



CONNECTICUT

Woodlands

MAGAZINE



CHANGING THE CAR LIFESTYLE

DEAD TREES GIVE OFF METHANE. MANAGING FORESTS FOR CLIMATE CHANGE.

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PAUL EDWARDS

Diane Friend Edwards stops at the overlook on the Henry Buck Trail. See page 22.

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Our mission: The Connecticut Forest & Park Association protects forests, parks, walking trails and open spaces for future generations by connecting people to the land. CFPA directly involves individuals and families, educators, community leaders and volunteers to enhance and defend Connecticut's rich natural heritage. CFPA is a private, non-profit organization that relies on members and supporters to carry out its mission.

Our vision: We envision Connecticut as a place of scenic beauty whose cities, suburbs, and villages are linked by a network of parks, forests, and trails easily accessible for all people to challenge the body and refresh the spirit. We picture a state where clean water, timber, farm fresh foods, and other products of the land make a significant contribution to our economic and cultural well-being.

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CONTENTS



On the Cover:

Early-morning selfie of a bicycle commuter's shadow. See page 6.

PHOTO BY SCOTT LIVINGSTON

FEATURES

CAN CONNECTICUT REDUCE GREENHOUSE GASES?

6 CHANGING THE CAR LIFESTYLE.

Meet an electric-car owner and bicycle commuters who are leading the way.
By Christine Woodside.

8 "CLIMATE CHANGE IS REAL."

Wesleyan professor who serves on international climate panel says we must face our moral imperative to address its greatly evident impacts.
By Gary Yobe.

9 DEAD WOOD GIVES OFF SIGNIFICANT METHANE, A POWERFUL GREENHOUSE GAS.

Scientists are trying to figure out this under-studied source.
By Christine Woodside.

10 IS GOOD FOREST MANAGEMENT THE ANSWER TO CLIMATE CHANGE?

Probably not all by itself, but it reduces carbon buildup in the atmosphere, recent research finds.
By Thomas J. Degnan.

DEPARTMENTS

4 PRESIDENT'S MESSAGE.

Bringing back the American chestnut.
By Eric Lukingbeal.

5 EXECUTIVE DIRECTOR'S MESSAGE.

The importance of silence.
By Eric Hammerling.

12 NEW ENGLAND TRAIL POET-IN-RESIDENCE PROJECT.

David K. Leff continues his project highlighting nature poetry by other Connecticut poets. This issue: poems by John Stanizzi.

13-16 CFPA IN THE COMMUNITY.

► "The Harvest of a Coming Age": Remembering James L. Goodwin and his preserved land in Chaplin and Hampton.
By Jean Wierzbinski.

17 ALMANAC.

Summer's sculptors and sippers.
By Katherine Hauswirth.

18 ON THE TRAILS.

"Where shall we walk today?" A brief history of the *Connecticut Walk Book*.
By Christine Woodside.

20 FROM THE LAND.

Thinking about nut trees. *By Jean Crum Jones.*

21 OBITUARIES

Richard A. Bauerfeld and Ned Zaglio.

22 TRY THIS HIKE.

Henry Buck Trail: A rugged, but short and very pretty, hike in American Legion State Forest. *By Diane Friend Edwards.*

23 BOOK REVIEWS.

Traprock, tree communication, and classics.

25 FORESTER'S NOTES.

Be a good witness. *By Jerry Milne.*

26 ENVIRONMENTAL UPDATE.

Why honeybees are suffering and what beekeepers are doing about it. *By Bud Gavitt.*



Bringing back the American chestnut



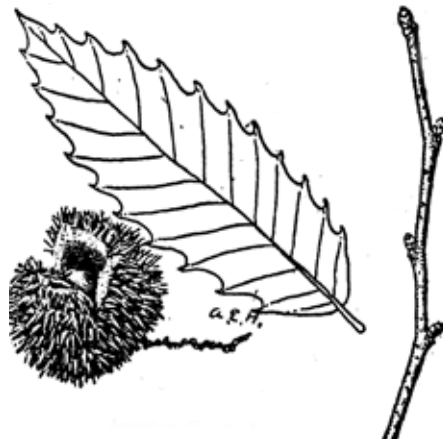
BY ERIC LUKINGBEAL

For several centuries before 1895, when the Connecticut Forest & Park Association was founded, the biggest, most dominant, and most useful trees in Connecticut were American chestnuts (*Castanea dentata*).

They grew to 100 feet and had trunk diameters of up to 14 feet. Chestnut wood was used for houses and barns (like mine, built before the Civil War). The wood was strong, light, resisted rot, and did not warp or check. As most of us know, the chestnut blight of the early 20th century devastated the chestnut population in the Northeast. An airborne fungal infection killed about 4 billion trees. The disease was introduced in 1904 by accident, on nursery stock imported from Japan. It was first found and identified at the Bronx Zoo in 1905. As an exotic invasive, it had no natural enemies and quickly spread. By about 1940, the great majority of American chestnuts were gone.

A few isolated trees survived in small groves in California, Michigan, Wisconsin, and Georgia, but these were exceptionally lucky.

The American chestnut root system, however, was quite large and robust. These old stumps still send up shoots a century later. Some reach heights of 20 to 25 feet, and even produce seeds. This April, when hiking with several friends on Granby Land Trust property, we spied a small clump of American chestnuts, a few spiny nut cases still hanging from a branch. One tree, about 3 inches in diameter, did not look very healthy. Its bark was a dark orange in places, and gooey "sap" was oozing from a large canker. Connecticut College Arboretum in New London has a similar specimen, which it labels as American chestnut infected with blight. It's worth a visit and a look at the tree, which will likely succumb before much longer, as will the one we saw in Granby.



American Chestnut.

CFPA

Chestnut Studies Began in 1930

The country's oldest ongoing chestnut breeding effort is based in Connecticut. Beginning about 1930, woodlot owners and nut growers encouraged the Connecticut Agricultural Experiment Station in New Haven to work on breeding resistant trees for both nut and timber production. In the 1970s, a hypovirulent strain of the blight fungus was discovered in Italy, and imported to CAES, which in its research has shown that some trees can survive contact with the hypovirulent strain. Dr. Sandra Anagnostakis ran the CAES breeding program from 1973 until her recent retirement. Some of the Connecticut work was done in an orchard in Griswold, where she supervised the planting of 800 trees. Of those trees, Dr. Anagnostakis said, perhaps 40 will be saved for further crossing with each other, with a goal of producing seeds that might produce timber or nut trees.

The seeds to these trees are available to the public because, as Dr. Anagnostakis points out, the public paid for them to be developed. Call CAES at 203-974-8500.

Blight-Resistant Chestnuts in NY

Many of us have read about the efforts to produce resistant chestnuts by hybridizing American chestnut material with Chinese or Japanese chestnuts. These efforts have not been entirely successful. But now, there is

better news. Scientists at the State University of New York's College of Environmental Science and Forestry (ESF) in Syracuse, Drs. William Powell and Charles Maynard, have engineered a chestnut with full blight resistance. How was it done?

According to SUNY's ESF (see <http://inside.esf.edu/category/esf-science-matters/>) a single gene from wheat was added to the 38,000 genes of the American chestnut.

Want one? I do, but we will all have to wait. The scientists are seeking regulatory approval from the federal authorities before distributing the trees to the public. Several agencies must review to ensure that the tree will not harm the environment or human or animal health. ESF estimates this approval process will take two to four years. If the tree is approved, it will mark the first time that a plant functionally extinct is reintroduced to the wild.

Right now, there are 100 of these transgenic (some would say genetically modified) trees being grown in a two-acre plot in upstate New York. When they are able to produce pollen, that pollen will be used to fertilize flowers from trees in the wild. Because the wild surviving "mother trees" are crossed with the transgenic blight-resistant trees, half of the offspring will be fully blight-resistant. Though it will take more time to do the crossing with wild trees, more genetic diversity will result, and the species should be hardier. Several transgenic trees have been planted in the New York Botanical Garden for the public to observe.

The ESF scientists have even devised a field test that can identify the nuts with the blight-resistant gene. The test takes only four hours. The long-term goal is to secure funding for "century study." This would result in two 120-acre sites to run comparison studies of wild, transgenic, backcrossed, and hybrid American chestnuts.

The ESF scientists have been working on this project for more than 20 years. Perhaps we or our descendants might someday taste the roasted American chestnut again.

Eric Lukingbeal, a retired environmental lawyer, lives in Granby with his wife, Sally King.

The importance of silence



BY ERIC HAMMERLING

We live in a world of 24-hour/day television and radio news and entertainment, the internet, email, texting, and an endless flow of information. I perform some daily triage to deal with the constant

barrage of noise and data coming at me, and then when I go for a walk in the woods, I can feel my built-up work and life stresses diminishing. Instinctively, I know that taking some time to “get away from it all” is a good thing. However, I am only beginning to learn how essential it is to find silence, true silence, to improve my health and well-being.

Of course, providing access to places of solace for you is a big part of what the Connecticut Forest & Park Association is all about. The best Blue-Blazed Hiking Trails and protected lands enable the normal stresses of your job or life to melt away as the sounds of suburbia subside, and you may have noticed new educational programs at CFPA geared toward finding a “sit spot”—literally a place where you can be quiet, contemplative, and alone with your thoughts. Fighting to keep public lands from being given away is another way that we work to protect those special places that provide essential silence for all of us.

Indeed, too much noise has become a global problem. A World Health Organization report in 2011 called noise pollution a “modern plague” and noted that “overwhelming evidence that exposure to environmental noise has adverse effects on the health of the population.” Specifically, WHO cited increased risks of hypertension and heart disease, sleep disturbance problems, cognitive impairment in children, a heightened state of agitation, and tinnitus, which itself often leads to “anxiety, psychological distress, depression, communication problems, irritability, inability to work, reduced efficiency, and restricted participation in social life.”

Clearly, we live in a loud and distracting world where silence is increasingly difficult to come by, but the health benefits of silence are compelling.

Silence relieves stress, tension, and other health problems. A study in the journal *Heart* in 2006 found that actual silence is more relaxing than listening to “relaxing” music, based on changes in blood pressure and blood circulation measured in the brain. Various studies have also found that meditating in silence may reduce blood pressure, symptoms of irritable bowel syndrome, anxiety, depression, and insomnia.

Silence helps decision-making. The constant demands for attention in our lives can lead to mental fatigue, which affects our ability to make decisions and solve problems.



ADOBE STOCK

However, the quiet stillness you can find when walking alone in nature can help recharge your cognitive resources.

Silence can regenerate brain cells. A study on mice in the journal *Brain, Structure, and Function* in 2013 documented that two hours of silence daily led to the development of new cells in the hippocampus, a key region of the brain associated with learning, memory, and emotion. These findings suggest to researchers that silence could be an important part of therapy for conditions such as depression or Alzheimer’s.

The next time you find yourself stressed out, worn down, or overloaded with information, keep in mind that it may just be a walk in the woods and the sound of silence that you need.

Eric Hammerling lives in West Hartford with his family.



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CHANGING THE **CAR LIFESTYLE***Meet an electric-car owner and bicycle commuters who are leading the way*

BY CHRISTINE WOODSIDE

The Connecticut Transportation Strategy Board concluded a decade ago that if the state hopes to meet goals to reduce greenhouse gases and slow the effects of climate change, its residents must change the “transportation culture.” Mobile sources of air pollution—cars, trucks, buses, lawn mowers, equipment, and the like—contribute half of all human-generated air pollution in the Northeast.

Without the burning of fossil fuels by human civilization, the planet’s atmosphere would hold about 275 parts per million of carbon dioxide. Civilization started adding to the carbon dioxide accumulations in the 1700s, burning wood, coal, and oil. The acceleration of human-made CO₂ emissions increased dramatically in the 20th century. Today, the atmosphere contains about 400 parts per million of CO₂. Since the industrial age, earth has warmed on average about 1.8 degrees Fahrenheit (1 degree Celsius). Glaciers are melting faster, droughts and extreme storms are disrupting the food supply and human safety, and oceans’ acidity has risen. Last fall, 197 nations meeting in France drafted a common goal to prevent the global average temperature from rising by more than 3.6 degrees F (2 degrees C). Here in the Northeast, according to the Intergovernmental Panel on Climate Change’s regional assessment, “If emissions continue to increase, warming of 4.5 degrees F to 10 degrees F is projected by the 2080s; if global emissions were reduced substantially, projected warming ranges from about 3 degrees F to 6 degrees F by the 2080s.” At both extremes, we can expect more and longer heat waves in the summer, the report said. A coauthor of the regional assessment is Wesleyan University economics professor Gary Yohe, an expert on climate assessment. Dr. Yohe’s call to action about climate science appears on page 8.

The United States and 143 other countries signed the Paris Agreement. President Donald Trump has said he thinks the agreement is unfair to the United States, but Secretary

of State Rex Tillerson, former head of Exxon Mobil, has said the country should remain in the agreement. Regardless of the president’s complaints and threats to reevaluate America’s participation, all of these facts just remind us that Americans have been living like royalty.

Connecticut is starting to realize that its love affair with the automobile must change from the traditional gasoline-fired engine. We must enter a new phase.

In this article, we will meet an electric-car owner and three Connecticut residents who commute without emitting greenhouse gases. They have found a way to follow a regular routine that combines getting to work with reducing their impact on greenhouse gas emissions. The bicycle riders also get a workout.

Stephen Devoto

Stephen Devoto rides his bicycle 4 miles door to door to Wesleyan University, where he is a biology professor. He has made this trip on city streets and past a bit of forest since 1997. “It was a criterion for where we bought a house,” he says. “That was an absolute requirement. I gave myself an 8-mile radius. I’ve always biked to work and to school.” He grew up in California and recalls walking to fifth grade in Palo Alto and biking to high school in Livermore.

Dr. Devoto has traveled by bicycle in New York City; in Durham, North Carolina; and in Eugene, Oregon. “My parents commuted or shopped by bicycle. They were a little old to be hippies, but they were kind of caught up in that pre-Earth Day environmentalism.”

If he adds the time it would take for him to walk down the driveway, get in the car, drive to Wesleyan, park, and walk to his office, he believes that whole process would save him maybe five minutes over the 15 he needs to get there by bicycle.

“I also go downtown a lot. To do the one mile or half mile downtown—it’s so much faster on a bike. Overall, I think it’s just as fast, and then of course it’s healthy and it saves an enormous amount of money.” He does own



ED McKEON

Stephen Devoto riding to work past a sign for his campaign for the city’s Planning and Zoning Commission.

a car. He drives it only 5,000 miles a year.

If it’s cold, he puts on his skiing outerwear. In snow, he skis to work. The only time he’ll take his car is when plows are on the road—in deference to a request by his wife, Joyce Powzyk. Overall, the benefits of commuting without a car connect him to his community. He’ll roll by neighbors on their porches and wave.

Jennifer Sharp

Jennifer Sharp is in her second year of bicycling year-round from her house at the West Hartford–Hartford line to the Hartford Public Library, where she is a librarian. She lives about 3 miles from work now, but she used to live a bit farther from work and would bicycle about once a week in good weather. Last year, she challenged herself



COURTESY OF JENNIFER SHARP

Jennifer Sharp pauses on the way to work.

to commute by bike every day for a year. “I didn’t actually start out thinking I was going to do that,” she said. “On February 24, 2016, I rode that day and just kept riding and riding and riding, through the rain, which we didn’t have much of last year. At some point during the fall I realized how close I was to hitting the year mark, so I became very determined to do that. I did ride after the February blizzard—on the sidewalk and taking the Fast Track [car-pool lane]. The roads were really in terrible shape. I was going between the roads and the sidewalk.”

Ms. Sharp has found that riding her bicycle takes her no longer than if she drove. “I don’t have to get my car in the parking lot at work and walk back to the building from the parking lot. I feel better when I get to work. It’s built-in exercise for the day.”



SCOTT LIVINGSTON

Two-wheel travel allows for a break on the Phoenix Gateway Bridge in downtown Hartford.

Scott Livingston

Scott Livingston varies the distances he rides his bicycle from his house in Bolton to his office at Horst Engineering in East Hartford, where he is the chief operating officer. “I have several routes and mix it up depending on my available time, the weather conditions, and the bicycle I choose to ride,” he says. “A typical route would be a mix of rail trails, bicycle paths, and roads. If I’m in a rush, I might ride all roads on a direct 13-mile (45-minute) route. It is slightly downhill

from my home to work, but that means it’s slightly uphill in the opposite direction.” He likes taking the Hop River State Park Trail, a cinder-dirt route near his house. He also likes the paths on the East Coast Greenway, including Charter Oak bike paths that parallel I-84 and I-384. He also likes the Hockanum River trails in East Hartford and the roads and paths of Wickham Park.

He’s found that if he needs his car at work, he can take a bicycle and ride that home, leaving the car. Then bicycle back to the car the next day. “This gives me the flexibility of having a car at work and helps on days when my schedule doesn’t permit me to commute both directions,” he says.

The uphill ride home doesn’t seem to bother Mr. Livingston, an enthusiastic mountain biker, trail runner, and member of the Connecticut Forest & Park Association Board of Directors. “When time permits, I’ll take the long way home,” he says.

He uses a headlight and taillight even during the daylight and wears reflective clothing, including a vest and ankle bands. “My ‘cross’ or ‘hybrid’ bicycles are ideal for riding on smooth trails, and there is no speed penalty when riding those bikes on roads,” he says. “I’m often asked if I wash up at work. I do have access to a shower, and if it is a weekday, I take advantage of the opportunity to clean up. Even if I didn’t have a shower, it wouldn’t deter me from riding.”

Jeff Murphy

The business manager of Wesleyan University is an environmentalist at heart, he says. Jeff Murphy looked at how much transportation contributes to America’s carbon footprint and was looking for a way to do something that would match his beliefs. “I’m happy to put my money where my mouth is, but I don’t have a ton of money,” he says. “If it doesn’t make economic sense. . . .”

Two years ago, the Murphy family realized they didn’t need two full-sized sedans for commuting about a half-hour’s drive to the Middletown area from the shoreline town of Guilford. Mr. Murphy’s wife, Kara, is the development coordinator at CFPA’s office in Middlefield. The car Mr. Murphy had been driving needed expensive repairs he could not justify. At Wesleyan, two electric car chargers are offered free. In Guilford, the town offers four free chargers, two of them at Town Hall and two at Bishop’s Orchard.



COURTESY OF JEFF MURPHY

Jeff Murphy charges his electric car at Wesleyan University’s Freeman Athletic Center.

Free charging sounded a lot cheaper than the \$150 in gas he had been spending just for the daily commute. Even charging it at home overnight, which takes about 10 hours, does not raise the electric bill much. In 15,000 miles, he calculates he’s spent \$27 on electricity to charge it. Of course, one incentive was rebates available through the state government, and whether those will continue after the current round can’t be predicted.

Until electric cars with longer ranges come out, owning an electric car means it is the local transportation, Mr. Murphy notes. His 2015 Volkswagen E-Golf (which he is leasing for \$250 a month on the theory that technology will improve before he would be able to pay off such a vehicle) can run 95 to 100 miles on a charge, but fewer miles in cold weather because his car uses lithium ion batteries that cold will deplete.

“You have to do a little bit of planning,” he says. If he takes his family somewhere, he needs to know there’s a charging station. They took a day trip about 33 miles to New London recently, charged the car while they walked around, and then drove home with no problems.

Perhaps the greatest challenge is sharing the charging station at work. Mr. Murphy thinks everyone should plug in other people’s cars as a courtesy when theirs are finished charging. “We need to be exemplars for the community,” he says. “Not everyone feels that way, as I’ve found out. We’ve had some trouble with people leaving the handles and cords on the ground, sticking them in snowbanks.”

Christine Woodside is the editor of Connecticut Woodlands.

“CLIMATE CHANGE IS REAL”

Wesleyan professor who serves on international climate panel says we must face our moral imperative to address its greatly evident impacts

BY GARY YOHE

The following remarks were made at a March 22 public event with Governor Dannel P. Malloy and other policy and science leaders by Wesleyan economist and environmental studies professor Gary Yohe, recipient of the Nobel Peace Prize in 2007 for his work on the Intergovernmental Panel on Climate Change. Dr. Yohe was responding to President Donald Trump’s proposed deep cuts to federal environmental spending, including about \$6 million that would go to Connecticut. At this event, Connecticut Department of Energy and Environmental Protection Commissioner Rob Klee said, “Science itself is under attack in the federal budget.”

Dr. John Holdren, past science advisor to President Barack Obama and director of his Office of Science and Technology Policy, has often asserted: In confronting the growing risks associated with climate change, America has three choices—“mitigate, adapt, or suffer.”

Climate change is real. We have already seen its impacts in every corner of the country most vividly in terms of increases over the past few decades in the intensity and frequency of extreme weather events—increased risk from riverine flooding, widespread droughts, associated wildfires, intense heat waves, severe cold spells, coastal flooding, rising seas driven by warming temperatures, shrinking ice sheets, so on.

Climate science has shown us unequivocally that climate change and these risks are, in large measure, the products of human reliance on fossil fuels.

The Obama administration took these growing risks very seriously. The Department of Defense called climate change a “risk enhancer” to our national security. Various other departments and the Environmental Protection Agency developed and implemented a Clean Power Plan and an Adaptation Plan for federal properties and for governments of all sizes and persuasions.

Perhaps most important, the Obama administration reached a bilateral agreement with China early in 2014 for verifiable and quantifiable reductions of greenhouse gas emissions over the near-term with the expectation of more stringent cuts over the longer term after more than a year of intense negotiations in Washington and Beijing. The agreement broke the logjam that had blocked progress in international negotiations for a global approach to moving forward with Dr. Holdren’s first two options. With American and Chinese leadership, more than 190 nations signed the Paris Accord in December of that year. It is an agreement collectively

- ▶ To reduce global emissions of greenhouse gases,
- ▶ To underwrite adaptation across the globe,
- ▶ To incentivize innovation and economic development in alternative energy sources and, thereby,
- ▶ To promote global opportunities for high-paying and productive jobs in a dynamic economic sector that will surely drive economic growth for decades.

The accord came into force on November 4, 2016.

By way of stark contrast, President Trump does not even have a science advisor, and he has not populated the OSTP. His administration has attacked climate science, and it has announced its intention to abandon any initiative designed to ameliorate climate risk in any way. This White House has disallowed taking account of growing climate risks across the federal government as part of its plans for “administrative deconstruction.” It will undoubtedly disallow including future climate change in the design of its forthcoming \$1 trillion infrastructure initiative.

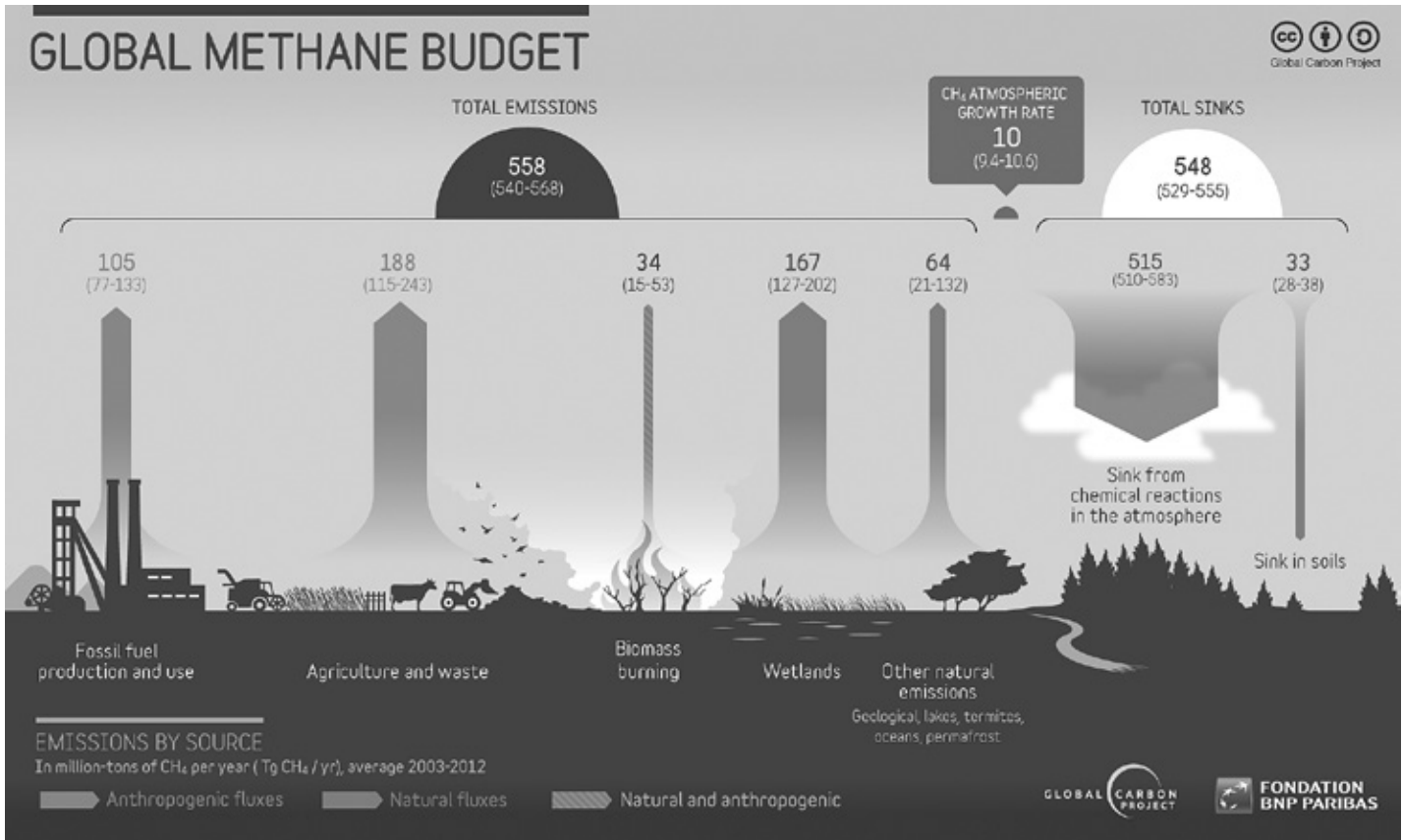
The Trump administration will try to implement this anti-climate science

perspective by imposing a budget that would defund climate science and climate policy across the board—at the EPA, at NASA [the National Aeronautics and Space Administration], in the Department of Commerce where NOAA [the National Oceanic and Atmospheric Administration] resides, in the Department of Energy where fundamental research in alternative energy resides, in the Department of Transportation where much of the infrastructure planning will occur, and so on. Only Secretary of Defense [James] Mattis has bucked this enormous headwind.

As an American citizen, and on the basis of more than three decades of personal experience in research and assessment work about climate risks, I am convinced that it is irresponsible and immoral for the elected and appointed leaders of our country to dismiss the science that has produced undeniable evidence describing those risks and their human sources.

Ignoring the lessons from climate science unnecessarily puts the lives, the communities, the livelihoods, and the societal, economic, and natural systems that sustain the well-being of their constituents directly in harm’s way. In short, their doing so is nothing short of an abdication of their solemn oath to “serve and protect” every American.

Gary Yohe is the Huffington Foundation professor of economics and environmental studies at Wesleyan University. He has been on the faculty at Wesleyan for more than 30 years and involved with the IPCC since 1990. He was educated at the University of Pennsylvania, and received his PhD in economics from Yale University in 1975. He is the author of more than 100 scholarly articles, several books, and many contributions to media coverage of climate issues. Most of his work has focused attention on the mitigation and adaptation/impacts sides of the climate issue. Contact him at gyohe@wesleyan.edu.



DEAD WOOD GIVES OFF SIGNIFICANT METHANE, A POWERFUL GREENHOUSE GAS

Scientists are trying to figure out this under-studied source

BY CHRISTINE WOODSIDE

The study of methane—which among human sources of greenhouse gases going into the atmosphere makes up just 16 percent—sometimes fades into the background of the public’s understanding. Forests, of course, give off carbon dioxide, methane, and other gases as the wood grows and decays. The contribution that the dead trees make has caught the notice of some researchers in the past few years. I talked with Kristofer Covey, a postdoctoral researcher at Yale School of Forestry and Environmental Studies who studies methane in various types of downed wood. He says that he and his colleagues in this somewhat new branch of climate science are looking at three factors that drive the amounts of methane emitted by deadwood. First,

time. Recently cut timber, especially standing tree trunks, contains higher concentrations of methane than does wood on the ground. Second, the diameter of the log. A bigger log contains more methane, and the middle of the log is deficient in oxygen. Single-cell organisms that consume the decaying wood will go to the places with less oxygen, and as they break down the wood, they produce methane. Third, the species of wood. Hardwoods such as oak and hickory, which dominate Connecticut’s forests, contain more methane. Conifers such as hemlock and pine contain less.

Dr. Covey says his former professor, the late Dr. Thomas Siccamo, used to talk about the crowd-pleasing trick of coring a tree and listening to it hiss. This proved trees contain high concentrations of methane. But for

many decades, forestry studies did not look closely at methane. Methane traps heat in the earth’s atmosphere at a greater rate than carbon dioxide does, so it’s now something scientists look at more closely. A handful of studies have verified the high concentrations in recent years, and at least one more study is under peer review now, Dr. Covey says. But the greater implication of this understanding—whether trees aren’t as good greenhouse gas sinks as thought—is completely uncertain at this point because, like many situations, methane, trees, and decomposition are complicated.

So far, he says, it’s clear that significant amounts of methane reside in dead trees as they lie on the ground, but the amounts vary greatly from log to log, branch to branch, trunk to trunk. Methane leaves the wood

DEAD WOOD *continued from page 9*

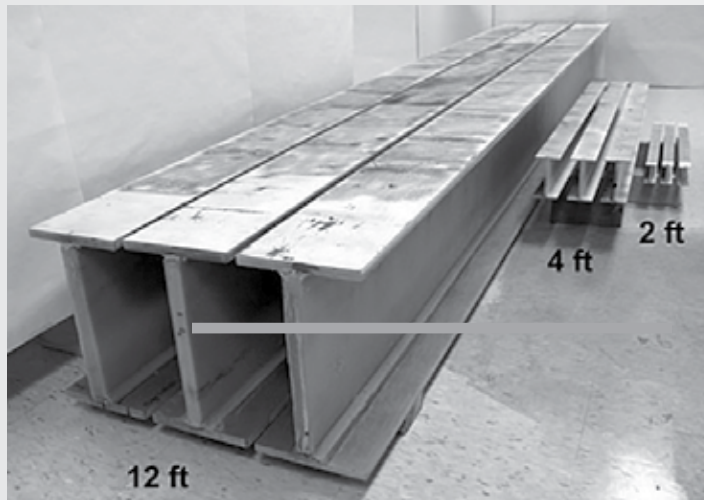
and goes into the air fairly soon after the tree falls or is cut. A cut log, or a standing tree trunk recently cut, could provide an easier way out for the methane because of the tree's vascular system. Microbes that produce methane as they consume the wood seem to be able to get at it quickly through cut surfaces.

Dr. Covey reported in a 2012 paper that he and three colleagues—Dr. Xuhui Lee, a professor of meteorology at Yale, Dr. Stephen Wood, and Dr. Robert Warren, sampled 60 trees in Yale Myers Forest. The trees “contained concentrations of methane that were as high as 80,000 times ambient levels,” Dr. Lee said.

“These are flammable concentrations,” Dr. Covey said at the time. “Because the conditions thought to be driving this process are common throughout the world’s forests, we believe we have found a globally significant new source of this potent greenhouse gas.”

In his latest published research in the journal *Biogeochemistry*, Dr. Covey and others calculated northeastern trees’ methane emissions as equal to 23 percent of the carbon these forests sequester, reducing their value as carbon sinks.

Since this new wave of research began only a few years ago, it can’t yet suggest how forest management might change in response, or if it should change. Because methane is a particularly powerful greenhouse gas, scientists are watching the “global methane budget,” so called by the international scientists’ group the Global Carbon Project. Greater methane emissions come from farm animals and natural gas production. Forests as a whole still absorb dramatically more greenhouse gases than they emit. But the amount they absorb is less than previously thought.



Engineered wood products like these laminated I-beams save carbon and are easier than steel to cut and move on job sites.

WIKIMEDIA COMMONS

IS GOOD FOREST MANAGEMENT THE ANSWER TO CLIMATE CHANGE?

*Probably not all by itself, but it reduces carbon buildup
in the atmosphere, recent research finds*

BY THOMAS J. DEGNAN

Trees are naturally good at carbon sequestration, also known as carbon storage. Well-managed forest trees and forest soils have long been known as great places to store carbon. As a tree grows, it converts carbon dioxide in the air to stored carbon in the wood, leaves, twigs, and soil of the tree and releases oxygen back into the air. The storage of carbon in the wood of trees is only temporary. A young, vigorous tree grows fast and can store up to half its dry weight in carbon in its wood, but as the tree gets older and nears the end of its life, carbon intake and storage decrease only to be released again when the tree dies and slowly decays. There is a way to improve on the ability for trees to function as stored carbon, and we have been doing it for a long time through the use of wood products for building.

A working forest that is well managed to produce high-quality wood products can play a significant part in reducing carbon being released into the atmosphere. Look around almost any house or apartment: kitchen cabinets, wood floors, wood furniture and, behind the sheet-rock, usually more wood, all store carbon. These wood products are designed to last, capture carbon, and keep the natural cycle of decay and release of CO₂ from occurring.

Today, engineered wood products go even further as carbon storage. Laminated beams and cross-laminated timbers can replace steel and concrete in many building applications. Not only is the carbon in the wood stored for as long as the building is standing, the more carbon-intensive process of making steel and concrete is avoided. Chad Oliver, a professor at the Yale School of Forestry and Environmental Studies and director of Yale’s Global Institute of Sustainable Forestry, has estimated that 14 to 31 percent of the world’s CO₂ emissions could be avoided using the combination of stored wood products, avoiding CO₂ from more carbon-intensive building products, and displacing fossil fuels in the energy production process from the use of forest residue for feedstock in bioenergy facilities.¹

Studies show that wood buildings require less energy from resource extraction through manufacturing, distribution, and end-of-life disposal and are responsible for far less greenhouse gas emissions than are fossil fuel-intensive materials such as steel or concrete.²

Using Wood Starts with Sustainable Forest Management

Sustainable forest management maximizes growth of high-quality trees best suited for a particular forest site. High-quality forest products such as good-grade oak, cherry, maple, and pine lumber have a better chance of ending up in residential or commercial applications that store carbon over the long run. Even low-value wood from forest thinning or from the tops and branches of trees can be used in bioenergy facilities or in the production of wood pellet and brick products made from sawdust. When wood is used to generate heat or electricity, it offsets the use of oil, gas, or coal.

Engineered wood products offer even more opportunities to reduce a building's carbon footprint. "Engineered wood products that can replace steel in residential structural applications started gaining popularity in the late 1990s, but were still very expensive," says Lance Pylko, senior structural engineer at Burns & McDonnell, the firm where I also work. "Over time, prices came down as demand for longer spans in residential applications increased and additional product manufacturers became available. Engineered wood products such as laminated I-beams and cross-laminated timbers can be used to increase a span without adding supports. These types of building materials can be cut and installed on the job site by carpenters without specialized tools versus steel I-beams that require specialized tools to cut and lift into place."

Case Study of an Arkansas High School

A case study for the use of wood versus concrete and steel done by Woodworks.org for El Dorado High School in El Dorado, Arkansas, offers us a useful example of how wood can replace steel and concrete to save money while reducing the carbon footprint of the building. A new 322,500-square-foot building was proposed to replace the outdated 165,000-square-foot El Dorado High School. As in most construction, cost was a concern. Original budget estimates of just over \$60 million were too high, so the engineers were forced to look at alternatives to traditional steel and masonry where considerable savings were able to be found. The project's construction managers worked with the lead architect to evaluate various



WOODWORKS.ORG

El Dorado High School in Arkansas saved 11,440 metric tons of carbon by using wood instead of steel and concrete for its new building.

systems, and the ultimate goal was to maximize wood framing throughout the project. "By just changing the framing to wood, we were able to save about \$2.7 million, which was 5 percent of the original \$60 million budget," says architect Blakely Dunn, principal of CADM Architecture, Inc.

Dimension lumber was used for interior and exterior load-bearing walls, and laminated wood I-joists were used to support a second-floor concrete floor slab and were used for the roof structure of the two-story building. Altogether, the project used

- ▶ 521,760 square feet of plywood
- ▶ 632,928 board feet of dimension lumber
- ▶ 230,000 board feet of glued laminated beams
- ▶ 134,376 linear feet of wood I-joists

Final construction and site development costs totaled \$43.2 million, which was within the school district's budget.

Although the El Dorado High School case study focused on costs and how using wood brought the building back within the budget, the carbon benefits were impressive also:

- ▶ 153,140 cubic feet of lumber panels and engineered wood used on the project
- ▶ 3,660 metric tons of carbon stored in the wood
- ▶ 7,780 metric tons of CO₂ emissions were avoided by not using steel and masonry construction
- ▶ For a total potential carbon benefit of 11,440 metric tons of CO₂
- ▶ Equivalent to 2,100 cars off the road for a year and the energy to operate an average home for 970 years.

North American Forests Store Carbon

According to the U.S. Department of Agriculture, the volume of net growth in U.S. forests is two times higher than the volume of annual removals. "Removals are at the lowest level in 60 years, and growth has also slowed," according to the report "U.S. Forest Resource Facts and Historical Trends."³ In Canada, less than 1 percent of managed forests are harvested annually.⁴ These results show that year after year, carbon continues to be stored in North American forests, and there is opportunity to harvest and store even more carbon in wood products used in new construction.

Well-managed forests provide landowners with income to offset property ownership, support local economies, and more and more, research shows that they can lower carbon emissions compared with using other, more carbon-intense building materials. So, by encouraging good forest stewardship and choosing wood products from sustainably managed forests, each of us has the ability to do our part in reducing the carbon footprint of development.

Thomas Degnan is the forester for the Connecticut Forest & Park Association and senior scientist and forester for Burns & McDonnell, an engineering and architecture firm in Wallingford.

1 Oliver, C. D., N. T. Nassar, B. R. Lippke, and J. B. McCarter. 2014. Carbon, fossil fuel, and biodiversity mitigation with wood and forests, *Journal of Sustaining Forests*.

2 American Wood Council, "Wood and Carbon Footprint." See awc.org.

3 United States Department of Agriculture, "U.S. Forest Resource Facts and Historical Trends," August 2014. Accessed in May 2017 at https://www.fia.fs.fed.us/library/brochures/docs/2012/ForestFacts_1952-2012_English.pdf.

4 Natural Resources Canada; Forest Products Association of Canada



Throughout the year, the New England Trail poet-in-residence, **David K. Leff** of Collinsville, Connecticut, presents poetry in this space to amplify understanding of the 215-mile-long trail. The NET is the first of the 11 national scenic trails designated by the U.S. Congress to get its own poet. The trail begins at Long Island Sound in Guilford and continues north through the traprock ridges and backcountry of Connecticut and Massachusetts to the New Hampshire border.

Featured poet:

JOHN L. STANIZZI

John L. Stanizzi is the author of the collections *Ecstasy Among Ghosts*, *Sleepwalking, Dance Against the Wall*, *After the Bell*, *Hallelujah Time!*, and *High Tide—Ebb Tide*. Mr. Stanizzi's poems have appeared in *Prairie Schooner*, *American Life in Poetry*, *The New York Quarterly*, *Tar River Poetry*, *Rattle*, *Passages North*, *The Spoon River Quarterly*, *Poet Lore*, and many others, and he is finishing up a new collection entitled *Chants*. He teaches literature in an adjunct capacity at Manchester Community College in Manchester and lives with his wife, Carol, in Coventry.

STUCK LYRICS

The goldfinches have been cast,
ingots against the fractured landscape
of winter's wreckage,
crooked fingers on knuckled hands
reaching up toward prodigious blue clouds,
those unreachable miracles
we've come to anticipate—
nothing like the lyrics looping in my head
for three days now,
or the mockingbirds
that have returned after 15 years
to see if there's anything new to say,
though our aspirations should be for silence
which the skulls disallow,
disappointing the mockingbirds
headed for the hills
repeating only what they hear.

SKEIN II

I was on my way into the gym and
heard the geese blaring before I saw them,
a skein from the west, the *V* visible
but ragtag. I was looking up now, and
from the east a second skein was coming,
their raucous clamor growing as they rammed
the first *V*, though "rammed" may not be the best
way to describe what I saw; it was more
like the calibration of clockworks, each
bird part of a pinion meshing with the
larger wheel, a gear-train powering south.

As one bird pulled in behind the other,
their heart rates slowed but their speed increased as
they slipstreamed across the January
sky; and then a third skein came barreling
in from the north, the third wheel in this huge
going-train, urging and gliding, every
goose baying a one note song millions of
years old; and below their riotous noise

the *V* appeared with the kind of wonder
that becomes visible only *after*
it has happened. And I was left standing,
my senses staggered, my spirit increased,
as in the distance their yawping became
quiet, their instinct, their impulse for south
moving them along, me waiting for spring,
the geese gone, their perfect escapement done.



"THE HARVEST OF A COMING AGE"

Remembering James L. Goodwin and his preserved land in Chaplin and Hampton

BY JEAN WIERZBINSKI

James L. Goodwin believed that Connecticut citizens must manage forests well. His ideas agreed with those of the Connecticut Forest & Park Association when it formed as the Connecticut Forestry Association in 1895, recognizing the “urgent need for preserving and using them rightly” and the need “to disseminate information related to the science of forestry.”

In his privately printed 1951 book *A History of Pine Acres Farm*, Mr. Goodwin wrote, “A forester should, if he has the means and time, in my estimation, own and manage a tract of woodland according to forestry principles and in this way learn in a truly practical way what it means to cut timber conservatively and make it pay.”

Mr. Goodwin had both the means and the time. He made it his mission to do his part in restoring the state’s woodlands while also earning income. He started about a century ago by moving into an old farmhouse and acquiring old farm and forest tracts. In 1964, he donated 80 acres and the farmhouse to the state of Connecticut and provided a trust for its development as a conservation education center.

The Goodwin property today is the James L. Goodwin Conservation Center in Hampton



JAMES L. GOODWIN STATE FOREST

*Above, James L. Goodwin.
Top, Pine Acres Lake at sunset.*

and the adjacent town of Chaplin, owned by the Connecticut Department of Energy and Environmental Protection and operated in a public-private partnership with CFPA. The Goodwin Center, situated in the 2,000-acre Goodwin State Forest, runs programs for students, teachers, land managers, and other interested visitors on the natural world and forest management. The land includes three ponds and 17 miles of trails for hiking, skiing, and horseback riding.

The state provides a naturalist for eight months a year; an all-volunteer group, the Friends of Goodwin Forest, works under CFPA on fund-raising, planning programs and speakers, maintaining the trails and gardens, and building and maintaining kiosks with park information and maps. According to

Friends President Steve Broderick, the group provides 2,500 volunteer hours per year, the equivalent of one-and-a-half staff positions. The Friends fund the Goodwin program director, Beth Bernard.

From New York to a Tired Woodland

Mr. Goodwin’s wife, Dorothy Wendall Davis Goodwin, was descended from an old Hampton family with deep ties to this small, rural town. There, the Goodwins established a working forest and farm in the out-of-the-way eastern Connecticut village, aiming to replenish the state’s lost woodlands. The effort elevated him to prominence in the state’s nascent forest conservation movement.

Born in New York City in 1881, Mr. Goodwin was descended from one of Connecticut’s earliest and most illustrious families. His ancestor, Ozias Goodwin, came to America in 1632 and helped found Hartford. His grandfather was Major James Goodwin, founder of the Connecticut Mutual Life Insurance Company, and his father was James Junius Goodwin, a prominent banker who was first cousin to J. P. Morgan. When he died in 1915, James Junius’s estate was valued at \$30 million—the equivalent of nearly \$724 million in 2017 dollars. James L. Goodwin had good connections on his maternal side, as well. His mother was

a member of the Lippincott publishing family. The Goodwin family lived in New York City but kept a “country home” in Hartford, a huge Gothic mansion known to the city’s residents as “The Castle.”

As a boy, James attended prestigious Groton School, where his father’s cousin J. P. Morgan was a trustee. While there, James befriended the future President Franklin Delano Roosevelt. Upon his graduation from Groton, James attended Yale, initially because he wanted to study law. As he later wrote in a history of Yale graduates, “After one year, however, I made up my mind quite decidedly that the law was not for me, nor I for the law.” He travelled in Europe and the southwestern United States before enrolling in the Harvard Forestry School. He transferred to the Yale Forest School (which later became the Yale School of Forestry and Environmental Studies), epicenter of the emerging forest preservation and management movement. James graduated in 1910 with a masters of forestry, a new area of concentration. A photo of him from that year shows a handsome young man with an expression at once determined and kind, traits he exhibited throughout his life.

Connecticut’s landscape had altered dramatically from the time of the first European settlers to the early 20th century. Colonial farm settlement began clearing forests in the 17th century. By 1825, just 20 percent of the state remained forested, and many grazing animals such as deer and bears had almost disappeared. Although westward movement in the 1800s allowed abandoned farmland to revert to woods, only about 47 percent of Connecticut was forested in 1913, according to the Long Island Sound Study.

Concerns had been growing since the late 19th century about the harmful effects of deforestation, including loss of habitat for native wildlife, near elimination of some native tree species, and negative repercussions for the land itself. As Mr. Goodwin scouted for suitable places for his woodland farm, he may have read Soil Survey of Windham County, Connecticut, which the U.S. Department of Agriculture published in 1912.

The survey reported, “Increasing interest in forestry is being manifested. Such of the rough areas that cannot be used for farming purposes are being planted, particularly to white pine.” It reported that apples grew well and that “the opportunities in Windham



JAMES L. GOODWIN STATE FOREST

The Goodwin house in 2017.

County for scientific farming are good.” After visiting Hampton, Mr. Goodwin wrote there “was much abandoned and unused farm and pasture land suitable for reforestation, and a large area of red oak hardwood.” The price was right at \$8 to \$15 an acre. He bought 28 acres in 1913, adding 19 acres on which a farmhouse stood one year later.

In *A History of Pine Acres Farm*, Mr. Goodwin described it as “an old, tumbled down house” that was “surrounded by ancient lilac bushes and apple trees.” A photograph shows a house in disrepair with no windows or doors, its siding weathered. Across the road stood a small barn.

The tall pines and winding trails in Goodwin State Forest give James Goodwin’s farm an air of enchantment. It is not surprising that there is a legend attached to it. Susan Griggs tells the story in her book *Folklore and Firesides in Pomfret, Hampton and Vicinity* (Ingalls Printing, 1950). Pine Acres Hill was once known as Moulton Hill, probably after early settler Robert Moulton. The tale goes, though, that the hill was “so named for an old woman who was believed to be a witch, even that she had charmed an immense gray squirrel that ran chattering along the road side walls, defying the sharpshooters’ skill.”

His Brother Designed the House

By 1915, Mr. Goodwin determined he needed a superintendent. He razed the old house to build another for this overseer, saving hearth and chimney stones, paneling, and beams for the new structure.

His architect brother, Philip, designed the home. Philip was one of the designers of the

Museum of Modern Art in New York City, but the simple, elegant design for his brother’s three-story house is quintessential New England. It is similar to a classic Connecticut salt-box with a huge stone center chimney and an ell. There were dormers on the second floor, and under the overhang of the roof at the back wide decorative columns defined a porch area.

Stan Crawford from the Friends of Goodwin Forest notes an interesting architectural feature that creates the illusion that the offset chimney is in the center of the house. “The massive center fireplace is of local stone, unique in that as it protrudes through the third floor, it then has a built-in list of approximately 15 degrees from plumb, so that the exterior appearance is of a chimney passing exactly through the center of the peak of the roof.”

Mr. Goodwin did not intend to maintain his primary residence on the property. “The east side of the house was planned for the use of the forester and the west side had rooms for me while visiting the farm.” The caretaking family originally lived in “the canvas house in the pine grove” and “much of the time lived on the rabbits which abounded in the woods.” Their substantial new home must have seemed quite luxurious in comparison.

In 1916, an old pasture and stone wall were cleared from the front of the house. Vegetable and flower gardens were planted in their stead. Photos show a walkway leading from the house to Route 6 with orderly plantings on either side.

In 1923, Mr. Goodwin had built a large addition to the west side of the house, also designed by his brother. It included a new living room, and two bedrooms above. The old

living room became a dining room and the upstairs bedroom was converted to a bathroom. Included in this addition was a lovely, sunlit study/library with recessed arched windows decorated with classic columned trim. The room has been restored, with workers scraping through five layers of paint to match the original color. Glass-fronted bookshelves still hold many of Mr. Goodwin's books.

Across the road, he built a large barn to replace the small older one. The shingles and siding of the new barn came exclusively from white cedar harvested from a nearby cedar swamp. The barn had a second and third floor with living quarters for his workers. At one point in the 1940s, a family of Latvian refugees lived there.

Between 1914 and 1915, as Mr. Goodwin recounted in his history, he cleared the land, planted white and red pines and hardwoods, added more land, planted more trees, and added gardens. In 1917, he bought still more land and continued planting trees and adding gardens. He planted six acres of oats and 1,000 Douglas fir trees, although the latter did not work out well. At the end of the winter, deer had eaten all but 10 to 12 trees.

Work slowed because of World War I, when, he wrote, "all farmers were urged to produce as much food as possible, no tree planting was done, and potatoes and oats were planted" in the open fields. When the war ended in 1918, Mr. Goodwin planted 4

acres of apples in addition to pruning existing orchards. He also planted rye. A local resident brought his portable saw and cut 175,000 board feet and 200 cords of dead chestnut and some white pine.

Over the next few years, Mr. Goodwin acquired additional land and planted timber trees, apple orchards, potatoes, and stands of Christmas trees. A new caretaker and his wife added "cows and chickens, pigs and ducks, and geese and guinea hens." Deer continued to pester him, finding the new apple trees a delicacy. Mr. Goodwin spent \$175 to completely fence in two orchards with a total of 10 acres. He experimented with Scotch pine but found it unsuitable for reforestation.

By 1922, he had replaced teams of horses with a tractor. Two years later, after a passing train's spark ignited a fire that burned 43 acres, Mr. Goodwin dug pools to provide water, the remains of which can still be seen today. His papers record his involvement with forest fire prevention for years afterward.

Nursery Manager to Superintendent

In 1926, Edson Stocking became farm superintendent and continued in that role for 40 years. Mr. Goodwin was pleased with Mr. Stocking's meticulous work. Mr. Stocking had managed the state nursery in Simsbury and worked as a patrolman for the Connecticut State Forestry Department and Talcott Mountain Forest Protective Association. He married just as he accepted the new position. Mr. Stocking and his wife moved into the "forester's house," where they raised two children. The Stockings appear often in the Goodwins' book and photo collections. Mr. Stocking loved wildlife and once adopted two orphaned fawns. Old photos show them eating from his hand.

Land acquisition, plantings, and improvements continued over the next few years. Mr. Goodwin improved the wood roads, drilled an artesian well, created a small pond by damming a brook, built a sawmill, and cut dead chestnuts, which had been decimated by the chestnut blight accidentally introduced to the United States in 1900. The chestnut was sold to a company specializing in producing portable fences. Mr. Goodwin also dealt with an invasion of the pine weevil, which fed on the leaders of young white pines, destroying their value as lumber. By 1934, the farm consisted

of 1,442 acres, including a cedar swamp surrounding "Governor's Island," which rose above the wetland and on which grew large white pines, hemlock, tulip, oak, beech, hickory, and chestnut trees, with a thick growth of mountain laurel beneath.

(Mr. Goodwin wrote that Governor John Cleveland owned the island in 1843, hence the name. However, it was John's father, Chauncey F. Cleveland, who was the governor of Connecticut from 1842 to 1844.)

The island, Mr. Goodwin recalled, held "many rare and unusual flowers such as trillium, and Calla lilies grew in thick profusion and formed a delightfully secluded spot, which when the swamp was flooded could only be reached by water. Owing to the inaccessibility of the island, the trees had never been cut, were quite old and formed a practically virgin forest."

Mr. Goodwin created 135-acre Pine Acres Lake in 1933 by damming Cedar Swamp Brook, inspired by beavers. An experiment with stocking the lake with trout failed when the water proved too warm. Large-mouth bass did better and still populate the lake. During the summer of 1945, Mr. Goodwin allowed customers to fish Pine Acres Lake. He charged 50 cents to rent a boat. Only catfish could be kept—any bass caught had to be thrown back. The Goodwins made \$104 from this enterprise. During the unusually cold winter of 1945, Pine Acres Lake froze to the bottom, resulting in a massive fish kill.

During the Great Depression, "boys" from a nearby Civilian Conservation Corps camp became available to help with work on the farm. Mr. Goodwin built a cold storage structure to store apples while he waited for buyers. One of his primary customers was "Foster, a wholesale fruit seller of Willimantic" who came once a week to select apples, which he then sold to retailers.

Hurricane Devastation

The Hurricane of 1938 was a disaster for the farm. High winds and heavy rains battered the tree plantations, some of them 50 years old. The soil was already wet because of previous heavy rains, and the trees, unable to maintain their grasp of the sodden earth, toppled to the ground. It took the Goodwins' workers a week to clear the roads and an incredible four years to cut and sell the blown timber.

World War II brought change of a different kind. Mr. Goodwin writes, "Due to the



JAMES L. GOODWIN STATE FOREST

A stone wall catches splotches of sunlight.

difficulty of obtaining coal or oil during the war the demand for firewood was becoming greater every year and many people were burning wood in their furnaces.” The farm sold wood at the roadside for \$10 a cord.

Mr. Goodwin’s wife, Dorothy, died on December 5, 1945. He married Genevieve Harlow the following year and remained deeply involved in his property. Thirty-seven years after his first land purchase, Mr. Goodwin reported that 1950 was the first profitable year for the farm. It grossed \$4,845, but after losses and overhead costs, the net profit was \$2,833. Despite the stark truth of farm income, soon after Mr. Goodwin reported glowingly of his lifetime farm project in an autobiography he wrote for a Yale alumni publication. He wrote that his “chief interests” were managing his property in Hampton, by then measuring 1,700 acres. “From a small beginning, this has grown and developed since 1914. It has been interesting to watch trees planted twenty or thirty years ago grow to merchantable size which now can be cut and from which there is an appreciable income. . . . On account of the fast growth of Southern pines, this has been a very successful business enterprise since 1930.”

Christmas trees became an important crop. In 1953, Stocking reported in *The Providence Sunday Journal* that 70,000 Christmas trees at various levels of maturity grew on 50 acres. He anticipated cutting and selling 4,000 that year. After 28 years of experience, he concluded that white spruce was best because “it holds its needles better, shapes up better, has better color.” He eventually became the Connecticut representative to the executive board of the National Christmas Tree Growers Association.

Mr. Goodwin worked as a forestry consultant and landscape architect. He was president of the CFPA Board of Directors from 1954 to 1961. He also was an officer of the Talcott Mountain

Forest Protective Association, vice president of the Society for the Protection of New Hampshire Forests, and senior fellow of the Society of American Foresters. Another property Mr. Goodwin owned and later donated to the state of Connecticut, Great Pond Forest, was named tree farm of the year in 1956 by the American Tree Farm System. In 1986, CFPA named its new headquarters the James L. Goodwin Forest and Park Center.

Mr. Goodwin was beloved in Hampton. Resident Leila Osbty remembers him as a down-to-earth member of the Grange, the social center of the town, where she recalls him wearing “an apron tied around his waist doing dishes” after dinners.

Renovation Funds Badly Needed

The Goodwin house still welcomes visitors at the main entrance on Potter Road. It is on the Connecticut Register of Historic Places and houses a small museum dedicated to Mr. Goodwin. Stan Crawford of the Friends of Goodwin Forest reports that most of the original interior woodworking and trim are intact. Stephen H. Broderick, president of the Friends, notes that the exterior needs painting. Although some state bond funds are available for this project, the amount is not sufficient to pay the entire cost. The Friends are working with DEEP and the state legislature to raise the money needed.

The Goodwin land remains a working forest. Continuing with James L. Goodwin’s goals, timber is harvested. Damaged and weakened trees are removed. Recently, areas between the farmhouse and Pine Acres Pond have been cleared. Mr. Goodwin planted these white pines after the 1938 hurricane. Many of the trees had heart rot, representing a hazard to heavily traveled Route 6 as well as a fire danger. Because the planting was dense,

all trees had to be harvested. Healthy trees would not be able to withstand strong winds if thinned. Foresters are hoping that native trees such as tamarack (*Larix laricina*) will regenerate and are trying to keep out invasive species if possible.

Across the pond, a prior cleared area is regenerating and provides a scarce early-succession habitat for wildlife, according to Mr. Broderick. He reported that “the moist soil near a pond contains all the perfect components” for water-loving species of birds like the woodcock. This spring, a woodcock was spotted displaying his dance for the first time in years. Timber near smaller Brown Pond, including trees felled by Hurricane Sandy, was sold before it rotted.

Today, visitors to Goodwin Forest can still see traces of its history. Stumps and logs in Pine Acres Lake speak to its origins as the “Burnt Cedar Swamp,” where Mr. Goodwin harvested his barn’s shingles. Hikers can walk along old railroad beds now part of Air Line State Park Trail or follow the marked path to Governor’s Island and spot the small rock-lined pools Mr. Goodwin had built to fight fires along the way. The house stands at the main entrance, and the roads Mr. Goodwin built still wind their way through the woods. One can still fish in Pine Acres pond.

Mr. Goodwin died three years after donating his land to the state at the age of 86, having left behind “the harvest of a coming age.” He had included this quotation from Henry Cuyler Bunner’s poem, “The Heart of a Tree,” in *A History of Pine Acres Farm*:

The harvest of a coming age;

The joy that unborn eyes shall see—

These things he plants who plants a tree.

Jean Wierzbinski is the retired principal of Sayles School in Sprague.

Coming in the next issue of

CONNECTICUT WOODLANDS

EVERYONE’S CONNECTICUT:

- ▶ A reporter visits a “closed” park
- ▶ Remembering Frederic Walcott’s 1921 report on Connecticut’s lost habitats
- ▶ More poems celebrating the New England Trail

BY KATHERINE HAUSWIRTH

One blustery day long before it was warm, I came home from my walk with a downed wasp's nest the size of a basketball. I reached in through a jagged tear in the narrower end and pulled out one of the perfectly hexagonal sections made up of smaller hexagonal cells. It looked as if it had been assembled from a kit of interlocking blocks. The outer shell's subtle streaks of white had a wavy appearance and was trailing strips of "paper," no doubt loosened by autumn and winter's insistent wind and showers.

I watched a video about a family that had ordered a defunct wasp's nest through the mail, quite similar to my find. They pulled it out of its box with groans of disgust and sliced it open with horrified drama. The children kept saying, "Ugh!" My own attitude, borrowing an apt phrase from the Psalms, is that these nests are "fearfully and wonderfully made," but I do appreciate that the "fearfully" part is quite literal for some because wasps sting. Once stung, many of us are forever wary. I did notice, though, that in the video the kids' eyes brightened with interest and their jaws dropped in amazement when they witnessed the fine detail of the structure within and the few cubbies still occupied with unlucky offspring that had never made it out.

Wasps will, of course, sting en masse if their home is threatened—by a Godzilla-sized sneaker that tramples their roof, for example—but they are not otherwise especially aggressive insects. One author pointed out that many aerial nests only become apparent when the leaves start to fall. For the most part, wasps avoid humans.

As I walk through hill and dale this summer, I will pass mostly unawares below and above (and hopefully not directly on) a variety of wasp's nests bustling with activity. Both yellow jackets and hornets, which share the *Vespidae* family, build paper-like nests that include outer walls. Some fashion their homes in vacated animal burrows in the ground. Others build aerial nests on tree branches or buildings. (People often refer to these nests as "paper wasp" nests, but the paper wasp is a distinct variety that doesn't construct an outer layer.)

Experts urge us to coexist with these paper-lantern-like abodes when they are not in an especially threatening spot. Wasps' predation of other insects, including caterpillars, makes them a gardener's friend (unless, of course,



WIKIMEDIA COMMONS

The intricate layers of a wasp's nest resemble fine sculpture.

SUMMER'S SCULPTORS AND SIPPERS

that gardener is highly allergic!). Keeping the nests around, when feasible, can have a silver lining: They are never reused and their continuing presence can actually be a deterrent to new wasp "condos"—you can even buy faux nests that will announce to these territorial creatures that your deck or patio is already taken.

What's going on in the aerial nests that are mostly obscured by the summer foliage? Back in the spring, a fertilized queen, who had perhaps overwintered under some tree bark, emerged and started to set up her home. She found some good wood to chew, breaking down the fibers with her saliva, and she built some cells where she could lay her eggs, one in each compartment. She fed her babies some liquefied caterpillars, and the worker wasps born from her larvae joined in to craft hexagons that together formed the rooms of their home. A quick Internet search provides some time-lapse videos of the methodical sculpting project that makes the nest. The artisans eject softened wood from their mouths and lay it down like plaster, carefully smoothing the surface. They leave a narrow opening that is a good spot for defending their home and for controlling its temperature and humidity. Over time, they continue to remodel, expanding the nest to make room for more young. Several generations of workers are coming and going as we go about our summer—they live just two to four weeks.

Adult wasps are out scouting for fruit juice and nectar this time of year, and they seek meat, mostly in the form of other insects, to feed the youngsters back at home. Some breeds will go after carrion and even our picnic lunches when they go looking for food.

As summer progresses, new fertile females will hatch and mate with young males, and the whole life cycle will begin anew. By late summer or early fall, we'll be seeing more of the wasps, too—by then the kids have been raised and they are all just enjoying the long days of the season, zooming around and looking for sweets.

A volume from 1900, *Wasps and Their Ways* (Dodd, Mead), by Margaret Morley, credits these creatures with being well ahead of us, industriously churning out paper while we humans were carving on stone, tanning animal hides, and flattening papyrus and birch bark, all in an effort to design a good writing surface. When we finally took up the craft of making paper, our method of mashing wood into pulp and adding liquids was not too far from that of the Vespids.

In *Sojourns of a Backyard Biologist* (Little, Brown, 1991), Roger B. Swain captures the pleasures we can find in the wasp, if we can get past some initial apprehension: "If we can forget the few times we were stung, ignore the fearful warnings of friends, we can watch wasps catching flies and small caterpillars to feed their young. We can watch as they scrape up wood fibers into pulpy balls to carry back and add to the nest. In the fall... we can cut the big bald-faced hornets' nest out of the lilac. Slicing open its many-layered paper envelope, we will find level upon level of comb, intricate architecture built without blueprints or a foreman."

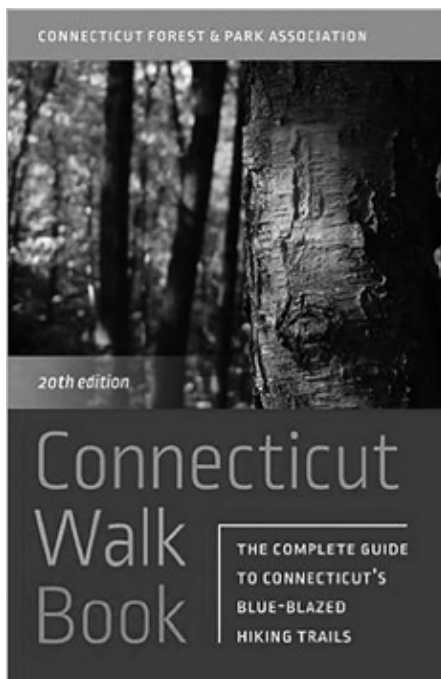
As I walk through the woodlands, I often tune into "big picture" things—the vista at the top of a rocky climb, the way the canopy looks in the light, the path ahead. I find it a comfort that so much is going on beneath the surface. Earnest, if tiny, life cycles go on beneath those leaves and alongside that path. Summer is a good time to think about the unseen, to be curious and watchful, and to look closer.

Katherine Hauswirth lives in Deep River and blogs at fpnaturalist.com. Her new book, The Book of Noticing: Collections and Connections on the Trail (Homebound Publications) was published in May.

“WHERE SHALL WE WALK TODAY?”

A brief history of the Connecticut Walk Book

BY CHRISTINE WOODSIDE



The new Connecticut Walk Book has evolved back to one volume, produced in partnership with Wesleyan University Press.

Where shall we walk today? This book tries to help you find the answer. Connecticut makes good hiking country, with its rugged hills, glacial streams and lakes, and the trap rock ridges running up and down the central lowland. Though the State is densely populated, there is a surprising amount of wild land, attractive, accessible. Go out a few miles from any of our larger cities and you find yourself in the wilderness.

—Edgar Heermance in the introduction to the first Connecticut Walk Book, October 1937

The Connecticut Forest & Park Association published its first edition of the *Connecticut Walk Book* in 1937. It cost 50 cents and covered 127 pages. Although he did not credit himself, we know that Edgar Heermance, “Father of the Blue Trails” and then secretary of the association, wrote the book. The prose wasted no words, and trail descriptions usually were in short phrases. Hand-drawn maps appeared as pullout pages with each trail section. The book was divided into three parts: “Walks About Connecticut,” “Through Trails,” and “General Information.” By then, volunteers had been marking and painting blue blazes on some 400 miles of trail in the explosion of trail marking and exploration dating to 1929.

The *Walk Book* was the 36th publication CFPA put out. (Others included pamphlets about flood control, *How to Burn Wood*, and this magazine, which had begun the year before. A guide to ski trails had appeared earlier the same year.) The *Walk Book* cost \$600 to produce, which CFPA paid in installments. In December 1937, Treasurer Charles W. Whittlesey reported that Mr. Heermance “was sure that if he could get the cost charged into 1938, he could make the book pay for itself.” He thought it could because not even three months after publication the book had brought in \$130, meaning that 260 books had been sold already.

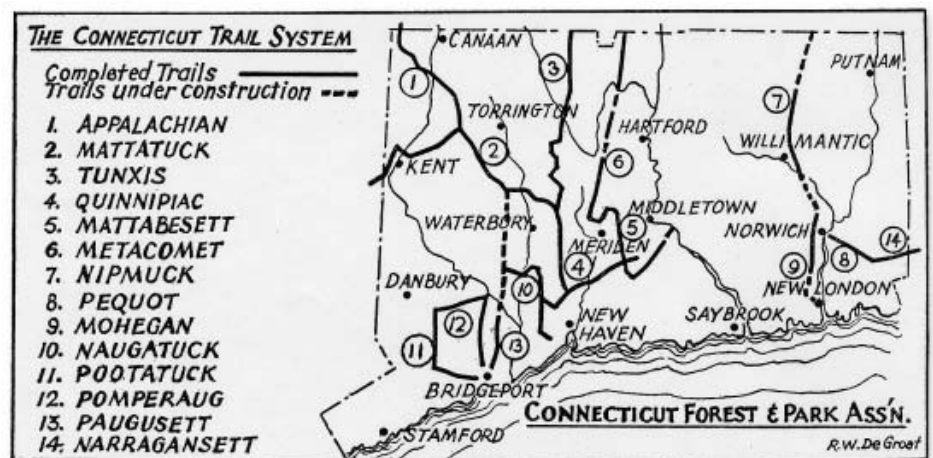
The fifth edition, published in 1962, cost \$2.75. It included redrawn maps by Seymour R. Smith—these would guide

hikers for several more editions. All the way through the 16th edition published in 1990, the guide followed the basic format and text of Mr. Heermance’s original. The introduction through all those years still started out, “Where shall we walk today? This book was compiled to help you find an answer.” And it noted the importance of those who kept the trails open:

Due credit should be given to our volunteer trail crews, busy men and women who work on trails in spare hours and provide their own tools and gasoline. They cannot be expected to maintain their trails perfectly, especially after the heavy growth of late spring and early summer. Branches and trees continually fall across the trail, and hikers who remove these can provide valuable assistance.

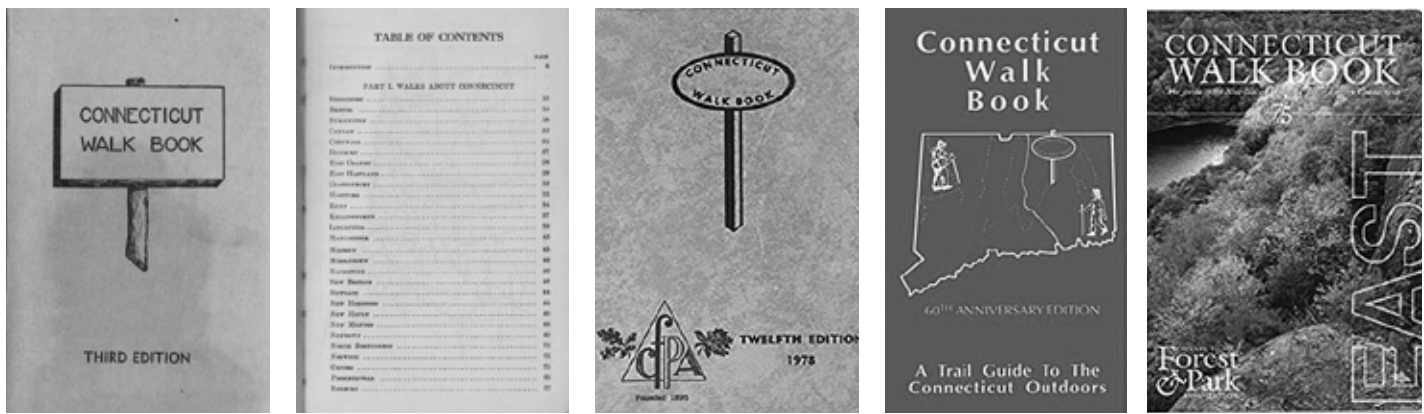
—From the introduction to the 1978 edition, page 11.

The ninth edition in 1972 introduced a three-ring-binder format and cost \$4.50. Like previous guides, it warned hikers that they traveled at their own risk across private land, through which many of the trails went. This edition introduced walkers to Connecticut’s 1971 Public Act 249, legally limiting the liability of property owners whose land trails crossed. This meant that walkers must remember that they are responsible for their own safety, and owners could not be held liable for any injury. This edition also noted that motorized vehicles were not allowed and urged people witnessing such uses to tell CFPA about them.



A map of the Blue-Blazed Hiking Trails in 1940 shows interconnected trails in the west. Later, some sections of those trails were closed by landowners.

CONNECTICUT FOREST & PARK ASSOCIATION ARCHIVES



From left, the Walk Book in 1946 featured simple art on the cover and a section of suggested walks; in 1978, the cover featured a then-modern CFPA logo; a royal-blue plastic cover first appeared in 1981; and in 2005 the first of two volumes was published.

As new editions were compiled every few years, the reasonable price crept up—the seventh edition in 1968 cost \$3.50 and numbered 117 pages, the 12th edition in 1978 cost \$5.50, the 13th in 1981 cost \$7, the 14th in 1984 cost \$9.95, the price had risen to \$14 by the 16th edition in 1990, for example—and in each edition, trail descriptions were updated to match changes. Through all the editions, the introduction credited the many people who had worked on the book, revealing what a group effort the *Connecticut Walk Book* was. The 12th edition, published in 1978, placed the maps at the end and credited a second mapmaker, William C. Schmidt.

Blue Plastic Introduced

The look of the outside changed dramatically in 1981 with the 13th edition. A royal blue plastic cover mimicked the blue shade of the state of Connecticut’s oval trail-crossing signs on state roads. It printed an outline of Connecticut and the new slogan, “A Trail Guide to the Connecticut Outdoors.” Through five more editions, this blue color enclosed the trail descriptions and maps. The 14th edition was the first to grow in size—a full inch taller.

John Hibbard, CFPA executive director, secretary, and forester, edited the book from the mid-1960s until 1978. Shelton B. Hicock edited editions 13 through 15. The book’s editor for the 16th (1990) and the 17th (1993) editions was retired chemist John S. Burlew, the former director of the Connecticut Research Commission. Dr. Burlew made major changes. In the 16th, the introduction included diagrams of how blazes and double turn blazes on the trail

look. In the 17th, Mr. Heermance’s original introduction, beginning, “Where shall we walk today?” was scrapped, the book starting out instead, “Enjoyment of Connecticut’s forest and open space heritage requires access. For many residents sufficient access is provided by an automobile. . . . Other residents—those who want a more intimate association with the forest—can use the system of over 500 miles of Blue-Blazed Hiking Trails sponsored by the Connecticut Forest and Park Association.” This new preface sounded a bit sterner—perhaps because it was designed to introduce new hikers to the trails. Dr. Burlew seemed to take the editing to heart, achieving nothing less than a complete rewrite of the opening pages. He did the editing and proofreading with his wife, Grace Schaum Burlew, with whom he ran an advertising map business.

That 16th edition also changed formats: It tabulated mileages on the left side of the pages, and it described trails in a new way. Dr. Burlew offered a bit of a grammar lesson in the preface as he explained the change:

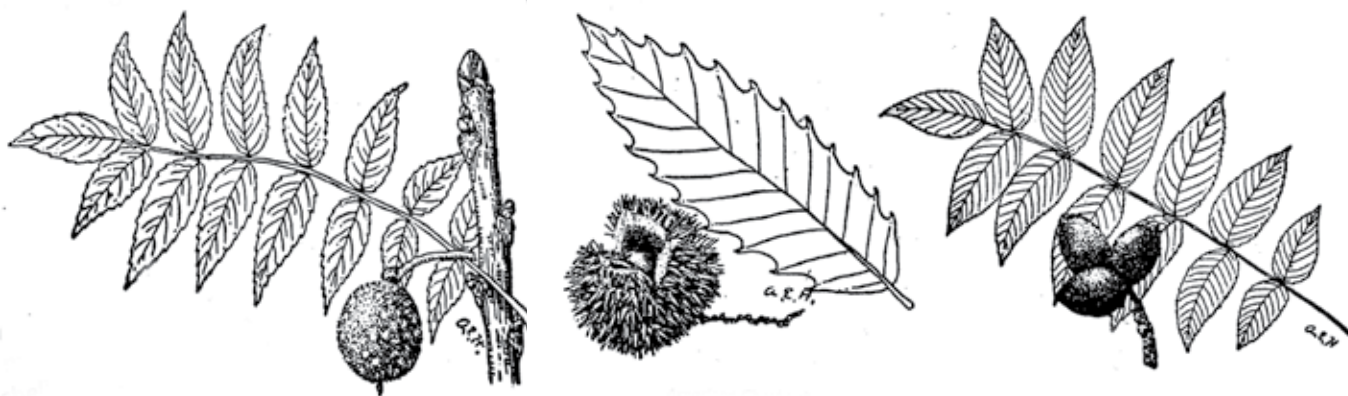
The change to tabulated mileages has made it convenient to express the descriptions from the point of view of the hiker, rather than to describe the route of the trail. This means that the verb in a description of the trail route is in the imperative mood: The hiker is told where to go or what to do. The declarative mood, used for information not directly related to the hiker’s route—such as the destination of a side trail—is put in square brackets. Regular parentheses are used for information of immediate concern, such as an elevation along the route.

—Page v.

Then came the 18th edition, one a *Walk Book* committee had hoped would greatly improve hiker navigation. It was published in 1997 and was in use until 2005. Engineering firm Fuss & O’Neill created topographic maps using U.S. Geological Survey and Appalachian Trail maps, superimposing Blue Trail routes on top of the topo maps. Many hikers and CFPA members found these maps hard to read. They appeared only in that edition.

The 19th edition grew in size and split into two volumes. *Connecticut Walk Book East*, edited by CFPA trail coordinator Ann T. Colson and Cindi D. Pietrzyk, came out in 2005. It included attractive photographs by Robert Pagini and others, and sidebar articles. The maps were entirely new, created by Mrs. Colson using the latest map technology. The *Connecticut Walk Book West*, edited by Mrs. Colson, appeared the next year.

The new *Connecticut Walk Book* has evolved back to one volume, produced in partnership with Wesleyan University Press. The book continues its distinguished practice of using a large group of volunteers. Trail managers and others provided trail descriptions and checked data against the new maps. The maps are in color for the first time and include mileage tables. An e-book and connection to online interactive maps gives hikers access to the latest trail changes and conditions, as well as directions to the trailheads. Just as the first edition promised, the *Walk Book* will answer that question, “Where shall we walk today?” and make those journeys safe and fun.



THINKING ABOUT NUT TREES

FOREST TREES OF CONNECTICUT, CFPA

From left, black walnut, chestnut, and butternut.

BY JEAN CRUM JONES

There is an old proverb, “The best time to plant a tree is 20 years ago. The second best time is now.” Deciding to plant a nut tree requires a lot of space because they grow to be big trees. They also take a while to mature before producing a crop. But, the benefit of such trees is a belief in the future and the knowledge that these trees will benefit grandchildren and the surrounding wildlife for a long time.

Over the winter, I had the longevity of nut trees on my mind. In February, my family decided that three stately black walnut trees in our farmyard must be cut down. The reason for their demise? Their nuts.

Each September, the trees began shedding their seed capsules—avocado green globes about three inches round. The nut husks drop to the ground and splay out in a 50-foot diameter circle around the bottom of the tree. We farmers know not to walk too close to the black walnut trees in the fall because a fresh nut case falling from eighty feet can give one quite a bonk on the head. Our young grandchildren were paid a penny a nut to pick them into large pails—their first moneymaking enterprise while learning how to count into the hundreds. We don’t know why my father-in-law, Philip H. Jones, planted these trees about 75 years ago, but they have been pleasant trees in our yard,

tall and straight, with a nice canopy of shade leaves in the summer.

I knew the fruits of these trees could yield a tasty treat and were used by Native Americans as a winter food source. But, try as I did—by putting them between stones and whacking them with a sledgehammer—they never yielded delicious nut pieces; they were truly “too tough a nut to crack.” I was also careful when handling the fallen husks because they excrete a dark brown dye that permanently colors whatever material it touches.

One of the black walnut trees grew near the base of our family’s vegetable garden, and through the years, I would hear my husband, Terry, muttering about how his vegetables would not grow well near this tree. Despite the characteristic allelopathic trait of black walnut trees—they exude substances that can suppress the growth of other plants—it seemed the grass lawn flourished well around the base of the trees!

The death knell for our three beautiful black walnut trees was a consequence of guests walking to our farm’s wine tasting room, located in the former dairy barn, and having to pass under them. Wine lovers arrive in droves in the fall, and they were not enchanted by the falling dive bombs, the unexpected slipperiness of an array of green “golf balls” in their path, nor the dark

brown stains on their children’s hands. Try as we did to keep the nuts raked up, we could not compete with the trees’ fertility. We have saved the sawn black walnut lumber and are considering how best to use it to remember Philip and his great love of growing trees.

Black walnut trees yield a precious lumber that has long been valued for furniture making, and it was also used extensively in Connecticut for the manufacture of small arms since the Colonial period. Black walnut was favored for gunstocks because it is such a handsome wood that does not split, warp, or shrink. It has less recoil than any other species, and the satiny surface of black walnut does not irritate one’s hand. By 1795, high-quality black walnut trees could no longer be found in New England because of its extensive use. Today, the active black walnut industry is centered in the Midwest. More than 50 million pounds of nuts are harvested annually.

Our farm also lost three legacy white oak trees, due to old age and stress from the extreme drought of 2016. They were heavily laden with acorns and just collapsed, one by one, at the end of the summer. Saddened by the loss of these familiar native trees that have lived on our farm much longer than I have, I began pondering how to replace these old friends with new trees. I

want to replant heritage nut-bearing trees that would have been familiar to the northeastern American Indians, who once lived here and depended on a variety of gathered nuts for their winter survival. However, it seems native New England nut trees are becoming rare.

Butternut: Food and Dye

Butternut trees are a species that were widely used by the Native Americans and the European settlers for foods and dyes. A close relative of the black walnut, the tree is also known as the white walnut. Butternuts, once husked and dried, are sweet and delicious and can be eaten straight from the shell, raw, or cooked. Alas, the species is on the verge of extinction in the wild because of a canker disease. Vigorous efforts are being made in New England to preserve this native tree by experimental forestry research organizations.

Chestnut and Hickory

The tragic story of how Connecticut lost the magnificent American chestnut tree in the early 20th century to an Asian fungus disease was related in an article I wrote a few years ago for this magazine (“A Yearning for Chestnuts,” Fall 2014). (See also the President’s Message on page 4.) Heroic efforts have been made by chestnut researchers to develop hybrids that would be resistant to the blight. Quite recently, there is a restrained enthusiasm for some promising hybrids, and they are currently being field tested in the Northeast.

Hickory trees provided another favored nut of the Native Americans, and the hickory tree still grows throughout the eastern and central forests of the United States. Hickory trees are nicknamed the “pioneer tree” because their nuts provided a valuable food source to the new settlers and the wood is very hard and resistant, useful for tools, tool handles, and fences. In today’s world, with their large taproots, hickory trees will not lift up sidewalks or blow over easily in windstorms. When fully grown, they make stately shade trees.

When the fall comes, I plan to plant a couple shagbark hickories and some Chinese hybrid chestnut trees. I am figuring out the best places on the farm to plant them and deciding where to get healthy specimens to transplant. I am looking forward to planting the trees with my grandchildren and watching them all grow into maturity. Nostalgic tree memories bind a family together.

Jean Crum Jones lives in Shelton with her farming family.



RICHARD A. BAUERFELD

Richard Alfred Bauerfeld, 90, who served on the Connecticut Forest & Park Association Board of Directors for a quarter century, died March 28 at Meadow Ridge in Redding, where he had lived in recent years. Mr. Bauerfeld helped plan the transition of leadership following the retirement of long-time Executive Director John Hibbard in 2000.

Mr. Bauerfeld was a lifelong resident of Connecticut, born and raised in Stamford (where he graduated from St. Basil’s Prep), then lived in Cheshire, Redding, Branford for 46 years, and finally Redding again. He was an Eagle Scout, served in the U.S. Navy during World War II, and graduated from the University of Connecticut in 1950. He worked for more than 30 years at Southern New England Telephone Company, retiring as division operations manager of eastern and central Connecticut.

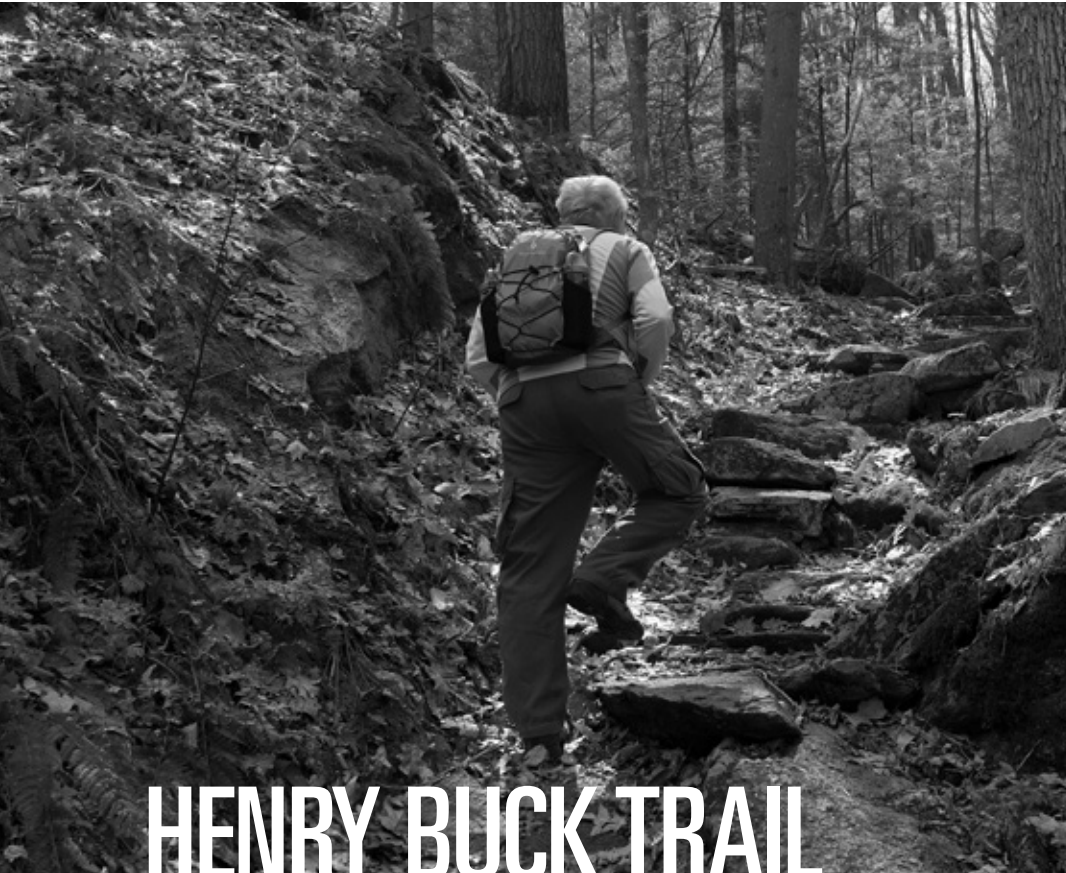
Mr. Bauerfeld also served on the Redding Conservation Commission and the Branford Inland Wetlands Commission, which he founded and chaired. In 1995, he and his wife, Lee Sperry Bauerfeld, received the Bronze Medal from the Federated Garden Clubs of Connecticut.

Mr. Bauerfeld and his wife were married for 66 years. He also leaves his son, Rick Bauerfeld, of Wilton; his daughter, Bonnie Hataley, of Odessa, Florida; and three grandsons. A memorial service took place on April 9. Memorial donations may be directed to the Connecticut Forest & Park Association.

NED ZAGLIO

Edmond S. Zaglio, a forester for the state of Connecticut for his entire career, died December 16, 2016 at his home in Woodbridge, Virginia. Mr. Zaglio was born in West Virginia, grew up in Manchester, Connecticut, and in 1967 graduated with a political science degree from Brown University, where he played on one of the only two undefeated soccer teams in Brown history.

He served two tours with the 6th Battalion, 32nd Field Artillery, in the Vietnam War. He then earned his master of forestry from the University of Massachusetts. He and his family lived in Torrington for many years. He leaves his wife of 45 years, Jeannette A. Zaglio; his son, Justin of New York, New York; his daughter Stefanie Marchinkoski of Woodbridge, Virginia; four grandchildren. He is also survived by his brother, Peter, and his sister, Laura. A memorial service took place in Manchester on January 7. Memorial donations may be directed to CFPA.



HENRY BUCK TRAIL

A RUGGED, BUT SHORT AND VERY PRETTY, HIKE IN AMERICAN LEGION STATE FOREST

BY DIANE FRIEND EDWARDS

Thank goodness for trail work crews. This is what I thought as my husband, Paul, and I climbed upward on rock steps set into the hillside. Similar staircases made the going easier in several places along the Henry Buck Trail, named for the man who had designed it and overseen its creation by the Civilian Conservation Corps in the 1930s. (He was also the vice president of the Connecticut Forest & Park Association from 1928 to 1930.)

Back at the trailhead, where the land rises abruptly from the road, our initial reaction had been: “Well, this starts out steep!” But then we saw that the trail cut diagonally across the hill. “Not so bad,” I said to Paul.

Not bad, indeed. In fact, delightful. The trail goes up the convenient stone steps and occasionally follows a more level course through switchbacks. We passed boulders cloaked in moss and ferns, small waterfalls

cascading into little streams, a wooden footbridge, cliffs, a broken boulder whose pieces looked like a jigsaw puzzle, and logs laden with turkey-tail mushrooms.

The Hike

The 2-mile Henry Buck Trail is one of Connecticut’s Blue-Blazed Hiking Trails. It begins and ends on West River Road, just above the banks of the West Branch Farmington River, in Barkhamsted’s Pleasant Valley section. A 0.3-mile walk along the road brings you back to the trailhead, making for a 2.3-mile hike.

The trail rises gradually on the diagonal line across the hill, then levels off in a glen where you need to pick your way around rocks and tree roots. The trail then heads steeply uphill, following a stream, veering away from it and then back again. Soon some of the CCC’s rock steps appear, improving the footing (and minimizing erosion). About 0.8 mile from the trailhead, you will

Paul Edwards starts up the stone steps.

DIANE FRIEND EDWARDS

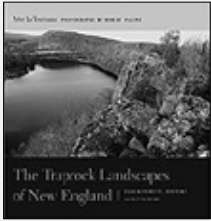
come to an old water wheel pit, which had been part of a long-gone cheese box mill, and a stone wall. We couldn’t help wondering why someone would build a mill on this steep hillside! Continuing on, the trail levels off a bit, crosses a wooden footbridge, cuts through a patch of mountain laurel (a native shrub that in June blooms with Connecticut’s state flower), then heads downhill before ascending again. More stone steps take you to a stone terrace at the base of a cliff whose face has a plaque honoring Henry Buck. At the overlook, enjoy the southerly view of the Farmington River Valley. In mid-April, we were surprised to see, on the most distant hill, a few snow-covered slopes at Ski Sundown in New Hartford. Leaving the overlook, the trail heads down a short distance before making a sharp left turn and then ascending steeply. This climb passes over a ledge and between glacial erratics—large boulders left behind when the ice retreated. I needed to use my hands to scramble up here. (Not surprisingly, the *Connecticut Walk Book West’s* description of this hike warns that this area is hazardous when wet or icy.) From here, the trail descends steeply, passing more erratics and crossing tiny streams, and finally reaches the road. Turn right and walk along the road back to the trailhead.

Directions

From the junction of Routes 318 and 181 in Pleasant Valley, go north on West River Road for 2.5 miles. The trailhead, with a sign and parking for four or five cars, is opposite the old stone bridge abutments that once supported a footbridge across the river.

From northwestern Connecticut: From Winsted, take Route 8 north to Route 20 (Riverton Road) east. At West River Road (just before the river), turn right and drive 1.4 miles, passing the first sign for the Henry Buck Trail, to the second trail sign opposite the bridge abutments.

Diane Friend Edwards is a writer and editor who has written this column for several years. She also proofreads this magazine. She and her husband, Paul, live in Harwinton.



THE TRAPROCK LANDSCAPES OF NEW ENGLAND

By Peter M. LeTourneau with photographs
by Robert Pagini. Middletown, Connecticut:
Wesleyan University Press, 2017. 233 pages

BY DAVID K. LEFF

Traprock ridges have long inspired artists, protected rare plants and animals, and drawn adventurers. Their dramatic cliffs and irregular crests host some of the oldest and most popular of the Blue-Blazed Hiking Trails. Now there is a book worthy of their significance.

Peter LeTourneau's engaging writing and Robert Pagini's vivid photographs are well matched in a book connecting nature to culture. It's a joyful exploration that covers geology; climate; art and architecture; ecology; history; mythology; botany; wildlife; recreation; and human uses of the land, rock, and water. Despite the work's focus on the ridges, they are not left in isolation. The author puts them in context, relating them to the Connecticut River Valley in which they are found.

Mr. LeTourneau and Mr. Pagini take us on a journey along the volcanic ridges "with their barren windswept summits and deep rock-lined ravines, savanna-like meadows and cool broadleaf forests, and splashing cascades and sparkling lakes." They trace the fiery molten origins of these distinctive geological features in three successive ancient lava flows. We learn that the term *traprock* derives from the Swedish *trappa*, which is said to mean steps or stairs, a reference to the angular fractures of the rock that form what appears to be a series of successively set back block-like treads. The cliffs, summits, and talus slopes of fallen rock all have distinctive and unusual microclimates and habitats that harbor some creatures and plants not commonly found elsewhere in the area. Among the photographs are a peregrine falcon, pickerel frog, marbled salamander, copperhead snake, prickly pear cactus, and various types of lichen and moss whose beauty surprises.

The book also documents significant human relationships with the area from the ongoing use of quarried and crushed traprock for road base, concrete aggregate, and other uses, to the proliferation of summit tourist buildings and antenna farms. In these pages, we discover ruins of long-gone structures and familiar ones like the Heublein Tower on Talcott Mountain, the Prospect House on Mount Holyoke, and Castle Craig on East Peak.

Water captured among the ridges has long provided potable supplies. At relatively high elevations, with fairly impermeable bedrock and water filtered through forests and rocky slopes, more than 40 former or still-active reservoirs exist between New Haven and Northampton.

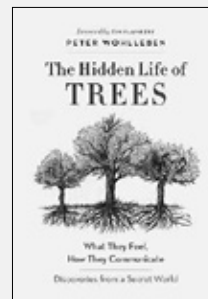
The ridges have also served as inspiration to great artists. In the 19th century, Thomas Cole kicked off the Hudson River School of art with his painting of the Connecticut River oxbow from Mount Holyoke. Frederic Church's image of West Rock (displayed at the New Britain Museum of American Art) is among his most famous paintings. George H. Durrie's lithographs that included traprock hills

in the New Haven and Meriden areas became enduring American icons when reproduced by Currier and Ives and others on calendars, ceramics, and household goods. Contemporary artists remain energized by these ridges, as the work of Mr. Pagini evidences.

This book surveys the many values of traprock ridges, and for additional information there is an excellent bibliography. Although there are some maps, they are small and not very detailed. I found myself wanting to know more about where various places were in relation to others. The photographs are spectacular but an embarrassment of riches. There are so many that they sometimes disrupt the flow of the text. However, there is compensation in that almost all illustrations contain detailed and interesting captions that add valuable information.

Mr. LeTourneau and Mr. Pagini deserve much credit for their impassioned plea in the final chapter for the significance of these traprock landscapes and the need for further protection. Given the book's combination of poetic prose and images, it would take effort not to be convinced. Every time I sat down to read, I found myself eager to take a hike.

David K. Leff is the book review editor of Connecticut Woodlands, author of books about landscape and adventure, and the poet-in-residence of the New England Trail. He lives in Collinsville.



THE HIDDEN LIFE OF TREES: WHAT THEY FEEL, HOW THEY COMMUNICATE— DISCOVERIES FROM A SECRET WORLD

By Peter Wohlleben.
Vancouver, British Columbia:
Greystone Books, 2016. 288 pages.

BY ROBERT M. RICARD

Every so often, a book comes along challenging scientific dogma. Most simply fade away, but a few change the way we see and think. After much wrangling and debate, if enough scientists become proponents and supporters of the thesis proposed, the outcome may be what Thomas Kuhn, a physicist and philosopher of science, coined as "a paradigm shift."

Peter Wohlleben has caused just such a sensation. In *The Hidden Life of Trees: What They Feel, How They Communicate—Discoveries From a Secret World*, the German forest ranger has been popularizing what has been called tree and forest behavioral science. First published in German and recently translated into English, the author has revised or enhanced the centuries-old humanization of nature using highly anthropomorphic language to great effect. His book is an international best seller, and he is in demand for hundreds of appearances.

Mr. Wohlleben is a professionally trained, experienced forest ranger and comes from the German intensive forest management tradition

of even-aged forests commonly planted with species not native to Germany. He eventually laments this and prefers the forests of the sort found in New England. That is, here we live with a diverse forest composed of multiple species of wide-ranging ages, growing in association with great areas of plant and animal species, including those in the forest floor and subsurface. Professionally, Mr. Wohlleben moves away from the world of intensive forestry to small-scale, low-to-minimum-impact forestry. He also experiences anxiety and depression, seeks treatment, and ultimately finds solace in the wonderment of a more natural forest.

His accomplishment is the humanized language he employs. In a chapter entitled “Street Kids,” for example, he posits why giant redwoods planted in Europe never get as tall as those growing in their native Sierra Nevada mountains in California. Mr. Wohlleben claims their early growth is influenced by the fact that these trees are orphans, that these redwoods were planted in city parks by “princes and politicians as exotic trophies.” He adds that what is missing for these artificially planted trees are relatives. They are “indeed only children, growing up here in Europe far from their home and without their parents. No uncles, no aunts, no cheerful nursery school—no, they have lived all their lives out on a lonely limb.”

Using fan favorite language, rather than scientific jargon, is not new. Expressing science in non-technical language has always been a good way to teach, convince, and motivate people. It is common for foresters to ask people to “think like a tree” to help them understand tree growth. The influential forester and wildlife biologist Aldo Leopold, for example, famously asked us to “think like a mountain” in *A Sand County Almanac* (Ballantine Books, 1966) to shift our view of forestry and wildlife management. *Reading the Forested Landscape: A Natural History of New England* (Countryman Press, 1997) and *Forest Forensics: A Field Guide to the Forested Landscapes* (Countryman Press, 2010), by Tom Wessels, are wonderful examples of books intended to teach and motivate us about forest ecology using largely non-scientific language.

Interesting, too, is that Mr. Wohlleben is pulling along with his book and interviews forest scientists who have been studying tree and forest communication for years. For example, Dr. Suzanne Simard, University of British Columbia, is a renowned forest behaviorist who has studied the “wood wide web” for more than 30 years. In 1997, part of her PhD dissertation was published in *Nature*, no small feat. Her specialty and breakthroughs have been in the world of mycorrhiza, the symbiotic association of the mycelium of a fungus with the roots of trees. Dr. Simard’s work is without a doubt rooted in the scientific tradition and method. She has influenced a generation of tree biologists to better understand the belowground ecology of trees and forests.

Dr. Simard has more recently been engaged in popularizing tree and forest behavior and communication by contributing to such programs as David Suzuki’s *Nature of Things* documentary film, *Smarty Plants*. Here Dr. Simard talks about her research on tree-to-tree communication through interlinking belowground fungal networks. The gist of it is that trees form a mutualistic symbiosis with mycorrhizal fungi and become linked together by a belowground superhighway made of fungi. She explains that big, old “mother trees” are the hubs of the network, and that they shuttle carbon, nutrients, and water directly to the surrounding trees and regenerating seedlings through the networking fungi.

Because it presents trees in humanizing language, I am not a fan of Mr. Wohlleben’s book. Maybe in 50 years or so I will be cited as one of those scientists referenced as a failed, unimaginative critic after it has been accepted as mainstream science. I will say that the author’s explanation of the science of tree growth and biology is sound. It is well worth the adventure of reading this well-written and well-presented topical book.

Robert M. Ricard is a senior extension educator for the University of Connecticut Cooperative Extension.

CLASSIC ENVIRONMENTAL BOOKS

First of a continuing series

BY ERIC LEHMAN

THE NEW EXPLORATION: A PHILOSOPHY OF REGIONAL PLANNING

By Benton MacKaye. First published in 1928.

Born in Stamford in 1879, forester and author Benton MacKaye is best remembered today for his groundbreaking 1921 proposal for the Appalachian Trail. This volume takes that idea to the next level, arguing for the necessity of planning civilization in harmony with the natural world. Living in the populous Northeast, MacKaye knew that conflict between man and nature would continue to grow. Responding to the multiplication of cars and roads, he offers new methods for controlling them, and his proposals for “open ways” in cities seems prescient.

MacKaye makes a case for developing our environment by synthesizing industry, art, and nature. He also reminds us, “All the possibilities of love, adventure, and enjoyment narrow themselves into the routine of a merely busy existence.” We need recreation to live rather than just exist, and not just the “decreation” of passively consuming other peoples’ stories. We need to get outside, to interact with nature, and to create our own stories. It is a message even more important today than when it was written almost 100 years ago.

A NATURALIST BUYS AN OLD FARM

By Edwin Way Teale. First published in 1974.

When Edwin and Nellie Teale moved to rural Hampton, Connecticut, from Long Island, he was already a renowned naturalist, making his reputation by combining travel and nature writing. His books sometimes depicted long automotive rambles across North America, but at the property they named Trail Wood, he found nature within walking distance, exploring these 156 acres with a careful eye. This relaxed chronicle of these backyard explorations could be the best of his 31 books.

Teale is a tolerant property owner, allowing local beavers to build dams and create a home for themselves and a few hundred frogs. One night he hears the beavers splashing and waits patiently until moonrise, finally spotting his woodland neighbors patching a muddy dike, while fireflies drift above the sparkling water. A small earthquake goes unnoticed while he watches. It’s one of many sublime moments that Teale finds just a few steps from his door, and a reminder that the same adventures wait for us. We only have to wander outside and look.

BE A GOOD WITNESS

See vandals or other illegal activity?
Call the authorities

BY JERRY MILNE

Readers of this magazine value the Connecticut state parks and forests because they like to hike, watch birds, hunt, fish, cut firewood, mountain bike, kayak, or appreciate the outdoors in many other ways. Those of us who work for the Department of Energy and Environmental Protection Bureau of Natural Resources share those same passions. We studied fisheries, wildlife, forestry, and natural resources in school. It's not just a job, it's a way of life.

But it seems that a conservation ethic is lacking in some individuals in our state. Judging from the many emails, phone calls, and Facebook posts we receive from concerned people, this problem is getting worse.

Lands managed by DEEP are being ruined by people who seem to enjoy destroying property held for the common good. Gates ripped out of the ground, signs shot up, picnic tables burned, roads torn up on purpose by four-wheel-drive vehicles, dumped garbage, illegal trails, brush fires, the list is endless. It costs DEEP thousands and thousands of dollars to repair damage caused by vandals each year.

If You See Illegal Activity, Call

How can you keep our DEEP lands from being ruined? Be a good witness. If you see an illegal activity on DEEP land, call **860-424-3333**, DEEP's 24-hour radio



From top, a dirt road in a state forest torn up by four-wheel-drive joyriders.

A state forest boundary sign riddled with bullet holes.

Flower boxes dumped after their contents were delivered. (Connecticut EnCon Police traced the culprit by the return address on the boxes.)

CONNECTICUT DEEP

dispatch for its environmental conservation, or EnCon, police. Get a good description of the individual. Don't confront anyone, but remember what he or she looks like and what clothes he or she was wearing. Maybe you see a vehicle with a trailer unloading dirt bikes or ATVs to ride in the state forest. Call **860-424-3333** with a description including make, model, license plate, and color of the vehicles.

Maybe you pass a truck filled with construction debris parked at a trailhead on a quiet state forest road. Write down the make, model, and color of the vehicle. Take a picture if you can do so safely. On the way back, the truck is gone but there is a pile of roofing shingles. Call **860-424-3333** and provide the dispatcher with the information.

Some people are afraid to report a violation because they don't want to give out their names. You do not have to provide your name. It might be helpful for EnCon police to follow up, but you don't have to if you don't want to.

Help DEEP keep our lands beautiful for generations to come. Be a good witness.

Jerry Milne is a forester for the Connecticut Department of Energy and Environmental Protection.

THE HARVEST OF A QUIET EYE

By Odell Shepard. First published in 1927.

Born in Illinois, Odell Shepard taught English for decades at Trinity College, editing the works of Thoreau and Longfellow, writing a Pulitzer Prize-winning biography of Bronson Alcott, and penning a small Connecticut classic. He follows Thoreau's model and records a two-week walking tour of northern Connecticut, from Brooklyn in the east to Salisbury in the far northwest. He meets tramps, woodsmen, and small-town politicians. He encounters goldfinches, hawks, and butterflies. He muses under elm trees, wanders through the dark forests, and splashes along little rivers, enjoying the silence before paved roads changed the landscape forever.

He tells us of his "ever-deepening love of Connecticut," which "shows nearly everywhere a beauty that invites my collaboration, and seems to need my human comment—a beauty, in short, that can be harvested only by a quiet eye." In later life, Shepard became lieutenant governor of the state, and his musings on history, religion, and economy informed public policy. We can only hope that future leaders will understand his values of solitude, of quiet, and of connection with the natural world.

Eric D. Lehman of Hamden is author of Afoot in Connecticut (Homebound Publications, 2013) and several other books of both nonfiction and fiction.

Why honeybees are suffering and what beekeepers are doing about it

BY BUD GAVITT

Almost half of the honeybees raised in Connecticut, 48 percent, died last year, a shocking statistic that matches the struggles of these important pollinating and honey-producing insects around the United States. Nationwide, 44 percent of honeybee colonies died between April 2015 and April 2016. The White House reports that the number of managed honeybee colonies in this country has declined from 4 million in 1970 to 2.5 million today.

State entomologist Kirby Stafford of the Connecticut Agricultural Experiment Station submitted a 60-page pollinator protection plan to the Environmental Committee in the Connecticut General Assembly. He says that 50 percent of the honeybees along the East Coast perished last year.

Naturally, the problems greatly worry the 1,643 registered beekeepers with 7,995 hives in Connecticut. “These are mostly backyard hobbyists,” says state apiary inspector Mark Creighton. Tracy and Jim Kelly, who took up beekeeping a decade ago in their spare time, report that last year only 150 pounds of honey were produced from their dozen hives operated as Autowork Apiary at two locations in Lebanon and Willimantic. The previous year, their hives produced 870 pounds.

Mr. Kelly says he gives away much of the honey produced from his bees to family members, relatives, and friends. The rest is sold. (The going price for a pound of honey is between \$8 and \$15.)

But more important than their production of honey at small farms is the role honeybees play in pollinating one-third of the nation’s crops, from apples and blueberries to watermelon and zucchini. In addition to fruits and vegetables, bees pollinate flowers in millions of home gardens across America.

Mr. Creighton says that the number one killer of honeybees is the Varroa mite, which causes infection as well as transmits viruses. The mites are able



ADOBE STOCK PHOTO

to destroy a hive in 18 to 24 months. So far, scientists have been unable to develop a good effective treatment to control the mites. Controlling this mite would increase honeybee health by 70 to 80 percent.

Ways to Control Destructive Mites

One way of controlling these mites is to breed for a hygienic hive. Selectively breeding for hygienic bees will recognize sick bees and remove them from the hive. This cleaning helps break the mites’ reproductive cycle and reduces the spread of disease in the hive.

Another option to improve honeybee health is to have more diversity in the habitat. This would enable honeybees to have a food source from early spring to late fall. Without diversity, beekeepers are forced to supplement the diet of bees by feeding them sugar water or corn syrup to keep a colony alive in the winter.

Pesticides are another contributing factor to honeybee losses. One family of pesticides, the neonicotinoids, can be highly toxic and will kill bees. Some uses are much less risky than others. Chronic exposure to this insecticide could be making it harder for bee colonies to breed, fight off disease, and survive in winter.

The Natural Resources Defense Council, an environmental action organization, notes that this class of insecticides is a key factor in the loss of bee colonies. The NRDC, with 2.4 million members, is seeking to stop Bayer, the German chemical giant, from selling this insecticide in the United States. Other makers include Monsanto and Syngenta. Both Bayer and Monsanto have projects underway on ways to improve the health of honeybees.

More than 90 percent of the nation’s corn, 90 percent of canola, and 50 percent of soybeans start from seeds treated with this bee toxic insecticide, as are many plants sold at home and garden retailers.

Before banning neonicotinoids, the control desired might be better management. One option is only using neonicotinoid treatments in fields that have a history of pests instead of applying it to every field. This widely used insecticide is under review by the U.S. Environmental Protection Agency.

It is recommended, before using any pesticide, to read and follow directions on the label. Don’t apply pesticide when bees are foraging during the day in a treated area. Instead, apply it in the late afternoon once bees have stopped foraging. Honeybees are generally active about an hour after sunrise until an hour before sunset.

Beekeepers are advised to avoid spraying a pesticide to blooming crops in the spring. This is the greatest risk to honeybees. Beekeepers should notify neighboring beekeepers if they are applying a pesticide, and leave a buffer between the application area and the hive.

Earthjustice, the first and largest non-profit environmental law organization in the country, continues to oppose the use of this insecticide by taking legal action against the EPA. Earthjustice’s intent is to achieve better protection for honeybees, beekeepers, farmworkers, and children at both the state and federal level.

Bud Gavitt was agriculture writer and editor for nearly 31 years at the University of Connecticut.

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