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David M. Carroll, Swampwalker's Journal: A Wetlands Year (Boston: Houghton Mifflin Co., 1999).

B. 1943, Pennsylvania.

Let us start our journey with the swampwalker, David Carroll: "September 24, first full day of autumn, 4:47 p.m. Reed canary grass rustles momentarily on a slight dance of evening air that quickly fades away" (3). Our guide shows us that all the landscape is brimming with life in perennial renewal, "unless the landscape and the cycles of its water are disrupted" (3). Swampwalker's Journal is the culmination of 50 years of exploration of the "mystery of earth's landscape and life," and Carroll proposes the reader accompany him on his seasonal rounds to forge a deep, personal connection for the reader so that he or she might see that the "human-serving modern landscape" threatens the "spirit that moves with the water, the light, and the life of the marsh" (xii). The tour takes us through seven wetland landscapes: vernal pools, the marsh, the swamp, the shrub swamp, the pond, the floodplain, bogs and fens. We see the animals, mostly focusing on amphibians, which inhabit them, but also the flora and hydrology of these linked environments. The language and illustrations are as richly diverse as the landscapes. True understanding requires a deep immersion in the descriptive, often scientific language, from which readers surface when Carroll ends his observations with the turn of the seasons or abruptly reminds us that these life-sustaining places are being destroyed by the one species that can read about them. The book exhilarates the senses, especially sight and hearing ("ructious cacaphony of wood frogs"), and it profoundly challenges the conscience and consciousness of readers who bear witness to the complexity of life in a New Hampshire wetland.

David M. Carroll chronicled his life in Self-Portrait With Turtles (2004), a compelling memoir of his childhood fascination with turtles as a child in suburbanizing Connecticut. The autobiography tells the story of his growing commitment to recording the lives and environment of this and other wetland species in their habitats in the "wet-sneaker trilogy, Trout Reflections (1993) The Year of the Turtle (1996), and Swampwalker's Journal, which won the John Burroughs Medal in 2001. A graduate of the School of the Museum of Fine Arts in Boston and of Tufts University (1965), he taught art in high school, but the call of the turtle was strong, and the wetlands of southern New England were fast disappearing to backhoe and bulldozer, leading to his family's move to Warner, New Hampshire in 1969. He won an Environmental Merit Award from the U.S. Environmental Protection Agency in 1999. In 2006 he was the recipient of a MacArthur Fellowship. His artwork has won awards from the US Department of Agriculture and the International Society of Arboriculture, and it is frequently exhibited and reproduced.

For all his honors, David Carroll has given his life to turtles, recording the lives of hundreds of individuals and several species during the past 40 years in New Hampshire. Swampwalker's Journal demonstrates what is at stake, both physically and spiritually in preserving wetland biodiversity. The vernal pools, with its promise of annual renewal, is a fitting starting place for the book. The revelations are manifold about six indicator species, fairy shrimp, wood frogs, and spotted, Jefferson, blue-spotted, and marbled salamanders. "Vernal pool habitats hold a galaxy of small things that come to life the instant ice and snow turn back into water," and Carroll searches for emergence of salamanders at this moment. He finds "a glistening, impressively sturdy jet-black salamander over eight inches long, brilliantly decorated with two slightly staggered rows of stunning yellow spots" (16). The reality of the salamander is a revelation beyond what memory or mental image can contain, much as "reality outran apprehension" for Melville in Moby-Dick. Carroll asserts, then that human consciousness cannot exist or be renewed without contact with the real salamander whose existence is threatened—by "the ever-expanding, landscape-fragmenting grid of roadways and chemical wastelands of lawns and parking lots that has been superimposed upon their once-unhindered world. These seasonal migrations subject frogs and salamanders to enormous roadkill, and in some situations, chemical death" (17). Migration patterns are ancient, and amphibians have histories far predating humans, but now, by timing, they inhabit the same landscape with us. Carroll hears a wood frog crying out, for its foot is caught by a very small garter snake, prompting him to free it, a happy coincidence in timing, perhaps, for the frog. Carroll asks, "How could such a primordial crying-out ever imagine ears and a sensibility that might interpret it as an appeal for intervention. . . . And yet, in the face of an unfathomable unhearing, life cries out at times" (11). These scenes set a pattern for the book, as we learn our particular power and responsibility as a species that hears yet is unhearing.

There are mysteries aplenty in the vernal pool, including the Liebespiel, the "loveplay, a great communal congress of salamanders," the nest-guarding behavior of four-toed salamanders, fish who can't survive in disappearing pools, but the biggest mystery of all is David Carroll. A reproduced journal page about fairy shrimp reveals the careful sketching and field notes, with temperature, location, and time, but they also show his attentive, magical language: "ghostly, iridescent crustaceans . . . I watch several move through the waters with their singular grace, fluorescent in my lantern light, just as I have seen them appear in shafts of sunlight penetrating the wine-and-black waters of deeply shaded forest vernal pools . . . they hover and glide with rhythmic, wavelike pulses of their legs, ascending and descending, as if by magic, in the water column. Subtle neon creatures in the night, pale blue-white, tipped at time with bronze, a slash of red toward their conspicuously forked green-white tails; they have a quality of starlight about them" (26). This is the mystery of the artistic genius, but how he came to be in a wetland is a mystery between man and turtle. Ariadne, the star of The Year of the Turtle, appears on May 10, the fifteenth year of observation that has yet to produce a full picture of her behavior. This cameo appearance (as if Katherine Hepburn was just seen fleetingly surfacing from a swim in On Golden Pond), has the aura of Carroll's first encounter:

I was eight years old, wandering alone, when I entered the turtle's world. . . . My bonding with that wild animal in her wild place was immediate and deep. . . . The first spotted turtle was the Rosetta Stone for a language I had never known existed before, a language that cannot be spoken. The turtle became my translator of and guide into an ultimately unknowable world, the embodiment of an ineffable realm I seek to know, in the sense of being there without needing to fully understand it. I have come to realize in later life that the turtle was my liberator, as well, from an exclusive bondage to the human world, from a form of political imprisonment and a denial of spiritual and intellectual freedom that I was already coming to resist. (43-44)

This language is easily silenced by a backhoe draining a wetland. Amphibians metamorphose to survive changes in their landscape with the drying up of vernal pools, the "commonplace miracles" of these creatures that challenge humans with the question, "What, this is what you are, for your duration on earth? There will be no new form and life within your form and life, no new limbs or set of wings to take you to another world?" (62).

Carroll next visits the marsh by following muskrat trails into the rich life of an emergent wetland; in a trap he sets on such trails, he finds "eighty spotted salamanders in a single night, as well as surprising numbers of red-spotted newts, spring peepers, wood frogs, young green frogs and bullfrogs, little chain pickerel, giant water bugs, water scorpions, and predacious diving beetles" (75). Many bird species depend on the marsh, from the marsh hawk whose nest reveals a dozen little muskrat skulls, to the elusive Virginia rails and sora. Quiet observation occasionally yields a moment, as when a coyote passes unaware of Carroll's presence, of "the invisibility I desire." Observation yields insights into what most people don't see in a marsh ecosystem, such as an acre of cattails that may be composed of no more than three plants and the timing of redwing hatchings to coincide "with the metamorphosis and aerial emergence of mayflies, dragonflies, and damselflies" (85). Timing permits him to encounter a snapping turtle, a dragonfly, and a black bear on one outing in this shared place. The sense of time leads to an exploration of the hatching of painted turtles and their journey from nest to water. One hatchling wood turtle is a "veritable Odysseus," migrating from nest to stream for 26 days. "As I watched the hatchling wood turtle at the pivotal moment when he first entered the stream, a moment beyond which I could not follow, I felt that he had found his home at last. But of course he had been home all the while" (99). By invoking Odysseus, Carroll probes at the sense of homelessness that has impelled humans both to experience spiritual, psychological, and physical displacement and to transform, and destroy, natural resources in the effort to make a home.

Carroll uses this moment to question human efforts to preserve the "homes" of the turtle, wetlands. He writes about misguided policies to "save" symbolically resonant species or celebrated environments, rather than simply pulling back. "We are unwilling to step back from the marsh and allow its rightful margins to stand, to let its complexity and biodiversity, its very destiny, play out along ancient and ongoing pathways. Our overwhelming anthropocentrism does not allow the solution to take the correct form, of

limiting our own numbers and presence to create a balance in the biosphere. Instead, people encroach everywhere, in ever-greater numbers with ever-greater demands. We line the wetlands with houses, then ask what we can do to help the turtles. We are the problem, and under the terms of the day, we cannot be the solution.” He finds “wildlife management” a contradiction in terms, since a viable management plan has unfolded since life began (105). Carroll’s frustrations derive from personal experience and from the bigger picture provided by various governmental and private agencies.

The National Oceanic and Atmospheric Administration reports that 100 million acres of wetlands have been lost in the United States since the late 1700s, in the 1950s-70s, the loss was 500,000 acres per year later 1970s and early 1980s, 300,000 acres of coastal wetlands were lost a year, reduced after the Clean Water Act to 70-90,000 acres a year through the mid 1990s. It estimates New Hampshire had lost 9% or 20,000 acres of its wetlands. The U.S. Geological Survey provides maps of New Hampshire’s water resources (<http://water.usgs.gov/wid/html/nh.html>). In 1969, New Hampshire passed RSA 482:A: “no person shall excavate, remove, fill, dredge or construct in surface water, bank or wetland without a permit from the Department of Environmental Services.” In 2005, New Hampshire implemented new wetland mitigation rules which established ratios for mitigation for wetlands destroyed by development and allowed for upland buffers to complement plans to restore or create wetlands—just the kind of programs doomed to failure, in Carroll’s view. Urban and suburban development are now the leading causes of wetland loss, obvious to New Hampshire residents, like Carroll, who saw childhood wetland destruction in Pennsylvania, Connecticut, and then as a teacher in Massachusetts before moving to the state, where such development is rapidly absorbing wetlands across the southern tier. New Hampshire’s Changing Landscape (1999) predicted that by 2020, forest cover will decline to 80%, with 144,000 acres lost between 1993 and 2020. As of 1999, only 22.2% of the state’s high-quality wetlands were protected. These changes were put on display in Claiming the Land: Our Past, Our Future, Our Choice, a collaborative exhibition of the New Hampshire Historical Society and the Society for the Protection of New Hampshire Forests, was on view at the Museum of New Hampshire History from March 23, 2002, through March 28, 2004, and as a traveling exhibit today. The evidence can be found on the internet, or we can simply take a walk and look down at the land at our feet.

Carroll next leads us into deeper waters in the swamp to explore a landscape some find a stygian netherworld in the days of high heat in mid-June. It seems to some to be an ancient world or a world out of time, yet its ecology is a contemporary result of evolution. In this landscape, then, we become time-travelers: “The sun-glinted, gold-leafed eye of the frog at my feet seems to have been looking out on the earth since the dawn of life” (111). Like the frog, ferns have ancient roots, but their current form shares an environment with more recent flowering species. The timescape of the swamp reminds Carroll that humans are not separate from such evolution, but they have become estranged from it in the short period of the past few centuries. Given the threat of mass extinctions caused by this estrangement, he is grateful to be able to experience this red maple swamp now, an capability that makes him “the strangest thing in this swamp” (114). Carroll leads us in this chapter and subsequent ones into stranger landscapes and

concepts, such as the function of decay in trees to provide habitat for creatures from bacteria to bears. He hopes the swamp will keep its “wild heart,” a wildness that can only be approached through by learning the names of flora and fauna to gain a sense of the distinct features, functions, and natures of them in such a place.

In the shrub swamp, Carroll takes us to the very moment, March 28, 10:30 A.M., when the temperature of the first open water surpasses the biological zero of 41 degrees so life can teem anew. The emergence of renewed life is tenuous and fragile, as evidenced by a severely incapacitated spotted turtle exhausted and depleted upon emergence, and unlikely to survive the night’s cold, so into the pocket of the swamp vest it goes. Unlike Star Trek’s prime directive not to interfere with other species history, in the New Hampshire swamp galaxy Carroll occasionally intervenes to save a turtle and a snake who is rescued and put in “a hibernaculum in my refrigerator” (180). A sighting of the saved turtle later in the year provokes questions about turtles living in an eternal present, linked to ancestors 220 million years ago, while humans have little contact with world of their grandparents. The turtle encounter seems “preternatural. But if this place holds and I can continue to be here, such meetings, with all the revelations and questions they engender, are inevitable” (152). It is this contingency and serendipity upon which life and wisdom depend. The swamp may appear to be monotonous, but it is in fact exceptionally varied. The diversity is the result of its having been left alone. Carroll provides a hand-drawn map of Wading Bear Pond, and it may remind readers of such maps in Milne’s Winnie the Pooh or the books of Beatrix Potter. Such intimate detail evokes childhood wonder, but it also tells so much more about a place than a survey map or GIS system. His impulse is to stay close to and map the home places in the here and now, a familiarity that makes discoveries possible over time.

Carroll’s final two chapters treat landscapes most subject to human manipulation and destruction, the floodplain and bogs and fens. The floodplain chapter will resonate with New Hampshire readers after two years of 100-year floods, for Carroll points out that development has heightened flooding and flood damage. “Along many rivers and streams, flood damage to humans and wildlife is greatly exacerbated by runoff from acres of roofs and paved surfaces, and by human alteration and conversion of floodplain wetlands that disrupt their natural regimen and greatly reduce their flood-storage capacity” (215). His hand-drawn map of the floodplain sends a message about the complexity of the riparian corridor to planning boards and state Department of Environmental Services experts and DOT engineers who delude themselves about the feasibility of mitigations and offsets when building near streams and rivers and wetlands like the grotesque plan for widening the Route 93 corridor.

The hurried and harried human world contrasts with the slow processes of the floodplain. His wading stirs up soil colloids, tiny particles that may take 50 years to sink a foot in still water, he observes the pebbled pyramid nesting mounds of fallfish, and he discerns the complex botany of a riverbank. Considering the meanderings of a brook, he observes, “It appears to be some living form of mathematics, as changeable, even willful, as it is reckonable, involving measuring, depths, distances, flow rates, degrees of heat and cold; perhaps it is an organic geometry whose forms resist the pure triangle, circle, and

square. Water has its own way of mapping the earth, without reference to fixed points. And so many living things, moving on belly, feet, or wings, or traveling as seeds or broken bits of stem capable of rooting, follow its endless, shifting tracteries over the time and space of the earth” (207). This passage raises another unvoiced question about whether human forms of representation, be they mathematic, verbal, or visual, can represent the processes of nature. It’s these moments of slippage in a book that magnificently portrays chosen environments that Carroll indicates the illusion that is human consciousness. People have to shed their presumptions about being able to know and control nature and simply be present: “The wordless but infinitely evocative dialogue of living and nonliving elements of a wetland is always a vision, always a revelation, always worth my being here” (220).

The concluding chapter on bogs and fens tests the reader’s ability to see life in a seemingly alien, acidic, peat bog. In what looks like gunk to most of us, Carroll finds a magic Persian carpet of colorful plants: “blue-green drifts of bog rosemary, Labrador tea with white clusters of flowers at its branch tips, shrubby spreads of ocher-tinged leatherleaf, aromatic sweet gale, scattered sprays of tawny green sedges, and the rosy blushes, rich deep greens, and radiant yellowgreens of the various sphagnum mosses” (234). This is the carpet dug up to be spread on gardens, accounting for the vast loss of bogs in recent decades. Sphagnum mosses and peatlands are links to an ancient past, one of the isolated, silent places where Carroll comes closest to “an understanding of the completely nonhuman” (247). Bogs contain an extraordinary record of past times, from plants and pollen to the oldest known human DNA, and now radioactive fallout. The story of life on the planet, and humanity’s effects on it, are “written in the libraries of peat, inorganic soils, stone, water, and air . . . written in footprints and scraps and scratches on the earth’s solitary moon, on other planets and their moons, in bits of rubble drifting in outer space. Traces and markings, records and evidence, a history being written whether or not there will be a reader” (259). This concluding word, ‘reader’, challenges the person who holds the book in hand, who still has the opportunity to read what Carroll has written, to decipher the signs of the species on the land. An epilogue notes the shift of the “wet-sneaker trilogy” from celebration of wetlands to mourning for a lost landscape. The final book was delayed by Carroll’s efforts in an ultimately losing battle to preserve wetlands. His concluding jeremiad points to blindness about the consequences of global habitat loss: “We are, as a species, environmental racists” (262) whose population and pretenses will destroy the world and ourselves, “as if we possessed some divinely mandated dominion over all creation. As we will learn in time, none of this belongs to us” (262).

Swampwalker’s Journal takes its place in a literary and artistic tradition that originated with European exploration of America. Carroll’s exquisite watercolors and drawings (150 in all) hark back to John White’s watercolors for Sir Walter Raleigh’s expedition in 1585-86. Early artists and natural historians tried to capture this new world, at times evoking the example of Adam naming the creatures of Eden as acts of possession and dominion. This biblical ideology of sovereignty joined European scientific theory in the seventeenth and eighteenth century in the project of ordering nature for its utility. Linnaeus’s taxonomic nomenclatures to classify plants and the works of other scientists

led to questions about the antiquity and originality of America for Europeans and for Americans, such as Thomas Jefferson and Jedidiah Morse. Charles Willson Peale opened his American Museum (1786) to display his collection of Mastodon bones and other natural history curiosities. His Self Portrait shows him pulling back a curtain to reveal all within, as if the enlightened mind could prove a guide to a novus ordo seclorum in America. However, naturalists like his contemporary William Bartram found strangeness and estrangement in the American wilderness, the kind of personal transformation in nature that came to characterize Romanticism, in his swampland encounters with alligators, spiders, and exotic flora. Explorations of America's wilderness bespoke future possibilities, but they quickly were accompanied by warnings about the destruction of the wilderness, in James Fennimore Cooper's The Pioneers and in the paintings of the Hudson River and White Mountain School artists. Painter Thomas Cole wrote that God still speaks in the mountains of New Hampshire, even as his work helped spark a tourist boom there. By the time Thoreau sojourned at Walden Pond or traveled to the Maine woods, the wilderness was disappearing. Audubon's great project of illustrating bird species was accompanied by an awareness of the loss of habitats and species.

This early history of American nature writing celebrated the spiritual quality of nature, but there is a profound turn in sensibility after Darwin Origin of the Species (1859), in the works of naturalists such as Burroughs, Muir, and Thomas Starr King. King, a Unitarian minister whose The White Hills: Their Legend, Landscape and Poetry popularized White Mountains tourism and development, went west and became instrumental in efforts to preserve California's wild places. Preservation movements arose in New England in the late nineteenth century. Women often took a leading role. Celia Thaxter campaigned against the use of feathers of rare species of birds in women's hats and described the special environment of the Isles of Shoals. Women's clubs were instrumental in the preservation of the White Mountains under the Weeks Act of 1911. Such efforts were primarily human-centered, a combination of aesthetic, spiritual, and pragmatic arguments. The efforts to preserve the Adirondacks as "forever wild," as historian Philip Terrie has shown, required a fundamental shift in the understanding of hydrology—how an entire ecosystem contributed to the maintenance of a clean water supply for New York. As a result, a new scientific and aesthetic appreciation of wetlands and swamps, places seemingly useless, ugly, and potentially unhealthful, emerged. The artistic parallel to this scientific movement is the artistic journey of Martin Johnson Heade, who found poetry in the light and water of north-shore Massachusetts marshes, and then an exotic, continuing creation in Florida and South America.

As debates raged between Darwinists and the proponents of what is now-called intelligent design, such as Harvard's Louis Aggasiz, painters and naturalists turned to landscapes void of human presence. The work of Loren Eiseley popularized in the 20th century the implications of Darwinian understandings of ecological science, leading people to contemplate a world in which humans, too, were products of an environment, and might be temporary inhabitants of an earth they can destroy. In this context, Rachel Carson's The Sea Around Us and Silent Spring alarmed the public to the implications of environmental pollution. Nature writers of the 1950s and 1960s understood the need to integrate scientific study in their works, not only to understand what they saw, and the

dangers of pollution and chemical contamination, but also to communicate that vision to the public. A pioneer in this effort was New Hampshire's John Hay, in his studies of the unique and threatened landscape of Cape Cod, in The Great Beach (1964). His work was followed by other writers in other places, such as Aldo Leopold and John McPhee. Annie Dillard's Pilgrim at Tinker Creek turned attention from America's vast landscapes to small places where small ecological dramas and zen-like attentiveness to minute beings transformed American consciousness of nature by suggesting that human consciousness may arise from the environment, and certainly human understanding cannot exist without a humbling recognition of the need to shed self in the act of knowing.

The "Deep Ecology" movement of the 1970s argued that humans cannot claim any privilege over any other form of life on earth, and Wendell Berry put such insights into practice by trying to live in balanced, sustainable harmony with nature on his Kentucky farm. David Carroll's work, then, joins an important lineage of classic American nature writers, and his work marks an extraordinary advance that in time may be seen as significant as that of Thoreau. A chronicler of lost environments who understands that what is at stake is not sundry acres of wetlands, with their turtles, trout, frogs, and bugs, but human life itself, and any pretense of homo 'sapiens' to wisdom or morality. Carroll does this by bearing witness through persistent pilgrimage and observation in a landscape almost any New Hampshire dweller will find a few steps away. Through extraordinary language and illustration, Carroll comes as close as one can to representing the places observed to readers. The swampwalker seems to disappear before our very eyes, into the landscape and into the prose, emerging occasionally to remind readers of the phenomenal aspects of such witnessing—the serendipity and fatalism of time, the gift-visions of encounters with other sentient beings, the delight and empathy that seem instinctual to humans, and the sorrowful recognition that one species has the power to destroy the world.

Discussion Questions:

1. Can you recall your early close encounters with nature—pond, woods, wetland, back yard—and its creatures? What fascination did they hold for you, and why? Are these places still there, and if not, what happened to them?
2. Have you visited recently any of the seven wetland types Carroll explores? What did you see? Do you think Carroll is a good guide to such places? Why or why not?
3. Carroll challenges humans to reevaluate their distinction from other creatures, whether based on religious or scientific principles. He challenges people to leave nature alone, thus implying drastic changes in population growth and lifestyle. What do you make of his analysis of human society in its relationship to nature, and what do you think about the need for and the possibility of change?
4. Take a close look at one of Carroll's drawings? What do you see? What do they communicate that words can't? Visit his website to see color illustrations.

5. Select a passage that particularly appealed to you. What do you like about the writing? This book doesn't read like many non-fiction books—there seems to be no sustained story. Is it hard to read? Is the effort worth it?

Books for further reading:

David M. Carroll, Self-Portrait With Turtles: A Memoir (2005); Trout Reflections: A Natural History of the Trout and Its World (1993); The Year of the Turtle: A Natural History (1996). See <http://www.davidmcarroll.com/index.html>

Rachel Carson, The Sea Around Us (1951) and Silent Spring (1962).

Annie Dillard, Pilgrim at Tinker Creek: A Mystical Excursion Into the Natural World

John Hay, The Way to the Salt Marsh: A John Hay Reader

Carolyn Merchant, Radical Ecology: The Search for a Livable World

Bill Devall and George Sessions, Deep Ecology: Living As If Nature Mattered

Aldo Leopold, A Sand County Almanac

Ricard Ober, ed., At What Cost? Shaping The Land We Call New Hampshire: A Land Use History

Philip G. Terrie, Forever Wild: A Cultural History of Wilderness in the Adirondacks