of science and literature from the outset of Silent Spring using an epigraph: a set of lines taken from John Keats’s poem, “La Belle Dame Sans Merci.” This interrelationship echoes across all of her work. In her 1952 acceptance speech for the National Book Award for Nonfiction, she said: “The aim of science is to discover and illuminate truth. And that, I take it, is the aim of literature” (qtd. in Felstiner 13). Likewise, in her introduction to Under the Sea-Wind (1941), she admits to “hav[ing] deliberately used certain expressions which would be objected to in formal scientific writing” (Buell 206).

For Carson, non-scientific modes of expression conveyed meaning as truthful as the knowledge produced by science. They permitted new and crucial ways of imagining the world and its nonhuman beings as sentient and as kin. Such modes of expression allowed her to move beyond the divide between subject and object, human and nonhuman—to posit something as amorphous and alien as the sea as a “central character” who acts and feels, and thus inspires a sense of responsibility or concern in Carson’s readers. Silent Spring’s opening “Fable for Tomorrow” demonstrates the many conceptual possibilities that emerge when science and literature are deliberately intertwined. “By clustering together “scattered microdisasters into a single imaginary community,” Carson drew together seemingly
local or distinct modes of environmental degradation to create an overtly fictional and yet chillingly realizable apocalyptic future (Nixon 64). The fable is a work of fiction insofar as its composite vision of apocalypse did not yet exist. The fable is a work of nonfiction insofar as each of its component “microdisasters” were real and its resulting macrodisaster within the realm of possibility, should no action be taken to stop the spread of environmental toxicity.

Silent Spring thus demonstrates that art or literature—however imaginary or immaterial they seem—possess real, material, ethical consequences for our orientation toward other humans, as well as nonhumans and the planet. As Carson popularized ecological science, she revealed the omnipresence of imagination in environmental discourse and policy. Ecology affords a particular form of “environmental imagination,” according to Carson, that calls into question “how we see and how we learn to see, how we suppose the world works, how we suppose that it matters, and what we feel we have at stake in it” (Purdy 6-7). When Carson writes, for instance, of humankind’s “depressing record of destruction” and mentions in particular “the slaughter of buffalo on the western plains” (85), she writes of the ways colonial visions of futurity coincide with imaginative fantasy—of how Europeans came to America with an imagined plan of progress, conquest, and prosperity in mind, and then cleared the land of humans and nonhumans to realize that dream. As discussed extensively in Units 2, 3 & 4, contests over environment are “contests over imagination” (Purdy 10). Silent Spring locates in ecological science a new and necessary aesthetics—a distinctly ecological form of environmental imagination that possesses a very different, increasingly pressing sense of ethics and material concern.

As it critiques humankind’s war against nature, Silent Spring shows us how “we live our lives by metaphors”—such as “progress” or “improvement”—“that have come to seem deceptively transparent through long usage” and which “call attention to the power of language” and of imagination in the world (Buell 3). “How we image a thing, true or false,” Carson tells us, “affects our conduct toward it” in consequential ways (Buell 3). In Silent Spring, ecological science—like the term “Anthropocene” (see Units 1 & 2)—does not amount to a mere “statement of fact” (Purdy 2). Ecology is for Carson “a way of organizing facts to highlight a certain importance that they carry” (Purdy 2). It is as much aesthetic as it is scientific, making possible new ways of imagining the interrelationship between human and nonhuman, as well as our environmental present and future. The legal legacies of Silent Spring also demonstrate the ways in which “imagination,” like science, “is intensely practical” (7). If Silent Spring made accessible complex ecological science that possessed serious implications for industry and environment, it was only through the work of imagination that decisive action was taken. “Law,” as Jedediah Purdy argues, “is the circuit between imagination and the material world” (22). Carson and other activists in the mainstream American environmental movement envisioned a more symbiotic relationship between humankind and planet—they imagined a very different environmental future that might replace the threat of an apocalyptic one. These imaginings took material effect through legislative reforms, which “choreograph[ed]” or rerouted “human action” and industrial activity to “provid[e] the implicit blueprint of the landscape architecture” for a renewed, healthy, vibrant planet. It was imagination, in other words, that visualized a world in which the bald eagle was not on the verge of extinction as a result of DDT poisoning. It was legislative action like the Endangered Species Acts that made this imagined world material. Silent Spring—both in content and legacy—confirms what Purdy argues: “The history of law, politics, and power is also the history of imagination” (30).
For this reason, a growing number of scholars argue that we need imagination—and the imaginative, speculative, conceptual disciplines of the humanities—now more than ever before. The forms of environmental degradation we face at present are “vaster by orders of magnitude than the worst environmental prospects of earlier times” (Purdy 200). Threats of “systemic failure”—such as those outlined in Silent Spring—are extremely difficult to understand, and require newly interdisciplinary and overtly conceptual modes of thought in order to do so. The current crisis highlights how “familiar approaches are failing to match new” and increasingly expansive “problems” (Purdy 20). Thus, scholars in a burgeoning field called the environmental humanities contend that we must “tak[e] seriously and lear[n] to work with the natural sciences” (Bonneuil and Fressoz xiii). We need the humanities and the sciences, and we need them together. At the same time, it is important that the distinctions between these fields—the modes of questioning, methods of inquiry, and forms of production that are unique to them—be preserved. Scholars working in the humanities cannot simply “becom[e] mere chroniclers of a natural history of human interactions between the human species and the Earth system” (Bonneuil and Fressoz xiii). If “it is not enough to measure in order to understand,” then the humanities must protect that which is distinctive to them even as they also work closely with the sciences to transcend the “fissures” between disciplines and develop new ways of “[r]ethinking the past to open up the future” (Bonneuil and Fressoz xiii). This is what interdisciplinary work looks like at its best: not a flattening out of the differences between fields of inquiry to create a shapeless, inflexible, monolithic way of thinking, but an attention to common points of inquiry or concern at which distinct fields converge, how these fields approach such problems in different ways, what it might mean to think across these different ways of thinking, and what individual fields of inquiry might gain by seeing things from another disciplinary perspective.

Imagination is central to this project. It has already and will continue to prove crucial to the efficacy of our response to the pressing environmental challenges we face today. Take, for instance, the fact that “[a] major challenge” standing in the way of effective response “is representational: how to devise arresting stories, images, and symbols adequate to the pervasive but elusive violence of delayed effects,” of environmental degradation that remains relatively invisible, or of gargantuan concepts—like climate or planet—that push the limits of comprehension and thus challenge our ability to understand and respond (Nixon 3). Much of the current struggle against environmental crisis hinges, as Rob Nixon argues, on the “struggle[e] to give shape to amorphous menace” (10)—to “giv[e] the unapparent a materiality upon which we can act” (16), to make visible that which can remain all too easily “out of sight out of mind” (20), and to offer the beginnings of an answer to the question of “[w]ho gets to see, and from where” (15). The opening chapter of Silent Spring, “A Fable for Tomorrow,” serves precisely this purpose, as does the overarching chapter structure of the text as a whole. Both “plot” or lend a “shape to formless threats” (Nixon 10), mapping them across space and time so that they might be seen and understood. Literature—and, more broadly, the humanities—are thus critical to understanding and responding to environmental crisis. This crisis presents significant “representational, narrative, and strategic challenges” that fields of speculative, aesthetic, historical inquiry are best equipped to take on (Nixon 2).

The problem of scale is a case in point. As mentioned briefly above, a major obstacle to understanding our current environmental challenges is scalar: how do we respond to a crisis that unfolds on scales that elude our perception and push the limits of our comprehension? This is a question Silent Spring explores. It is also a central point of debate in the environmental movement. Ecology—with its attention
to kinships that cut across everything from the microscopic to the cosmic—forces us to consider “at what scale or scales should one think or work in environmental politics” (Clark 136). Many of us have heard the popular slogan “Think globally, act locally,” which would seem to suggest a mirroring between the local and the global. It implies, in other words, that large-scale environmental problems can be addressed on small-scale registers—that the local is a microcosmic embodiment of the global, and that individual action will produce a change in the whole. Ursula K. Heise traces this way of thinking back to the historical moment in which Silent Spring emerged, wherein “an entire planet becomes graspable as one’s own local backyard” (4). Silent Spring often imagines the local and global as mapping onto one another in this way.

Yet, Carson’s ecological worldview also demonstrates how “scale can vary enormously” (Heise 45). In an ecological context, there are no “natural boundaries” (Heise 45). If, in other words, “identities are at their core made up of mixtures, fragments, and dispersed allegiances to diverse communities”—if individuals are porous to one another and the boundary lines between them are unsettled—it becomes difficult if not impossible to establish a scale according to which we can map environmental problems. What, in the context of planetary environmental crisis, is local? Is the individual still the appropriate unit for measuring the local, and what constitutes an individual in an ecological context? Or should we focus instead on other units that are, like the individual, relatively small in comparison to the global (such as region or nation)? And how do we make sense of the ways the global, on the one hand, affords an essential scale for imagining widespread environmental crisis while, on the other hand, attending to how the global flattens out difference or particularity in potentially dangerous ways? How do we think the global while also being cognizant of the ways it “does not represent universal human interest” (Mies and Shiva 9) and can erase important local distinctions? The scale at which we imagine and respond to problems—environmental or otherwise—might seem like a neutral question, but this brief discussion demonstrates “how attachments to a particular category or scale of place can shift in value and function” (Clark 59). Just as we need a way of thinking across disciplinary boundaries that at the same time preserves disciplinary difference, we also need a way of thinking across scales so that our response to environmental crisis is as equitable as possible—so that our response does not subscribe to a single scale of logic and thus coincide, however inadvertently, with the dominant “interest” and values of those who possess power. This is one reason scholars argue that it is not only science but also the humanities that are positioned to make significant contributions to contemporary debates about environmental crisis and reform. We live in a moment when such debates must “think on several scales at once” (Clark 136). As Silent Spring attends to the local and the global, their profound interconnection and their difference, it demonstrates the power of literature to hold different scales in simultaneity and, thus, to envision environmental crisis in holistic and yet complex, nuanced, dynamic ways. “Relocat[ing] the concept of ecology from ‘out there’ (the wilderness, the forest reserve, the oceanic island) to ‘in here,’” Silent Spring gathers argumentative strength from its “ab[ility] to move between different worlds and different scales” (Twidle 79). It is by way of this scalar mobility that the text reveals “the sheer otherness of nonhuman”—and human—“life,” and “the pressure that it exerts at the boundaries of human representation” (Twidle 75).

Carson suggested a significant consequence for widespread environmental toxicity is the depletion of the imagination—of that which seems most indicative of the human. Arguing that the unthinking extermination of animal life “diminishe[s]” us as “human being[s],” she illustrates how the extraordinary capacity of humankind to act upon the planet has developed alongside and perhaps through the
impoverishment of imaginative capacity (100). Thus, an environment teeming with natural beauty—“drifts of white clover,” “clouds of purple vetch,” “the flaming cup of a wood lily”—is reduced by “those who make a business selling and applying chemicals” to a noxious tangle of weeds in desperate need of eradication (71). When we purchase these same “chemicals” for use at home, our imaginations are similarly bankrupted—our capacity to appreciate and locate value in the beauty of a “weed,” and to recognize our ecological interconnection with it, is weakened. This is a pressing concern for scholars at present. Ashley Dawson laments that “the wave of extinction that is decimating plants and animals around the planet strikes at the most intimate and potent of human faculties: our ability to imagine” (102). He observes that “[t]he power of human dreams has historically been closely tied to the generative multiformity of the plant and animal life that surrounds us”—it is this “multiformity” that gives rise to “stories like The Tale of Peter Rabbit” that go on to shape our lives in lasting ways (Dawson 102). And yet, as species are eradicated and landscapes decimated, “our capacity to dream, to imagine different, more manifold worlds is radically impoverished” (Dawson 102-3). Carson’s contention that the health of the environment is intertwined with that of the human capacity to imagine is in this way prescient. Silent Spring insists that literature and science are parallel modes of inquiry, and sometimes goes so far as to suggest that imagination is central to—or at the very least should complement—scientific enterprise. The text also demonstrates the centrality of imagination to environmental discourse and policy, suggesting the fate of the planet might hang in the balance of which kinds of environmental imagination we choose to embrace, which we sideline, and which—perhaps most ominously—we inadvertently eradicate.

CLOSE READING:
In the following passage, Carson suggests the majority of humans are unaware of the profound beauty and teeming activity that surrounds them. Students might close read it to explore how imagination makes visible that which is invisible—how it provides access to the true “drama” of nature, even as its powers are aesthetic rather than scientific.

70 to 80 per cent of the earth’s creatures are insects. The vast majority of these insects are held in check by natural forces, without any intervention by man...The trouble is that we are seldom aware of the protection afforded by natural enemies until it fails. Most of us walk unseeing through the world, unaware alike of its beauties, its wonders, and the strange and sometimes terrible intensity of the lives that are being lived about us. So it is that the activities of the insect predators and parasites are known to few...we see with understanding eye only if we have walked in the garden at night and here and there with a flashlight have glimpsed the mantis stealthily creeping upon her prey. Then we sense something of the drama of the hunter and the hunted. Then we begin to feel something of that relentlessness pressing force by which nature controls her own. (249)

Ask students to close read the following passage, attending to the ways Carson locates aesthetic or imaginative value in nature. Focus, in particular, on the question of the “weed,” which highlights the clash between different forms of imagining or knowing landscape, and the material consequences these conflicts possess. (See pages 71-2 for an unabridged version.)

I know well a stretch of road where nature’s own landscaping has provided a border of alder, viburnum, sweet fern, and juniper with seasonally changing accents of bright flowers, or of fruits hanging in jeweled clusters in the fall...the sprayers took over and the miles along that road became something to be traversed quickly, a sight to be endured with one’s mind closed to thoughts of the sterile and hideous
world we are letting our technicians make. But here and there authority had somehow faltered and by an unaccountable oversight there were oases of beauty in the midst of austere and regimented control—oases that made the desecration of the greater part of the road the more unbearable. In such places my spirit lifted to the sight of the drifts of white clover or the clouds of purple vetch with here and there the flaming cup of a wood lily. Such plants are ‘weeds’ only to those who make a business selling and applying chemicals. (71) Many of us would unquestionably be suspect, convicted of some deep perversion of character because we prefer the sight of the vetch and the clover and the wood lily in all their delicate and transient beauty to that of roadsides scorched as by fire...We would seem deplorably weak that we can tolerate the sight of such ‘weeds,’ that we do not rejoice in their eradication, that we are not filled with exultation that man has once more triumphed over miscreant nature. ‘Yet was not her right to search out a banded cup or a tiger lily as inalienable as the right of stockmen to search out grass or of a lumberman to claim a tree?’ asks this humane and perceptive jurist [Justice Douglas, on protests by citizens against plans for the spraying of sagebrush]. ‘The esthetic values of the wilderness are as much our inheritance as the veins of copper and gold in our hills and the forests in our mountains.’ (72)

DISCUSSION QUESTIONS:

- What do you think of when you think of art versus science? How does an artist’s creation differ from the work of a scientist? Do you know of any writers, artists, filmmakers, or musicians who incorporate scientists in their work? Do you know any scientists who use art in their work? How does Silent Spring call into question the divide between art and science?

- “The aim of science is to discover and illuminate truth. And that, I take it, is the aim of literature” Do you agree with this? How does literature illuminate truth? How is this book a work of literature and science? How does it synthesize those two forms to become something singular?

NARRATING APOCALYPSE

Silent Spring gives narrative shape to an environmental crisis of systemic and thus apocalyptic proportions. Chronicling “the contamination of man’s total environment” (8), Carson traces an “intricate web of life whose interwoven strands lead from microbes to man” (69). She tells a story that made visible what was otherwise invisible—that illustrates how “[t]oday we are concerned with a different kind of hazard” which “we ourselves have introduced into our world” (187). Carson was acutely aware that the environmental hazards with which she was concerned “were vaster by orders of magnitude than the worst environmental prospects of earlier times” (Purdy 200). The ecological imagination made these “hazards” and their destructive potential newly legible. If “interconnection” is “so deep and widespread that boundaries among organisms, places, and systems are neither stable nor secure,” then “[t]he suburbs were unsafe” and “even the body was not secure” (Purdy 41). Carson conjured “the apocalyptic specter of a ‘poisoned world’” in Silent Spring using narrative techniques. Beginning with “A Fable for Tomorrow”—which charts in miniature the story that is about to unfold—the text’s chapters move progressively from the spaces of nature to the human home and body. Silent Spring culminates with the climactic revelation that “Nature Fights Back” and, should we fail to choose “The Other Road,” an “Avalanche” is most certainly headed our way. The form of Carson’s narrative—like the ecological web she maps—is continuous and interpermeable. Though each chapter charts a particular ecological domain—soil, water, air, body—they are at the same time interwoven, hearkening back to and foreshadowing one another. Thus, even as Silent Spring tells a story about ecology and environmental toxicity that possesses a beginning, a middle and an end (or, rather, two endings), its narrative form
encourages the reader to move through back and forth through the text in ways that are not always linear—to make connections between its parts and, in so doing, to trace a pattern similar to the web of life.

Lawrence Buell and many others have described *Silent Spring* as a marking a key moment in environmental discourse wherein visions of nature and arguments on behalf of environmental reform shifted from a pastoral or idyllic sensibility to a “monstrous” one (291). The core concepts of ecology, including “biotic community and ecosystem,” were revealed by Carson as “readily adaptable to apocalyptic ends” (Buell 302). Apocalypse was to be found not only in Carson’s imagery, which was “borrowed from military holocaust reportage,” but also from a broader “apocalyptic frame of reference” that structures the text as a whole (Buell 86 and 293). *Silent Spring* is a work of dystopian fiction even as it is also a work of science. It popularized the narrative of “doomsday by environmental genocide” that is now ubiquitous in American popular culture, as illustrated by recent films like “Mad Max: Fury Road” (Buell 295). Readers were and continue to be gripped by fictions that “portray global agricultural landscapes gone so toxic they could only be worked by robots”—by stories that figure “collapse as global rather than local or national” (Heise 26). If American environmentalism developed “powerful visions of the global”—such as “the Gaia hypothesis”—in response to increasingly large-scale forms of environmental crisis, it also pioneered and popularized apocalyptic narrative forms that would bring this crisis chillingly into view (Heise 20).

With Carson’s help, apocalypse became a critical rhetorical device for the mainstream American environmental movement in the 1960s. It allowed environmentalists to “project...the future of a civilization that refuses to transform itself according to the doctrine of the web” (Buell 285). Thus, some argue that apocalypse was and “is the single most powerful master metaphor”—the most effective mode of telling a story about our environmental past, present and possible futures—“that the contemporary environmental imagination has at its disposal” (Buell 285). Apocalyptic narrative enabled environmentalists to “convey the deadly seriousness of the crisis” before its potential consequences became a certainty (Heise 26). Its power, in other words, derived not only from its ability to “address the fate of the world as a whole,” but to do so while also “assuming that the End of the World can in fact be prevented” should appropriate, decisive, timely action be taken (Heise 141). Thus, invoking Robert Frost’s poem “The Road Not Taken,” Carson writes: “We stand now where two roads diverge. But like the roads in Robert Frost’s familiar poem, they are not equally fair. The road we have long been traveling is deceptively easy...but at its end lies disaster. The other fork of the road...offers our last, our only chance to reach a destination that assures the preservation of our earth” (277). Do we opt for apocalypse or futurity? A different “course is open to us” (278), Carson insists, and “[t]he choice...is ours to make” (277).

*Silent Spring* harnessed apocalypse as a narrative “indicator of the urgency of its call for social change” and, thus, “as a form of risk perception” that juxtaposed “desirable and undesirable futures” while asking if the “necessary trade-offs” would be worth the price (Heise 141). Some argue Carson’s narrative strategy was both imperative and effective. It afforded a way of making the scope and consequences of global environmental toxicity digestible while at the same time offering the reassurance that time had not run out—that choosing a different future remained possible. But decades after the publication of *Silent Spring* others have begun to question whether apocalypse narratives do more harm than good. Whereas in the 1960s these narratives helped catalyze a mass environmental movement and a
widespread sense of urgency, “[b]y the 1980s, the tone of the early ecological era had given way to a new mood—of a crisis that was not acute but chronic” (Purdy 226). Despite environmentalists’ warnings, “[e]nvironmental apocalpyse had not come” (Purdy 226). Crisis transformed from apocalyptic to normal in tone, and “[a] sense of urgency, a hint of the end times, could not last in the face of unrelenting normality” (Purdy 226). Furthermore, Bonneuil and Fressoz understand the word “crisis” as possessing “ a deceptive optimism” that implies “we are simply faced with a perilous turning-point of modernity, a brief trial with an imminent outcome, or even an opportunity” (21). In this way, apocalypse narratives are, despite their dystopian subject matter, surprisingly naïve: they misunderstand and misrepresent the current environmental crisis as “a transitory state” from which the planet can make a full comeback should we choose to amend our ways (Bonneuil and Fressoz 21).

To be absolutely clear: this is not to say that humankind cannot or should not do anything to thwart the ongoing and intensifying environmental problems of the present. What it is to say is that rolling back these problems and their consequences will almost certainly not return us—or nature—to where we were prior to industrialization, the rise of fossil fuels, the Great Wars, and the geological shift into the Anthropocene epoch. Apocalypse narratives are potentially dangerous insofar as they promise a return to normality when a “return to the normality of the Holocene” seems increasingly impossible (Bonneuil and Fressoz 21). They also underestimate—or, at the very least, inadequately grapple with—humankind’s capacity “to live with, and sometimes to accommodate to, a multitude of daily ecological risk scenarios” (Heise 27). Lawrence Buell wonders: “Can our imaginations of apocalypse actually forestall it, as our fears of nuclear holocaust so far have?” (308). He answers that “[e]ven the slimmest of possibilities is enough to justify the nightmare” (Buell 308). Is apocalypse a narrative strategy worth preserving in the twenty-first century or is it one of those “familiar approaches” whose value has been exhausted? Do apocalypse narratives motivate or exhaust—does their potency outweigh their shortcomings? Or are there other, more accurate, better motivating techniques of representation to which we should turn instead? These are questions students might take up in classroom debate.

CLOSE READING:
Ask students to close read “A Fable for Tomorrow” alongside the following passages, which outline the global scope of environmental toxicity, its human causation, and its “macabre” fruit. Students might debate the value of apocalypse imagery and narrative in environmental discourse using these excerpts.

Some would-be architects of our future look toward a time when it will be possible to alter the human germ plasm by design. But we may easily be doing so now by inadvertence, for many chemicals, like radiation, bring about gene mutations. It is ironic to think that man might determine his own future by something so seemingly trivial as the choice of an insect spray. (8)

It is not possible to add pesticides to water anywhere without threatening the purity of water everywhere. Seldom if ever does Nature operate in closed and separate compartments, and she has not done so in distributing the earth’s water supply...[Groundwater] travels by unseen waterways until here and there it comes to the surface...Except for what enters streams directly as rain or surface runoff, all the running water of the earth’s surface was at one time groundwater. And so in a very real and frightening sense, pollution of the groundwater is pollution of water everywhere. (42)

In the general holocaust that followed the spraying of salt marshes in eastern Florida, aquatic snails alone survived. The scene as described was a macabre picture—something that might have been created by a
surrealist brush. The snails moved among the bodies of the dead fishes and the moribund crabs, devouring the victims of the death rain of poison. (257-8)

Invoking Robert Frost’s “The Road Not Taken,” the following passage showcases the dystopian and utopian possibilities of apocalypse narrative. Framed as such, environmental crisis is dangerous but also preventable. Students might use this passage to consider whether this sense of apocalypse—as at once dystopian and utopian—remains alive in the twenty-first century, and whether apocalyptic narratives are adequate representational devices for the environmental challenges we face at present.

We stand now where two roads diverge. Bun like the roads in Robert Frost’s familiar poem, they are not equally fair. The road we have long been traveling is deceptively easy, a smooth superhighway on which we progress with great speed, but at its end lies disaster. The other fork of the road—the one ‘less traveled by’—offers our last, our only chance to reach a destination that assures the preservation of our earth. The choice, after all, is ours to make. (277) [W]e should look about and see what other course is open to us. (278)

DISCUSSION QUESTIONS:

- Why do we enjoy imagining the apocalypse? What’s the literary use of the apocalypse? The environmental use? The political use? How is the apocalypse a mode of inquiry similar to scientific modes of inquiry? Or has the apocalypse’s usefulness as a form been exhausted by its iterations?
- Does Frost’s poem hold up as a way of imagining our current world? How does Carson imagine the two roads? Who else has traveled these two roads? How would you characterize those two roads in terms of our environmental history?

THE POETRY OF PROSE
As scholars routinely observe: “Carson’s first ambition was to be a creative writer” (Buell 291). She once said: “The aim of science is to discover and illuminate truth. And that, I take it, is the aim of literature” (qtd. in Felstiner 13). Silent Spring serves as a window into Carson’s philosophy of literature and science, revealing how she intertwined them with great skill and to great effect. It seems no coincidence that, though she valued immensely the praise the book received from her scientific peers, the “most meaningful letter Rachel received...was one from E.B. White”—beloved author of children’s classics like Charlotte’s Web—expressing “the greatest respect and admiration” for Carson’s “courage” and predicted Silent Spring would become “an Uncle Tom’s Cabin of a book,—the sort that will help turn the tide” (qtd. in Lear 420-1). But in Silent Spring Carson is not only storyteller—a narrator of apocalypse, a weaver of fictions that might become reality. She is also a poet. Her choice of epigraph—taken from John Keats’s balladic poem, “La Belle Dame Sans Merci”—is both illustrative of the text’s content and an homage to her beloved British Romantic poets. Scholars have thus described Carson as “a scientist who wrote like a poet” (Sideris and Moore 3). Carson’s books on the sea are perhaps the most overtly poetic of her works, but Terry Tempest Williams argues that Silent Spring demonstrates as much as any other work by Carson “her dual nature as both a scientist and a poet” (25). In the text “we see her signature strength on the page, and witness how a confluence of poetry and politics with sound science can create an ethical stance toward life” (T. Williams 25-6). Flashes of poetry glimmer and gleam in the prose of Silent Spring. They can be found in Carson’s gorgeous turns of phrase—“drifting ribbons of waterfowl
across an evening sky” (45)—and in its sense of “lyric evocation” (Norwood 258): the way the text interweaves the voices of different speakers in much the same way as a poem, or how it attends to things as “ephemeral and seemingly inconsequential as a wildflower” and draws from them a sense of profound beauty and drama (Norwood 259). Like Carson’s sea books, Silent Spring was written through the lens of a poet’s eye and framed using a poet’s turn of phrase.

We tend to think of poetry as obfuscatory—as hiding away its meaning, as trying to outsmart the reader, as willfully resistant. But Silent Spring mobilizes poetry for very different purposes and, in so doing, suggests that many of the foundational assumptions we make about poetry are misguided. Timothy Morton argues that “all art...hardwires the environment into its form” (11)—that the materials and structures of art and environment are one and the same. Carson argued precisely this point in her 1952 acceptance speech for the National Book Award for Nonfiction: “If there is poetry in my book about the sea, it is not because I deliberately put it there, but because no one could write truthfully about the sea and leave out the poetry” (qtd. in Elder 172-3). To write about nature was, for Carson, to write poetry. Perhaps this is because poetry, like nature, is profoundly ecological: it is about interrelationships—about the webs that shape the world and our place in it. Morton describes poetry in precisely these terms: “[t]he shape of the stanzas and the length of the lines determine the way you appreciate the blank paper around them” (11). Poetry, like ecology, “organizes space” as it gives form to the interrelatedness between things (Morton 11).

Silent Spring is of course not composed of stanzas and lines that possess a shifting relationship to blank space. So where is the poetry in the prose, and how does it make visible that which is otherwise elusive or difficult to understand? If poetry, like ecology, is that which situates things in relation to one another—if it is that which traces a web of complex interrelationships and interdependencies—then one answer to this question lies in Carson’s repeated use “of quotation and allusion” (Twidle 55). Drawing interconnections between Silent Spring and literary works that were omnipresent in the minds of American readers—Greek myth, Romantic poetry, Lewis Carroll’s Alice in Wonderland, the works of Robert Frost—Carson’s used quotation and allusion to create “an intricate ‘literary ecology’” within the text of Silent Spring. She created, in other words, a web of distinct and yet interconnected stories that together would give illustrative shape to the material ecological relationships with which she was concerned, thus making the science of the text more accessible. Carson’s literary ecology also made visible how the “fictions” and “myths we have chosen to adopt” possess real, material consequences for humankind’s orientation toward nature—they show us how “our obsession to control nature” is fueled as much by the imagination as it is by practical desires for resources and wealth (T. Williams 18). To read and write poetry—to live by stories, lines, turns of phrase and even single words (think, for instance, of “progress”) that contain within them entire logics of relationality which then shape our ethics and actions—is, as Carson argued, to read and write nature.

But there is another aspect of Silent Spring that teems with poetry: Carson’s predilection for lists. Lists might seem the complete opposite of poetry. We use them most often to “organiz[e] data relevant to human functioning in the world, from financial transactions to knowledge of tides,” “to record commercial exchanges or property ownership,” and to implement “[s]chemes of accountancy” that possess “unambiguous exactness” (Belknap 8). Lists would seem data-driven and numerical—they provide a framework for tracking quantitative information. “But in the literary sphere,” lists serve a very different and decidedly more poetic function (Belknap 19). They “do more than record”: they also
“display,” “lay out,” “arrange”—they “create reality,” sometimes as it is but also as it might be (Belknap 19). The list affords a way of “hold[ing] separate and disparate items together “ and thinking across them—of mapping “constellations” of interrelationality (Belknap 2 and 9). They are emphatically poetic. Like poetry, they possess a variety of forms, they unfold through “repetition” and “conjunction,” they have a kind of rhythm (Belknap 28). It is difficult to read one of Carson’s many lists and not slip into the impression that one is reading a poem. Take, for example, the following passage:

Botanists at the Connecticut Arboretum declare that the elimination of beautiful native shrubs and wildflowers has reached the proportions of a ‘roadside crisis.’ Azaleas, mountain laurel, blueberries, huckleberries, viburnums, dogwood, bayberry, sweet fern, low shadbush, winterberry, chokecherry, and wild plum are dying before the chemical barrage. So are the daisies, black-eyed Susans, Queen Anne’s lace, goldenrods, and fall asters which lend grace and beauty to the landscape. (70)

The “grace and beauty” of the landscape under attack is conveyed by Carson as she lists species of plants one by one. Reading the passage aloud is both illustrative and pleasurable. Doing so makes legible the poetry of Carson’s prose—the rhymes (“blueberries, huckleberries,” “winterberry, chokecherry”) that cut across that prose and make ecological interconnections audible, the joy Carson takes in the vibrancy of nature and the accumulation of detail, the feeling of familiar or mundane words made strange on the tongue, the deliberate arrangement of everyday plant names such that they take on an alien beauty. These list-poems thus provoke the reader to see the landscape anew and to revalue it. In the many lists of Silent Spring, we can see the poetry of Carson’s prose.

Such list-poems are begging to be close read. In Carson’s lists, the smallest of words transform to take on the greatest significance. For example, she uses conjunctions—perhaps the most mundane element of grammatical structures—to string together “unit[s]” that “posses[s] an individual significance but also a specific meaning by virtue of [their] membership with the other units in the compilation” (Belknap 15). In Silent Spring, list-poems constellate ecological collectivities on the page, their grammar making legible the interrelationalities that reach from microscopic life forms to humankind. Take, for instance, the following little list-poem: “Water must also be thought of in terms of the chains of life it supports—from the small-as-dust green cells of the drifting plant plankton, through the minute water fleas to the fishes that strain plankton from the water and are in turn eaten by other fishes or by birds, mink, raccoons—in an endless cyclic transfer of materials from life to life” (46). Each ecological unit is endowed with its own sense of purpose and yet, at the same time, Carson’s use of conjunction performs the “endless cyclic transfer of materials from life to life” on the page. Here, poetry is not obfuscatory, but intensely practical. Carson uses it to draw together individual life forms and to map the nodes between them—to chart a web of life, and to preserve the vibrancy of that web’s “cyclic” rhythm and shifting dynamism even as she writes in prose. There are moments in Silent Spring that possess a poetic quality akin to something you might find in Gertrude Stein’s Tender Buttons or William Carlos Williams’ “The Red Wheelbarrow.” It is the poetry in Carson’s prose that conveys most forcefully “the richness and beauty of life on Earth”—its alien and yet intimate forms, its ubiquitous and yet ephemeral presence. If readers praised Silent Spring for its science, they also loved it for its sense of poetry.

CLOSE READING:
The following passage affords one example of how Carson interweaves a literary ecology that is inextricable from natural ecology in Silent Spring. Students can explore the relationship between the
stories humankind tells and humankind’s orientation toward nature using this passage. They might discuss Carson’s invocation of myth and fairy tale to illustrate the apocalyptic potentials of an ecological world without borders, as well as the notion that the exploitation of nature is stranger than fiction.

In Greek mythology the sorceress Medea, enraged at being supplanted by a rival for the affections of her husband Jason, presented the new bride with a robe possessing magic properties. The wearer of the robe immediately suffered a violent death. This death-by-indirection now finds its counterpart in what are known as ‘systemic insecticides.’ These are chemicals with extraordinary properties which are used to convert plants or animals into a sort of Medea’s robe by making them actually poisonous. This is done with the purpose of killing insects that may come in contact with them, especially by sucking their juices or blood. The world of systemic insecticides is a weird world, surpassing the imaginings of the brothers Grimm—perhaps most closely akin to the cartoon world of Charles Addams. It is a [33] world where the enchanted forest of the fairy tale has become the poisonous forest in which an insect that chews a leaf or sucks the sap of a plant is doomed. It is a world where a flea bites a dog, and dies because the dog’s blood has been made poisonous, where an insect may die from vapors emanating from a plant it has never touched, where a bee may carry poisonous nectar back to its hive and presently produce poisonous beauty. (32-33)

Below is one of Carson’s list-poems. While many of them are small, this particular list-poem spans entire pages. Students might close read it to explore the ecological function of the list in *Silent Spring*, the effect of Carson’s poetic turns of phrase, and the notion that poetry possesses a special place in environmental discourse because it helps see anew those aspects of nature that are otherwise invisible, mundane, or taken for granted. (See pages 249-51 for the unabridged quotation.)

The predators— insects that kill and consume other insects—are of many kinds. Some are quick and with the speed of swallows snatch their prey from the air. Others plod methodically along a stem, plucking off and devouring sedentary insects like the aphids. The yellowjackets...Muddauber wasps...The horse-guard wasp...The loudly buzzing syrphid fly...Lady bugs or lady beetles...Literally hundreds of aphids are consumed by a single ladybug to stoke the little fires of energy which she requires to produce even a single batch of eggs. Even more extraordinary in their habits are the parasitic insects. These do not kill their hosts outright. Instead, by a variety of adaptations they utilize their victims for the nurture of their own young...Everywhere, in field and hedgerow and garden and forest, the insect predators and parasites are at work. Here above a pond, the dragonflies dart and the sun strikes fire from their wings. So their ancestors sped through swamps where huge reptiles lived. Now, as in those ancient times, the sharp-eyed dragonflies capture mosquitoes in the air, scooping them in which basket-shaped legs. In the waters below, their young, the dragonfly nympha, or naiads, prey on the aquatic stages of mosquitoes and other insects. Or there, almost invisible against a leaf, is the lacewing, with green gauze wings and golden eyes, shy and secretive, descendant of an ancient race that lived in Permian times. (249-50) And there are many wasps, and flies as well...All these small creatures are working—working in the sun and rain, during the hours of darkness, even when winter’s grip has damped down the fires of life to mere embers. Then this vital force is merely smoldering, awaiting the time to flare again into activity when spring awakens the insect world...Thus, through the circumstances of their lives, and the nature of our own wants, all these have been our allies in keeping the balance of nature titled in our favor. Yet we have turned our artillery against our friends. The terrible danger is that we have grossly underestimated their value in keeping at bay a dark tide of enemies that, without their help, can overrun us. (251)

**DISCUSSION QUESTIONS:**
• What is poetry? Is Silent Spring poetic? Where and how? Why not? Can science be poetry and science poetry? Does Carson’s poetry illuminate her science or muddy it?

ACTIVITIES, ASSIGNMENTS & PROJECT IDEAS:

• Have the students write haiku and haibun about a place in nature that is familiar with them, or even by taking a walk in their neighborhoods. Typically haibun are first-person prose descriptions of a scene or moment told in an objective style, interrupted by lyrically insightful haiku (more instructions here). What are their experiences in this place? Who goes there with them? What flora and fauna do they observe? What is living and what is dead? What thoughts pass through their mind as they spend time there? What conflicts happen in this space? What threatens the integrity of this space?

• Have students choose and read selections from an environmentally-minded literary journal (Ecotone, Terrain, Poecology, Canary—all available online). What is the vision of the environment presented by these authors? If they could write and include one more piece of fiction or poetry to include in the issue, what would it be and what would it communicate about nature? If students take interest, consider having them put together their own class zine of nature writing.
OBJECTIVE: To prepare students to make the most of the Annual Student Conference through active engagement; and to provide strategies for building student confidence, addressing concerns, and setting expectations for conference participation.

ABOUT THE CONFERENCE KEYNOTE SPEAKER: SANDRA STEINGRABER
This year, the Great World Texts program will welcome Sandra Steingraber to the Annual Student Conference. Students from across the state will have the opportunity to engage her in a conversation about thoughts on the environment and her activism. This interaction is the core component of the Annual Student Conference.

Biologist, author, and cancer survivor, Sandra Steingraber, Ph.D. writes about climate change, ecology, and the links between human health and the environment. Steingraber’s highly acclaimed book, Living Downstream: An Ecologist’s Personal Investigation of Cancer and the Environment was the first to bring together data on toxic releases with data from U.S. cancer registries and was adapted for the screen in 2010.

ON MEETING AN AUTHOR
Meeting an author is a thrilling experience, but it might it also prove a nerve-wracking one for students. To prepare students for this event, consider the following in advance of the conference: What are the expectations for students’ behavior? What kinds of questions should they ask and how will they present their work to the keynote speaker? How can they best prepare for this meeting? What should teachers do if students are nervous, disruptive or unprepared? The preparatory materials listed below will help you and your students to develop a deeper sense of Steingraber’s work, as well as what to expect at the Annual Student Conference and how to prepare for it.

PREPARATORY MATERIALS & HANDOUTS
Author Website
http://steingraber.com
Sandra Steingraber, “Lessons For Our Time From Rachel Carson”
UPROXX, “Will Politicians Ever Stop Taking Money from Big Oil?” (video)
https://youtu.be/-dgtKTi13ml
Sandra Steingraber, “Huge Victory: Natural Gas Storage Plan Halted at Seneca Lake” (and other Ecowatch articles available)

ADDITIONAL READINGS & RESOURCES
Cooperative Children’s Book Center (UW-Madison), “Tips on Hosting an Author/Illustrator Visit”
http://ccbc.education.wisc.edu/authors/tips.asp
Dane Gutman, “The Perfect Author Visit” – tips for preparing students to meet the keynote speaker
http://dangutman.com/school-visitsskypes/the-perfect-author-visit/
Suzanne Roberts, “How to Talk to a Writer”

Teaching Silent Spring in Wisconsin
Great World Texts: A Program of the Center for the Humanities, University of Wisconsin-Madison
© 2017 The Board of Regents of the University of Wisconsin System
http://the-how-to.tumblr.com/post/32877145596/how-to-talk-to-a-writer

Jo Walton, “How to Talk to Writers”
http://www.tor.com/2008/12/21/how-to-talk-to-writers/

POINTS FOR LECTURE:

- **Prepare your students for meeting Sandra Steingraber.** Emphasize that, like all people, our keynote speaker could be nervous, excited, happy, sad, shy, in a good or bad mood, etc. Show clips of her doing interviews, and show the class her photograph so they can think of her as an individual from the start.

- **Emphasize being courteous and respectful.** Those students designated to ask questions during the keynote should always greet and thank Steingraber, introduce him- or herself by name and school affiliation, and then ask a question. Encourage students to make eye contact, and to be polite and confident!

- **Help students avoid feelings of anxiety.** Focus on the experience, not the “performance” or act of talking to Steingraber. Emphasize that she is coming to the conference precisely because she is interested in and excited about the ideas students have developed as they’ve read *Silent Spring.* She came all the way to Wisconsin just to talk to us—know that she thinks students have something to say that is worth hearing. Emphasize that this is a dialogue, meaning that student voices matter. Steingraber wants to hear from students as much as they want to hear from her.

- **Encourage them to be specific.** Don’t just say: “I love this book!” Students should be prepared to articulate what they loved most about it. In preparation, ask students to consider what was most inspiring, thought-provoking or challenging about the text.
  - **Tips for asking questions.** Avoid yes or no questions. Instead, ask questions that allow room for thought and interpretation. Consider, too, the “lead in” to the question. Students should give a little context to let the author know where they’re coming from. For example: “Why did Carson choose [X]?” would be a much more interesting question if the student first explained what about [X] is interesting or confusing to him or her.

- **Be prepared.** Ask students to think about how Steingraber might react to a given question. Once you’ve chosen which questions to ask the keynote speaker, role-play possible answers as a class. Prepare a list of follow-up questions, too.

- **On decorum.** This conference is a serious academic affair and a lot of planning has gone into this event by teachers, students, UW faculty and staff, etc. The people in attendance have traveled far and spent months preparing for this event. Disruptive, discourteous or disrespectful behavior is unacceptable. Teachers whose students do not follow the decorum guidelines are expected to remove students immediately from the room.

DISCUSSION QUESTIONS:

- How would you like to be treated (or not) if you were the keynote speaker? If you were a student from another school?
- What questions do you most want answered? What do you want to know about *Silent Spring* and its effect on politics, the environment, society, and literature today?
ASSIGNMENTS, ACTIVITIES & PROJECT IDEAS:

- Hold a conference dress rehearsal. If your group of participating students is small, this might consist of each student giving a brief but formal presentation of her project, followed by a question and answer session. If your group of participating students is large, split them into two groups. Have one group present their projects first and the other second. Students will alternate between presenting and viewing, just as they will on the day of the official conference.
- Read some of Steingraber’s articles together. Students can also get excited about her visit by studying her background in activism.
- Role-play meeting Steingraber. Have students prepared with questions, and practice asking and answering them. What questions got the best (or worst) answers? Why?
- Brainstorm productive questions. In small groups, students should write down as many questions as they can think of to ask Steingraber. Then switch questions with other groups and select those which seem best and those which seem least effective. Use this as the basis for a discussion about how we decide if a question is “good” or “bad”? (Hint: the least effective questions are those that are too easy to answer, produce obvious answers, or could easily be answered by anyone reading the book.) You might have students revise with this discussion in mind, practicing how to construct a clear, direct and interesting question.
WHAT IS A CLOSE READING?

Close reading is a specific method of literary analysis that uses the interpretation of a small piece of text as a way to think about the whole. This kind of analysis invites readers to pay close attention to the effects of the specific words on the page. We ask ourselves why each word was chosen, how, it contributes to the broader themes and ideas of the text, and how it interacts with other words / images in the text. While there is no “right” way to analyze a text, there are more or less compelling ways of interpreting different passages. The steps below are intended to help you persuasively close read a passage in a literary text (though the skills you develop are applicable to the close reading and analysis of any text anywhere):

1. **Summary.** Read the passage once without making any annotations. Start by asking yourself: What is going on here? Who is speaking? What is the speaker / character / narrator saying? In what context? If you are unable to write a 1-2 sentence summary of the passage, read through it again until you have a clearer idea. Don’t panic if you’re unsure. Many texts are deliberately ambiguous or confusing—it is not always possible to articulate in definite terms what is happening.

2. **Mood & Tone.** The second time you read through the passage, consider the overall mood created by the writing. Is it comic, tragic, sinister, serious? How would you describe its tone and its attitude? Formal, playful, ironic? Does the writer use understatement or exaggeration?

3. **Literary Devices.** Circle / underline the specific words, images and literary devices which contribute to the mood and tone you have identified. These might include any of the following:
   a. Unusual vocabulary or diction (archaic words, neologisms, foreign imports, slang, colloquialisms). Use a dictionary if you need to look up words you don’t recognize.
   b. Symbols: does the writer use images which would seem to represent something else?
   c. Metaphors and similes
   d. Striking comparisons or contrasts
   e. Personification
   f. Alliteration and / or onomatopoeia
   g. Repetition

4. **Bigger picture.** Having considered these details, you can start to develop an overall interpretation of the passage. Consider the ways that your passage fits into the text as a whole. What do you think is the text’s main message? How does it contribute to the broader themes of the work? How do the particular literary devices you have identified help to emphasize, intensify or trouble the questions and issues with which the text is concerned?