

## History of Ecological Sciences, Part 39: Henry David Thoreau, Ecologist

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When Spencer Baird attempted to enroll Thoreau in the American Association for the Advancement of Science, Thoreau responded (19 December 1853) on the questionnaire that he was “especially attracted by such books of science as White’s *Selborne* and Humboldt’s *Aspects of Nature*” (Harding and Bode 1958:309–310). However, that interest was not enough to convince this individualist to join a national scientific organization. Although Thoreau was an unconventional naturalist, many scholars have studied his science in general and his ecology in particular. Thoreau scholar Laura Dassow Walls and I have critiqued that literature (Egerton and Walls 1997). Audubon may be America’s most popular naturalist (Egerton 2011:70–76), but there is more written about Thoreau.

Henry David Thoreau (1817–1862) was born in Concord, Massachusetts, a small town on the Concord River that remained his lifelong home (Figs. 1–3).

Thoreau’s mother, Cynthia Dunbar Thoreau, a former teacher, was fond of nature and instilled that fondness in her four children. She was a founder of the Concord Female Anti-Slavery Society in 1837. Henry acquired his outlook on life at home. Looking back, on 16 July 1851, Thoreau recalled a happy childhood (1906*d*, II:306–307)

*I think that no experiences which I have today comes up to, or is comparable with, the experiences of my boyhood... My life was ecstasy... This earth was the most glorious musical instrument, and I was audience to its strains.*

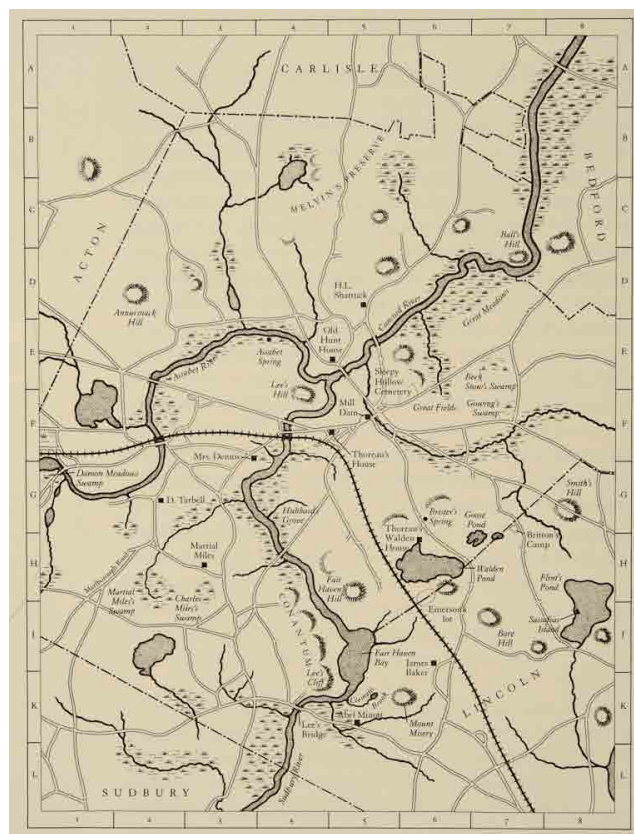


Fig. 1. Map of Concord, Massachusetts, showing Walden Pond south of Concord (Thoreau 1993:18). This is a slightly corrected and simplified version of Herbert W. Gleason’s map for the 1906 edition of Thoreau’s *Writings*. Gleason’s map is reproduced in the reprint of Thoreau’s *Journal* (1962, II:1753–1757) and by Stowell (1970:32).

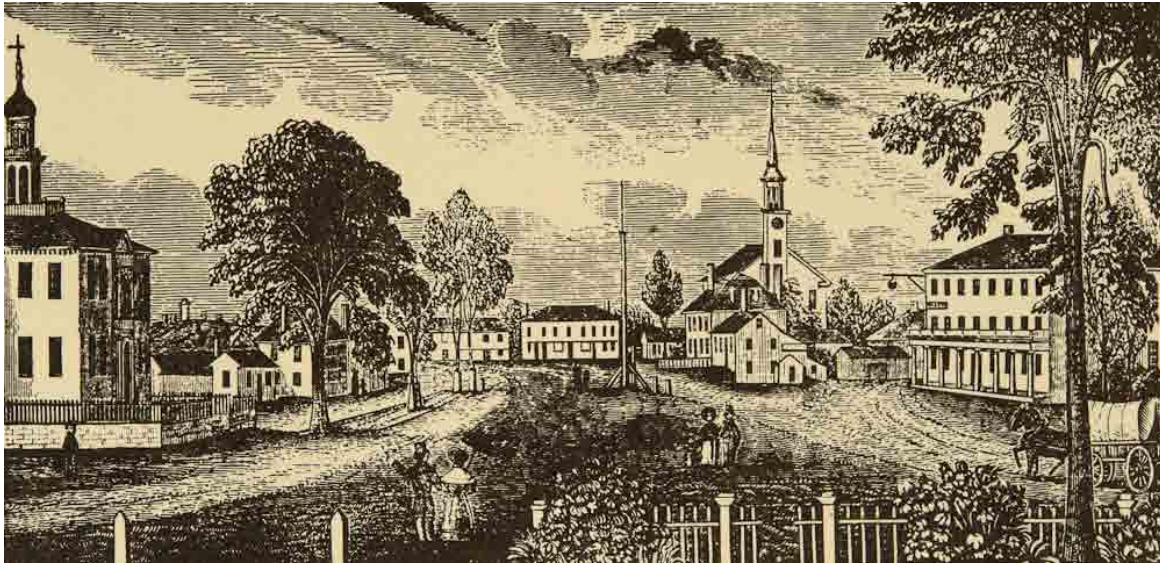


Fig. 2. Center of Concord, showing court house, Unitarian Church, and a hotel. Engraved by J. W. Barber, 1841.

Not entirely ecstasy; as a child he was afraid of thunderstorms. Henry, at age 11 or 12, gave a clue to where he was headed when he wrote an essay, “The Seasons,” with one paragraph per season (Thoreau 1975:3). At Harvard, one of his few friends was the librarian and entomologist Thaddeus William Harris (1795–1856), whose course in natural history was one of two science courses Thoreau took (Wade 1926, Mallis 1971:25–33, Elliott 2008). In 1836 Thoreau read William Howitt’s *The Book of the Seasons; or the Calendar of Nature* (1831), which strengthened his interest in what we call phenology (Sattelmeyer 1988:10). Howitt’s book inspired an essay, first published in 1951, in which Thoreau quoted approvingly Howitt’s phenological goals, followed by Thoreau’s own paragraphs for every month of the year (Thoreau 1975:26–36).

Thoreau initiated his role as social critic in several essays he wrote for classes at Harvard (1975:4–26), where Professor Edward Tyrell Channing taught him to write (Richardson 1986:13). On 3 April 1837 Thoreau checked out *Nature* (1836) from the Harvard library. This anonymous volume, by Ralph Waldo Emerson (1803–1882), was the founding work of American transcendentalism (Emerson 1990:2–36, Walls 2003). “The book revolutionized Thoreau’s intellectual life and provided him with a worldview that he expanded in distinctive ways but never forsook” (Dean 2007:77). Perhaps the comment most influential on Thoreau is in *Nature*’s first paragraph: “Why should not we also have an original relation to the universe?” Thoreau publicly assumed the role of social critic in the commencement address he delivered to his graduating class on 30 August 1837, entitled “The Commercial Spirit of Modern Times, Considered in Its Influence on the Political, Moral and Literary Character of a Nation.” Since New England’s economy was mainly built on commerce, and his father was a sometime businessman, it seems surprising that he complained that the commercial spirit sustains a “blind and unmanly love of



wealth,” and that the remedy was for his classmates to be “true to their natures,” and if so, “we shall hear no more of the commercial spirit” (Thoreau 1975:115–118). His father was too easygoing to prosper at making and selling pencils, and so was not a good testimonial for the rewards of commerce. However, with Henry’s post-graduate assistance they made the best pencils in America until imported German pencils in 1849 diverted them to making plumbago for electrotyping (Sullivan 2009:140–141). Thoreau took over the business when his father died in 1859 (Laura Dassow Walls, *personal communication*).

On 31 August, Emerson also gave a Harvard commencement address, “American Scholar” (1990:32–52), which was an inspiring call for Americans to create their own literature and culture, and not just trail along after Europe. Transcendentalism was a kind of natural theology, in which one studied nature both to understand and to relate to God. For Emerson, “Nature is the symbol of spirit.” To him, nature in general was very important, but he never descended to the particulars. Emerson was a philosopher–poet. However, natural theology had inspired the science of John Ray (Egerton 2005), and Emerson’s transcendentalism inspired Thoreau to become both philosopher–poet and naturalist. They became friends in the fall of 1837, a friendship that lasted the rest of Thoreau’s life. He was for several years Emerson’s disciple. Emerson opened his library to Thoreau, and on two occasions (1841–1842, 1847–1848) Thoreau lived with the Emersons for more than a year. Emerson was largely responsible for Thoreau becoming a writer. But in the 1840s, Thoreau broke free, around the same time that Emerson began to run out of new ideas; and by the late 1840s Emerson was absorbing more ideas from Thoreau than the reverse (Harding 1965:298–304). For Emerson, nature was symbolically important, but he thought Thoreau wasted time studying the details (Sattelmeyer 1995:35).

Thoreau began keeping a journal on 22 October 1837, in which he wrote almost daily for the rest of his life, almost two million words, or 7000 printed pages. One biographer claimed that “It was his major literary accomplishment,” though elsewhere he stated that “*Walden* is, without question, Thoreau’s masterpiece” (Harding 1965:71, 333). The journal served as a resource for later publications and/or lectures, but it also contained essays that were never published elsewhere, which is why it is seen as a literary work itself (Peck 1990, x:39, Neufeldt 1995). Walls (1999) has compiled an anthology, in chronological order, of observations on science from the *Journal*. In June 1838 Thoreau opened a school in Concord, and his older brother, John, joined him in teaching there. One of their students was Louisa May Alcott, who had a crush on Henry (Cheever 2006:17–19). Henry taught Latin, Greek,

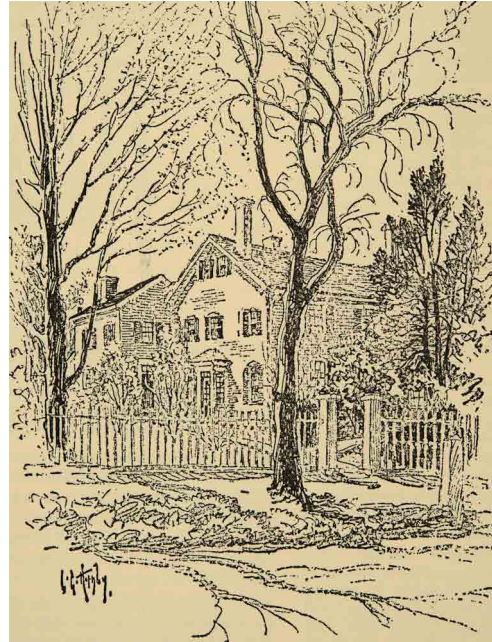


Fig. 3. Thoreau house on Main Street. The Thoreaus lived in several houses; this was the last one Henry lived in, 1850–1862 (Harding 1962:110). A photograph of it is in Harding 1965: facing 365 and in Berger 1996a:44.

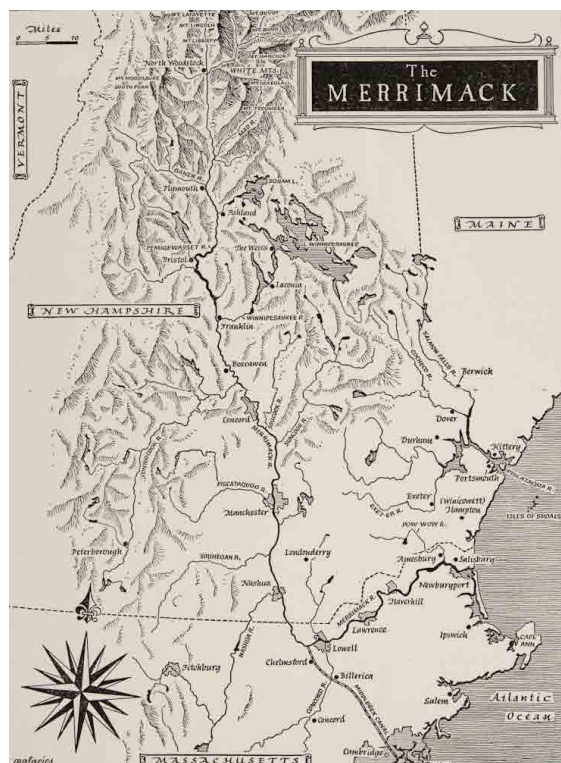


Fig. 4. Map, from the Concord River and Middlesex Canal, Massachusetts, in the south, almost to Mount Washington, New Hampshire (just north of the top of the map, midway between the Merrimack River and the New Hampshire–Maine boundary). Holden 1958:2–3.

French, mathematics, natural philosophy (physics and chemistry), and natural history. In his natural history course, he took his students on field trips, and he told them he knew the flowers of Concord well enough to tell the month of the year by seeing which flowers were in bloom (Harding 1965:82). Once he shot a Slate-colored Junco so the students could examine it, and he brought back from one trip three live frogs. The school lasted almost three years, until 1 April 1841, when John's tuberculosis forced him to stop teaching (Harding 1965:87–88). Alcott included memories of their school in her novel, *Moods* (1865).

In spring 1839 the Thoreau brothers built a boat 15 feet long, with two sets of oars, two masts

and sails, and wheels to roll it around waterfalls or dams. On 31 August they rowed down the Concord River, turned north on the Middlesex Canal, and then up the Merrimack River (Fig. 4). This was the first of many New England trips that Thoreau took and later described in print. His specialty was philosophical natural history travelogues, which also included local history. The trip took two weeks, one on the rivers and one climbing through Franconia Notch, Crawford Notch, and to the top of Mount Washington, New Hampshire, 6288 feet elevation. One commentator judged Thoreau at this time was in his golden age, “his sensitivity was exquisite and rewarding” (Paul 1958:193). Thoreau's first book, *A Week on the Concord and Merrimack Rivers* (1849) was a memorial to brother John, who had died of lockjaw on 11 January 1842 (Lebeaux 1977:198–199, 1984:1–5, Peck 1990:8–11). It includes essays which some critics have viewed as unrelated, though some recent critics disagree (Adams and Ross 1988:35–50, 76–103, Johnson 1995). The edition I own omits those essays (Thoreau 1954).

The book was well reviewed but did not sell well. Thoreau had 1000 copies printed and sold about 300. *A Week on the Concord and Merrimack Rivers* has fine nature writing. Here is his description of plants seen along the bank as they left Concord (1906a:18, 1954:20, 22)

*The narrow-leaved willow (Salix Purshiana) lay along the surface of the water in masses of light green foliage, interspersed with the large balls of the button-bush. The small rose-colored polygonum raised its head proudly above the water on either hand, and flowering at this season and in those localities, in front of dense fields of the white species which skirted the sides of the stream, its little streak of red looked very rare and precious. The pure white blossoms of the arrow-head stood in the shallower parts, and a few cardinals on the margin still proudly surveyed themselves reflected in the water, though the*

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*latter, as well as the pickerel-weed, was not nearly out of blossom. The snake-head (Chelone glabra) grew close to the above, while a kind of coreopsis, turning its brazen face to the sun, full and rank, and a tall, dull red flower (Eupatorium purpureum,) or trumpet-weed) formed the rear rank of the fluvial array.*

And this is only half of the paragraph. A botanist could enjoy this, as could an ichthyologist or a fisherman enjoy his discourse on the 10 species of fish he described in the Concord River (1906a:24–32, 1954:28–41), but he had not yet persuaded many general readers to come along for this ride. Although Thoreau turned to other subjects, his interest in the rivers around Concord persisted (McGregor 1997:121–166).

On 4 September 1841 Thoreau expressed in his *Journal* the idea for a poem, “Concord,” which was actually a list of his interests in nature (Thoreau 1981–2008, I:330)

*For argument I should have the River—the Woods—the Ponds—the Hills—the Fields—the Swamps and Meadows—the Streets and Buildings—and the Villagers. Then Morning—Noon—and Evening—Spring Summer—Autumn and Winter—Night—Indian Summer—and the Mountains in the Horizon.*

Excepting streets, buildings, and villagers, these were all themes of his subsequent writings. Plants and animals are not named, but were implicit in the environments listed.

In 1840 the transcendentalists decided to establish their own journal, *The Dial*, which lasted from July 1840 until April 1844. In 1842, Emerson became editor, and he received for review four volumes of the new Commonwealth of Massachusetts natural history surveys. He gave them to Thoreau to review. What passes for Thoreau’s essay review runs to 29 pages in the edition I own, but it is not a review that would have pleased any of the authors. His direct comments on these volumes cover less than a page (Thoreau 1980:28)

*The State wanted complete catalogues of its natural riches, with such additional facts merely as would be directly useful.*

*The reports on Fishes, Reptiles, Insects, and Invertebrate Animals, however, indicate labor and research and have a value independent of the object of the legislature.*

*Those on Herbaceous Plants and Birds cannot be of much value, as long as Bigelow [on plants] and Nuttall [on birds] are accessible. They serve but to indicate, with more or less exactness, what species are found in the State. We detect several errors ourselves, and a more practiced eye would no doubt expand the list.*

*The Quadrupeds deserve a more final and instructive report than they have obtained.*

*These volumes deal much in measurements and minute descriptions, not interesting to the general reader; with only here and there a colored sentence to allure him, like those plants growing in the*



*dark forests, which bear only leaves without blossoms.*

The rest of the essay consists of musings and observations from his *Journal* (McGregor 1997:210) that he related to what he read in these volumes. His comments on Harris' insect volume were positive (1980:5–6), but in his *Journal* (1906, XII:171) he complained that Harris only reported “noxious” insects (Wolf 1974:149). The interest of Thoreau's “Natural History of Massachusetts” for us is twofold: it shows that he was already using identification manuals for plants and animals and was acquiring four further reference works on them, and it shows an early, rather condescending attitude toward scientific natural history works, which changed as his own first-hand knowledge deepened. Since Thoreau did not even mention the names of the authors of these reports or make clear what was in each volume, it seems helpful to list the authors and titles (Meisel 1924–29:II, 648–649)

David H. Storer and William B. O. Peabody, *Report on Fishes, Reptiles and Birds of Massachusetts* (Boston, 1839): ichthyology and herpetology by Storer, pages 1–253; ornithology by Peabody, pages 255–404.

Chester Dewey and Ebenezer Emmons, *Reports on the Herbaceous Plants and on the Quadrupeds of Massachusetts* (Cambridge, 1840): herbaceous plants by Dewey, 8 + 277 + 86 pages; quadrupeds by Emmons, 5 + 4-86 pages.

Thaddeus W. Harris, *Report on the Insects of Massachusetts Injurious to Vegetation* (Cambridge, 1841, 8 + 459 pages).

Augustus A. Gould, *Report on the Invertebrata of Massachusetts, comprising the Mollusca, Crustacea, Annelida, and Radiata* (Cambridge, 1841, 13 + 373 pages, 15 plates).

A fifth volume, on trees and shrubs, by George B. Emerson, appeared in 1846, too late to be included among those Thoreau reviewed. However, he obtained a copy of it and frequently consulted it, as his *Journal* citations attest (Thoreau 1906d:index, Harding 1957:47, Buell 1995b:173–174).

In 1844, Emerson bought property on the shore of Walden Pond, 1.5 miles south of Concord, and in 1845 he gave Thoreau permission to cut some pines to build himself a cabin there. Thoreau also bought boards from a shanty for railroad workers (after the railroad was built) for his cabin. Staying there enabled Thoreau to live closer to nature than he did in Concord; he lived there from 4 July 1845 to 6 September 1847. Living partly withdrawn from society—he went home often, went to Maine, people went there to see him, and he spent a night in jail for refusing to pay a poll tax to a government that supported slavery and a war against Mexico. Partial seclusion gave him the opportunity to make substantial progress on his two books, *A Week on the Concord and Merrimack Rivers* (1849) and *Walden* (1854). One of his visitors was Louisa May Alcott, who enjoyed boating and hiking with him as he explained nature to her (Cheever 2006:114). *Walden* had a New York publisher, with sales no better than his previous book, yet one recent critic judged it “one of the most magnificent books in English” (Cheever 2006:131).

*Walden* is partly a natural history of an area and partly a philosophical discourse on living an independent life (Schneider 1995, Newman 2005:133–160). An independent life meant growing his own food. He planted 2.5 acres in beans, potatoes, corn, peas, and turnips, and what he did not eat he sold so that he could buy things he did not grow.



Fig. 5. Thoreau's cabin at Walden Pond, with Thoreau in his boat. By May Alcott. Canby 1939:218.

Thoreau seems to have been first to publish, in *Walden*, a detailed natural history of a lake (Buell 1995:475). Probably many more readers have read the book for its philosophy than for its natural history, but since there is philosophy tucked into the five chapters on natural history (out of fifteen chapters), those chapters probably were read by readers who were not primarily interested in natural history, as well as being read by naturalists. A prominent limnologist wrote an essay on Thoreau as limnologist, primarily focused on *Walden* (Deevey 1942), and he considered Thoreau the first American limnologist. Deevey wrote for scientific readers; Donald Quick (1972) and Kristina Joyce (1993) have written nontechnical accounts for Thoreau scholars. In 1840, while still teaching school, Thoreau had bought a surveying instrument to show students a practical application of mathematics, and after his school closed, surveying became his favored means of earning a living. At Walden Pond he extended this practice to the lake itself (Walls 1995:109–112), and he drew a map of it based upon precise measurements, including depth measurements along several straight lines, using compass and chain.

He measured depths in early winter 1846 by chopping holes through the ice and dropping a 1.5-pound weight and line into the hole until it hit bottom (Thoreau 1973:287–288). He found this gave greater accuracy than measuring from a boat in summer. He made over 100 measurements, 75 of which are indicated on his map. Deevey re-measured Walden Pond and was astonished at how close to modern values Thoreau's data are. Thoreau's data then led him to ask other questions, a hallmark of the scientific method (Botkin 2001:8–9). Subsequently, he also drew other maps (see below).

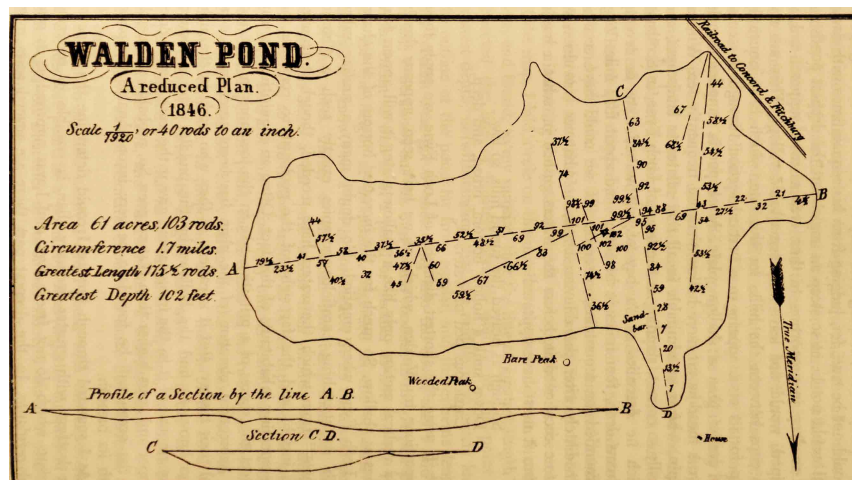


Fig. 6. Walden Pond, 0.75 miles long and 0.5 miles wide. Map by Thoreau 1854: facing 307, 1973:286, 2004:278. His cabin was at point D. Against tradition, he drew the map with north at the bottom. If he had stood in front of his cabin and drawn the outline of the lake as seen, it would have been on the page as this is. Compare to Walden Pond in Fig. 1 (right of center).

Thoreau noted that Walden Pond was “without any visible inlet or outlet except by the clouds and evaporation” (1973:175, 2004:170). This unusual situation was due to it being a glacial lake—unknown to Thoreau, as ice age theory was still in its infancy (McGregor 1997:11)—and that much of its water comes from groundwater seeping in from the east and out to the west (Deevey 1942:6, Barosh 1993). Thoreau suspected the latter situation, because the lake level fluctuated slowly over the years. Since the rise did not seem closely correlated with rain or snowfall, he concluded that “this overflow must be referred to causes which affect the deep springs” (1973:181, 2004:175). He also noted that Flint’s Pond, east of Walden Pond, and White Pond, west of Fair Haven Bay (not labeled in Fig. 1), rose and fell in a sequence similar to Walden Pond. Flint’s Pond was at a higher elevation than Walden Pond, and they seemed connected by a chain of small ponds, as though in some other geological period they were connected by a river, and there was a similar chain of small ponds between Walden and the Concord River, at a lower elevation (1973:194, 2004:187). Walden and White ponds were similar in having very clear water, which enabled one to see much of the bottom, but they also had little vegetation and supported many fewer fish than the shallower and less clear Flint’s Pond.

Thoreau recorded the nights in late December in which it froze over, for 1845, 1846, 1849, 1850, 1852 (not until 5 January), and 1853 (Thoreau 1973:249, 2004:239). Flint’s and other shallow ponds froze 10 days sooner than Walden Pond. On 13 March, Bluebirds, Song Sparrows, and Red-winged Blackbirds had arrived from the south, yet the ice was still a foot thick. He also recorded the dates on



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which Walden Pond was completely open, in late March or early April, for 1845, 1846, 1847, 1851, 1852, and 1854 (Thoreau 1973:303, 2004:292). The ice broke up on the shallower Flint's Pond earlier than at Walden.

Walden's only bottom vegetation was a green moss that came up with anchors retrieved from the bottom, which Deevey (1942:5) identified as *Fontinalis*. Organic sediment found in only the deepest parts of Walden Pond Thoreau correctly attributed to leaves blown into the lake in the fall.

Besides the moss, the only aquatic plants in Walden Pond were a few small heart-leaves, potamogetons, and water-targets (= water-shield *Brasenia peltata*) (Thoreau 1973:178–179, 2004:173). At one point, Thoreau says that whenever the water level rose a few feet, it killed the shrubs and trees that had sprung up along the edges since the last rise: pitch-pines, birches, alders, and aspens. However, on the next page he explained that when water rose around alders, willows, and maples, they sent out a mass of roots three or four feet from the ground, “in an effort to maintain themselves; and I have known the high-blueberry bushes about the shore, which commonly produce no fruit, bear an abundant crop under these circumstances” (Thoreau 1973:182, 2004:176). Laura Dassow Walls photographed such a mass of roots directly from stems in the Walden Pond flood of summer 2010 (L. D. Walls, *personal communication*). White Pond had equally clear water, but contained other aquatic vascular plants: white lily, common sweet flag, and blue flag (Thoreau 1973:199, 2004:192).

Although the clear water of Walden Pond did not support an abundance of life, it did have the advantage of allowing one to see its fish. One could see schools of tiny perch and shiners, only about an inch long, the former distinguished by transverse bars (Thoreau 1973:177–178, 2004:172). Other fish were chivins, breams, pouts, eels, and three kinds of pickerels, including *reticulatus* and *guttatus*. Perch and pout grew to two pounds, eels to four, and pickerels to seven or eight pounds (Thoreau 1973:183–184, 2004:178). Most lake shore had smooth rocks, but there were two sandy beaches, and near the sandy east beach at 8 or 10 feet deep were circular heaps of small stones about 6 feet in diameter and about a foot high, like those in rivers made by suckers or lampreys; since neither species was in the lake, perhaps chivin gathered the stones. Walden Pond's residents included frogs, tortoises, mud turtles (snapping turtles), mussels, muskrats, and mink. In spring and fall, ducks and geese passed through, and summer residents included white-bellied swallows *Hirundo bicolor* (Tree Swallow, *Tachycineta bicolor*), kingfishers, and peewees *Totanus macularius* (Spotted Sandpiper, *Actitis macularia*), and an



Fig. 7. Thoreau in front of his cabin, based upon his description of it in *Walden*. *Walden Ever Wild* brochure.

occasional fish hawk (osprey) and loon (Cruickshank 1964). An old timer remembered that 60 years earlier there had been more waterfowl and many eagles. Aquatic insects did not attract much notice from Thoreau. He only mentioned the water-bug *Gyrinus* and skaters, both of which disappeared in October (Thoreau 1973:185–190, 2004:180–184). There were also raccoons and a four-foot-long otter, seldom seen (Thoreau 1973:227, 2004:218).

Up near his cabin, in the woods, were other mammals and birds. Wild mice (*Mus leucopus*)—not to be confused with the domestic mice in Concord houses—built a nest under his cabin before he had finished building it and came out at lunchtime to pick up crumbs, and finally became tame enough to sit in his hand and eat a piece of cheese. A phoebe built a nest in his shed, and a robin built its nest in a pine next to his cabin. A partridge *Tetrao umbellus* (= Ruffed Grouse, *Bonasa umbellus*) appeared in June and (Thoreau 1973:226, 2004:217)

*led her brood past my windows, from the woods in the rear to the front of my house, clucking and calling to them like a hen, and in all her behavior proving herself the hen of the woods. The young suddenly disperse on your approach, at a signal from the mother, as if a whirlwind had swept them away, and they so exactly resemble the dried leaves and twigs that many a traveler has placed his foot in the midst of a brood, and heard the whir of the old bird as she flew off, and her anxious calls and mewing, or seen her trail her wings to attract his attention, without suspecting their neighborhood. The parent will sometimes roll and spin round before you in such a dishabille, that you cannot, for a few moments, detect what kind of creature it is. The young squat still and flat, often running their heads under a leaf, and mind only their mother's directions given from a distance, nor will your approach make them run again and betray themselves. You may even tread on them, or have your eyes on them for a minute, without discovering them. I have held them in my open hand at such a time, and still their only care, obedient to their mother and their instinct, was to squat there without fear or trembling.*

Thoreau got his water from a spring, and there he saw a woodcock, who brought her brood to the damp mud, seeking worms. Turtle (mourning) doves sat on white pine limbs nearby.

Thoreau was fascinated by a battle between smaller red and larger black ants which snipped off the legs and antennae of their opponents and fought to the death (Thoreau 1973:228–232, 2004:219–222). On this phenomenon he consulted “Kirby and Spence,” meaning *An Introduction to Entomology*, by William Kirby and William Spence (two volumes, 1815–1826), without specifying which edition. Perhaps he used the sixth edition (1843); if so, he found the passage in Volume 2, pages 58–61. (After publishing *Walden*, Thoreau obtained Volume 1 of an 1856 edition [Harding 1957:64–65].) The earliest descriptions of such battles Kirby and Spence cited was by Nicholas Pistoriensis, during the pontificate of Eugenius IV (1431–1447); the second by Olaus Magnus, during the reign of Christian II of Sweden (1520–23); and so Thoreau dated his observations to “the Presidency of Polk, five years before the passage of Webster’s Fugitive-Slave Bill.” This was one of 51 discussions of insects in *Walden* and of 2512 discussions in Thoreau’s writings published by 1926 (Wade 1927:2). He tried unsuccessfully to identify two species of glowworms given to him (Dedmond 1994).

His cabin was “in the midst of a young forest of pitch pines and hickories” near an older forest. There

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were flowers and shrubs all around (1973:113–114).

*In my front yard grew the strawberry, blackberry, and life-everlasting, johnswort and golden-rod, shrub-oaks and sand-cherry, blueberry and ground-nut. Near the end of May, the sand-cherry, Cerasus pumila, adorned the sides of the path with its delicate flowers arranged in umbels cylindrically about its short stems, which in the fall, weighed down with good sized and handsome cherries, fell over in wreaths like rays on every side.... summach, Rhus glabra, grew luxuriantly about the house...*

In October he collected wild apples and chestnuts. He competed for the latter with squirrels and jays. Once while digging for worms for fish bait, he saw ground-nuts (*Apios tuberosa*) and commented: “Cultivation has well nigh exterminated it” (1973:239, 2004:230) by which he perhaps meant that where it grew was being planted with domesticated plants.

In winter, a red squirrel, *Sciurus Hudsonius*, woke Thoreau at dawn, “coursing over the roof and up and down the sides of the house” (Thoreau 1973:273, 2004:264). He amused himself by throwing out of his door a half-bushel of corn ears to watch his neighbors feed. Red squirrels came and went all day, and some became tame enough to occasionally step on his shoe. At twilight rabbits came to feed. A jay tried to swallow a kernel too big for its throat; at great labor disgorged it and pounded it with its bill. Chickadees picked up crumbs squirrels dropped and hammered them into pieces they could swallow. In winter, mice gnawed bark of pitch pines, 1 to 4 inches in diameter, and even if completely girdled, the pines lived and grew a foot during the following summer. However, they died after a second winter. Thoreau saw this as nature’s way to thin trees growing too densely (Thoreau 1973:280, 2004:270-271). Partridges and rabbits lived in the forest, but if trees were cut, sprouts and bushes sprang up and afforded concealment, and they became more numerous than before. Walden Pond froze 1 to 1.5 feet thick, men came out on the ice to fish for pickerel and perch. They used worms as bait, which prompted Thoreau to comment on a food chain (Thoreau 1973:284, 2004:275)

*The perch swallows the grub-worm, the pickerel swallows the perch, and the fisherman swallows the pickerel; and so the chinks in the scale of being are filled.*

Yet, if grub-worms the perch swallowed were bait, fisherman ate the perch, bypassing pickerel.



Fig. 8. Henry David Thoreau, scholar and public speaker, by Samuel Worcester Rowse, 1854.





Fig. 9. Map of Thoreau's travels in Maine, 1846, 1853, and 1857. Huber 1981:2.

When Thoreau left Walden on 6 September 1847, he went to live with Mrs. Emerson and children while Ralph went on a lecture tour of Britain. When the tour ended, Thoreau moved back to his own home. For the rest of his life he traveled frequently in New England.

In 1849, after leaving Walden Pond but before publishing *Walden*, Thoreau began reading Humboldt's *Views of Nature*, *Personal Narrative of Travels*, and *Cosmos*, which strongly influenced his new Humboldtian outlook and scientific method (Walls 2009:262–264). The passage quoted above from *A Week on the Concord and Merrimack Rivers* shows Thoreau had a serious interest in botany by 1849, and by mid-November 1850 he began keeping records of his field observations on seasonal changes (Buell 1995:130–131). There was already a significant literature on the subject (Egerton 1976:330–331). In December 1850 he was elected a member of the Boston Society of Natural History and could borrow books from its substantial library. In spring 1851, the Smithsonian Institution sent out to naturalists an appeal, “Registry of Periodical Phenomena,” to record observations on “periodical

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phenomena of Animal and Vegetable life” and send them to the Institution (Dean 2000:x–xi). It had a checklist of 127 plants by which one could mark flowering dates. Here was scientific reinforcement of his persistent interest. Dean (2000:xii) suggests Thoreau apparently intended to write a history of periodical phenomena of the Concord region and then synthesize it into an “archetypal year,” as he had done in *Walden*. He organized eight years of his botanical notes into detailed monthly charts on first day of flowering for several hundreds of species (Egerton 1976:332–333, Peck 1990:163–166). Using Ray Angelo’s *Botanical Index to the Journal of Henry David Thoreau* (1984), Richard Primack and Abe Miller-Rushing have contrasted Thoreau’s phenology data with current phenological data for Concord to detect the effects of global warming (Nijhuis 2007).

Thoreau made several journeys into Maine and to Cape Cod, wrote essays, and lectured on these experiences. The essays were collected posthumously into *The Maine Woods* (1864) and *Cape Cod* (1865). Both are travelogues with natural history insertions. A Pennsylvania plant ecologist, John W. Harshberger (1869–1929), climbed Katahdin on 1 August 1900 (Burgess 1996:52), and when reporting his observations he quoted Thoreau appreciatively (1902:24). J. J. Moldenhauer (1995) critiques *Maine Woods* and P. F. Gura critiques *Cape Cod* (1995). In *The Wildest Country: a Guide to Thoreau’s Maine* (1981), Parker Huber provides a map with dates indicating where Thoreau went on his explorations in 1846, 1853, and 1857. Huber also provides 10 larger-scale maps, and chapters, describing what Thoreau saw in each of those regions.

The first part of Thoreau’s book had been a magazine article, “Ktaadn and the Maine Woods” (1848). Part of that account is about climbing Mount Katahdin (as it is now spelled; for its location, see 1846 arrow inside Baxter State Park in Fig. 9). He started out with several companions, but he was the only one who climbed near the top. As he began his descent, he was awe-struck by the vast wilderness stretched out before him (Thoreau 1906b:88, 1972:80)

*What is most striking in the Maine wilderness is the continuousness of the forest, with fewer open intervals or glades than you had imagined. Except the few burnt lands, the narrow intervals on the rivers, the bare tops of the high mountains, and the lakes and streams, the forest is uninterrupted. It is even more grim and wild than you had anticipated, a damp and intricate wilderness...*

Maine was not a larger version of the semi-domesticated woods around Walden Pond. He summarized the mental picture of it that he took home (1906, 89, 1972:80–81)

*It is a country full of evergreen trees, of mossy silver birches and watery maples, the ground dotted with insipid, small, red berries, and strewn with damp and moss-grown rocks—a country diversified with innumerable lakes and rapid streams, peopled with trout and various species of leucisci, with salmon, shad, and pickerel, and other fishes; the forest resounding at rare intervals with the note of the chickadee, the blue-jay, and the woodpecker, the scream of the fish-hawk and the eagle, the laugh of the loon, and the whistle of ducks along the solitary streams; at night, with the hooting of owls and howling of wolves; in summer, swarming with myriads of black flies and mosquitoes, more formidable than wolves to the white man. Such is the home of the moose, the bear, the caribou, the wolf, the beaver, and the Indian.*

Appendixes list plants and birds seen by Thoreau in Maine (1906b:329–349, 1972:298–318).

A recent illustrated edition of *Cape Cod* (Thoreau 2008:3) includes a photographic copy of a rather detailed map of the Cape that Thoreau either drew or copied. His surveying background gave him the skills to draw it, if motivated, but he had a strong interest in maps and did copy maps from published works (Hessler 2010–2011). *Cape Cod* has brief discussions of kelp, jellyfish, sea gulls, and clams that are hardly more profound than what any curious tourist might write. He recorded a story a native told him about taking young domestic ducks for a swim and finding that one of them got stuck, with a foot caught in a quahog's shell. The man dug up the quahog to free his duck, then had the quahog for dinner (1906c:86). Realizing that the marine animals he found on the beach were an inadequate sample of what was living along the shore, Thoreau supplemented his account with information from Gould's report on the invertebrates of Massachusetts, which he had reviewed in 1842, including the fact that the Massachusetts coast had 197 species of mollusks, of which 83 live only north of the Cape and 50 live only south of it (1906c:110–111). Thoreau did not indicate what references he may have used to identify the nine species of plants that he listed with both common and scientific names (1906c:111), but possibly they included Chester Dewey's 1840 report on herbaceous plants. When he got beyond an inventory of the species at the beach, and focused on the area between forest and beach, his account is more interesting to modern ecologists (1906c:134–135)



Fig. 10. Thoreau in 1854 as traveler, by Daniel Ricketson. Harding 1962:109.

*The highest and sandiest portion next the Atlantic was thinly covered with beach-grass and indigo-weed. Next to this the surface of the upland generally consisted of white sand and gravel, like coarse salt, through which a scanty vegetation found its way up. It will give an ornithologist some idea of its barrenness if I mention that the next June, the month of grass, I found a night-hawk's eggs there, and that almost any square rod thereabouts, taken at random, would be an eligible site for such a deposit. The killdeer-plover, which loves a similar locality, also drops its eggs there, and fills the air above with its din. This upland also produced Cladonia lichens, poverty-grass, savory-leaved aster (Diplopappus linariifolius), mouse-ear, bearberry, etc. On a few hillsides the savory-leaved aster and mouse-ear alone made quite a dense sward, said to be very pretty when the aster is in bloom. In some parts the two species of poverty-grass (Hudsonia tomentosa and ericoides), which deserve a better name, reign for miles in little hemispherical tufts or islets, like moss, scattered over the waste. They linger in bloom there till the middle of July. Occasionally near the beach these rounded beds, as also those of the sea-sandwort (Honkenya peploides), were filled with sand within an inch of their tops, and were hard, like large ant-hills, while the surrounding sand was soft.*



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More details on poverty-grass follow. In a later chapter he returned to the biota of the beach near Provincetown. There were spiders, myriapods, turtle tracks, toads, mosquitoes, and a resident told of seeing mink, muskrats, foxes, raccoons, wild mice, and snakes. There were shad-bush, and the dead remains of a forest of 30 or 40 years before that had been overtaken by a sand dune (1906c:201–203). He tried pulling up grass from a sand dune, but found it firmly rooted (1906c:205–206)

*...it usually broke off ten inches or a foot below the surface, at what had been the surface the year before, as appeared by the numerous offshoots there, it being a straight, hard, round shoot, showing by its length how much the sand had accumulated the last year; and sometimes the dead stubs of a previous season were pulled up with it from still deeper in the sand, with their own more decayed shoot attached, so that the age of a sand-hill, and its rate of increase for several years, is pretty accurately recorded in this way.*



Fig. 11. Daguerreotype of Thoreau in 1856 by B. W. Maxham.

Natural history was a minor theme in *Cape Cod*, a book with diverse perspectives and goals (Hildebidle 1983:126–146). A modern guide to Cape Cod natural history is a collaboration among specialists (O’Brien 2003). On the other hand, Tim Traver (2006) has written a Waldenesque book about his own and nature’s life at Cape Cod’s Sippewissett Marsh, drawing upon ecological studies conducted by Woods Hole scientists.

Nature-lovers easily become concerned with the preservation of plants, animals, and the natural environment. Thoreau as a youth had enjoyed hunting, and in 1847 he collected animals as scientific specimens for Louis Agassiz (Harding 1965:195, Walls 1995:113–115). He continued to fish. However, in 1852 he stopped using guns. His lecture-essay, “Walking” (1851) contains one of his most famous comments (1980:112)

*...in Wildness is the preservation of the World. Every tree sends its fibers forth in search of the Wild. The city imports it at any price. Men plow and sail for it. From the forest and wilderness come the tonics and barks which brace mankind.*

On 16 October 59, he wrote (1906d:XII, 387)

*Every town should have a park, or rather a primitive forest, of five hundred or a thousand acres, where a stick should never be cut for fuel, a common possession forever, for instruction and recreation. We hear of cow-commons and ministerial lots, but we want men-commons and lay lots, inalienable forever. Let us keep the New World new, preserve all the advantages of living in the country... All Walden Wood might have been preserved for our park forever, with Walden in its midst...*

He followed George Emerson's example (1846:2) of worrying about thoughtless destruction of forests (Minson 1999:47–48). In 1861 he argued that “natural objects of rare beauty” should become public property (McGregor 1997:183–184). He was among the first to call for public natural parks, and he inspired several modern organizations dedicated to preserving and restoring Walden Pond in a natural environment (Couture 1993:274, Jordan 1993). In his *Journal* (1906, X:51) he commented: “If some are prosecuted for abusing children, others deserve to be prosecuted for maltreating the face of nature committed to their care.”

On 1 January 1860, Charles Brace came to Concord with a copy of Darwin's *Origin of Species*, borrowed from his brother-in-law, Asa Gray. He dined with Thoreau and some of Thoreau's friends, and they discussed the book (Dupree 1993:45). Thoreau was so impressed that he obtained his own copy and took six pages of notes. Thoreau had read Darwin's *Journal of Researches* and had copied passages from it into his own *Journal*, in June 1851 (1906*d*, II:228, 240–248, 1981–2008, III:244–245, 253–259, 269–271). He admired not only Darwin's book, but Darwin himself (Christie 1965:74–80, Richardson 1986:242–245, Walls 1995:121, 144, 275, 2009:267). When Emerson told him that Agassiz scoffed at Darwin's theory, Thoreau scoffed at Agassiz (Harding 1965:429, Richardson 1986:367–368, Sattelmeyer 1988:89). Thoreau and many other transcendentalists already believed in “transcendental progressivism” before reading Darwin (Wilson 1965). On 19 October 1860, Thoreau commented in his *Journal* (1906, XIV:147)

*The development theory implies a greater vital force in nature, because it is more flexible and accommodating, and equivalent to a sort of constant new creation.*

Thoreau incorporated this statement into “The Dispersion of Seeds” (1993:102) and followed it with a quotation from Darwin's *Origin of Species*.

Some literary critics who admire *Walden* wonder if Thoreau lost his creativity in his last years (Paul 1958:396, Hildebidle 1983:69–96, Berger 1996*a*:46, 1996*b*:395–396). What seems to have happened is that other transcendentalists, like Emerson, ran out of new things to say, and consequently Thoreau spent more time reading natural histories and travelogues (Harding 1965:290), which encouraged his own observations and writings (Hoag 1995, McGregor 1997:121–174). On 19 August 1851, he expressed concern about this shift in focus (1906*d*, II:406)

*I fear that the character of my knowledge is from year to year becoming more distinct and scientific; that, in exchange for views as wide as heaven's cope, I am being narrowed down to the field of a microscope. I see details, not wholes nor the shadow of the whole. I count some parts, and say, “I know.”*

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In the 1850s he began a large unfinished undertaking, “Notes on Fruits and Seeds.” Two major portions of that project, “The Dispersion of Seeds” and “Wild Fruits” were recently published (Thoreau 1993, 2000).

Thoreau began “Wild Fruits” in fall 1859. It opens with a romantic idea that native fruits are better for New Englanders than exotic ones: “Better for us is the wild strawberry than the pine-apple, the wild apple than the orange, the chestnut and pignut than the cocoa-nut and almond, and not on account of their flavor merely, but the part they play in our education” (2000:5). If so, New Englanders needed more awareness of their native fruits, which this book provides. He discussed wild flowers in the order in which they appeared in the spring, beginning with elm, dandelion, willow, sweet flag, mouse-ear, and maple. Since humans eat none of them, knowledge of their fruiting is presumably important for our education. When he considered wild fruits that humans eat, beginning with strawberries, he focused on gathering, eating, and attitudes, not on biology. Under blueberry, he at least noticed competition from bears (2000:25-26)

*On the headwaters of the St. John and Penobscot Rivers in Maine I have found the Canada blueberry in great abundance, instead of our kind, occupying the more bare and barren ridges, where the Pinus resinosa and banksiana grow, and the rocky portages. Also on the side of Katadn mountain, where quite late in the season they had a decidedly spicy taste. They are a favorite food of the bears in those parts, and you are most likely to meet with bears where these berries abound at the season when they are ripe. The traveller Mackenzie says that gooseberries and raspberries, as well as “hortle berries” springing up amid the fallen trees in the almost bare country north of Lake Superior, attract the bears in great numbers. The same kind is common on Red Hill in New Hampshire, and they also grow on Monadnock mountain mingled with the Pennsylvania blueberry, indeed, they pass into one another there by insensible degrees...*

From his book-length manuscript (631 pages), “Wild Fruits,” he extracted a lecture edited for posthumous publication, “Wild Apples” (1980:178–210), and began editing “Huckleberries,” which remained unfinished when he died (now in print 1980:211–262). “Wild Fruits,” despite botanical details, was part of his critique of society and his suggestion of an alternative world view (Newman 2005:171–183). Instead of publishing this long manuscript, he developed a related project, “The Dispersal of Seeds.”

Thoreau’s interest in this subject predated his reading of Darwin’s *Origin of Species*, but his copying of passages from the *Origin* into his natural history notebook indicates that its relevance to Darwin’s theory may have added stimulus to this research (Richardson 1986:343, 1993:12–13). Madeleine Minson (1999:41) thinks Darwin’s theory may have helped Thoreau to understand why only one willow seed in a million survives to become shrub or tree (Thoreau 1993:61). Although Thoreau died before completing “The Dispersal of Seeds,” leaving a briefer manuscript (354 pages) than “Wild Fruits,” it was a more dynamic and less descriptive project, and so is more ecologically interesting (Walls 1995:183–199, Berger 1996a:49, 53). Seeds are transported by wind, water, and animals; the lighter ones by wind and water, the heavier acorns and nuts by animals (1993:24). Unlike white pine, pitch pine cones open and disperse seeds gradually all winter, into the air, and they slide over snow and ice. Many blow to shores



of ponds and lakes, and so many pitch pines spring up there during summer and grow maybe 15 or 20 years before they are tipped over and destroyed by shifting ice in winter or early spring. Squirrels also disperse pitch pine seeds, because they cut some cones off the trees, and may bury some cones, as they do nuts (1993:27–30).

White pine cones grew at the top of the tallest trees, turned brown and opened in mid-September, and winds blew seeds far and wide. White pines produced fewer seeds than do pitch pines, yet had a wider range, because their seeds grew better in open ground and in woods than pitch pines. Pigeons, nuthatches, and other birds ate great quantities of white pine seeds. A pigeon with crop full of them might fly away and be killed, and some of these seeds might grow in that new location. Squirrels cut green cones, with seeds viable for several years if uneaten. In 1793, Samuel Alden saw only one white pine in Duxbury, but when Thoreau wrote, an eighth of Duxbury's woods was white pine (1993:34–38). If conifers bore a heavy crop of seeds one year, they bore few or none the next year. For example (Thoreau 1993:40)

*In 1859 the white pine, hemlock, and larch bore abundantly, so that the northern birds which feed on their seeds (redpolls and goldfinches and others) were very numerous, and the following spring I saw the crossbills here for the first time in my life. Indeed, I think that I can tell by the numbers of the above birds in our woods whether there is a good crop of these and of birch seeds. But in 1860 I did not chance to see a single fresh hemlock or larch cone and I am not sure that I saw a ripe white-pine cone of that year—neither did I see any of the above-named birds the following winter.*

Michael Berger emphasized the importance of “The Dispersion of Seeds” in two articles, one on its literary and philosophical aspects (1996a), and one on its science (1996b). He argues persuasively that this work is not merely a noteworthy amateur natural history, but also a detailed scientific treatise that supported Darwin's theory of evolution by natural selection. The published version of Thoreau's work has an adequate index (1993:273–283), but Berger (1996b:397) supports his argument with a supplementary index of 40 ecological concepts represented in the text. Sometimes Thoreau used the same term used today—adaptation, disperse, disturbance, extinct, pioneer, succession—more often he discussed a modern concept using a different name.

Thoreau's most scientifically interesting essay, “The Succession of Forest Trees,” is a spin-off from “Dispersal of Seeds,” which he gave as a talk in Concord on 20 September 1860 before the Middlesex Agricultural Society. George Emerson had previously reported on tree succession, without explaining cause, in his report on the trees and shrubs of Massachusetts (1846:29), and European botanists had published observations on plant succession, without attracting attention in America (Spurr 1952, Egerton 2009). Constantine Rafinesque's brief comment on plant succession was in a newspaper (4 April 1822) unread by contemporary botanists (Bryant 1997, Stuckey 1998:139). In 1850 Thoreau had noticed a pitch pine in his family's yard, though there were no others within a half-mile. In 1851 he saw squirrels carry seeds long distances. Railroads seemed to help plant species to spread. He began taking notes on seeds in his *Journal*. On 28 April 1856, while surveying along Marlborough Road, George Hubbard commented that if pines were cut, oaks often replaced them. They checked a lot where white pines had been cut and found the ground covered with oak seedlings. Thoreau began taking notes on the dispersal of seeds by animals, man, and wind. In winter 1859–1860 he studied the structure of tree buds, leaves, and seeds, and in June he studied pollen (Harding 1965:438–440). Many observations were made while surveying

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or during walks. Like most of his writings, the succession essay has a mystical–philosophical dimension (Walls 1995:199–211), which does not obscure his science.

His main hypothesis was that when a pine forest is cut, an oak forest succeeds it, and vice versa (Thoreau 1980:72–92). However, this only occurred when the alternate forest was close enough to the logged forest to provide seed. Pines did not replace pines because oak seedlings were already growing there when the pines were cut. Pine seedlings were less able to grow in shade than oak seedlings. Thoreau had seen squirrels bury acorns in pine forests for winter food, but squirrels never recovered all those buried. He had also found chestnuts buried by the common wood mouse (*Mus leucopus*). Pine seeds blew annually into oak forests, and when those forests were cut, they sprang up in the sunlight. Cherry trees grew in isolation because birds ate cherries and later expelled the seeds elsewhere in their droppings. Birds and mammals were more important for disseminating seeds than most people realized, and there was abundant evidence that many kinds of seeds could lie dormant for years in unfavorable conditions and then produce seedlings when conditions improved.

Thoreau also had two other points he wanted to make in this essay. First, that plants only arise from seeds or shoots, never spontaneously (1980:75). By 1860, the controversy among biologists about spontaneous generation had sunk to the microscopic level (Farley 1977), but the general public was not yet convinced about all plants (Dean 1993). Second, he hoped that his insights could be useful for forest management (Whitford and Whitford 1951, Kehr 1983:31). His records on forests in and around Concord have proven valuable to forest ecologists trying to reconstruct the history of Concord’s forest (Whitney and Davis 1986).

The succession essay was Thoreau’s most widely reprinted, and perhaps most widely read essay during his lifetime. The Middlesex Agricultural Society published it in its *Transactions* (1860); Thoreau sent a copy to his friend Horace Greeley, who published it in the New York *Weekly Tribune* on 6 October 1860; it appeared in the *Eighth Annual Report* of the Massachusetts Board of Agriculture; and it was summarized in the *New England Farmer* in 1861. It also appeared in his first posthumous volume, *Excursions* (1863).



Fig. 12. Etching of Thoreau, based on ambrotype by E. S. Dunshee in 1861.

Thoreau traveled to and from Minnesota, 11 May to 7 July 1861, accompanied by Horace Mann, Jr., age 17. Both were interested in botany, and Thoreau hoped the trip would help him recover from the tuberculosis that would kill him (Harding 1965:445–450, Stowell 1970:40–45, Boudreau 1998). They traveled by train to Iowa, then took a steamboat to St. Paul and Minneapolis, where they stayed three weeks. In Minneapolis libraries Thoreau took notes from naturalists' accounts of their observations on expeditions led by Henry Cass (1820), Stephen H. Long (1823), and Henry Schoolcraft (1832). Thoreau was especially in quest of wild crabapples, which they found near St. Anthony's Falls. The state geologist, Dr. Charles Anderson, showed them around the Lake Calhoun region, and Thoreau and Mann stayed at the lake for 10 days, exploring the prairie and seeing pocket gophers. On 17 June they embarked on a six-day excursion up the Minnesota River, to a Sioux Indian reservation, where they saw a prairie without trees. They returned to Concord by steamboats through the Great Lakes and then by train.

Although Thoreau's last two book-length manuscripts were only published more than a century after his death, other manuscripts were published more promptly: *Excursions* in 1863, *The Maine Woods* in 1864, *Cape Cod* in 1865, *A Yankee in Canada* in 1866, and then substantial portions of his "Journal" appeared in four volumes entitled *Early Spring in Massachusetts* (1881), *Summer* (1884), *Winter* (1888), *Autumn* (1892), and his *Poems of Nature* appeared in 1895. In 1906, his *Journal* appeared in 14 volumes, as part of Thoreau, *The Writings* (20 volumes). Dover reprinted his *Journal* photographically (in two volumes, 1962), and in 1971, Princeton University Press began publishing all of Thoreau's writings in scholarly editions. Walter Harding and others founded the Thoreau Society in 1941, the first society devoted to an American author (Harding 1993). Based in Concord, it publishes an annual, *The Concord Saunterer*, and a quarterly, *Thoreau Society Bulletin*, and has a Web site that provides a broad introduction to Thoreau and his influence. There is also a Thoreau Institute at Walden Woods.

Thoreau was one of America's most enthusiastic disciples of Humboldt (Walls 2009:267). He clearly felt the need for an ecological science, and lacking one, he nevertheless wrote from an "ecological" perspective in many of his writings (McGregor 1997:3). His transcendentalist outlook was partly responsible for his ecological perspective, but he was also prepared for it by reading Linnaeus, White, Humboldt, Lyell, and Darwin (Sattelmeyer 1988, Walls 1993). Thoreau's ecological philosophy "had as a base at least two major components: (1) a mystical sense of the oneness of all life through reciprocal interrelationships, and (2) a sensitivity toward all of nature, organic and inorganic, and a desire for fellowship with all things" (Wolf 1974:147). Thoreau's writings encouraged an interest in natural history, and some of those he influenced became ecologists. His writings were among Aldo Leopold's favorite boyhood reading, and Leopold's mother gave him as a wedding present the 14 volumes of Thoreau's *Journal* (Meine 1988:16, 128). Rachel Carson's biographer reports: "Enormously fond of Thoreau's writing, Carson kept a copy of *Walden Pond* by her bedside" (Lear 1997:509, note 7). Thoreau's writings also exerted an enormous influence on later nature writers (Buell 1995a), whose works have also steered young readers toward ecology. Out of this blend of nature writings and ecology has come a new literary tradition, ecocriticism (Glotfelty and Fromm 1986, Newman 2005:2). Thoreau would have been pleased.



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## Literature cited

- Adams, S., and D. Ross, Jr. 1988. Revising mythologies: the composition of Thoreau's major works. University Press of Virginia, Charlottesville, Virginia, USA.
- Angelo, R. 1984. Botanical index to the journal of Henry David Thoreau. Peregrine Smith, Salt Lake City, Utah, USA.
- Barosh, P. J. 1993. Bedrock geology of the Walden Woods. Pages 212–221 in E. A. Schofield and R. C. Baron, editors. *Thoreau's world and ours: a natural legacy*. North American Press, Golden, Colorado, USA.
- Berger, M. 1996a. The saunterer's vision: Henry Thoreau's epiphany of forest dynamics in *The dispersion of seeds*. *The Concord Saunterer* 4:44–71.
- Berger, M. 1996b. Henry David Thoreau's science in *The dispersion of seeds*. *Annals of Science* 53:381–397.
- Botkin, D. B. 2001. The depth of Walden Pond: Thoreau as a guide to solving Twenty-first Century environmental problems. *The Concord Saunterer* 9:4–14.
- Boudreau, G. V. West by southwest: Thoreau's Minnesota journey. *The Concord Saunterer* 6:144–160.
- Buell, L. 1995a. The environmental imagination: Thoreau, nature writing, and the formation of American culture. Harvard University Press, Cambridge, Massachusetts, USA.
- Buell, L. 1995b. Thoreau and the natural environment. Pages 171–193 in *The Cambridge companion to Henry David Thoreau*. J. Myerson, editor. Cambridge University Press, Cambridge, UK.
- Canby, H. S. 1939. Thoreau. Houghton Mifflin, Boston, Massachusetts, USA.
- Cheever, S. 2006. American Bloomsbury: Louisa May Alcott, Ralph Waldo Emerson, Margaret Fuller, Nathaniel Hawthorne, and Henry David Thoreau: their lives, their loves, their work. Simon and Schuster, New York, New York, USA.
- Christie, J. A. 1965. Thoreau as world traveler. Columbia University Press, New York, New York, USA.
- Couture, C. H. 1993. Walden restoration: legal and policy issues. Pages 272–280 in E. A. Schofield and R. C. Baron, editors. *Thoreau's world and ours: a natural legacy*. North American Press, Golden, Colorado, USA.
- Cruikshank, H., editor. 1964. Thoreau on birds. McGraw-Hill, New York, New York, USA.
- Dean, B. P. 1993. Henry D. Thoreau and Horace Greeley exchange letters on the "spontaneous generation of plants." *New England Quarterly* 66:630–638.
- Dean, B. P. 2000. Introduction. Pages ix–xvii in B. P. Dean, editor. *H. D. Thoreau, wild fruits*. Norton, New York, New York, USA.
- Dean, B. P. 2007. Natural history, romanticism, and Thoreau. Pages 73–89 in M. Lewis, editor. *American wilderness: a new history*. Oxford University Press, New York, New York, USA.
- Dedmond, F. B. 1994. Thoreau and the glowworms. *The Concord Saunterer* 2:130–136.
- Deevey, E. S., Jr. 1942. A re-examination of Thoreau's "Walden." *Quarterly Review of Biology* 17:1–11.
- Dupree, A. H. 1993. Thoreau as scientist: American science in the 1850s. Pages 42–47 in E. A. Schofield and R. C. Baron, editors. *Thoreau's world and ours: a natural legacy*. North American Press, Golden, Colorado, USA.
- Egerton, F. N. 1976. Ecological studies and observations before 1900. Pages 311–351 in B. J. Taylor and T. J. White, editors. *Issues and ideas in America*. University of Oklahoma Press, Norman, Oklahoma, USA. Reprinted, 1977, in *History of American ecology*. F. N. Egerton, editor. Arno Press, New York, New York, USA.

- Egerton, F. N. 2005. History of ecological sciences, part 18: John Ray and his associates, Francis Willughby and William Derham. *ESA Bulletin* 86:301–313.
- Egerton, F. N. 2009. Homage to Frederic E. Clements, historian of plant succession studies. *ESA Bulletin* 90:43–79.
- Egerton, F. N. 2011. A history of ecological sciences, part 38A: Naturalists explore North America, mid-1820s–about 1840. *ESA Bulletin* 92:64–91.
- Egerton, F. N., and L. D. Walls. 1997. Rethinking Thoreau and the history of American ecology. *The Concord Saunterer* 5:3–18.
- Elliott, C. A. 2008. Thaddeus William Harris (1795–1856): nature, science, and society in the life of an American naturalist. Lehigh University Press, Bethlehem, Pennsylvania, USA.
- Emerson, G. B. 1846. Report on the trees and shrubs growing naturally in the forests of Massachusetts. Commissioners on the Zoological and Botanical Survey of the State, Boston, Massachusetts, USA.
- Emerson, R. W. 1990. Ralph Waldo Emerson. An anthology. R. Poirier, editor. Oxford University Press, Oxford, UK.
- Farley, J. 1977. Spontaneous generation controversy from Descartes to Oparin. Johns Hopkins University Press, Baltimore, Maryland, USA.
- Glotfelty, C., and H. Fromm, editors. 1996. The ecocriticism reader: landmarks in literary ecology. University of Georgia Press, Athens, Georgia, USA.
- Gura, P. F. 1995. “A wild, rank place”; Thoreau’s *Cape Cod*. Pages 142–151 in J. Myerson, editor. *The Cambridge companion to Henry David Thoreau*. Cambridge University Press, Cambridge, UK.
- Harding, W. 1957. Thoreau’s library. University of Virginia Press, Charlottesville, Virginia, USA.
- Harding, W. December 1962. “This is a beautiful world; but I shall see a fairer.” *American Heritage* 14, number 1:106–120.
- Harding, W. 1965. The days of Henry Thoreau. Knopf, New York, New York, USA.
- Harding, W. 1993. Recollections of the early days of the Thoreau Society. Pages xiii–xix in E. A. Schofield and R. C. Baron, editors. *Thoreau’s world and ours: a natural legacy*. North American Press, Golden, Colorado, USA.
- Harding, W. 1999. Henry David Thoreau (1817–62), author and naturalist. *American National Biography* 21:599–603.
- Harding, W., and C. Bode, editors. 1958. The correspondence of Henry David Thoreau. New York University Press, New York, New York, USA.
- Harshberger, J. W. 1902. A botanical ascent of Mount Ktaadn, Me. *The Plant World* 5:21–28.
- Hessler, J. 2010–2011. From Ortelius to Champlain: the lost maps of Henry David Thoreau. *The Concord Saunterer* 18–19:1–26.
- Hildebidle, J. 1983. Thoreau: a naturalist’s liberty. Harvard University Press, Cambridge, Massachusetts, USA.
- Hoag, R. W. 1995. Thoreau’s later natural history writings. Pages 152–170 in J. Myerson, editor. *The Cambridge companion to Henry David Thoreau*. Cambridge University Press, Cambridge, UK.
- Holden, R. P. 1958. *Rivers of America: the Merrimack*. Rinehart, New York, New York, USA.
- Huber, J. P. 1981. *The wildest country: a guide to Thoreau’s Maine*. Appalachian Mountain Club, Boston, Massachusetts, USA.
- Johnson, L. C. 1995. A week on the Concord and Merrimack Rivers. Pages 40–56 in J. Myerson, editor. *The Cambridge companion to Henry David Thoreau*. Cambridge University Press, Cambridge, UK.
- Jordan, W. R. 1993. Renewal and imagination: Thoreau’s thought and the restoration of Walden Pond.
-

- 
- Pages 260–271 in E. A. Schofield and R. C. Baron, editors. *Thoreau's world and ours: a natural legacy*. Cambridge University Press, Cambridge, UK.
- Joyce, K. A. 1993. Underwater Walden. Pages 196–198 in E. A. Schofield and R. C. Baron, editors. *Thoreau's world and ours: a natural legacy*. North American Press, Golden, Colorado, USA.
- Kehr, K. 1983. Walden three: ecological changes in the landscape of Henry David Thoreau. *Journal of Forest History* 27:28–33.
- Kirby, W., and W. Spence. 1843. *An introduction to entomology; or, elements of the natural history of insects*. Edition 6. Longman, Brown, Green, and Longmans, London, UK.
- Lear, L. 1997. *Rachel Carson: witness for nature*. Henry Holt, New York, New York, USA.
- Lebeaux, R. 1977. *Young man Thoreau*. University of Massachusetts Press, Amherst, Massachusetts, USA.
- Lebeaux, R. 1984. *Thoreau's seasons*. University of Massachusetts Press, Amherst, Massachusetts, USA.
- Mallis, A. 1971. *American entomologists*. Rutgers University, New Brunswick, New Jersey, USA.
- Maynard, W. B. 2004. *Walden Pond: a history*. Oxford University Press, New York, New York, USA.
- McGregor, R. K. 1997. *A wider view of the universe: Henry Thoreau's study of nature*. University of Illinois Press, Urbana, Illinois, USA.
- Meine, C. 1988. *Aldo Leopold: his life and work*. University of Wisconsin Press, Madison, Wisconsin, USA.
- Meisel, M. 1924–1929. *A bibliography of American natural history: the pioneer century, 1769–1865*. Three volumes. Premier, New York, New York, USA. Reprinted 1967. Hafner, New York, New York, USA.
- Minson, M. 1999. Seeds of optimism: Thoreau's late field studies. *The Concord Saunterer* 7:32–53.
- Moldenhauer, J. J. 1995. The Maine woods. Pages 124–141 in J. Myerson, editor. *The Cambridge companion to Henry David Thoreau*. North American Press, Golden, Colorado, USA.
- Myerson, J., editor. 1995. *The Cambridge companion to Henry David Thoreau*. Cambridge University Press, Cambridge, UK.
- Neufeldt, L. N. 1995. Thoreau in his journal. Pages 107–123 in J. Myerson, editor. *The Cambridge companion to Henry David Thoreau*. Cambridge University Press, Cambridge, UK.
- Newman, L. 2005. *One common dwelling: Henry Thoreau, transcendentalism, and the class politics of nature*. Palgrave Macmillan, New York, New York, USA.
- Nijhuis, M. October 2007. Teaming up with Thoreau. *Smithsonian* 38(7):60–66.
- O'Brien, G., editor. 2003. *A guide to nature on Cape Cod and the islands*. Edition 2. Codfish Press, Brewster, Massachusetts, USA.
- Paul, S. 1958. *The shores of America: Thoreau's inward exploration*. University of Illinois Press, Urbana, Illinois, USA.
- Peck, H. D. 1990. *Thoreau's morning work: memory and perception in A Week on the Concord and Merrimack Rivers, the journal, and Walden*. Yale University Press, New Haven, Connecticut, USA.
- Quick, D. G. 1972. Thoreau as limnologist. *Thoreau Quarterly Journal* 4:13–20.
- Richardson, R. D., Jr. 1986. *Henry Thoreau: a life of the mind*. University of California Press, Berkeley, California, USA.
- Richardson, R. D., Jr. 1993. Introduction: Thoreau's broken task. Pages 3–17 in B. P. Dean, editor. *H. D. Thoreau. Faith in a seed: the dispersion of seeds and other natural history writings*. Island Press, Washington, D.C., USA.
- Sattelmeyer, R. 1988. *Thoreau's reading: a study in intellectual history, with bibliographical catalogue*.
-

- 
- Princeton University Press, Princeton, New Jersey, USA.
- Sattelmeyer, R. 1995. Thoreau and Emerson. Pages 25–39 in J. Myerson, editor. The Cambridge companion to Henry David Thoreau. Cambridge University Press, Cambridge, UK.
- Schneider, R. J. 1995. Walden. Pages 92–106 in J. Myerson, editor. The Cambridge companion to Henry David Thoreau. Cambridge University Press, Cambridge, UK.
- Schofield, E. A., and R. C. Baron, editors. 1993. Thoreau's world and ours: a natural legacy. North American Press, Golden, Colorado, USA.
- Spurr, S. H. 1952. Origin of the concept of forest succession. *Ecology* 33:426–427.
- Stowell, R. F. 1970. A Thoreau gazetteer. W. L. Howarth, editor. Princeton University Press, Princeton, New Jersey, USA.
- Sullivan, R. 2009. The Thoreau you don't know: what the prophet of environmentalism really meant. Collins, New York, New York, USA.
- Thoreau, H. D. 1854. Walden; or, life in the woods. Ticknor and Fields, Boston, Massachusetts, USA.
- Thoreau, H. D. 1906*a*. A week on the Concord and Merrimack Rivers. Houghton, Mifflin, Boston, Massachusetts, USA.
- Thoreau, H. D. 1906*b*. The Maine woods. Houghton, Mifflin, Boston, Massachusetts, USA.
- Thoreau, H. D. 1906*c*. Cape Cod. Houghton, Mifflin, Boston, Massachusetts, USA.
- Thoreau, H. D. 1906*d*. The journal. B. Torrey and F. H. Allen, editors. 14 volumes. Houghton Mifflin, Boston, Massachusetts, USA.
- Thoreau, H. D. 1954. The Concord and the Merrimack: excerpts from A week on the Concord and Merrimack Rivers. D. C. Lunt, editor. Bramhall House, New York, New York, USA.
- Thoreau, H. D. 1962. The journal. B. Torrey and F. H. Allen, editors. Two volumes. Dover, New York, New York, USA.
- Thoreau, H. D. 1972. The Maine woods. J. J. Moldenhauer, editor. Princeton University Press, Princeton, New Jersey, USA.
- Thoreau, H. D. 1973. The illustrated Walden. J. L. Shanley, editor. Princeton University Press, Princeton, New Jersey, USA.
- Thoreau, H. D. 1975. Early essays and miscellanies. J. J. Moldenhauer, editor. Princeton University Press, Princeton, New Jersey, USA.
- Thoreau, H. D. 1980. The natural history essays. R. Sattelmeyer, editor. Peregrine Smith, Salt Lake City, Utah, USA.
- Thoreau, H. D. 1981–2008. Journal. Nine volumes. E. H. Witherell, W. L. Howarth, R. Sattelmeyer, and T. Blanding, editors. Princeton University Press, Princeton, New Jersey, USA.
- Thoreau, H. D. 1993. Faith in a seed: the dispersion of seeds and other late natural history writings. B. P. Dean, editor. Island Press, Washington, D.C., USA.
- Thoreau, H. D. 2000. Wild fruits. B. P. Dean, editor. Norton, New York, New York, USA.
- Thoreau, H. D. 2004. Walden: a fully annotated edition. J. S. Cramer, editor. Yale University Press, New Haven, Connecticut, USA.
- Thoreau, H. D. 2008. Cape Cod. S. Miller, photographs. Houghton Mifflin, Boston, Massachusetts, USA.
- Traver, T. 2006. Sippewissett or, life on a salt marsh. Chelsea Green Publishing, White River Junction, Vermont, USA.
- Wade, J. S. 1926. The friendship of two old-time naturalists. *Scientific Monthly* 23:152–160.
- Wade, J. S. 1927. Some insects of Thoreau's writings. *New York Entomological Society Journal* 35:1–
-



---

21.

- Walls, L. D. 1993. Seeing new worlds: Thoreau and Humboldtian science. Pages 55–63 in E. A. Schofield and R. C. Baron, editors. *Thoreau's world and ours: a natural legacy*. North American Press, Golden, Colorado, USA.
- Walls, L. D. 1995. *Seeing new worlds: Henry David Thoreau and nineteenth-century natural science*. University of Wisconsin Press, Madison, Wisconsin, USA.
- Walls, L. D., editor. 1999. *Material faith: Thoreau on science*. Houghton Mifflin, Boston, Massachusetts, USA.
- Walls, L. D. 2003. *Emerson's life in science: the culture of truth*. Cornell University Press, Ithaca, New York, USA.
- Walls, L. D. 2009. *The passage to cosmos: Alexander von Humboldt and the shaping of America*. University of Chicago Press, Chicago, Illinois, USA.
- Whitford, P., and K. Whitford. 1951. Thoreau: pioneer ecologist and conservationist. *Scientific Monthly* 73:291–296.
- Whitney, G. G., and W. C. Davis. 1986. From primitive woods to cultivated woodlots: Thoreau and the forest history of Concord, Massachusetts. *Journal of Forest History* 30:70–81.
- Wilson, J. B. 1965. Darwin and the transcendentalists. *Journal of the History of Ideas* 26:286–290.
- Wolf, W. J. 1974. *Thoreau: mystic, prophet, ecologist*. United Church Press, Philadelphia, Pennsylvania, USA.

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