BY JULIE DUNLAP

Camp Long Run

Aldo Leopold and the Yale Forest School Camp of 1907

[1907]

Milford - July 4, 1904.

My dear mama:- Left New Haven yesterday morning on the 10:30, after an exciting race to the Station on the deck of an express wagon. Arrived in New York at noon, where I accidentally met Jed Prouty. We had lunch together, did a little shopping, and at three took the ferry for our train on the Erie road. Right here let me extend my compliments to the [illegible] to the punkest rootiest road in the country. But we didn't care any about that, as it was a glorious afternoon and beautiful country. It is a longer ride to

The lessons Aldo Leopold learned at the Yale Forest School summer camp would serve him well in his work as a scientist, conservationist, teacher, and ethicist.

Elk, Mexican gray wolves, and adventure recreationists still roam New Mexico's Gila Wilderness Area more than a century after Aldo Leopold envisioned its creation. In 1921, as a U.S. Forest Service assistant district forester in the Southwest, Leopold called for federal protection of the rugged and remote forest to benefit sportsmen of coming generations. He contended, "It will be much easier and cheaper to preserve, by forethought, what he needs, than to create it after it is gone."[1] Widely viewed as a rejection of forestry's founding wise-use principles, that statement was more precisely an assertion of higher uses than timber and grazing for the nation's public lands. Leopold's Gila proposal moved beyond, but also echoed, Forest Service Chief Gifford Pinchot's 1907 insight that natural resource decisions be guided by "the greatest good, for the greatest number, for the longest run."[2] With a time dimension added to a classic utilitarian axiom, Pinchot's Forest Service mission influenced Leopold's training and thinking for a lifetime. Both men defined conservation as a moral duty across generations.

Leopold belonged to the first generation of professional foresters educated in the United States at the zenith of Progressive Era conservation. While still a Yale undergraduate in 1907, the twenty-year-old boarded a train to the Yale Forest School's summer camp in Milford, Pennsylvania, for the first extensive field training of his chosen career. There he would formally embark on a lifelong search for the skills, concepts, relationships, and values essential for individuals and society to live on the land productively, responsibly, and—most important—perpetually. In a critique of Leopold's probing path toward an ecologically informed ethic, Curt Meine and Jed Meunier argue, "Forestry provided the foundation of Leopold's professional, intellectual, and ethical development."[3] His early lessons at forestry camp would profoundly influence his work as a scientist, conservationist, teacher, and ethicist, culminating in a land ethic based on long-term, intergenerational thinking. Forestry camp launched his journey from Pinchot's anthropocentric utilitarian philosophy of conservation toward a holistic and biocentric ethic for the long run.

Aldo Leopold's correspondence from the Yale Forest School camp to his family is charming, chatty, and revealing. His first letter home from the summer camp in Milford was inexplicably dated 1904.

"THE RIGHT TYPE OF MEN"

Deforestation had troubled Leopold since childhood. The family's Leopold Desk Company relied on local oak, cherry, and walnut, and the family observed that each passing year fewer pine rafts floated down the Mississippi River past their Burlington, Iowa, home. In 1904, as a senior at Lawrenceville School in New Jersey, he wrote an essay that echoed Progressive Era themes of resource conservation. Wood, Leopold argued, is a permanent necessity to the nation, "indispensable to our future welfare," yet timber famine loomed because "the lumber supply . . . once believed to be inexhaustible, is now almost used up." Like Pinchot, Leopold referred to forest crops and notes that Europeans had learned to harvest trees renewably whereas American lumbermen persisted in "careless and unnecessary methods in handling forest lands." The essay detailed "indiscriminate cutting" that left millions of treeless acres vulnerable to fire and erosion. "Where was yesterday a bountiful land," wrote the impassioned teenager, "is today a barren, lifeless, waste, destined to remain so for years to come or perhaps forever." The essay reveals Leopold's early adoption of human-centered conservation rhetoric and a precocious commitment to the prevailing view of a "rational forest policy": federal implementation of scientific forest management to check profit-driven resource abuse.[4]

In 1904, the only reputable training programs in forest management were a one-year course at the Biltmore Forest School, which emphasized lumbering and private forest management, and the graduate-level forestry school at Yale University. To train "the right type of men" to manage America's forests, Pinchot's family had endowed the school at his alma mater in 1900, and Gifford persuaded his friend and fellow Yale graduate Henry Graves to serve as director.[5] Graves and botanist James W. Toumey, the only other faculty member, scrambled to invent a curriculum; the Yale Forest School opened that September.[6]

The program built on students' required undergraduate courses in general science, presenting graduate-level introductions to forest measurement, planning, and silviculture.[7] With only limited fieldwork opportunities during the school year, in 1904 Yale added a mandatory summer term in the Pocono Mountains for entering students. Sited about a half-mile from Grey Towers, the Pinchot mansion in Milford, the camp offered a ten-week fieldwork immersion. The Pinchots granted use of more than 1,700 acres on the estate, provided tents for housing and erected a mess hall, clubhouse, classroom, and other structures. In town, the family built

UNIVERSITY OF WISCONSIN–MADISON, ALDO LEOPOLD PAPERS: 9/25/10-8: BIOGRAPHICAL MATERIALS

UNIVERSITY OF WISCONSIN–MADISON, ALDO LEOPOLD ARCHIVES, S01505

Aldo Leopold at Les Cheneaux, Michigan, in the summer of 1908, just before matriculating to the Yale Forest School.

Forest Hall, a bluestone edifice with classrooms and public lecture space seating 200.[8]

Establishment of the U.S. Forest Service in 1905 and the addition of dozens of new national forests boosted demand for trained foresters. To expedite graduations, Director Graves welcomed advanced undergraduates in Yale's Sheffield Scientific School to undertake the first year of a forestry master's during their senior year. Sheffield's civil engineering courses in particular offered math and mapping practice considered essential for technical foresters. The integrated program lasted only until 1910, but it allowed Leopold and other Sheffield students to complete their undergraduate and graduate degrees in four intense years.[9]

Shortly before Leopold matriculated to the Yale Forest School, the Forest Service issued a management guidebook, *The Use of the National Forests*, which became a basic text for Leopold and his classmates. *Use* readers were asked to imagine the nation a half-century hence, when more people and industry would demand more trees, water, and livestock forage. To be prepared, "The National Forests need more men," the *Use* book announced, "sound in body," "able to handle men well," and with "a good working knowledge of timber and lumbering, the live-stock industry, the land laws, and ordinary office work."[10] Another trait, held second only to good character, was the "forester's eye," "the power to note and understand, or seek to understand, what he sees in the forest." An essential part of the forester's equipment, the eye empowered him to "see what is wrong with a piece of forest, and what is required for its improvement," both now and decades later.[11]

Athletic, idealistic, and in love with the outdoors, Leopold itched to toss books aside and pack a trunk with blankets, rough "duds," and heavy boots.[12] In April, he wrote home eagerly, "My summer up at Milford is going to teach me many things."[13]

UNIVERSITY OF WISCONSIN–MADISON, ALDO LEOPOLD ARCHIVES, S01507

THE MOST INTERESTING WORK

A dawn bird chorus woke Aldo Leopold to his first full day at camp on July 4, 1907. The day before, during the train ride from New York, he sat with "Mr. Graves, one of the instructors," the two of them botanizing from the window, which made "the time pass very pleasantly." He arrived at camp to find two rows of canvas tents, along leafy lanes marked "Broadway" and "Fifth Avenue," tucked into the woods one-half mile across the Sawkill Gorge from Grey Towers. After breakfast that first morning, he and his new campmates hiked to Sawkill Falls and dived into its deep, icy pool. "I cannot half describe what fun it is," Leopold wrote home, "but I haven't yelled so loud or enjoyed anything so much for years and years as I did that swim."[14]

One half-day each week was dedicated to dendrology, which forester Bernhard Fernow called "the main basis of the forester's art" in his 1902 textbook. Fernow, founder of Cornell's short-lived forestry program, said the biology of woody plants, their responses to climate and soil conditions, and their physical characteristics "must be known to secure the largest, most useful, and most valuable crop."[15] Though in later years Leopold would object to growing trees "like cabbages,"

Yale students at Sawkill Falls, a short walk from the summer camp, in 1908. The students built the dam to create a swimming hole. Leopold and his classmates would visit the swimming hole twice a day.

in 1907 he was keen to learn how it was done.[16]

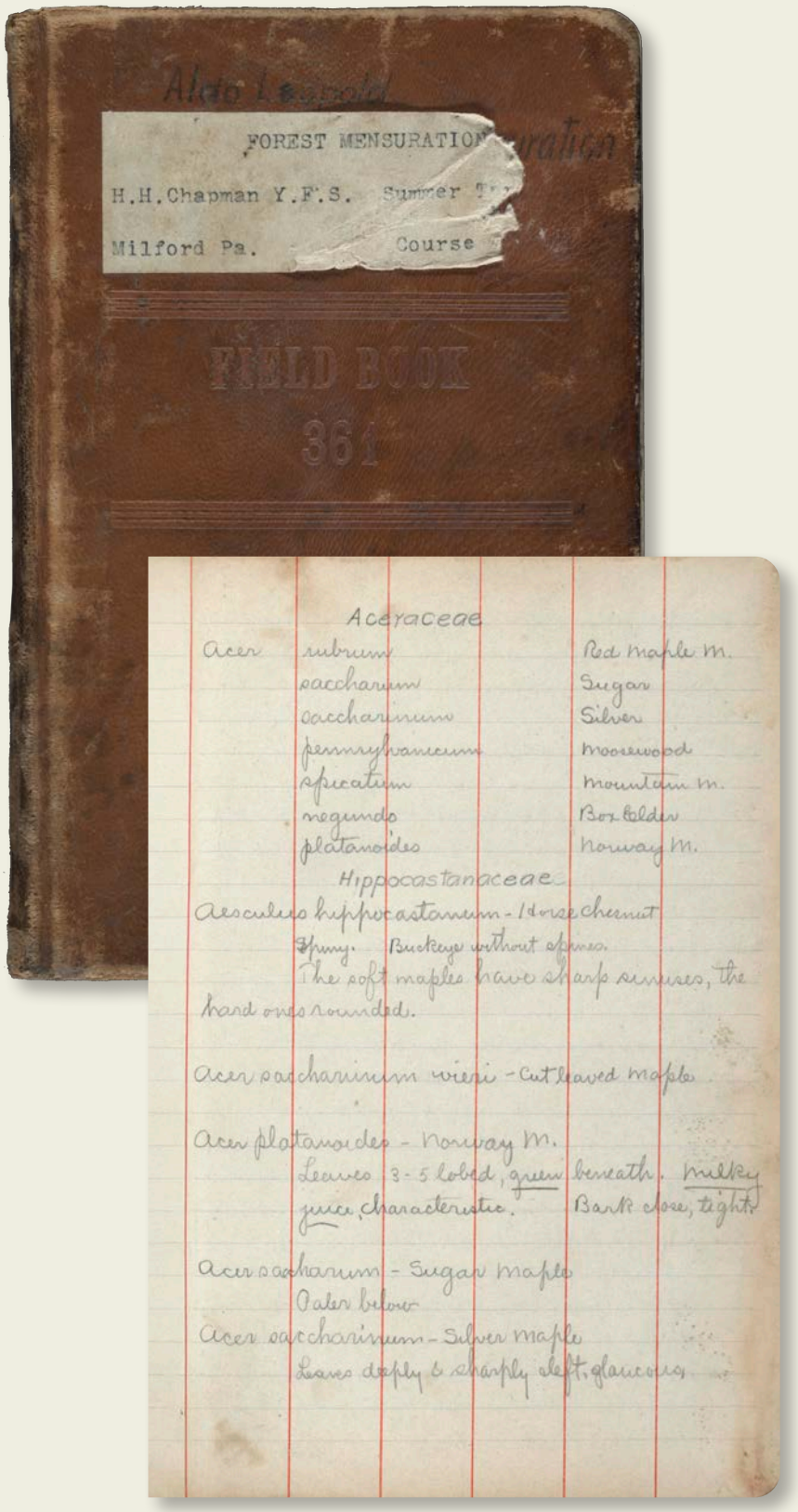
The school's dendrologist, Professor Toumey, was an innovator in silviculture.[17] Students warmed easily to the affable Midwesterner, trailing him around the estate and into the surrounding hills.[18] Identification of commercially valuable species was emphasized, but Toumey did not teach as if cellulose was "the basic forest commodity."[19] Knowledgeable about interactions among plants, soils, and climate, he highlighted effects of local conditions on tree survival and commercial yield and lectured on the roles of other plants in the forest community.[20] Leopold would not write extensively about ecology until the 1930s, but Toumey's Milford course description, as early as 1901, notes "some attention" would focus on "ecological study of the forests of the vicinity."[21]

Herbarium and lab work in New Haven had helped prepare Sheffield students for the long camp hours comparing oaks, chestnuts, pines, and hemlocks. Leopold also had the advantages of having planted trees with his grandfather, gardened with his mother, and hunted upland birds with his father. Nicknamed "the naturalist" in high school, in college he expressed surprise at some classmates' limited savvy afield.[22] "Many of the fellows not only are ignorant of the identity of things," Leopold confided to his father, "but fail to comprehend the way things hang together."[23]

As camp layered dendrology training on rich childhood experience, Leopold quickly developed his forester's eye. Toumey sharpened his ability to perceive conditions and assess the current state of plant life and nonliving forest components. Further, the training was preparing him to consider how past droughts, storms, and other events shaped today's woods, and to imagine how management choices, environmental forces, and happenstance could affect the landscape to come.

Leopold's understanding of "the way things hang together" would be encapsulated in maturity as "the odyssey of evolution."[24] Plant taxonomy lessons put into formal context his extracurricular readings of Darwin in high school and college.[25]

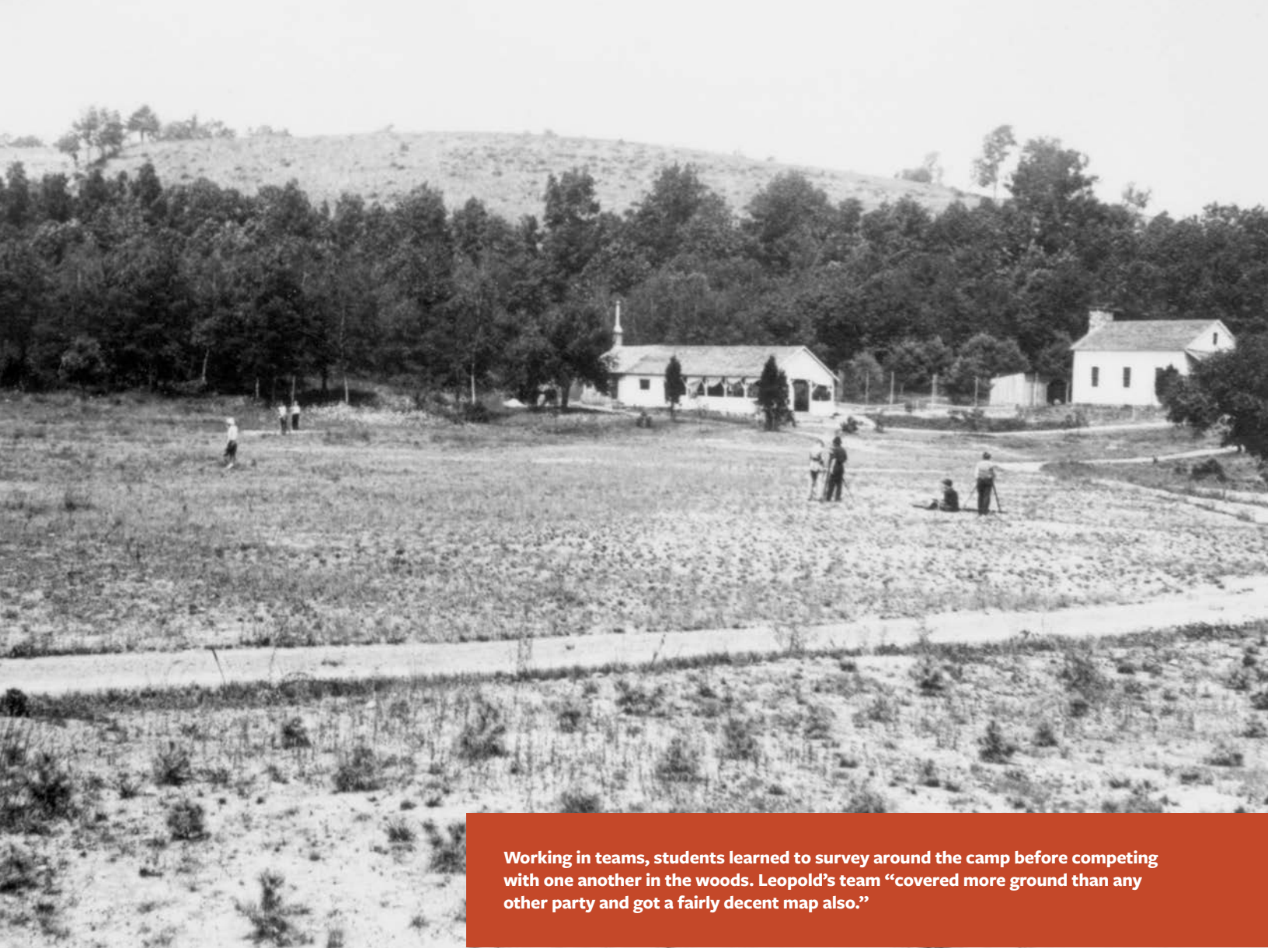
UNIVERSITY OF WISCONSIN–MADISON, ALDO LEOPOLD PAPERS: 9/25/10-12: STUDENT COURSE MATERIALS



USDA FOREST SERVICE PHOTO, UNIVERSITY OF WISCONSIN–MADISON, ALDO LEOPOLD ARCHIVES, S0152

Leopold made swift progress in learning the traits and habits of a hundred woody plants but struggled to memorize the "darn Latin names." The notebook from his Mensuration class contains long lists of plant names.

Evolutionary theory helped Leopold comprehend the interdependencies that Toumey pointed out, and also the vast reach of time required to develop such complexity at every biological level. He already grasped the idea that land is an interactive system with abiotic and biotic components, including wildlife, constantly reshaped by the struggle for existence. In high school, for example, he had pieced together how skunk cabbage blooms in spring woodlands attract flies, and flies brought hungry phoebes.[26] In Milford, he was learning to be a conscious manipulator of forest systems. But unlike those absorbed with maximizing annual timber yields, young Leopold recognized the



Working in teams, students learned to survey around the camp before competing with one another in the woods. Leopold's team "covered more ground than any other party and got a fairly decent map also."

forest as a tangled bank, dynamically intertwined through the millennia.

Two days a week, the students explored the tools and techniques of forest measurement, or mensuration, with Herman Haupt Chapman. A member of the school's class of 1904 and in only his second year of teaching, "Chappie" wrote about the direct experience each forester needed to predict the results of their work over "a generation or two," given the slow evolutionary processes behind America's wild native forests.[27] At least forty-five percent of students' time should involve outdoor application of "the science whose principles he has had ground into him at Yale."[28] The long-term goal was sustained use: "the forester must build not for present conditions but for those which can be forecast fifty years ahead when the new crops are ready to harvest."[29]

Chapman's quantitative discipline required students to calculate the volume of felled logs and standing trees, analyze and predict stand growth, and estimate the volume, worth, and growth potential of sample plots, preparatory skills for projecting timber values in large forests. In the woods with Chappie, Leopold learned to wield Biltmore sticks, calipers, hypsometers, and angle gauges with authority. Only six years later, as supervisor of the Carson National Forest in New Mexico, he would use a tool metaphor to remind his staff of their primary duty: to make responsible decisions about the forest's future. He wrote, "Our job is to sharpen our tools, and make them cut the right way."[30]

But in 1907 Aldo's most important mensuration tool was a notebook, essential for recording heights, diameters, and ages by species, calculating woodlot values in dollars and board feet, and planning cuttings to maximize long-term returns.[31] Leopold's neatly penciled notes and meticulous graphs reflect his commitment to deciphering the economic worth of standing oak, pine, and chestnut trees. Steady tree growth curves show something more: Leopold's emerging ability to use data to predict how forests change over time.

Wrangling with math, never Leopold's strong suit, detracted little from his enjoyment of mensuration. In a forest still graced with twenty-inch-diameter American chestnuts, a species that would virtually disappear in his lifetime, he said log scaling "fills me with an almost childish delight." Part of that pleasure derived from the teamwork. A day measuring mixed hardwoods with Franklin Moon and Rufus Maddox felt "very satisfactory" because "we all pull well together." He wrote home, "You don't know what a difference there is between congenial and uncongenial fellow-workers on a crew in the woods."[32] Turning tasks into friendly competitions, students competed to run the most accurate boundaries around sample one-acre plots. When Leopold's team bested Moon's, the winners' celebration "nearly rooted up the underbrush."[33] Working with others toward shared goals of land improvement would bring Leopold delights (and dilemmas) for the rest of his life.

As weeks passed, Leopold took pride in his growing skills and wrote home in admiration of his "very interesting" instructor. The letter recounted that as a government forester Chapman had resisted pressures to clear-cut public land in favor of leaving twenty percent of the trees for seed.[34] Decades later, in *A Sand County Almanac*, Leopold pointed to a preference for natural reproduction "on principle" as a hallmark of foresters enlightened by ecology and ethics.[35] Chappie's students learned to think analytically and with foresight, and Leopold probably spoke for many when writing home, "It is the most interesting work I have ever done, this estimating."[36]

Three full days a week were devoted to forest surveying. By 1907, thanks to forestry professionals, the rough outlines of the original forest reserves were being redrawn and new national forest borders finalized. "Every section of land is examined, mapped, and described," declared the *Use* book, "and the boundaries are drawn to exclude, as far as possible, everything which does not properly belong in a National Forest."[37]

Taught by a structural engineer, Sheffield School's John C. Tracy, the camp surveying course drilled proper handling of chains, compass, plane table, and transit, and demanded accuracy and speed in analyzing and mapping the landscape. In surveying too, Sheffield students had an edge over other campers. A fall 1906 workshop had exposed them to field instruments, and spring courses in mechanics, strength of materials, and timber construction had introduced them to Tracy.[38] Tracy's tough assignments launched students into a series of "Work Like the Devil Spells," and a single engineering problem might keep Leopold indoors all day.[39] Leopold found the subjects "hard but very interesting" and listened receptively when the professor argued that the most successful government foresters were, increasingly, civil engineers. Subsequent observations of channelized streams, drained marshes, and other engineered habitat degradation would reshape his views, but in 1907, he wrote approvingly, "I am glad our courses in that line are under a real hustler like Tracy."[40]

In a way, the demanding Tracy had fueled Leopold's expectations for forestry camp. "I am glad I am going to Milford next summer," he wrote home from New Haven in February 1907. "Tracy has persuaded me of late that I don't know a darn thing about anything."[41] Yet in the Poconos, Leopold warmed to his taskmaster. The professor still pushed students to meet high standards, but Leopold reported home that this time he "came out very well."[42] At the first campfire, Tracy gave a "wonderful" talk on Yale spirit.[43] One memorable night, instead of using the transit to shoot Polaris, Tracy's class trained it on a partial lunar eclipse.[44] A few nights later, when Tracy announced his departure for vacation, Leopold opined, "The old boy is certainly a wonderful man."[45]

The new surveying instructor's approach suited Leopold still better. "It is less tedious than the engineering methods," he wrote home, "being rough work and covering vastly more ground."[46] In early August, the crews spent days running valuation surveys of a 125-acre woodlot south of Grey Towers. He admired the "magnificent" white oaks but lamented his crew's inaccuracy, hoping that "perhaps the light will shine into their well-meaning craniums one of these days and then Crew 8 will improve its reputation for hustling."[47]

The course capstone was a multiday traverse down the Raymondskill. Covering fifteen to twenty square miles—fast—down the rugged creek tested the limits of their capabilities: "Our topography is rather difficult, as it includes some very high cliffs (400 feet). . . . There is also a big timbered section with crooked roads where long shots are impossible and progress slow."[48] Relishing another competition, Leopold's team trudged through drenching rains and plotted late into the night. In the end, "We covered more ground than any other party and got a fairly decent map also."[49] Leopold's high praise for his partner, Everett "Mac" MacDaniels, reflects the value both placed on field hardiness: "You can't kill Mac with mere work—he is a regular ox and never dies."[50]

Motivation to win and to excel physically and mentally stemmed from a keen sense of responsibility to himself, his family, and the public weal. "I have as good a chance as any man ever had," he wrote home, "so trust me to make good."[51] But preparing for the surveying exam was still tough, Leopold explained, because "a big red moon is just climbing over the black ridge of

the Jersey mountains in the East, and nobody should study on such a night—not in summer time."[52]

Professor Graves must have spotted Leopold's merit and verve, choosing him for an independent assignment at the Milford Forest Experiment Station, a two-hundred-acre tract established by James Pinchot, Gifford's father.[52] One of the first such sites in the United States, the station reflected the elder Pinchot's own long view of forest science and education. "Much can be learned about the forest from studying it as it exists at the moment," wrote James Pinchot in a 1903 article about the camp, "but there are numbers of most important facts that can be learned only by observing the same tract of forest for many successive years."[53]

From the outset, Leopold reveled in his job of improvement cutting. Letters celebrate the sensory pleasure he found in sinking an ax into a pine, to "bring out the big aromatic chips so clean and white," and in his emerging prowess at felling trees.[54] A dead pitch pine is "all hell to chop" but "goes where you put it," while a chestnut "takes lots of care to keep from smashing the young growth."[55] As much as he enjoyed survey teamwork, Leopold savored his independence at the station, thinning sample plots in the cool evening hours or Sunday mornings. "I take my lunch over with me," he wrote, "and chop till dark falls over the pine woods."[56]

Leopold especially relished how improvement work sharpened his judgment. He wrote happily that "every two minutes I have to stop and figure out the pros and cons of some doubtful step."[57] Of course not every choice was the correct one. While thinning a chestnut coppice, Leopold hacked into a yellow jackets' nest, "several of whom, being conservative gentlemen, resented my proposed improvements in their little estate, and did not hesitate to let me know the trend of their opinions."[58] But biographer Curt Meine highlights the significance of this early training in practical decision making as Leopold evolved from a naturalist who loved and observed the woods, to a student mastering measurement tools, to an experienced practitioner manipulating the natural world.[59] Leopold later contended that conservation "is a matter of what a man thinks about while chopping, or while deciding what to chop." A conservationist is "one who is humbly aware that with each stroke he is writing his signature on the face of his land."[60]

JAMES LIPPINCOTT GOODWIN PHOTOGRAPHS, FOREST HISTORY SOCIETY

He wrote his mother that his tent "is in good condition, including the floor. Size about 8' x 10'. It is furnished with a good cot, a little table on which I am writing, two camp-stools and a stand for wash-outfit. . . . I am very comfortable indeed."

THE SPIRIT OF THE THING

Even as the camp honed technical competence and scientific thinking, it also prescribed active recreation on evenings, Sundays, and Wednesday afternoons. Physical hardiness, said Pinchot, was paramount for foresters who must "expect the roughest kind of life in the woods."[61] In 1907, James Pinchot installed tennis courts and supported improvements to the Sawkill Falls swimming hole. The pool, "just like heaven," offered the perfect venue to rouse before breakfast and revive after a sweaty day in the field.[62] The camp also sponsored a baseball team, with student and faculty players relishing a fierce rivalry with Milford. Leopold tried out unsuccessfully, "just for the spirit of the thing."[63]

Much of his free time was devoted to the "most *important* task" of "getting into perfect shape again physically."[64] A cross-country runner in college, he raced solo along Milford's shady roads or hiked alone up a rise behind camp to "My Hill." Occasionally camp friends might join a fishing trip or tramp in the woods, but usually he explored on his own. Observing foxes, Pileated Woodpeckers, and other

The Yale Forest School Class of 1909. Aldo Leopold is in the light colored suit in front.

familiar wildlife in Pennsylvania's forest reminded him of childhood adventures in Iowa, where he first developed "the desire to someday help out our poor ducks and other game in return for what they have been and will be to me."[65] In one letter, Aldo insisted, "we have it all here, second only to that of the old Mississippi itself."[66]

Like athletics, school campfires were intended to build lasting camaraderie. Every week or two, campers stacked oak and chestnut logs in front of the clubhouse for a bonfire.[67] Talks by faculty and visiting experts provided inspirational reminders of why the campers were working so hard to become foresters. As the evening wound down, everyone joined in singing traditional ballads and popular tunes, often with substitute lyrics poking fun at camp chow (*Oh, beans for lunch, and supper, too,/ I really think that once would do*), technical work (*Those stem analyses I'll ne'er forget. . . those volume curves divine*), and themselves (*You can bet your sunburned complexion/ We're the jolliest woodsmen in sight*).[68]

Leopold's classmate Rufus Maddox recalled that both work and play "contributed their special parts in individualizing the 1909 class members, and at the same time in converting them into a distinct

UNIVERSITY OF WISCONSIN–MADISON, ALDO LEOPOLD ARCHIVES, S0508

entity in the Yale Forest School."[69] For Aldo Leopold, the shared values and fellowship built at camp helped lay a foundation for one of his most significant insights, that conservation is a collaborative enterprise. As reflected in the game cooperatives he founded in the 1930s, Leopold insisted on community as well as individual responsibilities to the land to assure its permanent protection.

THE BIOTIC ENTERPRISE

By late summer, water in the Sawkill was "colder'n Halifax."[70] Camp rhythms were also changing, as graphing, drafting, mapping, and other "indoor work" piled up.[71] One chilly morning, Leopold and Maddox built fires in the hall and the clubhouse, "so all the fellows are sitting around toasting themselves and studying, loafing, dreaming or writing according to need, temperament, or inclination."[72] Leopold had loved camp from the first day but was ready for New Haven and "hard brain work" to finish his Sheffield degree and tackle his first graduate forestry courses.[73] Fall letters from his Yale dorm confirm he felt prepared to dig deeper into dendrology, forest botany, and silviculture. The graduate curriculum still emphasized fieldwork: five half-days a week in the fall, and three days a week in spring in the first year, and four or five months in the woods in the second.[74] Ten weeks at a lumber camp near Doucette, Texas, in the summer of 1909 furnished final training in surveying, mapping, large-scale forest planning, and timber valuation, plus tours of logging operations and mills.[75] For Leopold, the Texas camp also offered a chance to handle longleaf and loblolly versions of his favorite tree.

Letters home from Texas are reminiscent of dispatches from Milford, with anecdotes, observations, worries about the Civil Service exam, and a few complaints (e.g., late delivery of gingerbread from Burlington).[76] They also reveal a new confidence in not only his abilities but also his prospective career. One telling note explains rejecting a job offer in Massachusetts state forestry; he was "bound for the Service, and no doubt about it."[77]

Leopold carried some limitations of his forestry training to his first job at the year-old Apache National Forest.[78] Without questioning, for example, he joined local campaigns to fight every fire and eliminate wolves and other livestock predators. But as he understood the forest better, he thought more independently. An article he wrote in 1918 conceded that handling timber was the forester's primary task but urged colleagues to help found a new science: game management. Allowing wild animals to vanish, without attempting management methods similar to forestry, "would be a sin against future generations."[79]

By 1928, when he left the Forest Service, Leopold's path away from anthropocentric utilitarian conservation is unmistakable. After conducting the first major game survey of the north-central states, he published the field's first textbook in 1933, the same year he became the nation's first professor of game management and research director for the new arboretum at the University of Wisconsin. *Game Management* presents tools and techniques (with tallies, maps, and growth curves recalling Milford camp notes) enabling land owners and managers to learn "the art of making land produce sustained annual crops of wild game for recreational use."[80] But his aims had changed, from producing sustained yields of quails and canvasbacks for recreationists to include restoring self-sustaining wildlife populations and habitats for their own sake. In *Game Management*, he explicitly recognizes esthetic and other values of non-game wildlife and urges land managers "to retain for the average citizen the opportunity to see, admire and enjoy" native birds and mammals.[81]

Leopold's graduate students learned the latest wildlife management and restoration methods he was pioneering at the arboretum, the Riley Game Cooperative, and his sand county farm. In some ways his tutelage resembled Chapman's in Milford, with demanding requirements for data collection,

record-keeping, and mathematical analyses coupled with creative imagining of the future landscape. Grouse and deer populations were assessed for trends, just as Milford students once compared growth in different age classes of pines, to discern problems. But influenced by Charles Elton and other ecologists, signs of trouble were analyzed as symptoms of larger ecological issues, evidence of impaired biotic community function. The aim had moved beyond individual resource development to improving land health, "the capacity of the land for self-renewal."[82] In the process, students developed an ecologist's equivalent of the forester's eye: an understanding of the woods and prairie as a dynamic whole over time, and an ability to imagine an abundant past and richer future. Their purpose had become to foster a healthy, self-renewing land organism.

A student exodus to serve in World War II gave Leopold time to write the essays that would comprise *A Sand County Almanac*. The writings illuminate further expansion of his values, as in "Wilderness" when he justifies wild land preservation on aesthetic, cultural, and scientific grounds. Wilderness, he says, is "a base datum of normality," crucial to long-term understanding of land health.[83] After forty years of study and experimentation on the land, Leopold writes most powerfully about evolved interconnections and the human duty to protect and repair them. Since Darwin, he says in "On a Monument to a Pigeon," we have known "what was unknown to all the preceding caravan of generations: that men are only fellow-voyagers with other creatures in the odyssey of evolution. This new knowledge should have given us, by this time, a sense of kinship with fellow-creatures; a wish to live and let live; a sense of wonder over the magnitude and duration of the biotic enterprise."[84]

Teaching wonder and "a warm personal understanding of land" were objects of Leopold's post-war undergraduate course, Wildlife Ecology 118. In contrast with the Milford camp, field tools were restricted to "eyes, ears, and notebook," and students who trailed him around campus and the arboretum were encouraged to enjoy the natural community and recognize their part in it. By 1947, he felt an urgency to reach beyond wildlife professionals to students in any discipline, using his teaching of ecological relationships as education toward forward-thinking land citizenship. "Once you learn to read the land, I have no fear of what you will do to it, or with it. And I know many pleasant things it will do to you."[85]

Leopold held that enduring land health relies on long-term, mountainlike thinking, on considering societal, evolutionary, even geological timescales before deciding on a course of action. His ethics remain relevant in the Anthropocene because they evolved past both the wise-use progressives and the hands-off preservationists of his day, toward a restorative vision of human-land relationships. As Leopold wrote in 1923, shortly before the establishment of the Gila Wilderness, "the privilege of possessing the earth entails the responsibility of passing it on, the better for our use, not only to immediate posterity, but to the Unknown Future, the nature of which is not given us to know."[86]

At camp in the Pennsylvania woods, he learned what and when to plant and chop, and how to lead crews in forest inventory, stand mapping, and land surveying. All were vital steps toward building a better tomorrow as then defined by wise-use conservationists. He and his classmates were consciously prepared with "the forester's long look ahead," as Gifford Pinchot said, for "the hardest kind of hard work . . . often for a distant result, the full flower of which they can not hope to live to see."[87] Those lessons did more for Leopold than whet his facility with a Biltmore stick or spark a passion for manipulating wildlife habitat to benefit hunters. His earliest professional education helped ingrain an expansive time horizon from which he could measure the success and shape the prospects of conserving the full biotic enterprise. His learning for the long run began in earnest at the Yale Forest School camp in 1907.

Julie Dunlap teaches about wildlife ecology and biological impacts of climate change at the University of Maryland Global Campus. Her most recent children's book is I Begin with Spring: The Life and Seasons of Henry David Thoreau (*Tilbury House*).

NOTES

1. Aldo Leopold, "The Wilderness and Its Place in Forest Recreational Policy 1921," in *The River of the Mother of God and Other Essays*, ed. Susan L. Flader and J. Baird Callicott (Madison: University of Wisconsin Press, 1991), 81.
2. Char Miller, *Gifford Pinchot and the Making of Modern Environmentalism* (Washington, DC: Island Press, 2001), 155.
3. Curt Meine and Jed Meunier, "Introduction," in *Aldo Leopold on Forestry and Conservation: Toward a Durable Scale of Values*, ed. Curt Meine and Jed Meunier (Bethesda, MD: Society of American Foresters, 2017), 2.
4. Leopold, "The Maintenance of Forests 1904," in *The River of the Mother of God*, 37–39.
5. Gifford Pinchot, *Breaking New Ground* (Washington, DC: 1947; Island Press, 1998), 152.
6. James G. Lewis, "Trained by Americans in American Ways: The Establishment of Forestry Education in the United States, 1885–1911," PhD diss., Florida State University, 2001, 253. The Pennsylvania State Forest Academy opened in September 1903 but wasn't proven yet.
7. Edith Nye Macmullen, "Planting the Seed: The Origins of the Yale Forest School," *Forest History Today* Spring 1999: 15.
8. Lewis, "Trained by Americans in American Ways," 261; James Pinchot, "The Yale Summer School of Forestry," *World's Work* 8 (May–October 1903): 5391.

9. James W. Toumey, "The Yale Forest School: An Historical Sketch," in *Biographical Record of the Graduates and Former Students of the Yale Forest School* (New Haven, CT: Yale Forest School, 1913), 24.
10. U.S. Forest Service, *The Use of the National Forests* (Washington, DC: U.S. Department of Agriculture, 1907), 32–33.
11. Gifford Pinchot, *The Training of a Forester* (Philadelphia: J. B. Lippincott, 1917), 66–67.
12. Letter to Clara Leopold, July 4, 1907, Aldo Leopold Papers, University of Wisconsin Archives, Madison, Wisconsin, Box 6, Folder 2 (hereafter, Leopold Papers). Citations are to the physical archives, not the online edition (https://search.library.wisc.edu/digital/AAldoLeopold).
13. Letter to Carl Leopold Sr., April 19, 1907, Leopold Papers, Box 6, Folder 1.
14. Letter to Clara Leopold, July 4, 1907, Leopold Papers, Box 6, Folder 2.
15. Bernhard Fernow, *Economics of Forestry* (New York: Thomas Y. Crowell, 1902), 100.
16. Aldo Leopold, *A Sand County Almanac* (1949; New York: Oxford University Press, 2020), 208.
17. Henry Graves, "James William Toumey," *Science* 75, no. 1953 (1932): 575–77.
18. Macmullen, "Planting the Seed," 14.
19. Leopold, *A Sand County Almanac*, 208.
20. Herman Haupt Chapman, *The Role of Yale in Forestry* (New Haven: Yale University, 1924), 20.
21. "Summer School of Forestry Bulletin," *Summer School of Forestry Bulletin* (New Haven, CT: Yale University, 1901), 6.
22. Meine, *Aldo Leopold*, 35.
23. Letter to Carl Leopold Sr., April 19, 1907, Leopold Papers, Box 6, Folder 1.
24. Leopold, *A Sand County Almanac*, 102.
25. Meine, *Aldo Leopold*, 35.
26. Matt Low, "The Lawrenceville Letters: Tracking the Origins of Aldo Leopold's Environmental Education," *ISLE: Interdisciplinary Studies in Literature and Environment* 18, no. 4 (2011): 805–07.
27. Chapman, *The Role of Yale in Forestry*, 17.
28. Chapman, *The Role of Yale in Forestry*, 30.
29. Chapman, *The Role of Yale in Forestry*, 15.
30. Aldo Leopold, "To the Forest Officers of the Carson 1913," in *The River of the Mother of God and Other Essays*, 43.
31. Leopold, Forest Mensuration Notebook for the Summer 1907 Course with Professor Herman H. Chapman, Leopold Papers, Box 2, Folder 2.
32. Letter to Clara Leopold, July 11, 1907(b), Leopold Papers, Box 6, Folder 2.
33. Letter to Carl Leopold Sr., July 25, 1907, Leopold Papers, Box 6, Folder 2. The Milford Experiment Station was established about five years before the Forest Service established its first such station, in 1908.
34. Letter to Clara Leopold, August 20, 1907, Aldo Leopold Papers, Box 6 Folder 2.
35. Leopold, *A Sand County Almanac*, 208.
36. Letter to Clara Leopold, July 11, 1907(b), Leopold Papers, Box 6, Folder 2.
37. *Use of the National Forests*, 8–9.
38. Meine, *Aldo Leopold*, 64.
39. Letter to Clara Leopold, January 20, 1907, Leopold Papers, Box 5, Folder 5.
40. Letter to Carl Leopold Sr., January 19, 1907, Leopold Papers, Box 5, Folder 5.
41. Letter to Clara Leopold, February 7, 1907, Leopold Papers, Box 5, Folder 5.
42. Letter to Carl Leopold, Sr., July 15, 1907, Aldo Leopold Papers, Box 6 Folder 2.
43. Letter to Clara Leopold, July 11, 1907(b), Leopold Papers, Box 6, Folder 2.
44. Letter to Carl Leopold Sr., July 25, 1907, Leopold Papers, Box 6, Folder 2.
45. Letter to Clara Leopold, July 31, 1907, Leopold Papers, Box 6, Folder 2.
46. Letter to Clara Leopold, August 30, 1907, Leopold Papers, Box 6, Folder 2.
47. Letter to Clara Leopold, August 5, 1907, Leopold Papers, Box 6, Folder 2.
48. Letter to Clara Leopold, September 4, 1907, Leopold Papers, Box 6, Folder 2.
49. Letter to Clara Leopold, September 11, 1907, Leopold Papers, Box 6, Folder 2.
50. Letter to Carl Leopold Jr., September 2, 1907, Leopold Papers, Box 6, Folder 2.
51. Letter to Clara Leopold, July 11, 1907(a), Leopold Papers, Box 6, Folder 2.
52. Letter to Clara Leopold, August 26, 1907, Leopold Papers, Box 6, Folder 2.
53. Letter to Carl Leopold Sr., July 25, 1907, Leopold Papers, Box 6, Folder 2; Pinchot, "The Yale Summer School of Forestry," 5392.
54. Letter to Clara Leopold, August 20, 1907, Leopold Papers, Box 6, Folder 2.
55. Letter to Carl Leopold Jr., September 2, 1907, Leopold Papers, Box 6, Folder 2.
56. Letter to Clara Leopold, August 20, 1907, Leopold Papers, Box 6, Folder 2.
57. Letter to Clara Leopold, August 11, 1907, Leopold Papers, Box 6, Folder 2.
58. Letter to Clara Leopold, August 20, 1907, Leopold Papers, Box 6, Folder 2.
59. Meine, *Aldo Leopold*, 71.
60. Leopold, *A Sand County Almanac*, 64.
61. Gifford Pinchot, "The Profession of Forestry," (Washington, DC: The American Forestry Association, 1901): 7.
62. Letter to Clara Leopold, August 11, 1907, Leopold Papers, Box 6 Folder 2.
63. Letter to Clara Leopold, July 4, 1907, Leopold Papers, Box 6 Folder 2.
64. Letter to Clara Leopold, July 11, 1907(a), Leopold Papers, Box 6 Folder 2; emphasis in the original.
65. Letter to Carl Leopold Sr., April 13, 1907, Leopold Papers, Box 6 Folder 2.
66. Letter to Marie, July 11, 1907, Leopold Papers, Box 6 Folder 2.
67. Norman Harsell, "Yale's Young Foresters Are Back in New Haven from Their Summer School," *New-York Daily Tribune*, October 16, 1910.
68. "Old Songs of the Yale Forest School," Milford, Pennsylvania: Grey Towers National Historic Site Archives.
69. R. S. Maddox, "Passing of the Yale Camp at Milford," *Yale Forest School News* 16, no. 2 (1928): 26.
70. Letter to Clara Leopold, August 30, 1907, Leopold Papers, Box 6, Folder 2.
71. Letter to Clara Leopold, August 20, 1907, Leopold Papers, Box 6, Folder 2.
72. Letter to Carl Leopold Sr., August 24, 1907, Leopold Papers, Box 6, Folder 2.
73. Letter to Carl Leopold Jr., September 2, 1907, Leopold Papers, Box 6, Folder 2.
74. *Yale University Department of Forestry 1907–1908 Catalog*, (New Haven, CT: Yale University, 1907), 10.
75. Dan K. Utley, "With the Yalies in the Deep Woods, May 10–13, 1909," in *Eavesdropping on Texas History*, ed. Mary Scheer (Denton: University of North Texas Press, 2017), 133–53.
76. Utley, "With the Yalies in the Deep Woods, May 10–13, 1909," 133–53; Meine, *Aldo Leopold*, 81–82.
77. Letter to Clara Leopold, April 12, 1909, Leopold Papers, Box 6, Folder 6.
78. Flader and Callicott. "Introduction," in *The River of the Mother of God*, 4.
79. Aldo Leopold, "Forestry and Game Conservation 1918," in *The River of the Mother of God*, 59.
80. Aldo Leopold, *Game Management* (1933; Madison: University of Wisconsin Press, 1986), 3.
81. Leopold, *Game Management*, 403.
82. Leopold, *A Sand County Almanac*, 208.
83. Leopold, *A Sand County Almanac*, 184.
84. Leopold, *A Sand County Almanac*, 102.
85. Leopold, "Wherefore Wildlife Ecology? 1947" in *The River of the Mother of God*, 336–37.
86. "Some Fundamentals of Conservation in the Southwest 1923," in *The River of the Mother of God*, 94.
87. Gifford Pinchot, "The Men Who Wrote the Verses," in *The Forest Ranger and Other Verse*, ed. John D. Guthrie (Boston: Gorham Press, 1919), 5–6.