



The
NATURALISTS' CLUB
NEWSLETTER

Springfield Science Museum at the Quadrangle, Springfield, Massachusetts

January to March
CALENDAR of EVENTS

January

- 6 Saturday Star Party at Noble View, *Russell*
- 17 Wednesday JANUARY MEETING: South Africa
- 20 Saturday Winter Wildlife in Bear Hole, *West Springfield*
- 28 Sunday Amherst College Natural History Museum, *South Hadley*

February

- 10 Saturday Cross-Country Skiing at Knightville Wildlife Area, *Huntington*
- 17 Saturday Nature in Winter – Snowshoeing or Hiking, *Belchertown*
- 21 Wednesday FEBRUARY MEETING: Wildlife Rehabilitation
- 24 Saturday Sharing Your Favorite Natural Place, *Westfield*



Groundhog Day - February 2

March

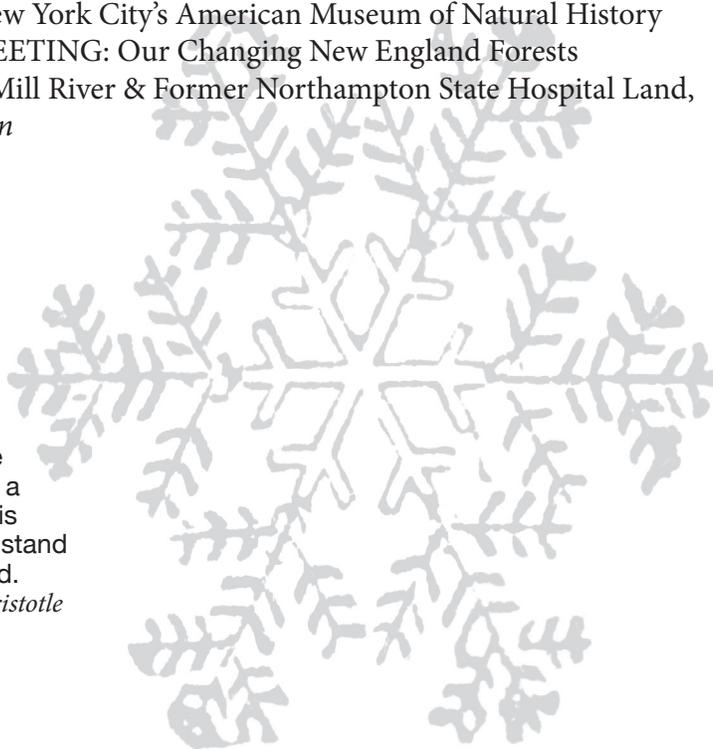
- 4 Sunday How Sweet It Is! Sugaring Time at Maple Corner Farm, *Granville*
- 10 Saturday Lair Mountain Hike, *Tolland*
- 18 Sunday Bus Trip: New York City's American Museum of Natural History
- 21 Wednesday MARCH MEETING: Our Changing New England Forests
- 24 Saturday Hiking the Mill River & Former Northampton State Hospital Land, *Northampton*

Needles on the pine trees turning to the west means snow.

~ *Anonymous*

To appreciate the beauty of a snowflake, it is necessary to stand out in the cold.

~ *Aristotle*



NATURALIST'S CORNER

FROM TEENAGE WOLVES TO HUMAN COGNITION

During the first week of November I got to visit some teenagers I'd first met when they were newborns. Many aspects of the experience were universal: amazement at how quickly a tiny individual can become tall, and consistency between specific personality traits apparent in infancy and adolescence. In the few months since their mid-May birth, these particular teenagers had reached nearly adult heights, and I'm almost certain that they recognized me not by my appearance, but by my scent!

I'm guessing that by this point you're beginning to wonder whether the teenagers I visited are human. The answer is, they're not! Instead, these remarkable teenagers are wolves that my colleagues and I had the good fortune to meet just two weeks after their birth and to visit weekly during their first two months of life, for collection of DNA samples.

The wolves were born at Zoo Académie, a wildlife rehabilitation Zoo in Nicolet, Québec, several miles east of Montréal. Zoo Académie is owned and run by Jacinthe Bouchard, whose vast knowledge about the development, behavior, and dietary needs of Canadian wildlife has saved the lives of countless animals injured in encounters with cars and predators. At a given time, Zoo Académie may be home to deer, beavers, skunks, groundhogs, horses, turkeys, chickens, lynx, and bears. To visit the Zoo and to talk with Jacinthe is to be at once saddened by the many dangers faced by wildlife in an increasingly human-dominated world and awed at how a combination of empathy for individual animals and knowledge of their physiological needs can guide work to restore animal's health and enable a return to the wild. (N.B. At the February 2018 Naturalists' Club Meeting, Dianne Benson Davis will offer an account of her own work wildlife rehabilitation — see pg. 5 for details!)

As will be familiar to Club members who attended the Spring 2017 Naturalists' Club talk presented by my collaborator Kathryn Lord, these visits, in addition to being tremendously fun, were part of our collaborative work at the University of Massachusetts Medical School and Broad Institute of MIT and Harvard to identify the genetic and epigenetic underpinnings of behavioral differences between wolves and domestic dogs.

Because they can interbreed to produce fertile offspring, wolves and domestic dogs are considered members of the same species. Nonetheless, these two groups of animals have clear morphological and behavioral differences. Many adult dogs respond with eagerness and excitement to a new food or toy introduced in their home. By contrast, even adult wolves raised in the company of humans tend to be wary of anything unfamiliar.

Many alterations to human cognitive health, including autism spectrum disorders and obsessive-compulsive disorder, are characterized by changes in the way individuals interact with others and respond to new items and experiences. My collaborators and I reasoned that identifying a small set of genetic and epigenetic differences amid the highly similar DNA of dogs and wolves might provide new insight into which genes help shape their social interactions. Because humans have many of the genes present in dogs and wolves, this approach could potentially inform new strategies useful for individuals with atypical cognitive features.

You may be wondering why collection of DNA from baby wolves required a two months of weekly visits. After all, though a small number of somatic mutations arise in a few cells during an individual's lifetime (some of these somatic mutations can lead cancer) genetic information encoded in DNA is remarkably stable. Each time a cell divides, a new copy of all of its DNA is written with very high precision. Nearly all of the errors that do arise are quickly detected and rectified by the DNA proofreading enzymes that scan DNA for errors, resolving most of them long before they can be propagated through subsequent rounds of cell division.

If genetic differences alone accounted for behavioral differences between dogs and wolves, then a one-time sample, taken from a newborn or juvenile, would be sufficient for comparison to DNA from domestic dogs. Indeed, a parallel project by some of our colleagues is comparing single DNA samples taken from a large number of dogs, to investigate genetic basis of behaviors such as head tilting and intermittent indoor sprinting – a behavior I've learned is dubbed “the zoomies” by some dog owners!

In our dog-wolf comparison project, though, we wish to examine not just genetic differences but epigenetic differences. If genetic information can be thought of as the set of instructions encoded in DNA, epigenetic information can be thought of as the set of instructions encoded on DNA. Consider, for example, a kidney cell as compared to a nerve cell. Genetically (save for a few somatic mutations, as described above), these two cells are identical. Functionally, though, they're quite different. Perhaps the nerve cell helps to transmit information like "this pan is hot!" from the fingertips to the brain, where it can be processed and used to direct movements that could save one's hand from injury. The liver cell, in turn, could be involved in minimizing urinary loss of sodium, thereby preserving blood solutes on a hot day when a great deal of sodium has already been lost through sweat. These two cells would be said to have epigenetic differences: although the two cells have the same genes, each cell is using a different subset of them, enabling it to perform a specific function.

In addition to conferring differences between cell types, epigenetic information can shift through time, with major implications. For example, humans from parts of the world where dairy food is not a major component of the adult diet have lactase genes that is highly active in childhood, enabling breakdown of milk sugars, but much less active, or even silent, in adulthood. In such individuals, adult-onset lactose intolerance arises not through genetic change but rather through an epigenetic change that renders them unable to use the lactase gene even though it in their genomes.

In our work with longitudinal samples from dogs and wolves, my colleagues and I are seeking to determine whether something similar could explain behavioral differences between dogs and wolves: Perhaps there is a set of genes, active in early life, that confers in young dogs and wolves alike puppy-level excitement about new foods, toys, and experiences. If that set of genes is silenced earlier in wolves than in dogs, then wolves may simply have less time to accumulate a list of "familiar" items, making them wary of more things once they reach adulthood.

Our repeated visits to the wolf puppies this spring — and, later in the year, to a litter of Corgi puppies in Central Massachusetts — are enabling us to explore the possibility that behavioral differences between dogs and wolves can be explained by such shifts in epigenetic timing. With both wolf and dog samples now in hand, we are beginning to apply molecular biology approaches to genes for which the timing of epigenetic activation or inactivation differs between dogs and wolves. If we do find some genes with disparate epigenetic timing, our next step will be to using existing information on gene function to assess which of those genes could possibly have a role in behavior.

As with any exploratory scientific endeavor, our work carries many uncertainties. For example, we cannot be sure the cells we collected — mainly, immune and epithelial cells accessible through saliva swabbing (a remarkably fun experience in our work with baby wolves and dogs alike!) — will reliably track epigenetic changes in brain cells relevant to behavior. We're also not sure that all the saliva samples we've collected contain enough cells to yield reliable data. In spite of these caveats, my colleagues and I remain enthusiastic about the possibility that our work could eventually lead to new insights into genetic and epigenetic features distinguishing pet dogs from their lupine ancestors, with possible relevance to human cognition.

~ Diane P. Genereux

Star Party at Noble View, Russell

Saturday, January 6, from 7 to 9 p.m.

Leaders: Tom and Nancy Condon (413-297-0778)

Registration: Call Tom or Nancy

Meeting Place: Noble View Outdoor Center,
635 South Quarter Road, Russell

Cassiopeia, a mythological queen, dared compare her beauty to the gods'. The hero Perseus slew the gorgon Medusa and turned the sea monster, Cetus, to stone before saving Cassiopeia's daughter, Andromeda, and flying off on the winged horse, Pegasus. These

stories, told for centuries, are immortalized in the constellations. On this first Saturday of the new year, we will explore these stories of old as we find our way across the night sky. Come on up to Noble View for an evening of observation and storytelling. We'll explore the sky from the field in front of the cabins. Bring along a chair, something warm to wrap up in, and your sense of adventure. Overcast conditions would limit viewing, but not storytelling, so let's gather whatever the weather, unless there's very heavy snow or rain.



South Africa: Fauna, Flora, Conservation and Culture

Wednesday, January 17, at 7 p.m.

Tolman Auditorium, Springfield Science Museum

Speaker: David Lovejoy

The above title is only slightly modified from the one used for a 15-day trip sponsored by the University of Connecticut Alumni Association in late summer 2017. The presentation will focus on the fauna and flora of this beautiful country and will include Cape Town's Table Mountain, the Cape of Good Hope, the "wildflower capital" of Nieuwoudtville, and Kruger National Park. Although plants and animals will be emphasized, conservation issues and poaching will be discussed as well, along with some comments on the cultural and economic inequities of this diverse land (apartheid did not magically disappear in 1994).

Dave and Debbie Lovejoy were two of only eight participants on this UConn trip. Slides to be shown will include photographs taken by Debbie as well as some found online.

Winter Wildlife in Bear Hole, West Springfield

Saturday, January 20, from 10 a.m. to noon

Leader: Dietrich Schlobohm

Registration: Please call Dietrich (413-788-4125)

Meeting Place: Intersection of Morgan Road and Prospect Ave. in West Springfield

Directions: Access Morgan Road directly opposite the Riverdale Shopping Center on Rte. 5. Take Morgan Road until it goes under the Mass Turnpike and comes to an end at Prospect Avenue. The last part of Morgan is a dirt road. You'll encounter three forks along Morgan en route to Bear Hole.

Winter. A time when nature supposedly slows down and creatures large and small seek shelter from the harsh elements. While many animals are less visible in winter, the season provides us with a unique opportunity to study wildlife from a different perspective – especially when Mother Nature blesses us with a blanket of snow. Dietrich Schlobohm, an environmental historian, will lead us on a journey of winter discovery. Depending on weather conditions, and the area we visit, there is the possibility of observing a wide variety of animal life including deer, otter, beaver, fox, coyote, and even the elusive fisher. Our observations will most probably not involve actual sightings, but rather the tracks and other signs these animals leave behind as they engage in their daily struggle for survival. Wear good, warm footwear, and pack a snack. Our outing will last about 2 hours. All ages are welcome, but please leave pets at home. Heavy rain or bad weather cancels.

Dinosaurs and Edward Hitchcock, Beneski Museum of Natural History, Amherst

Sunday, January 28, starting at 11:30 a.m.

Leaders: David Gallup and Richard Sanderson

Please call Dave with any questions (413-525-4697)

Meeting Place: Atkins Market parking lot, Route 116, Amherst

Richard Sanderson, curator of physical science at Springfield Science Museum, will give us an introduction to the life of geologist Edward Hitchcock, and to the discovery of dinosaur tracks in our valley. The rest of the day is yours to tour the impressive Museum, which has an extensive set of dinosaur tracks collected during the 19th century by the great geologist and one-time Amherst College President Edward Hitchcock. If you haven't yet visited the Beneski, you have been missing a jewel in the valley!

Cross-Country Skiing at Knightville Wildlife Area, Huntington

Saturday, February 10, from 9 a.m. to noon

Leaders: Tom and Nancy Condon (413-297-0778)

Registration: Please call Tom or Nancy

Meeting Place: Huntington Country Store, 70 Worthington Rd., along Route 112

Hope for snow Friday night, then throw your skis in the car Saturday morning for our trip along the Westfield River above Knightville Dam. We will ski (or walk if there is no snow) along old Montgomery Road and up into the Indian Hollow area. We'll stop to explore the area, looking for signs of wildlife in the valley. This is a beginner's skiing trip, so let's plan for 2 to 3 miles on open, flat terrain. Please watch the weather forecast the night before and dress appropriately. Layers of synthetics or wool blends are best. Bring a small pack to store your shed layers, a small snack, and plenty of water. You might throw in a thermos of hot cocoa, too. Call Tom or Nancy to pre-register.

Nature in Winter – Snowshoeing or Hiking,

Belchertown

Saturday, February 17, starting at 10:30 a.m.

Leader: Dave Gallup

Registration: Please call Dave (413-525-4697)

Meeting Place: Crystal Springs Plaza, near junction of Routes 9 and 202, Belchertown

Join us for a snowshoe – or for a hike if there is no snow. Dave has many extra pairs of snowshoes, so let

us know if you need a pair. We will explore an upland hardwood forest, then walk along old roads and trails. If there is snow, we may see tracks of deer, coyote, ruffed grouse, weasel, fisher, and many other species of animals and birds. Learn how these creatures survive in a cold, snow-covered landscape. We will see stone walls and foundations of farms long abandoned. Dress for the conditions, bring snacks or lunch, and don't forget your binoculars! Rain or bad weather cancels.



FEB.
Meeting

Wildlife Rehabilitation: Eagles and Foxes and Otters...Oh My!

Wednesday, February 21, starting at 7 p.m.

Tolman Auditorium, Springfield Science Museum

Speaker: Dianne Benson Davis

Dianne Benson Davis spends her days caring for the bald eagles, red foxes, river otters, owls, snakes, turtles, lizards, ferrets – and a love-struck scarlet macaw named O'Hara – that make their home at the EcoTarium, a science and nature museum in Worcester, Massachusetts. In addition to her vet tech responsibilities, Dianne gives weekly educational lectures about birds of prey and reptiles, introducing live hawks, owls, snakes, lizards and turtles.

Dianne will speak to us about her experience raising eight bald eagle chicks at Quabbin Reservoir as part of a Fisheries and Wildlife project to restore the U.S. national bird to Massachusetts. Her book, *Eagle One*, recounting this experience, will be discounted for Club members. Join us to hear Dianne's tales of encounters with these birds and the other animals she cares for and rehabilitates.

Sharing Your Favorite Natural Place, Westfield

Saturday, February 24, starting at 1 p.m.

Coordinator: Jack Megaw

Registration: Please call Jack (413-782-3962)

Location: Westfield State University, Wilson Hall, Room 221

We're looking for ten members willing to share their favorite natural places with us. Bring your remembrances, photos, books, maps, etc. Audience invited, too! Inclement weather cancels.

How Sweet It Is! Sugaring Time at Maple Corner Farm, Granville

Sunday, March 4, starting at 11:30 a.m.

Leaders: Dave and Suzy Gallup

Registration: Please call Dave or Suzy (413-525-4697)

Meeting Place: Westfield State University Commuter Parking Lot

It is once again the time of the year when we visit Maple Corner Farm in Granville. This visit has become a Naturalists' Club tradition! The Ripley Farm has been in the family for over one hundred years.

Enjoy breakfast or brunch with maple syrup from the Farm's maple forest. After eating, we will learn about the process and history of maple syrup production. Then, conditions permitting, we'll hike to the maple sugarbush (about one-mile round trip) to see how the sap is harvested. For ages 8 and up. Rain or bad weather cancels.

Lair Mountain Hike, Tolland

Saturday, March 10 from 9 a.m. to noon

Leaders: Tom and Nancy Condon

Registration: Call Tom or Nancy (413-297-0778)

Meeting Place: Blandford Post Office – Route 23

Join us in Tolland State Forest to hike the Lair Mountain trail as we look for early signs of spring. This trail, on the south end of Otis Reservoir, winds through beautiful hardwood as well as hemlock forests. The trail has some rocky sections and may be wet and muddy this time of year, or may still have snow – come prepared with proper footwear. Expect inclines. Bring a lunch and drinking water.



MAR.
Meeting

Our Changing New England Forests

Wednesday, March 21, starting at 7 p.m.

Tolman Auditorium, Springfield Science Museum

Speaker: Tim Parshall

Dr. Tim Parshall grew up in West Virginia, frequently investigating the forests just beyond his backyard. Today, he continues these investigations with students through his teaching at Westfield State University, where he is currently the chair of the Environmental Science Department. Dr. Parshall studies how forest ecosystems change over time and will present some results of ongoing research with students, addressing a wide range of questions. How long does it take for Oriental bittersweet to change a forest into a thicket? Are non-native shrubs leading to more ticks and Lyme disease? What changes can we expect to see as climate change continues?

Bus Trip: New York City's American Museum of Natural History, *New York City*

Sunday, March 18, from 7 a.m. to approx. 8 p.m.

Leaders: Dave Gallup and Dave Lovejoy

Registration: Send check payable to the Naturalists' Club to Dave Lovejoy at Westfield State University, Department of Biology, POB 1630, Westfield MA 01086

Meeting Place: Table and Vine parking lot at 1119 Riverdale Road on Route 5 West Springfield. Be sure to arrive in time for our prompt 7 a.m. departure. No assigned seating on the bus; first come, first served.

It has been several years since we arranged a Club trip to the American Museum of Natural History – truly one of the world's finest natural history museums. You will find that a full day is hardly sufficient to see all of the permanent and special exhibits on natural history, anthropology, human evolution, and fossils, plus the high-tech planetarium and IMAX shows. Round-trip bus fare (including driver tip) is only \$53, with full payment due by Wednesday, February 28th. Museum admission is not included. The suggested price for seniors and students is \$18 and \$23 for adults, but you may opt to pay what you can at the door. Visit the Museum website for information on pricing for special exhibits, IMAX shows, and the planetarium.

Our bus will depart promptly at 7 a.m., with a 30-minute coffee stop, and will arrive at the Museum around 10:30 a.m. We depart the Museum at 4:30 p.m. promptly, with another 30-minute stop along the way home. The anticipated arrival in West Springfield is 8 p.m.

Hiking the Mill River & Former Northampton State Hospital Land, *Northampton*

Saturday morning, March 24

Leader: Carole Dupont

Registration: For meeting time, please call or email Carole (413-896-0124 ; carole0136@gmail.com)

Directions: Take Route 66 west from Northampton Center. In 0.9 miles, turn right onto Prince Street. In 0.3 miles, just past the Community Gardens, turn right into parking area.

Our hike is on the parcel that was home to the old Northampton State Hospital, from 1858 through 1921. The land has since been converted into a community garden, housing, cropland for Smith Agricultural and Vocational High School, a dog park, and a charming hiking trail along the very scenic Mill River. Today, it feels almost like a little town unto its own. We will walk through the hay fields known as "Cemetery Hill" where 181 former residents from what was known as the "Northampton Lunatic Asylum" are buried in unmarked graves, now memorialized with a small monument in remembrance of their legacy. We will hike about 4 miles of mostly flat terrain with only one short steep hill. With the winter leaf loss, we will have wonderful views of the Mill River as we stroll along the shoreline. Bring your binoculars, water, snacks, hiking boots, and dress according to the weather conditions.

Events Sponsored by MassAudubon

Most events require registration fees. For details, please visit massaudubon.org

Superbowl of Birding

Joppa Flats Education Center, Newburyport

Saturday, January 27

Winter is a wonderful time to bird in northeastern Massachusetts and southeastern New Hampshire. In celebration of this season, Joppa Flats is hosting the Superbowl of Birding XIV on Saturday, January 27, 2018.

Owl Festival

Broadmoor Wildlife Sanctuary, Natick

Saturday and Sunday, February 3 and 4

Come explore the wonders of owls with friends and family! Go on a full moon owl prowl, or join us for an up-close and personal view of some of our local owl species.

Eagle Festival

Joppa Flats Education Center, Newburyport

Saturday, February 17

Winter's here, and the Bald Eagles have returned to the Merrimack Valley. Join us for this annual festival to celebrate these special winter residents of the greater Newburyport area.

Spring Flower Shows

The Amherst Orchid Society Annual Show and Sale, Northampton

Saturday and Sunday, February 24 and 25

Smith Vocational and Agricultural High School, 80 Locust Street (Route 9, west of town), next to the Cooley Dickson Hospital. For further information, visit amherstorchidsociety.org

Smith College Bulb Show, Northampton

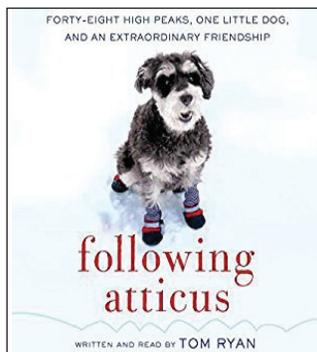
Lyman Conservatory, 16 College Lane

Saturday, March 3 to Sunday, March 18 from 10 a.m. to 4 p.m. most days, plus 4 p.m. to 8 p.m. on Fridays. For further information about the show, please visit <http://www.smith.edu/garden/Home/events.html> or call (413-585-2740)

Mount Holyoke Annual Spring Flower Show – Spring Pools, South Hadley

Talcott Greenhouse, MHC Botanic Garden

Saturday, March 3 to Sunday, March 18 from 10 a.m. to 4 p.m. For further information, visit https://www.mtholyoke.edu/botanic/flower_show or call Talcott Greenhouse at (413-538-2116).



Naturalists' Reading List...

Following Atticus by Tom Ryan

Newspaper man Tom Ryan and his friend, a miniature schnauzer Atticus M. Finch attempt to climb all forty-eight of New Hampshire's 4000-foot peaks twice in one winter, while raising money for charity. At the heart of the amazing journey was the extraordinary relationship they shared, one that blurred the line between man and dog.

~ Recommended by Loren Hoffman

