

RACHEL CARSON

AND THE MODERN ENVIRONMENTAL MOVEMENT

IN 1962, AMERICAN BIOLOGIST RACHEL CARSON WROTE *SILENT SPRING*. HER EXPLOSIVE BOOK REVEALED TO THE PUBLIC THE POTENTIAL DANGERS OF PESTICIDES AND ALSO HELPED SPARK THE MODERN ENVIRONMENTAL MOVEMENT.

Rachel Carson developed an early interest in nature when her mother took her on walks in the nearby Pennsylvania fields and woods to observe wildlife. Even when she was young, she seemed to have a gift for writing.

Carson attended a small Pittsburgh woman's college (now called Chatham University). She was determined to become a writer. After taking biology classes from an outstanding female professor, Carson decided to become a marine biologist, a career then dominated by men.

Following graduation in 1929, Carson got a full scholarship as a zoology graduate student at Johns Hopkins University in Baltimore, Maryland. She completed her master's thesis on catfish embryo development in 1932 and received her MA degree, but she did not have the money to go on for a PhD.

America was in the midst of the Great Depression, and Carson's impoverished parents came to live with her in Baltimore. Carson supported them by working part time. Later, her divorced sister and brother also moved in. She never married, but she supported and took care of her family. She even



Carson (right) and wildlife artist Bob Hines are ankle deep in the Atlantic Ocean in 1952.

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adopted her young grandnephew when his mother died.

In 1935, Carson found a job with the U.S. Bureau of Fisheries (later called the Fish and Wildlife Service), writing short radio scripts on fish biology. This experience taught her how to write about science in a way that appealed to the public. The next year, her boss at the Bureau hired Carson as a junior aquatic biologist.

Carson wrote an essay for the Bureau describing a tour of the sea from the shoreline to the ocean's depths. Her boss said it was too good for a Bureau publication and encouraged her to submit it to a magazine. *Atlantic Monthly* quickly accepted the essay and published it in September 1937.

A book publisher contacted Carson to expand her essay. Published in 1941, *Under the Sea Wind* told the story of the sea from the viewpoint of a bird, a fish, and an eel. While most marine biologists of the time studied sea creatures in the lab,

Carson studied and wrote about the creatures' relationships with one another and their environment.

Carson wrote two more books about the sea, which made her a national best-selling author on ocean life. By 1955, she was financially secure and had quit her government job to do more writing.

'Rachel's Poison Book'

In 1958, Carson learned about a court case in New York. Residents were suing the U.S. Department of Agriculture to stop aerial (from airplanes) spraying of the pesticide DDT to kill a bothersome insect. The residents claimed that the DDT spraying was poisoning birds, fish, marine life, beneficial insects, and probably people.

Pesticides come in two common types: insecticides, which kill insects, and herbicides, which kill weeds. DDT (dichlorodiphenyltrichloroethane) is a synthetic (man-made) chemical insecticide. DDT was used successfully during

World War II to control malaria and other diseases carried by insects. After the war, it was adopted widely to kill insects damaging farm crops and other insect pests.

Carson decided that her next book would describe the effects caused by the careless use of DDT and other synthetic chemical pesticides on the environment, wildlife, and humans. Her friends referred to this as “Rachel’s poison book.”

Carson wanted to build her case on a solid foundation. She did not, however, conduct scientific studies herself. Instead, she took four years to assemble the most current scientific research, reports from government agencies, testimony before committees in Congress, and case studies of what happened when pesticides were used.

In the middle of her writing, Carson was diagnosed with breast cancer. Radiation treatment and a temporary episode of blindness prevented her from working. She finally recovered enough in the summer of 1961 to continue writing.

Silent Spring

In September 1962, *Silent Spring* appeared in bookstores nationwide and caused an immediate sensation. Carson said her purpose in writing this book was first to inform the public about the downside of pesticides and to spur the government to take necessary action. Unlike her previous books, however, *Silent Spring* took a controversial position. The use of pesticides, she argued, was dangerously out of control.

Carson began her book with “A Fable for Tomorrow,” about a country town sometime in the future suddenly stricken by illness in families, dying farm animals, and the disappearance of birds. “It was a spring without voices,” she wrote, “only silence lay over the fields and woods and marsh.” Who had caused this catastrophe? By drop-

ping pesticides on their land, Carson answered, “The people had done it themselves.”

In the rest of her book, she presented evidence of what she called “man’s war against nature.” Throughout the history of life on earth, she wrote, there has been “interaction between living things and their surroundings.” Only recently has man attacked his surroundings, she continued, by contaminating the air, soil, and water with dangerous chemicals. She asked, “Can anyone believe it is possible to lay down such a barrage of poisons on the surface of the earth without making it unfit for all life?”

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Carson put most of the blame for this threat to life on government scientists because they failed to test the effects of pesticides but still assured the public they were safe. She also faulted chemical companies that sought economic gain with little concern for damage to the environment.

Carson discussed what her research revealed about DDT. This synthetic chemical insecticide can be stored in the fatty tissues of animals and humans and can accumulate to high levels. DDT also lasts a long time in the environment after it is used to get rid of

pests. Scientists at the time were not sure how much DDT could be stored in the human body without causing illness.

Carson studied research on other insecticides that were sometimes more deadly than DDT. Parathion attacked the nervous system of insects. Persons exposed to this insecticide experienced trembling, muscle spasms, convulsions, and in some cases death.

Carson described the case of Clear Lake, Calif., where diluted amounts of an insecticide weaker than DDT were applied to get kill gnats that bothered fishermen. When grebes and other birds began to die, scientists found they were loaded with the insecticide. Yet, it was no longer present in the lake water.

The scientists discovered that tiny organisms had absorbed the insecticide. Fish ate the organisms, and birds ate the fish. The astounding thing was that as the insecticide traveled up the food chain, its *concentration increased* until it reached a toxic level in the birds.

Carson described the spraying of DDT to exterminate the elm tree bark beetle. The DDT got into the soil where it persisted for a long time. Robins ate earthworms that had digested the DDT. Many of the birds either died or could not reproduce.

The killing off of up to 80 percent of robins in some areas greatly cut down the number of insects they ate. What started as an effort to eliminate a bark beetle ended up enabling insect populations to explode.

By 1950, scientists noticed a drastic decline in bald eagles. The scientists Carson contacted didn’t know the reason for the decline, but suspected insecticides were somehow involved.

Carson was especially critical of the widespread practice of aerial spraying of pesticides. She called this “the chemical death rain” that

not only killed the targeted insect or weed, but also wildlife, animal habitats, and sometimes people.

In 1958, the U.S. Department of Agriculture (USDA) began an aerial spraying program to eradicate fire ants. The ants had a nasty sting and built mounded nests up to five feet high that hindered farm equipment. The USDA sprayed millions of acres with insecticides more deadly than DDT. This blanket spraying killed bees and other beneficial insects, wild birds and mammals, farm animals, and pets. It also contaminated cows' milk. But the fire ant continued to thrive.

The main reason the fire ant survived, Carson explained, was that they, like other pests, can develop a resistance to insecticides. Some insects inherit immunity against chemical attack. When sprayed, the insects without immunity are killed off. Those with this protection pass it on to the next generation. In a matter of a few years, the insecticide becomes ineffective.

Carson also criticized the overuse of herbicides. Blanket spraying to kill weeds destroyed other plants that reduced wildlife food supplies and habitats.

Carson investigated whether pesticides could cause cancer in humans. At the time, studies involving lab animals proved some pesticides were carcinogens (cancer causing agents). But the connection between pesticides and cancer in humans was unproven.

Carson ended *Silent Spring* with a discussion of alternatives to the destructive pesticide practices she had described. To avoid the problem of insect genetic resistance, she called for alternatives such as introducing the natural enemies of pests to keep them in check.

Carson stated clearly: "It is not my contention that chemical insecticides must never be used." She realized that they may have to be

used to control human diseases. Her main concern was that they were largely untested, carelessly used, and could "destroy us along with the insects."

The Explosive Reaction

The reaction of some scientists, government agencies, and chemical companies was harshly critical. The worst attacks accused her of being a "fanatic defender of the cult of the balance of nature," an "emotional spinster," "not a scientist," and "probably a Communist."

Government scientists denied pesticides were harmful and pointed to their role in increasing food production. The chemical industry launched a campaign to show the horrors of starvation and disease that would occur if pesticides were banned. But academic scientists and environmental groups applauded Carson. Meanwhile, *Silent Spring* zoomed to the top of the bestseller list and won numerous awards.

On April 3, 1963, *CBS Reports* presented a TV program on the controversy over *Silent Spring*. Carson calmly explained the evidence from her book. The chemical industry representative appealed to emotion, charging that Carson wanted to take us back to a time when insects and diseases dominated the Earth.

An estimated 10–15 million people saw the program. Suddenly, the environment was on the national agenda. The following month, President John Kennedy's Science Advisory Committee released its report, "The Use of Pesticides." It clearly supported Carson's evidence and criticized government pesticide programs.

Carson presented her own recommendations before a congressional committee in June 1963. She called for strict control of aerial spraying and the eventual elimination of



U.S. Postal Service

Years after the death of Rachel Carson (1907–1964), she was awarded the Presidential Medal of Freedom, and her picture appeared on one of the Great Americans series of postage stamps.

long-lasting pesticides like DDT.

Although she was suffering from cancer, Carson kept on making speeches to explain her views on pesticides. On April 14, 1964, she suffered a heart attack at her Maryland home and died at age 56.

The Modern Environmental Movement

Silent Spring revived interest in ecology, the study of the relationships between living things and their environment. Carson's point was that people were fouling the environment, which threatened all life, including human.

In January 1970, President Richard Nixon in his State of the Union address said that past carelessness had created a "debt to nature." He called for a major effort to repair "the damage we have done to our air, to our land, and to our water."

April 22, 1970 was the first Earth Day, when millions of Americans demonstrated to increase public awareness about pesticides, pollution, and other environmental issues.

Congress and President Nixon responded with the first significant federal environmental protection laws in U.S. history. The National

Environmental Policy Act of 1970 established the Environment Protection Agency. Other important legislation included:

- Clean Air Act Amendments (1970)
- Clean Water Act (1970)
- Federal Environmental Pesticide Control Act (1972)
- Endangered Species Act (1973)

The Environmental Protection Agency (EPA) had authority to certify only those pesticides with “no unreasonable adverse effects.” In 1972, the EPA banned DDT use, except to protect public health.

During the 1970s, the modern environmental movement emerged and achieved a great deal, including the creation of an entirely new area of law that remains in effect today. By the end of that decade, environmentalism had reached its peak. Environmentalists began to encounter resistance from those who argued that the laws and regulations went too far and slowed economic growth.

Fifty Years Later

Rachel Carson still has critics today. Some charge that her relentless criticism of DDT caused its extensive global banning, which has resulted in the deaths of millions from insect-carrying diseases like malaria. Nevertheless, the early scientific evidence about the hazards of pesticides that she reported in *Silent Spring* has been largely confirmed.

The puzzle about what was causing the drastic reduction in bald eagles was solved when studies proved that DDT sterilized them or thinned their eggs. The eggs were often crushed by the weight of the big birds while hatching them.

In humans, DDT and other long-lasting pesticide chemicals may cause such conditions as diabetes, nervous system disorders, and child development problems. The Environmental Protection

Agency classifies DDT as a “probable” carcinogen.

The biggest controversy over pesticides today involves using DDT to combat malaria. In 2010, more than 200 million malaria cases, resulting in 655,000 deaths, were reported, mostly African children under age 5. Long-lasting DDT has been proven to be the most effective and cheapest way to eliminate malaria by killing the mosquitoes that carry it.

The U.N.’s World Health Organization (WHO) successfully relied on DDT to combat malaria in the 1950s and ’60s. Genetically resistant mosquitoes brought about mainly by the widespread use of DDT in agriculture, however, made it less effective. In 1970, WHO began to promote the use of non-chemical alternatives. These included such things as distributing bed nets, draining mosquito breeding areas, and providing increased medical treatment for malaria victims. But they proved to be less effective than DDT.

In 2001, 150 nations signed a treaty that banned DDT and other long-lasting pesticides in agriculture, but permitted it to control diseases like malaria. In 2006, WHO recommended DDT spraying of indoor walls and other surfaces in people’s houses. This minimized its harmful effects on wildlife and the environment.

Evidence now exists, however, that many exposed to indoor spraying have high levels of DDT chemicals in their bodies. These chemicals in the breast milk of some mothers exceed allowable levels, which could be dangerous to their babies.

DISCUSSION & WRITING

1. What do you think was the most harmful thing about the use of pesticides that Carson revealed in *Silent Spring*? Why?
2. How did Carson use ecology to make her case against the careless use of pesticides?
3. Do you agree or disagree with the charge made by some that Rachel Carson is responsible for the deaths of millions of malaria victims? Why?

For Further Reading

Kline, Benjamin. *First Along the River: A Brief History of the U.S. Environmental Movement*. 4th ed. Lanham, MD: Rowman & Littlefield, 2011.

Levine, Ellen. *Rachel Carson*. New York: Viking, 2007.



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ACTIVITY

Should DDT Be Used to Combat Malaria?

Form small groups to discuss which policy you think the U.N.’s World Health Organization should adopt, regarding the use of DDT to combat malaria. Each group will report its decision along with its reasons backed up by information from the article.

- A. DDT should be banned and replaced with non-chemical alternatives.
- B. DDT should be used only for indoor spraying.
- C. DDT should be used until an equally effective pesticide is developed that is less harmful to the environment and humans.
- D. DDT should be used only in areas that are greatly impacted with malaria.
- E. DDT should be used without restriction to eradicate malaria.

Sources

National Parks

“A Brief History of Pinnacles National Park.” KCET. 16 Jan. 2013. URL: www.kcet.org · Brinkley, Douglas. *The Wilderness Warrior: Theodore Roosevelt and the Crusade for America*. NY: Harper, 2009. · “Call of the Wild.” *The Economist*. 22 Dec. 2012. · Duncan, Dayton. *The National Parks: America’s Best Idea*. NY: Alfred A. Knopf, 2009. [This is the companion book to the Ken Burns TV series by the same title.] · _____. “Pinnacles — It’s a Good Start.” *LA Times*. 10 Feb. 2013. · Egan, Timothy. *The Big Burn: Teddy Roosevelt and the Fire that Saved America*. Boston: Mariner Books, 2009. · Heacox, Kim. *An American Idea: The Making of the National Parks*. Washington, D.C.: National Geographic, 2001. · Lowry, Wm. *Repairing Paradise: The Restoration of Nature in America’s National Parks*. Washington, D.C.: Brookings Inst. P, 2009. · National Park Service. U.S. Department of the Interior. 25 Jan. 2013. URL: www.nps.gov · O’Keefe, Ed. “Federal Government to Lift Restrictions on Guns in the National Parks.” *The Washington Post*. 19 Feb. 2010. URL: www.washingtonpost.com · Runte, Alfred. *National Parks: The American Experience*. 4th ed. Langham, Md.: Taylor Trade Publishing, 2010. · *Wikipedia* articles on “Arctic Refuge Drilling Controversy,” “History of the Yosemite Area,” “National Park,” “Yellowstone National Park.” URL: <http://en.wikipedia.org>

Rachel Carson

Carson, Rachel. *Silent Spring*. Boston: Houghton Mifflin, 1962. · Griswold, E. “How ‘Silent Spring’ Ignited the Environmental Movement.” *NY Times*. 21 Sept. 2012. · Kline, Benjamin. *First Along the River: A Brief History of the U. S. Environmental Movement*. 4th ed. Lanham, Md.: Rowman & Littlefield, 2011. · Koehn, Nancy F. “From Calm Leadership, Lasting Change.” *NY Times*. 17 Oct. 2012. · Lear, Linda. *Rachel Carson, Witness for Nature*. NY: Henry Holt, 1997. · Levine, Ellen. *Rachel Carson*. NY: Viking, 2007. · Lytle, Mark Hamilton. *The Gentle Subversive: Rachel Carson, Silent Spring, and the Rise of the Environmental Movement*. NY: Oxford U P, 2007. · Magoc, Chris J. *Chronology of Americans and the Environment*. Santa Barbara, Calif.: ABC-CLIO, 2011. · Meiners, Roger. “Silent Spring at 50: The False Crisis of Rachel Carson (Reassessing environmentalism’s fateful turn from science to advocacy).” 21 Sept. 2012. *Master Resource*. URL: www.masterresource.org · Neimark, Peninah and Mott, Peter Rhoades, eds. *The Environmental Debate: A Documentary History*. Westport, Conn.: Greenwood P, 1999. · Souder, William. “Rachel Carson Didn’t Kill Millions of Africans.” *Slate*. 4 Sept. 2012. URL: www.slate.com · Shabecoff, Philip. *A Fierce Green Fire: The American Environmental Movement*. Washington, D.C.: Island P, 2003. · “Stockholm Convention on Persistent Organic Pollutants (POPs).” URL: www.pops.int/documents/ddt/default.htm · *Wikipedia* articles on “DDT” and “Environmental Impact of Pesticides.” URL: <http://en.wikipedia.org>



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Standards Addressed

National Parks

National High School U.S. History Standard 20: Understands how Progressives and others addressed problems of industrial capitalism, urbanization, and political corruption. (2) Understands major social and political issues of the Progressive era (e.g., . . . the Hetch Hetchy controversy).

National High School Civics Standard 23: Understands the impact of significant political and nonpolitical developments on the United States and other nations. (5) Understands historical and contemporary responses of the American government to demographic and environmental changes that affect the United States.

California History /Social Science Standard 11.2: Students analyze the relationship among the rise of industrialization, large-scale rural-to-urban migration, and massive immigration from Southern and Eastern Europe. (9) Understand the effect of political programs and activities of the Progressives (e.g., federal regulation of railroad transport, Children’s Bureau, the Sixteenth Amendment, Theodore Roosevelt, Hiram Johnson).

California History /Social Science Standard 11.11 Students analyze the major social problems and domestic policy issues in contemporary American society. (5) Trace the impact of, need for, and controversies associated with environmental conservation, expansion of the national park system . . .

California History /Social Science Standard 12.7: Students analyze and compare the powers and procedures of the national, state, tribal, and local governments. (5) Explain how public policy is formed, including the setting of the public agenda and implementation of it through regulations and executive orders.

Common Core Standard SL.11-12.4: Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

Rachel Carson

National High School U.S. History Standard 26: Understands the economic boom and social transformation of post- World War II United States. (1) Understands scientific and technological developments in America after World War II . . .

National High School U.S. History Standard 30: Understands developments in foreign policy and domestic politics between the Nixon and Clinton presidencies. (1) Understands how the Nixon, Ford, and Carter administrations dealt with major domestic issues . . .

California History /Social Science Standard 11.8: Students analyze the economic boom and social transformation of post-World War II America. (6) Discuss the diverse environmental regions of North America, their relationship to local economies, and the origins and prospects of environmental problems in those regions.

California History /Social Science Standard 11.11: Students analyze the major social problems and domestic policy issues in contemporary American Society. (2) Discuss the significant domestic policy speeches of [presidents] (e.g., with regard to . . . environmental policy). (5) Trace the impact of, need for, and controversies associated with environmental conservation, . . . and the development of environmental protection laws . . .

Common Core Standard SL.11-12.4: Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

Common Core Standard W.11-12.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

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