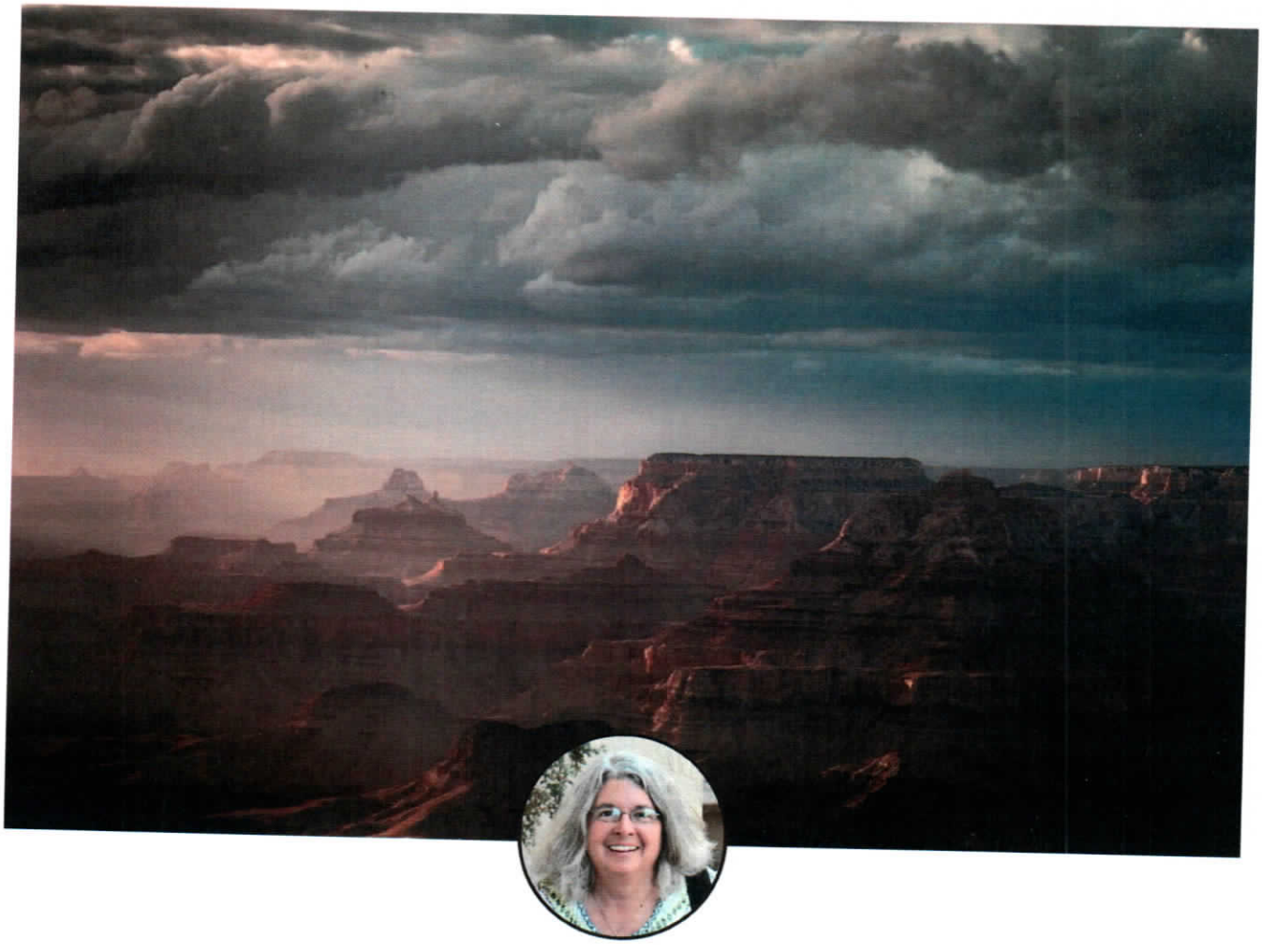
Public Books

SCIENCE TURNED UPSIDE DOWN: CAROLYN MERCHANT'S VISION OF NATURE, 40 YEARS LATER

In the latest installment of our partnership with the Center for Advanced Study in the Behavioral Sciences, Paula Findlen revisits Carolyn Merchant's "The Death of Nature: Women, Ecology, and the Scientific Revolution" on the occasion of the book's 40th anniversary.

1.22.2021

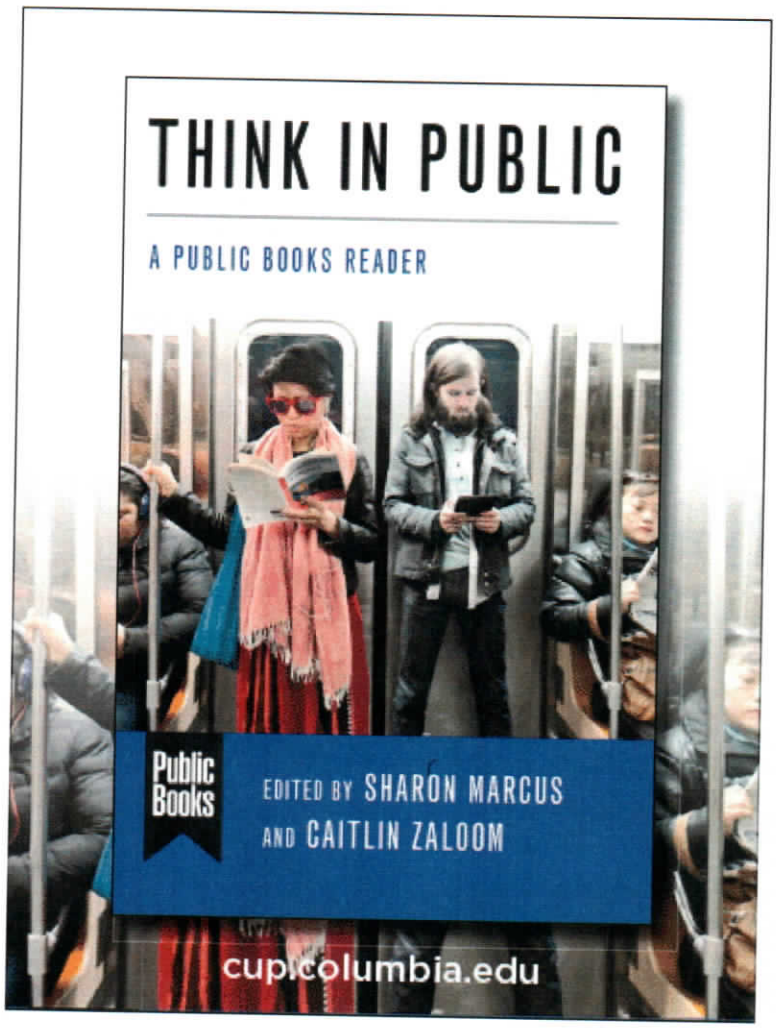
SCIENCE



BY PAULA FINDLEN

One night in 1975, on a camping trip to the Grand Canyon with her young sons, Carolyn Merchant lay awake contemplating the play of light on the living rock around her. At the time, she was a lecturer in the department of physics and natural sciences at the University of San Francisco, where she had taught for six years. Merchant had studied chemistry and philosophy in college, which led to her discovery of the history of science in graduate school in the Midwest. There she observed wildflowers bloom in a Wisconsin prairie rejuvenated by fire, a moment she would later recall as formative to her keen appreciation for the complex forces constantly reshaping nature. By the late 1960s, Merchant had found her way to the Bay Area. Its social and environmental activism and lively intellectual experimentation shaped the next phase of her education as a young professor. [1] That night in 1975, in the twilight of a western evening, as shadows danced along the canyon walls, making nature's vitality seem like pure poetry, the idea of calling her book "the death of nature" emerged.

Almost 20 years before Merchant published *The Death of Nature: Women, Ecology, and the Scientific Revolution*, Thomas Kuhn's *The Structure of Scientific Revolutions* (1962) transformed the field of the history of science. Kuhn famously defined the very idea of scientific revolution, articulating the circumstances under which one scientific understanding of the world gave way to another. Like Merchant, Kuhn had a great love of the 16th and 17th centuries, viewing this period as a foundational moment in the transformation of the human understanding of nature. The emergence, in 1543, of the idea that the planets revolve around the sun; the struggles to offer decisive proof that would persuade people that they inhabited a sun-centered cosmos—including the infamous 1633 trial and condemnation of Galileo by the Roman Catholic Church—and the magnificent synthesis of physics, mathematics, and astronomy in Newton's *Principia* (1687) all made scientific revolution the hinge of science's incipient modernity. The scientific revolution was—and still is—an exciting and alluring story of how human curiosity inspired the development of intellectual tools and scientific instruments to generate new evidence and new techniques for understanding nature. But it certainly is not the whole story.



In 1980, when Merchant published *The Death of Nature*, she made a remarkable departure from the foundational narrative Kuhn put forward. Few books in the history of science have had such a broad and diffuse impact, and few have been generative of so many other fields. [2] When the book was published, environmental history was just coming of age, ecofeminism was a brand-new idea, and the study of women in science was still in its infancy. Three Mile Island was a fresh trauma, barely a year old, and Congress had just passed the Superfund Act, which empowered the Environmental Protection Agency to begin the herculean task of investigating and cleaning up hazardous waste sites throughout the country. *The Death of Nature* somehow managed to capture all these currents, weaving them into a grand new counternarrative about the rise of mechanistic thought in England and Western Europe during the late 16th and 17th centuries—the age of Bacon, Galileo, Descartes, and Newton—and its consequences for the end of a more organic, animistic worldview. Rather than celebrating the achievements of this era as a triumph of science, Merchant instead invited her readers to turn the entire story upside down. What were the costs of this intellectual conquest of nature? Who gained and who lost?

Merchant's book did not challenge the importance of the scientific revolution, but rather questioned its Promethean ambitions. She raised provocative questions about the social, economic, and material conditions out of which new ideas emerged. Why was a mechanistic worldview so compelling at this particular moment in time? Who benefited from the increased

separation of mankind from nature that resulted? Merchant argued that language and imagery mattered, as crucial expressions of underlining beliefs and values. She envisioned a transformation of the natural world that had victims—women, laborers, and any aspect of nature that sated the endless appetite for commodities and profit—and that therefore had consequences. She also paid attention to the work of natural and experimental philosophers who actively resisted these developments. She explored alternative pathways of inquiry that coexisted with a new paradigm of knowledge, and argued that they mattered and should not simply be discarded. Kuhn offered a dramatic narrative of the triumph of the human mind; Merchant countered by presenting the same events as a struggle between victors and the vanquished, in which much more was at stake than the fortunes of a complex and compelling idea. The uncertain fate of nature hung precariously in the balance.

I first read *The Death of Nature* soon after it appeared, shortly before the beginning of my own forays into the history of science. Arriving in Berkeley in 1984, I was aware that Carolyn Merchant was on the faculty, but, institutional arrangements being less than perfect, she had no formal affiliation with the history department, nor were her classes cross listed. The department of environmental science, policy, and management seemed a world away. No one pushed the history students to seek her out, though I have no doubt that my mentors would have been perfectly encouraging had I asked for an introduction. I regret to say that I never seized the opportunity. Aside from occasionally seeing her across a room at a history-of-science colloquium, she remained, for me, the mythical author of an alluring, fascinatingly alternative book that challenged some of the core assumptions of the field I was entering. This made her cool, intriguing, and, yes, rather radical.

The Death of Nature was a daring enterprise. It synthesized a vast amount of scholarship on many subjects rarely considered together: women, peasants, witchcraft, magic, agriculture, mining, the utopian thinkers of the Renaissance, and, of course, natural and experimental philosophy.

Merchant boldly cited Rachel Carson's *Silent Spring* (1962) and Betty Friedan's *The Feminine Mystique* (1963) as key sources of inspiration. She filled her footnotes with references to historians such as Walter Pagel, Frances Yates, Allen Debus, Charles Webster, and Betty Jo Teeter Dobbs who specialized in esoteric subjects: the radical 16th-century German prophet and alchemical physician, Paracelsus; the southern Italian heretic Giordano Bruno, who dreamed of an infinity of gods and worlds; the Dominican prophet Tommaso Campanella, whose defense Galileo politely but firmly rejected; the radical utopian philosophers emerging from the Thirty Years War and the English Civil War; enigmatic perpetrators of the "Rosicrucian Enlightenment," whose cryptic promises to unlock arcane mysteries in the service of spiritual truth caused a young Descartes no end of worry; and Cambridge Platonists, such as Henry More, who tried to figure out what animated matter as their challenge to a mechanistic universe that made matter inert.

None of this material was unknown, at least for those following crucial developments in Renaissance intellectual history. Merchant's contribution was to weave all these different

episodes together into a remarkable synthesis that gave them cohesive meaning and purpose, as a record of enduring belief in nature's dynamic vitality and agency. Curiously, the Newton who wrote over a million words on alchemy and even more words on theology, while also transforming physics, optics, and mathematics, did not make an appearance, possibly because Merchant had a greater passion for Leibniz and his readers, male and female.

Merchant insisted on the necessity of writing a new narrative of science that explored the costs of modernity for nature and humankind. She made nature her principal protagonist. She argued for a history of science that was more inclusive, paying attention to the role of women as well as men, of artisans and laborers as well as learned scholars, observing that each of them had different relationships with the natural world. She advocated for "an earth's-eye view of history" that began and ended in the physical environment. Ultimately, she encouraged us to treat the past as an ecosystem—a fragile, interconnected world filled with strange and surprising juxtapositions effecting a delicate balance.

As a field, the history of early modern science has taken up many of Merchant's suggestions. When she began her work, the scientific revolution was primarily viewed as a history of physics, mathematics, and the experimental sciences. Alchemy was considered marginal because it was so unmodern. It did not have a gender despite its profusion of hermaphroditic imagery. Very little work was done on natural history—a subject virtually absent from *The Death of Nature* yet implicit in many of Merchant's remarks about the importance of understanding changes in agriculture, mining, metallurgy, and, more generally, perceptions and representations of nature. The histories of women, gender, and the environment all belonged to fields other than the history of science. The history of allegory was clearly a subject for *literature*, not for science or the historians who studied it.

By bringing the history of ideas into dialogue with social, economic, and cultural history—inspired by her discovery of an early Marxist historiography of science as well as by her feminist and environmental commitments—Merchant interrogated just about everything that had been written on late-medieval and Renaissance science and the scientific revolution and put it to new uses. Virtually every chapter in *The Death of Nature* laid the groundwork for a great deal of the research that has animated this field ever since.

Let me offer a few examples. Merchant's book discusses several instances of how nature was transformed for human uses—the draining of the English fens, the construction of Dutch sluices, the deforestation of the Venetian mainland—that are now subjects of a considerable scholarship. As younger generations of historians realized the significance of natural history as a subject enmeshed in the history of long-distance commerce, travel, curiosity, conquest, colonization, and commodities, these different fields began to coalesce. We now have a far more accurate, if still incomplete, portrait than we did before of how nature changed in the early modern period.

RATHER THAN CELEBRATING THE

ACHIEVEMENTS OF THE 16TH AND 17TH CENTURIES AS A TRIUMPH OF SCIENCE, MERCHANT INVITED HER READERS TO TURN THE ENTIRE STORY UPSIDE DOWN.

Likewise, Merchant's attention to alchemy presaged the way that its history has become one of the most important subjects in the history of early science. We no longer see the alchemist as a laughably delusional figure; he (and occasionally she) has become the ultimate laboratory geek, a fierce manipulator of matter whose knowledge of nature supported the sacred narratives and pecuniary passions of the early modern world. The role of artisans, from Leonardo da Vinci to Bernard Palissy and their more obscure contemporaries, has also moved to the center of the field. Their direct experience of the raw materials of nature and what we make from them, and the desire of the most learned and ambitious artisans to write things down, have profoundly reshaped our understanding of who makes knowledge.

Last but hardly least, the women featured in *The Death of Nature* are no longer marginal to narratives of early modern science. Merchant drew attention to the erudite Anne Conway, whose ideas about the relationship between mind and matter fascinated her contemporaries. She wrote about the delightful, irascible Margaret Cavendish, who had much to say about the early Royal Society's experimental philosophy. Then there was Émilie du Châtelet, who boldly improved Newton's physics. All found their place as objects of inquiry in the years following Merchant's book. They are no longer voices in the wilderness, but part of a rich and diverse literature on women, gender, and science in the early modern world, a literature that was also foregrounded in such works as Evelyn Fox Keller's *Reflections on Gender and Science* (1985) and Londa Schiebinger's *The Mind Has No Sex? Women in the Origins of Modern Science* (1989). I cannot help but think that Merchant should have discovered the German painter and entomologist Maria Sybilla Merian. Merian's studies of metamorphosis in Northern Europe and Surinam in the late 17th and 18th centuries serve as a terrific example of how ecological awareness, shaped by a female artisan, emerged in the early modern world long before "ecology" had a name. Merian is now a well-known figure, thanks to numerous excellent studies of her art and science, and of her experience of colonialism, slavery, and experimental religious communities as well as of the institutional world of science and publishing. That was not the case in 1980.

The more we know about women pursuing science, the more they sometimes complicate Merchant's thesis that they saw nature differently because of their more organic and intimate connections to nature. Nonetheless, issues of gender are always present in this history in a variety of different ways. When the Paduan Inquisition interrogated the 16th-

century apothecary Camilla Erculiani on the most unorthodox statements in her *Letters on Natural Philosophy* (1584), derived from her own reading of the Bible, she argued that she had the right to interpret Genesis by understanding the earth's history as a natural philosopher. Her lawyer instead declared that her accusers should be lenient because she was an uneducated woman. This was probably the reason she was not formally condemned.

In 1994, many years after I first encountered *The Death of Nature*, I was a visiting professor at Harvard, where they asked me to teach the scientific revolution and a seminar on gender and science. It was a wonderful East Coast fall, filled with memorable conversations with a terrific group of faculty and students. One exchange in particular stands out in my mind as I return to Merchant's book, which I was teaching at the time. A senior colleague asked me which sources I was using in my class on gender and science. I mentioned Francis Bacon's *The Masculine Birth of Time* (1603). Being a medievalist and therefore a far better Latinist than I will ever be, he wondered whether this really was the original title. I couldn't resist replying, "*Temporibus partus masculus*—how would you translate it?" We can puzzle over what this enigmatic phrase means, as many scholars have rightfully done, but at the moment I felt a certain kinship with the spirit of *The Death of Nature*. My colleague very graciously agreed that this would indeed be the title in any language! The question still lingers in my mind because I understood that he wondered whether modern feminist scholarship had done an injustice to the past through mistranslation.

Forty years ago, Merchant needed to write *The Death of Nature*. As Kuhn's case also illustrates, a classic book is not right all the time, but it should contain core truths and be good to think with. It should provoke more than one response. The basic insight of Merchant's book—that the material conquest of nature inspired, directly and indirectly, new ways of thinking about nature—still rings true to me. In the summer of 2020, as the sunny blue sky of the American West metamorphosed into a choking, hazy orange while fires raged below, what lessons did Merchant have to offer us? We are living through a moment in which we cannot ignore the challenges and perils of our relationship with the natural world. *The Death of Nature* offers important observations about the past that might inspire our own thinking about how to reframe our relationship with the world around us. I look forward to seeing how the current generation of historians of science, deeply interested in nature, climate, and environment, will rewrite the history of human interactions with nature for the future.

This article was commissioned by Caitlin Zaloom.

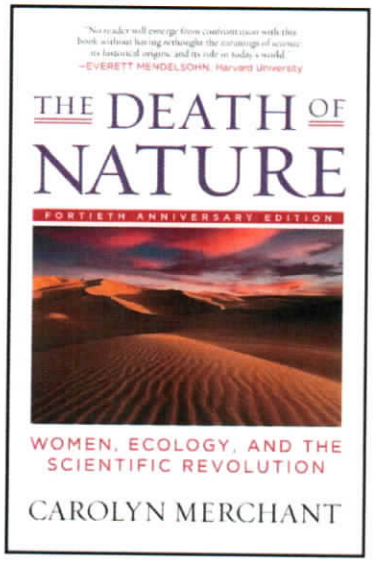
1. Carolyn Merchant, "*The Death of Nature*: A Retrospective," *Organization and Environment*, vol. 11, no. 2 (1998).

2. For the most recent assessment of this impact, see *After the Death of Nature: Carolyn Merchant and the Future of Human-Nature Relations*, edited by Kenneth Worthy, Elizabeth Allison, and Whitney A. Bauman (Routledge, 2019).

Featured image: *Cloudy Day at the Grand Canyon*. Photograph by Logan Meyer / Unsplash

#CASBS #ECOLOGY #HARPER & ROW #HISTORY OF SCIENCE #NONFICTION #SCIENCE #WOMEN

ON THE TABLE



The Death of Nature: Women, Ecology, and the Scientific Revolution

Carolyn Merchant

Harper & Row, 1980