JANUARY - MARCH 2024 VOL. 28 / NO. 1

# **Brown Family Environmental Center** N()TE



# The Winter Color of Lichens

BY MADI HOFSTETTER '24, BFEC STUDENT MANAGER

Winter often can be misunderstood as a period of ecological and chemical silence - a murmuring of surfaces, with greater, more complex things happening in the dormant cores beneath the snow. These seasonal changes bring new levels of detail to what might typically go unnoticed, with the winter sun imbuing shadows with richer shades of blue and sharpening the outlines of deciduous trees and green conifers. Through our observation and attention, the clear backdrop can help us give smaller, but equally worthwhile, natural phenomena our rapt attention — phenomena like the resilient display of chemistry and color that is lichen.

Lichens are organisms that add strange and unexpected hues to a monochromatic winter landscape. The lichen is a unique life form, as it is not a plant, despite its close resemblance to moss, the nonvascular plant which it often grows alongside. Rather, lichen is a symbiotic relationship, a life form that is the result of a collaboration between two separate organisms: a fungus and an alga. Working together to survive and grow, the fungus provides structure and absorbs moisture, while the alga provides food through its ability to photosynthesize.

Known for its ability to live in the harshest environments, lichens can be found on every continent, covering from six to eight percent of the earth's surface. Scientists believe there are hundreds of thousands of species undocumented by Western science, with roughly 400 of the approximately 18,000 identified species living in Ohio.

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However, dormancy is not always required for a lichen to survive in wintery conditions, allowing their bright, unusual colors to burst through landscapes of white snow and gray stone. As a uniquely resilient form of life, lichens are often able to create the strategic conditions needed to survive. Some lichens will utilize snow as a layer of insulation and can absorb the required water vapor from surrounding ice and snow, allowing the plant to photosynthesize while frozen. In acts of amazing chemistry, lichens might utilize internal antifreeze proteins or chemically spur the creation of ice to insulate themselves (making them what is known as "biological ice nucleators").

Our knowledge of lichens is probably still a rough sketch of what all lichens are capable of, not even accounting for all of the ways they create such varied hues. Lichens can take on seemingly almost any color, which is only highlighted by their wide variety in texture — ranging from the curling hoods of sunburst lichen to the frothy light green of reindeer lichen, to the red puffs of British soldier lichen (all of which can be found in Ohio).

With the extreme temperatures and steely landscapes that winter brings, lichen becomes an organism that proves to be a stunning, worthwhile subject. When hiking along the trails this winter, watch as the snow pushes forward the unexpected, often unnoticed facets of these ecosystems, including the multidimensional, vibrant adaptability of lichens.

# **Tree Rings**

### BY FRANCES CANNON, MELLON SCIENCE AND NATURE WRITING FELLOW

The word around town is that the oldest tree in Burlington, Vermont, is the "Bicentennial Oak," a white oak (*Quercus alba*) estimated to be around 288 years of age — as old as Westminster, the first town in Vermont and already thriving by the signing of the constitution in 1788. Note that these are common markers of this tree's history, as though the colonization of the Northeast was the only important event in her memory. All of the local newspapers make the claim that this is the oldest tree in the city.

Yes, this is a beautiful, ancient and very wide tree, but there are also many trees in this area as old as this oak, or much older, that might be overlooked due to their smaller girth and height. For example, white cedars (*Thuja occidentalis*) grow very slowly and can endure harsh conditions, such as clinging to the edge of a windy, lakeside cliff for hundreds of years, but they might not catch the attention of the populace because they are off the beaten path and less conspicuous than faster-growing species with more bulk. Just a stone's throw from the Bicentennial Oak, I found a handful of old cedars (pictured below) with trunks twisting around rocks and contorting in unusual positions, including one glorious individual growing up through a crack in the red quartzite with an impressive trunk — around 16 inches in diameter — which curved around the stone like a reclining



nude from a Rubens painting. I'll give this tree the nickname "Supine" for reference.

I scouted the area to find trees of the same species that might give me a clue about the age of Supine, and I was able to find four trees of varying sizes which revealed their rings for various reasons: weather, human disturbance or death. Keep in mind that I am not an expert, and these are approximate calculations. I did my best to measure as many trees as I could to find their growth rate per inch based on the number of rings (equivalent to years) and the DBH, or diameter at breast height, which is a common method for measuring trees. No trees were harmed! One fallen cedar in the area with a trunk diameter of around seven inches revealed 185 rings. Another cedar, which had been trimmed to make room for a trail, had a DBH of two and a half inches and revealed 60 rings. A cedar a bit further inland, perhaps deprived from the sun and water of its lucky neighbors, seemed to have grown at a much slower rate, boasting 53 rings at only an inch wide. Another nearby cedar: 150 rings and a diameter of about eight inches.

I took the average growth rate per inch of these four trees to find about 30 rings per inch. I then applied this average growth rate to the DBH of Supine, the largest cedar that I was able to find at Oak Ledge Park (within walking distance of the Bicentennial Oak) and came up with the rough estimate of 480 years old. My goodness! However, I acknowledge that this is based on a small sample size and simple math, but there is no way to learn the exact age of Supine without killing her to count her rings, and that is the last thing I would want for her. Instead, I will just suggest that she is a very old, beautiful tree, very likely older than the Bicentennial Oak by as much as a century, or even two. She has my respect.

Epilogue: Not long after my exploration of cedars along the lake's edge, a friend of mine currently employed as the Vermont state botanist, Grace Glynn, joined an arborist named Kris Dulmer to measure a dead eastern red cedar that had fallen off of a cliff on private land in Milton. Given that the tree had already died, they were able to take a slice and properly measure the tree's age. They counted at least 445 rings, although the center of the tree had long rotted away — in other words, the tree was easily over 500 years old. Take that, bicentennial oak!

# The Return — and Farewell — of "On the Ground"

### BY DAVE HEITHAUS '99, DIRECTOR OF GREEN INITIATIVES

**One of the most memorable events** during my time at the BFEC was a little thing called Pumpkinville<sup>™</sup>. Back in the halcyon days of a new front-end loader, not much of a mandate and very little supervision, I took it upon myself to become the world's greatest inventor of novel ways to grow the world's largest pumpkin. Enter Pumpkinville<sup>™</sup>.

I write this column from an office stocked with packing boxes rather than a garden throne, so you may infer how that saga concluded. (Hint: it involved neither the world's largest pumpkin nor the admiration of my colleagues on the grounds team). It was a good reminder about hubris and the folly of skipping the fundamentals as well as an opportunity to populate another fond memory: the Fall 2008 "On the Ground" (OtG) column.

OtG was my opportunity to eat crow and debatably contribute to the quarterly newsletter at a time when things at the BFEC were happening at breakneck pace. In 2006, having expanded its staff, the BFEC was blowing up programming, exploding the trail system and beginning the serious long-game of ecological restoration. There was always something to write about, and it was always a pleasure to put my spin on it for our valued supporters. It's nice to get another crack at that.

Today's BFEC is a very different creature. It is more mature, more refined, more intentional and, importantly, more integrated with the community. It's as if an Aikido master found a child wrestling a monkey in the back yard and said patiently: "please stop. I will show you how to do that properly ... But not with the monkey."

I couldn't be prouder of how the BFEC team has ditched my monkey business and steadily progressed toward mastering their craft. It is impossible to overstate just how far their dedication has taken the preserve and the programming. They routinely defy both expectations and the org chart, managing over 600 acres of land, thousands of visitors per year, and a staggering number of programs, Kenyon classes and elementary school field trips.

I will miss having people who make me look so good.

After more than a couple of years, I am hanging up my Kenyon ID tag and shutting my book of practiced nagging. It's time for new adventures, new leaders and new directions all around. The work that we have done has been meaningful and lasting and will be ongoing. I am beyond grateful to the many people who have been collaborators over the years and genuinely thankful for the opportunities, friendships and memories that I have been afforded by this community.

Indulge me another memory. This goes back a bit further, to the top of a hill recently clipped and bound for hay. There's a tractor there, a disc planter, some guy with a beard and about

> A younger version of Dave Heithaus trying to grow the world's largest pumpkin.

1,200 white pine trees. I recall the tractor bouncing around in mostly straight lines leaving rows of fluffy green sprigs in its wake. A handful of those wee trees bounced out of the cache and landed, later that day, in a yard south of Yauger Road — across from what is now Wolf Run Regional Park. They grew for a while, maybe 30, 35 years. They became homes for birds and squirrels and forts for neighborhood kids. They grew in the open so that, unlike their cousins in the plantation, their branches stretched out wide to meet one another by the road.

Eventually the utility came and cut them generally in half.

Things belong in a place for a time, but, as ecological succession (and rights of way) show us, at some point, things progress. The trees eventually progressed to be further from power lines, in a manner of speaking.

I am progressing to a new role as director of the Knox County Park District. In this role, I will continue to serve the BFEC constituency as well as a wider audience. Maybe I'll see you down by one of the many Kokosing landings or the justifiably renowned bike paths that now stretch from one end of the county to the other. Or perhaps, we'll be able to catch up at one of our phenomenal Knox County parks?

I think you'll be hearing from me again after all.



# **Trees That Built America**

BY SHANE MCGUIRE, BFEC LAND MANAGER/NATURALIST

Ah, the locust. Not the grasshopper known to swarm and eat everything in its path, but locust trees — specifically the honey locust (*Gleditsia triacanthos*) and the black locust (*Robinia pseudoacacia*). This time of year, locust trees are easy to spot with their long, dark brown, leathery and sometimes twisted seed pods dangling from the leafless trees.

Members of the Pea family, both trees are similar in appearance. During the summer, they sport pinnately compound leaves. At maturity, they grow 80 to 140 feet tall. Both trees bear thorns, and their seed pods are very similar in appearance. However, there are two details that set them apart. The seed pods of the black locust are usually only two to four inches long, while those of the honey locust can reach from six to 18 inches long. The spines of the black locust are fewer and shorter than the long, wicked and abundant spines of the honey locust.

Both trees are native to the eastern part of the U.S. They are short-lived, only living about 125 years. They can grow just about anywhere, and, even though they are native, they are considered nuisance species because they can take over areas. Just about everything on black locust is toxic to humans and animals, while honey locust is used extensively by wildlife and was used by humans in the past.

The reason I find these trees so interesting is the history behind them and how they helped build America. The lumber from locust trees is very dense and strong, stronger even than oak. It is resistant to rot and shock. Indigenous groups made bows from the wood, and early European settlers used the lumber to make fence posts, wood nails and foundation posts for their homes. Later on, the lumber was used for railroad ties.

The lumber was also used to build boats for the Navy, and some consider this a factor in the defeat of the British during

the Battle of Lake Champlain, a key battle in the War of 1812. On September 11, 1814, an American fleet engaged a British fleet in Plattsburg Bay in New York. The British ships were built with oak nails (wooden pins that hold the planks and beams together), while the American ships were held together by black locust nails. When cannonballs shot by the Americans hit the British ships, their ships shattered from the impact. But when American ships were hit by British cannonballs, the shock resistance of the locust wood helped keep the ships intact.

This relatively recent history of locust trees is fascinating, but there is more. For this, we have to go way back in time. Over 13,000 years ago during the Pleistocene era, locust trees provided a food source for the giant megafauna such as mammoths, mastodons and the giant ground sloth. They would eat the sugary pulp and seeds inside the seed pods and forage on the leaves of the trees. Researchers believe the trees evolved alongside these giant creatures. This, perhaps, explains why the locust trees produced spines — to help the giant animals from completely defoliating the tree.

This might also explain why the wood of the tree is so strong and springy. Giant ground sloths could reach heights up to 10 feet tall and weigh over 2,000 pounds. Mammoths and mastodons were well over eight feet tall at the shoulder and could weigh 12,000 to 16,000 pounds. The wood may have developed its shock resistance in response to so much weight pushing and pulling on the tree.

With such an illustrious history, you would think we would have a greater appreciation for the black locust and honey locust trees. Next time you come across one of these humble trees, take a moment to imagine the role its forebears played in building America.

Photo: Wikimedia Commons

# **Owl Prints**

BY AIDAN CULLEN '26, BFEC STUDENT MANAGER

If you ever find yourself exploring the woods on a clear snowy day, be sure to look out for some oddly shaped holes in the snow. When snow has sat on the ground for a few days, these prints can stand out amid the untouched snow. They look unlike any other known animal print — not oblong footprints like the rabbit, not the classic dog-like pattern for the fox and coyote, and definitely not the hand-shaped claws of the racoon. The first thing you might notice is how the print looks like a small snow angel carved into the ground.

These are owl prints, also known as owl plunge holes. They appear when owls touch down to hunt voles or small mammals. You can see, at the edges of the hole, the wing tips that the owls leave as they fly off with their prey. This act is all recorded in the snow, left for the casual hiker or explorer to find.

Owls are pretty incredible creatures that can locate prey by ear alone. Some owls, like the great gray owl, can pinpoint prey up to 50 centimeters below the snow. They also struggle with a very poetic-sounding problem, snow acoustic mirages. Acoustic mirages happen when sound gets refracted due to the complex ice skeleton structures in snow.



Think for a moment about the advance of the owl toward the vole. It pinpoints the vole below the snow first, finding it with hairpin accuracy. It launches into the air from a utility pole or a tall oak from about 50 meters away. It flies with a frightening silence, nothing more than a shadow in the air until it is right above the vole. Here it hovers for a quick second as the vole moves around in the snow, entirely unaware. Plunging deep into the snow, the owl grasps it and flies away, back to its perch. The only thing left of this act is a single footprint of the owl in the snow.

# Natural Building in Ohio

BY CLAIRE HAYNES '23, BFEC POST-BACCALAUREATE FELLOW

**In a one-mile radius** around where I am sitting right now writing this article are three buildings on the BFEC property. You might be familiar with them: the cob shed, the farmhouse and the resource center. Each one of these buildings reflects a distinct period in North American architecture, and drawing a line with them from north to south, one can see the general historical trajectory of building materials usage and resource management that we've been practicing to date. From a building made of mud to one of advanced green technology, it appears to be a straight path of progress. But, more complexity — environmental, cultural, technological — lies embedded in the mud of the cob shed than what first meets the eye.

Throughout human history, people have built dwellings with the natural resources found in abundance in their areas. In densely forested land, like Ohio pre-European settlement, timber was used to build permanent log structures. In mountainous land, stones were used to block out wind. In land with clay-rich soil, people made cob, or earthen, buildings, often setting these structures over the very ground excavated for the purpose. What came out of this tradition was functional and beautiful, and the exact opposite of the uniform landscapes seen in most American cities today.

Cob, the material that was used to construct the pale green building nestled in our wildlife garden, has been widely used for millennia in England, Iran, West Africa, Australia and the American Southwest, among many other places. Cheap, efficient and simple to learn, cob has been a staple in the development of human societies, and it continues to be used throughout the world. Nearly 700 million people worldwide reside in earthen dwellings today. Nonetheless, it has been over 150 years since building with cob was the norm for any community in North America.

What happened in that century-long gap? During the 19th century, following the industrial revolution, architectural journals disseminated fashionable trends, and new transport systems made mass produced materials widely available. An example of this type of building is the farmhouse, which overlooks the cob shed and garden and was built sometime in the early- to mid-20th century when the BFEC land was used for agriculture. It is emblematic of its time and aesthetically quaint, and it also marks the ongoing trend of mass production and outsourced labor.

In the past few decades, a recent movement toward sustainability can be seen in the design of buildings throughout North American campuses, including the resource center. Standardized guidelines like the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) certification have created a systemized approach to sustainable building. On many campuses, this has led to increased sustainability, but the certification standards and what they actually mean for those who use the buildings are not obvious to the non-environmentalist or engineer.

My primary interest in natural building lies not in its environmental sustainability or economic value, although both are surprising and heartening, but in its capacity for community building. Advanced green technology may be needed to satisfy our current building needs, but the expertise required to conceptualize and construct such buildings takes away from a once-fundamental human tradition of natural building. These technologies also detract from what I see to be a current and real potential for civic engagement: engaging people with the movement to counter climate change and re-engaging with each other. Places where people from different backgrounds can gather and mingle continue to decrease in our towns and cities, and community building projects were an early casualty of that trend.

Building with cob on a large scale may never be realistic in Ohio, but other natural building practices, like straw bale, are gaining in popularity. Straw bale, like other earthen building methods, is relatively simple and enables inexperienced builders to participate in construction. The environmental and economic benefits of straw bale houses are many. First and foremost, these structures are built using a waste product: straw. Straw bale houses repurpose this waste material, sequestering its carbon for over a century (the lifespan of a straw bale house), and consequently providing an extra source of income for farms who would otherwise dispose of it.



Community building. Turning the BFEC's cob shed (top) into a finished structure in 2005 was a team effort.

Straw bale buildings boast impressive insulation values and take advantage of natural sunlight for heating. They are fire resistant and can withstand earthquakes. Huge figures in the environmentalist movement, like Patagonia's founder Yvon Chouinard, have built and encouraged construction of straw bale houses, and these houses are also being constructed with more frequency by everyday people throughout Ohio.

A common cliché in sustainability is that "progress" means turning around and taking one step forward. The benefit of doing so does not only rely on relearning sustainable technology and practices utilized by humans for eons, but also in reconnecting communities to the earth and to each other. Back in 2005, photos from the BFEC cob shed build depict groups of people stomping away in mud, getting their hands dirty, laughing with one another. As large scale sustainable building projects continue to be adopted, I also hope that there remains room for communal construction of earthen dwellings, and that natural building does not become another relic of our past.

# **Upcoming Programs and Events**

### **Himalayan Bowls and Chanting**

SATURDAY, JANUARY 20, 10:30 A.M.

Allan Bazzoli M.D. will offer the sounds of 18 Himalayan singing bowls combined with harmonic chants from different cultures to immerse you in a very relaxing, transcendent experience of vibration and sound. Bazzoli will chant a blend of Native American sounds, the OM chant (the universal chant), the Dragon chant and the Snow Mountain chant. Cost: \$20 adults. \$10 students. *To reserve your spot, contact schutte1@kenyon.edu*.

# Family Nature Quest: Mammal Tracking

SATURDAY, JANUARY 27, 10:30 A.M. Most mammals are secretive or prefer to roam around in the night. Sometimes, the only way we can catch a glimpse of their presence is through the clues they leave behind. Join us to learn how to read animal tracks, and discover the hidden lives of the animals that live among us. Dress warmly. In the case of inclement weather, we may move inside. *Meet at the Resource Center*.

### **Family Nature Quest: Sounds of Winter**

SATURDAY, FEBRUARY 3, 10:30 A.M.

The crisp air and dormant nature of winter provide the perfect setting to orient our senses toward sound. Join us to play and practice sound activities and observations on this winter's day. Who knows what quiet things we may discover? Dress warmly, and bring your natural journal if you have one. *Meet at the Resource Center.* 

# Family Nature Quest: Tales of the Nighttime Sky

### FRIDAY, FEBRUARY 16, 8:30 P.M.

Throughout human history, we have looked to the stars and seen stories. Join us to learn about constellations and how they have been used to direct human movement and behavior in the past, and then create some tales of your own. Dress warmly; this program is partially outdoors. *Meet at the Resource Center*.

### **Family Nature Quest: Busy Birds**

SATURDAY, FEBRUARY 24, 10:30 A.M.

Winter in Ohio brings many opportunities to see all different kinds of feathered friends. Join us to learn about the different birds that visit us once the temperature drops, and come spot some yourself. Dress warmly. In the case of inclement weather, we may move inside. *Meet at the Resource Center*.

### Poetry in the Labyrinth, with The Kenyon Review

SATURDAY, FEBRUARY 24, 1 P.M.

Labyrinths are symbols rich in meaning from many different spiritual practices, and walking a labyrinth is used as a metaphor for taking a spiritual journey to our center. As we walk a labyrinth, moving ever closer to its center, we travel inward to our center. With guided writing exercises and poetry packets for inspiration, we encourage writers of all levels to bring a notebook and walk the Labyrinth Trail at the BFEC. *Meet at the BFEC Resource Center*.

# Harbinger of Spring: A Concert of Renewal and Inspiration

### SATURDAY, MARCH 30, 1:00 P.M.

Sarah Goslee Reed, a local singer, songwriter, and musician, and J.D. Stillwater, science ambassador and percussionist, present a concert celebrating the earth through music and the spoken word. Sarah Goslee Reed's original songs ask questions, challenge us, and inspire us to improve our relationships with one another and the earth. J.D. Stillwater's science-based poetry offers revelations and insights.The concert is free, but reservations are encouraged. *To reserve your seat, contact* 740-427-5053, or to schutte1@kenyon.edu.



# **Donors and Volunteers**

**FALL 2023** 

Kenyon provides financial support to the BFEC, but the center has been able to grow largely through the generosity of our donors and volunteers. We are indebted to the following individuals, groups and businesses for recent donations of time, materials and funding. If you would like to make a gift or volunteer for a project, please call the BFEC at 740-427-5050.

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This past quarter, our dedicated volunteers removed invasive species, taught our elementary field trips, worked the Fall Harvest Festival, pulled garlic mustard, aided in student programming and so much more. Collectively, they volunteered over 700 hours of time. Thank you so much! (Unless otherwise indicated, volunteers are Kenyon students)

Darya Aminia Amy Ballard, community Steven Bline Olivia Braun Marisol Hernandez Brito **Catelin Bromfield** Lynne Bush Liv Chepenik Isabella Clark Sam Connors Josiah Cox Samara Davis, MVHS Key Club AC Fleenor Damian Frazee, MVHS Key Club Portia Gharai Celia Goldstein Mae-Ling Gorin Sam Hafetz Thomas Hillmer Madeline Hofstetter Hind Ashraf Hosny Ari Jalomo Jory Kanaan Amelia Kovach

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## Brown Family Environmental Center Kenvon



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#### **OUR MISSION**

The Brown Family Environmental Center exists to support the academic goals of Kenyon College, to provide opportunities for education and research, to engage Central Ohioans of all ages with nature, and to conserve the natural diversity of the Kokosing River valley.

### **OUR STAFF**

Claire Haynes '23, Post-Baccalaureate Fellow Dave Heithaus '99, Director of Green Initiatives Bonnie Schutte, Administrative Assistant Shane McGuire, Land Manager Naturalist Noelle Jordan, Manager

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There are many reasons to give, including the satisfaction of knowing you're a part of critical environmental education and conservation programs. Receive preferred access to workshops, a hard copy of our newsletters, and a discount on bird seed. **Use the form below to send your contribution today.** 

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