

Rachel Carson: A Sustainability Pioneer

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Rachel Carson might never have used the word sustainability, but her well-known book "Silent Spring" sounded a warning that uncontrolled and careless overspraying of chemical pesticides could damage the web of life. Indeed, the very title of her book refers to the first chapter: She describes a fictitious town in which spring arrived but no birds sang.

"Silent Spring" is one of the first popular scientific statements supporting the idea that humans are part of nature, not its conquerors, and that we should use science and technology to maintain or strengthen rather than to weaken or break the strands of the web of life.

"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."

"The balance of nature is not a status quo; it is fluid, ever shifting, in a constant state of adjustment." "Water must be thought of in terms of the chains of life it sup-

ports. ..."

"The 'control of nature' is a phrase conceived in arrogance. ..."

"Future generations are unlikely to condone our lack of prudent concern for the integrity of the natural world that supports all life."

Carson was one of the first to publicize the accumulation effect, in which very small amounts of DDT sprayed over large areas eventually led to amounts, sometimes hundreds of times larger, in animals higher up the food chain as larger units consumed smaller ones and the DDT became stored in the animals' fat.

Carson also realized that natural biological processes of mutation make it possible for insects to develop resistance to human attempts to wipe them out with chemicals. This results in more massive sprayings, leading to more resistance and/or the introduction of ever-more poisonous chemicals leading only to further resistance. Carson suggested that insects—because of their short life spans—were likely to mutate more rapidly than humans can invent new chemical killers. Even in 1962, evidence indicated that as many as 140 insect species had become resistant to DDT.

Furthermore, even when successful, destruction of one pest might only result in the expansion

of another that had been its prey. One example is the spider mite that sucks chlorophyll out of evergreen needles. When the U.S. Forest Service sprayed 885,000 acres of western forests with DDT to control the spruce budworm, the forests turned brown, at first mystifying the Forest Service. Then it was discovered that the DDT had also killed most of the ladybugs that are the natural predator of the spider mites in that area.

By their very nature, chemical controls are self-defeating, for they have been devised and applied without taking into account the complex biological systems against which they have been blindly hurled, Carson states. She notes that the chemical barrage [of pesticides] has been hurled against the fabric of life—a fabric, on the one hand, delicate and destructible; on the other, miraculously tough and resilient, and capable of striking back in unexpected ways.

If we substitute "geology" for "biological systems" or "fabric of life," would Carson's warning apply to hydrofracking in the Finger Lakes region? Will geology strike back by poisoning our drinking water as the price of a paltry few decades of natural gas extraction?

The final chapter of "Silent Spring" offers some of Carson's alternatives, broadly lumped into the category of biological controls. These included male sterilization of undesirable insects, use of natural repellents, lures, ultrasonic sounds to repel certain insects,

species-specific bacteria or viruses, importation of natural enemies and restoration of the populations of predators, including birds, bats, spiders and some small mammals that all engage in effective insect control.

Some of these alternatives amount to human interference with naturally evolved systems. Aware of this, Carson explained that any alternatives should be "based on understanding of the living organisms they seek to control, and of the whole fabric of life to which these organisms belong."

Today we might say that Carson understood the need to maintain biodiversity. But it was not just species biodiversity; it was biodiversity of the elements and the networks and systems of the web of life that she recognized as crucial to the existence and quality of human life. Organic farmers today make use of many of the ideas Carson advocated. Her emphasis on connections among the elements of the web of life also makes Carson one of the first science writers to present to the public a systems view of nature and of our place in it.

Rachel Carson is both ancestor and heroine for all of us struggling to create and leave behind for our children and grandchildren a world of sustenance and beauty.

This is the latest in a series of articles on the history of sustainability. Richard W. Franke is professor emeritus of anthropology at Montclair State University, a resident of Ecovillage at Ithaca and a board member of Sustainable Tompkins.

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