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INNOVATION FOR A HEALTHIER PLANET

SILENT SHORE

From the same Maine shores that inspired the groundbreaking work of Rachel Carson, fellow female scientist **Dr. Susan Shaw** is battling at the frontline for our planet's future.

BY SARAH MOORE

ON A SMALL GRANITE BOULDER at the edge of the water in Southport, a bronze plaque recalls the spot where Rachel Carson's ashes were scattered in 1964, among ocean breezes and migrating Monarch butterflies. This quiet stretch of midcoast Maine had been a source of inspiration for the famed biologist and writer



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since she built a cottage on the rocky shores of Southport in 1953. Later, the coast became a refuge from the fierce backlash from chemical industries and politicians in the wake of *Silent Spring* (1962), her seismic, National Book Award-winning study on the destructive effect of synthetic pesticides on the environment. Over 9,000 acres of land have since been preserved in her name along Maine's shores. A framed biography of Carson greets visitors at the entrance to the Shaw Institute in Blue Hill, formerly the Marine Environmental Research Institute, where it hangs opposite the seven-foot skeleton of a gray seal—a neighbor Carson would surely have appreciated. From this former farmhouse on Main Street, a new generation of female scientists continues Carson's battle to protect the natural world.

SWIMMING UPSTREAM

Born in Dallas, Dr. Susan Shaw got her MFA in film from Columbia before undertaking a doctorate in Public and Environmental Health. Tracking her 30-year career, the parallels between Shaw's work and Carson's groundbreaking exposé are hard to ignore. "I read *Silent Spring* while I was in college," Shaw says. "It prompted me to start thinking differently about things and ignited my interest in a doctorate in Public Health."

Shaw's work soon caught the eye of legendary photographer Ansel Adams, who commissioned her to produce *Over-exposure*, the first book of its kind to detail the dangers of darkroom chemicals. This was Shaw's first experience speaking out against the titans of the chemical industry. "There was so much anger toward me that I would dare suggest these wonderful photographic chemicals could be harmful to human health. I thought of Carson and the PBS interview she gave in 1962. The interviewer absolutely eviscerated her. But you can't deny the truth of what she wrote. She's been a beacon to me."

Both women have dedicated their careers to exposing the deadly threat of chemicals widely used across agriculture, industry, and aviation on environmental sys-



"We stand now where two roads diverge [...] The road we have long been traveling is deceptively easy, a smooth superhighway, [...] 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 the earth."

Rachel Carson, *Silent Spring*, 1962

tems. Carson wrote eloquently of the rampage of DDT pesticide-spraying that could leave our green spaces empty and devoid of bird song. Meanwhile, Shaw has studied and shown how flame-retardant chemicals (used on our mattresses, plastics, and furniture) have insidiously poisoned marine mammal and fish species. In 2010, she was asked to dive in the Gulf of Mexico to assess the damage of oil-dispersant chemicals used in the wake of the BP oil spill. Carson and Shaw are both quick to emphasize the implied risk of chemical pollution to human health, lest we believe it is only songbirds and sea stars at risk.

"When I started all this," Dr. Susan D. Shaw says, "I thought the plight of the harbor seal pups would be enough to pull peo-

ple's heartstrings." She gives a wry smile at the memory of her naive optimism. After a summer spent in the late 1980s in Brooklin, where she still keeps a house, Shaw's environmental career began with a study to prove the agricultural and industrial chemicals that *Silent Spring* had helped to ban were behind the mass die-off of harbor seals. Today, she knows she has bigger fish to fry—nothing short of halting the growth of the global plastics industry.

NOT EASY BEING GREEN

"We began collecting plastic waste during field studies," Shaw says. "In 2012, I started looking at the breakdown of waste into microplastics—the minuscule fragments of plastic that we found even in the so-called 'pristine' waters of the Blue Hill Peninsula." Tune into the zeitgeist and you'd be hard-pressed to miss the global buzz around single-use plastic waste. Everyday eco-warriors avow the merits of reusable water flasks over your discardable bottle of Poland Spring. Requesting a plastic straw with your drink is now a cardinal sin. "People are struck by the image of the shorebird filled with plastic toothbrushes and the littered beaches in India and Thailand—and that's a truly worthy cause," Shaw says. "But I think—no, I know—they don't understand dangers of microplastics. It's the plastics you don't see that are the real danger. The tiny fragments moving through the food chain—moving through us."

Shaw has since formed an international coalition with fellow scientists called Plastics and the Human Health Connection with the express purpose of measuring the threat of microplastics to human health. "We've found a way of identifying microplastics in the bloodstream. Now we ask, what is the impact on the human body? On the brain? Can it cross the blood-brain barrier and interfere with neural transmissions? My instinct? Yes, it can. And I think they're inside every person to a varying degree."

TURNING THE TIDE?

Like Carson working in the postwar boom of industrial growth, Shaw faces an unfriendly political climate. "Plastic is a multi-



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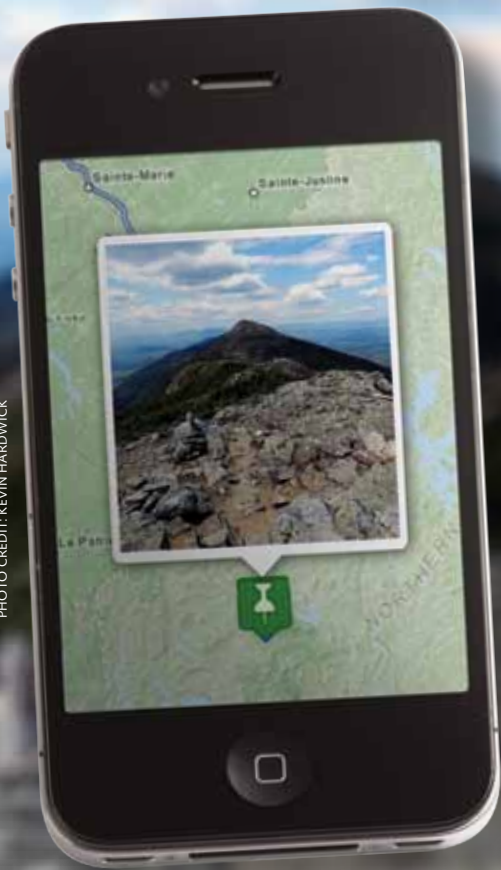


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billion-dollar industry. I don't think people realize that the U.S. plans to pour \$164 billion into increasing petroleum-based plastic production in the near future—that's a 36-percent growth." However, she remains confident the coalition's research could turn the tide in the same way that biomarker science toppled the monopoly of the tobacco industry. Shaw doesn't believe people will turn away from deadly human health risks the way they once turned from dying seal pups.

The native Texan finds Maine to be the ideal spot to conduct local studies with a global scope along with her female-dominated team of research scientists. "It's a beautiful place, but there's trouble in paradise. The Gulf of Maine is the second-fastest warming area in the world behind the polar caps. This means our food sources are moving northward, including lobster. Lobsters are the heartbeat of this area, and they're leaving. Over 40 percent of marine mammals are facing extinction. How far can this go on before life as we know it is interrupted? The planet will not be able to survive without functional, life-supporting oceans."

Despite the chilling outlook of a warming world, Susan Shaw, like Rachel Carson, is a firm believer in the human capacity to change for the better. "We're at the end of the fossil fuel age, and sure, we're experiencing all the consequences of this Anthropocene period. But we're also on the brink of a new age of awareness. Solar energy is going to displace fossil fuel—and soon. It's a cheaper and better alternative. The market will drive this change. I see a future that is very positive. The question is, can we get there?" ■

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