

# Stories about Stones:

A geological tale about the New York Sea  
during the Devonian Era

AUTUMN 2016 | VOLUME 40; EDITION 1



## In this Edition:

*A vision of the  
Rensselaerville Falls deep in  
the ancient New York Sea*  
pg. 4

*Is it time to reconsider how  
we manage natural  
predators?*  
pg. 8

*Reliving Summer 2016 with  
our photo gallery*  
pg. 10

# Myosotis Messenger



# A message from the Executive Director

“**Y**ou need to get outside and get some fresh air.” I work in the middle of a forest and yet our Buildings and Grounds Supervisor, Adam, must remind me of this several times a week once summer ends. It is about two hundred and fifty steps (thanks Fitbit!) from my desk to the base of the Rensselaerville Falls but some days the distance to breathtaking beauty and serenity can seem like ten miles. There is a planning meeting for the Winter Festival, a grant needs to be written, a request for research proposals drafted, or deeds need reviewing for our Land Trust Alliance accreditation application... the list of things tying me to my computer and chair are endless. On the days when I am not able to heed Adam's sage advice, I do take solace in knowing that the work keeping me indoors is for the community. The February 4th Winter Festival will be bigger and better than ever! That grant may be the necessary funds for upgrading our school field-trip curriculum to meet new science standards. The request for proposals will bring a researcher and ultimately the answer to why conifer trees at the Preserve are in decline. And a review of deeds brings us that much closer to securing our promise to protect the land so that future generations can get their daily dose of fresh air.



I also find comfort in knowing that a few months' prior, I had no shortage of fresh air and just needed to remember the sunblock. I could be found on the trail cheering in the runners from our first annual Rensselaerville Ramble and Forest Festival or knee deep in 10-mile creek convincing a fourth grader on a field trip that she *could* hold a crayfish. I was more

apt to hear, “Slow down!” as I sprinted past Nature Study students on the lawn, pretending to be birds migrating, on my way to salamander surveys with Wildlife Ecology Research students. On rare occasions, I even found a solitary moment to take a momentary breath and note the birds and bees as I conducted a trail assessment.

I was fortunate, in fact *I am* fortunate. Even as planning next summer reaches full pitch, I am still able to enjoy a trek to the top of the falls when I need a moment of inspiration. I can be amazed, for the first time in a very long time, by the gorgeous fall colors and the way leaves smell warm and solid like the earth as they crunch underfoot. On the best days, meetings and conference calls can still be conducted in the gazebo outside the Visitors Center under the gentle scolds of flocks of dark-eyed juncos. With the help of friendly reminders, I can still make connection to nature and get some fresh air to brighten my day.

In a perfect world, it would be wonderful if everyone's day coincided with a moment out at the Huyck Preserve. Peanut butter sandwiches and a jaunt around Lincoln Pond, yes please! But we know that many of you get your nature fix through our weekly Facebook posts as we document the first snow and the freezing of the Rensselaerville Falls. Even when you can't wind your way around Lake Myosotis catching downy woodpeckers prepping for cold, you *can* do your part for the Huyck community between visits by becoming a member and donating. It's no secret that we do amazing deeds thanks to the generous contributions of our members and donors. Our School Field-trip Program got a \$4000 boost this year thanks to donations from members, participation in our Benefit Raffle, and a 2015 annual fund donation from Uncle Larry's Fund. Generous support from Shirley Stevens French has allowed us to take the big step towards Accreditation by the Land Trust Alliance. Increased membership this year supported two additional hikes on mushrooms and bird communication and the success of our Annual Benefit has put us on track for ending the year with strong financial footing. If you were not one of the sixty people to receive a personal thank you at this year's Membership Dinner, please allow me to do so now: Thank you to all who support and continue to support the Huyck Preserve. I know that we can continue to count you as friends and protectors of this beautiful land. As always, I look forward to seeing you on the trails! 🍄

- Dawn O'Neal, Ph.D.

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# Winter at the Huyck Preserve

Save the date for some of our new and annual winter events!



## December 3rd, 2016: Join the Huyck Preserve at the Library's Annual Greenery Sale!

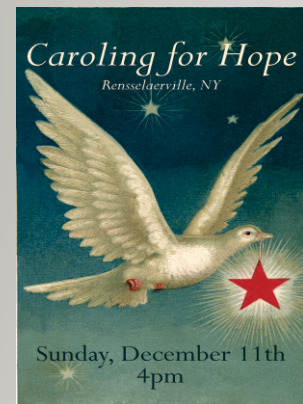
Rensselaerville Library, 9am-2pm

Are you looking for the perfect gift for the nature lover in your life? Visit the Preserve at the Library's Annual Greenery Sale to purchase a gift membership and contribute to the protection of valuable greenspace! While you're there, choose between some of the best Christmas trees around and an assortment of beautifully decorated wreaths. There will also be an array of local artisans and businesses who are ready to help you get ahead of your holiday gift-giving! Additionally, the Preserve will be holding a craft station in the Library's craft room where we'll be making pine-cone bird feeders for our year-round avian friends!

## December 11: Caroling for Hope

Rensselaerville Hamlet, 4pm

All are welcome and invited to join a community-wide event to raise our voices and spirits together in honor of unity, hope, and love. This event, spearheaded by the Rensselaerville Historic District Association (RHDA), will begin at the Huyck Preserve Visitor's Center and will bring carolers through the historic portion of the Hamlet, concluding at Conkling Hall. Neighboring organizations will be providing warm beverages and light treats to enjoy at the Hall as we bask in the good-natured company of friends and community members. Candles will be provided at the Huyck Preserve to illuminate the festive occasion.



## Full Moon Night Hikes

January 13<sup>th</sup>, 2017, 8pm

February 11<sup>th</sup>, 2017, 8pm

While our trails typically close at dusk, a few times a year we lead special night hikes! Please make sure to RSVP in advance, as these hikes fill up quickly and are limited to 40 people per hike. Sturdy shoes required! In the event of snowfall, a limited number of snow-shoes are available.

Visit our website at [www.huyckpreserve.org/whats-new-blog](http://www.huyckpreserve.org/whats-new-blog) to RSVP.

All hikes to meet at the Visitors Center.

## February 4<sup>th</sup>, 2017: Winter Festival and Artisan Market

Eldridge Research Station and Lincoln Pond, Noon - 3pm

One of our most popular festivals is almost here, and it's even better than ever! As always, join us for sledding, ice skating, hot cocoa, indoor activities, bonfire, and a fine selection of local artisans. **New for this year: Winter Baking Contest!** Bring your favorite pie, cake or cookies - a prize will be awarded to the winner of each category. Find more information on our website blog by visiting [www.huyckpreserve.org/whats-new-blog](http://www.huyckpreserve.org/whats-new-blog). We're still working on our list of partnering vendors and organizations, so be sure to check our website for updates. **Interested in bringing your goods to this fun event?** Contact [info@huyckpreserve.org](mailto:info@huyckpreserve.org).





# Beachfront Property in Rensselaerville, NY: The Devonian Seaway in Center-State

Katherine Byerly | Education Volunteer

When a food enthusiast travels to a new place, they might ask around for the best restaurants in town. When a fisherman travels, they might look up the nearby rivers and lakes. When a geologist travels to a new place, the first thing they look for are the rocks. For geologists, those grey-brown rocks along the roads or on ridges tell them not just what rock types are available, but also reveal clues about the ancient environment from where they were created. The ancient rocks found in and around the Huyck Preserve have their own stories to tell of an older New York: stories of the birth of mountains, the heyday of unique organisms, and even of the existence of an ocean in Central New York. Remember, our elders always tell the best stories!

Gathering the pieces of the story begins with observing the rocks that can be found. Unfortunately, the rock exposure at Huyck in general is poor, being approx. 5%-10%, while the ideal would hover around 30%. However, it is not necessary to have large, well-exposed outcrops to interpret geologic history. Where outcrops are rare, one can begin their search by observing the human-made stone walls for information. The property walls lining the trails of the Preserve are comprised of dark colored shales quarried in the area (Figure 1). In addition, even the small unobtrusive shale outcrops at the Preserve can be dated to early Devonian time based on the marine fossils they contain (Figure 2). Still more information can be seen in the flat-lying nature of the outcrops, indicating their paleodepositional environment was, in fact, a deep-marine sea. This feature is expressed in the steep-sided Rensselaerville Gorge (Figure 3).



**Figure 1:** Property wall on the west side of the Lincoln Pond Trail. Despite the low amount of outcrops at Huyck, it can be seen that this wall is comprised of dark shale pieces. Because the rocks for this wall would have been gathered and quarried nearby, it can be inferred that there are dark shale rocks in the bedrock of the Preserve.

Devonian period, at a time when large areas of the continents were covered in shallow seas. One wonders, "Where did all the extra water to cover such large expanses of land come from?" The answer lies in the continental glaciers and ice caps that were expansive



**Figure 2:** This piece of dark shale found on The Preserve contains a multitude of marine fossils, a few of which have been identified above with a marker for scale. Top Left: Brachiopod Rhynchonellid. Top Right: Brachiopod Spiriferids. Bottom: Marine Gastropod.

during a preceding Ordovician Ice Age, which began melting during the Silurian and were almost completely melted to ocean water in the Devonian. Our Preserve here in New York was situated in the minor supercontinent known as Laurentia, which was a smashed-together combination of the continents North America and Greenland (Figure 4).

In fact, the Huyck was actually completely

underwater in Devonian time, which lends itself well to the formation of limestones such as the Onondaga (Figure 5). Limestones only form in marine water that is clear, warm, and shallow, meaning the Onondaga shows clear evidence of a central New York Sea. Limestone is an organic sedimentary rock that forms from the accumulation of shallow water debris: debris such as shell, coral, and algae. In the case of the shell and coral, they contain an abundance of Calcium Carbonate -- a principle component of limestones that led to the Onondaga's creation.

This peaceful ocean environment could not last forever, and soon enough, the sea experienced a remarkable collision of worlds: the Acadian Orogeny. In the present day, the continents are constantly in motion. However, their movement is so slow, the only movement we can feel

**Figure 3:** Image of the shaley-mudstone beds in the Rensselaerville Gorge, as exposed along the Middle Falls Path. The flat-lying nature of the beds is evidence of a possible calm seafloor environment of deposition. Trees for scale.

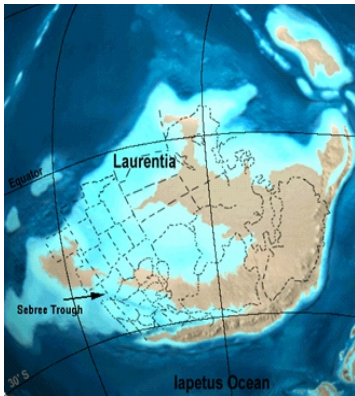
Similar flat-lying shale outcrops can be seen in Trout Creek, 10 Mile Creek, on Lincoln Pond Trail (west side), and on Route 85, 3 miles North of Rensselaerville. In-place shale outcrops at all locations expressed dip angles ranging from 0°- 5° when tested via brunton compass.





are slips in the continental plate boundaries or along fault lines, which we call earthquakes. An orogeny is when two continents completely move together and collide. In the case of the Acadian, it involved a collision between our North American Plate and Avalonia, which encompasses parts of present day Great Britain and North Africa. The end result was a great mountain-building event, where the land became bunched-up from the collision and was thrust skyward. When the dust had settled, the new Appalachian Mountain Chain now existed along North America's East Coast. No longer would the shallow sea waters exist, for they had now become a deep ocean at the base of the proto-Appalachian Mountains.

With the arrival of the Appalachian Mountains and the new deep-ocean basin, limestone creation gave way to shale, which can be formed in deep marine settings while limestone cannot. But how was this shale created you ask? The smoking gun for the formation of shale is the rivers flowing from the mountainous land into the ocean. Rivers carry all manner of sediments, from large gravels and sands, to even tiny silt and mud particles. They deposited their gravel and large sand in continental valleys, while smaller sand and silt made it to the beaches to form deltas. (A famous example of a Devonian delta is the Catskill Delta Complex.) Tiny silt carried farther out from the delta became part of the ocean-bottom mud, and eventually, the shale.



**Figure 4:** Image of the Paleogeographic reconstruction of Laurentia, reconstructed from ancient rock data. Laurentia contained parts of North America and Greenland.

This shale would be known as the Marcellus Shale, an important gas-bearing shale deposited directly atop the Onondaga, and is the primary rock type found at the Huyck Preserve. The Marcellus is what is known as a black, anoxic shale, meaning it was formed under low-oxygen conditions with high organic matter. Those two criteria are of high importance for the shale's ability to carry gas. The first criterion is self-explanatory: the deep ocean where the shale was formed is underwater with low oxygen.

The second criterion, containing high organic matter, is more complex.

When ocean plants or animals die, they begin to fall to the seafloor. If they can be quickly buried at the bottom while the body is fresh, the organic carbons in their body are trapped underground. Over an extended period of geologic time, their carbon-rich bodies are slowly turned to precious natural resources within the shale layers, such as oil and gas. Natural gas is rarely found in rocks like sandstone and limestone, making this characteristic rather unique to shales. It is occasionally possible to find oil in sandstones, such as the Ural-Volga sandstones in Russia, which was first discovered and produced in the 1930's.

The Marcellus Shale is especially important to New York and Pennsylvania's natural gas industry. Natural gas resources can be found in Northeastern and Southern-Central Pennsylvania, and in areas of New York where the shale is especially thick. First discovered in the early 1900's, the oil and gas industry of both states has existed ever since.

Drilling became much more economically profitable in the 1950's, when companies began employing a drilling technique called Hydraulic Fracturing, or "Hydrofracking," to break the layers of shale that contain resources. This creates open pathways for the gas to flow, which is then absorbed and collected by the company's Fracturing workers. The shale at the Huyck Preserve likely has potential to contain natural gas as well, though it is best not to tell Exxon, as fracking would leave the ground hollow and unstable.

The Marcellus Shale itself is part of a much larger rock group called the "Hamilton Group" or "Hamilton Beds." The Marcellus is the only consistent shale within this group, meriting it with its own distinct name. The other layers in the Hamilton above the Marcellus occur with more siltstones, sandstones, and even large, pebble-rich conglomerates. While the rock of the Preserve is mainly shale, these "successors" are found in the surrounding countryside. This signals a change from an ocean environment immediately after the rocks of The Preserve were created.

Back in Devonian time, as more and more sediment was carried to and deposited at the New York beachfront, the land began to extend outward from the continent, swallowing up the sea. No longer could the seafloor shales of the Marcellus exist in this area. Instead, they were replaced by increasingly larger-grained rocks comprised of the large particles carried from the mountains, forming the Hamilton's sandstones and conglomerates.

The age of the New York Sea may have ended for the Rensselaerville area, but it had left behind an undeniable remnant in the form of the shale upon which the Preserve rests. After all, the Earth is an ever changing place, and the ability to own beachfront property may eventually return for Central New York! 🌲



**Figure 5:** Image showing the extent of the "New York Sea" in Middle Devonian time, situated in the present-day Appalachian Basin. The area of Rensselaerville would have been completely submerged while the Onondaga Limestone was being deposited.

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# Making Friends with Your Enemies

Erin Sanderson | Education Assistant

For some of us, the call of coyotes is a comforting reminder that we are living close to nature. I have always enjoyed hearing the “yip, yip, aooooo” of a coyote in the evening. However, not everyone has the same feeling. The call of a coyote or another predator can be scary, and a strong reminder that we should be cautious. Many who have livestock of some form, or even outdoor pets and small children, feel very strongly that these animals represent a danger and should be removed. But is this really the best practice? New research says maybe not.



A review published this year in the *Journal Frontiers in Ecology and Environment* looked at studies about the effects of lethal and non-lethal predator control methods in North America and Europe. The study found that a very small number of lethal predator control techniques actually caused a decrease in attacks by predators, while the majority of them found that there was no change. Interestingly, a few of the studies found an increase in attacks after lethal methods were used. Additionally, when considering those studies that looked at the effectiveness of nonlethal techniques, the majority of them did show a decrease in predator attacks.

The review is far from perfect. Out of over 100 studies on predator control techniques, the authors felt that only 12 could hold up under scrutiny. Most of them had too few samples or other issues like not accounting for weather. Five of those 12 considered non-lethal techniques, while seven considered lethal options. While this may seem like a reason to dismiss the research review off-hand, the lack of studies in and of itself is an important point. According to the authors, more studies need to be done by the scientific community before they can recommend using lethal techniques. To them, the findings of their review are a reason to not use lethal techniques, until they are proven.

So why does this study affect us, here in New York? We may not have cougars or other very large predators here, but we do have the Eastern Coyote (*Canis latrans*). Coyotes are highly adaptable and can live in many different environments. As they adapt, their range is expanding. Another recent study, published in the *Journal of Landscape and Urban Planning*, reports that coyotes are found in 96 out of 105 U.S. Cities, or 91%. Most of those cities have very few human-coyote incidents, and the least incidents occur in the Northeast. Still, there is the potential for interactions to occur as coyotes become more commonplace.

Coyotes and other predators are of vital importance. As apex (or top) predators have been killed off globally, it has led to degradation of ecosystems and has impacted many important ecological processes. For example, when wolves were removed from the Yellowstone National Park, Elk populations grew enormously. The large numbers of elk ate all the small trees and shrubs along streams, and massive erosion and changes to the streams took place. The problems were reversed when wolves were reintroduced. Here in the northeast, we are having similar problems with deer. Without an abundant apex predator, deer populations have skyrocketed, which can increase tick populations, decimate forest floor ecology and crops, increase the number of vehicle collisions and human injury, and a host of other problems.



If we don't want to kill them off, then how do we stop them from harming our livestock or pets? There are a variety of techniques that can be used. To start, it is important to learn as much as you can about them. The DEC has a great article with information about coyotes at [www.dec.ny.gov](http://www.dec.ny.gov). Once you have learned about the coyote, you can make changes to help avoid conflicts. The most important thing is to keep coyotes afraid of people. This means that whenever you see a coyote you should not hesitate to be loud and scare the coyote off. Other changes can be made on your property to limit coyote interest too, like making sure that potential food sources (pet food, garbage, etc.) are not left outside or unsecured. You can remove tall grass and shrubs from around your property, to keep coyote from



getting too close, too easily. The DEC has more great tips about preventative techniques you can use on their website. If you are a farmer or rancher with livestock and concerns about their safety, there are a number of nonlethal techniques that can be used. Vertical woven fencing is one of the best techniques. Fladry, or flagging, where a rope is strung along a property boundary or fence with bright red flags hanging from it, is also an effective technique. This scares away most coyotes, and coupled with other techniques it can be effective for quite some time. Livestock guardian animals, like dogs, can be very effective too. For more information about nonlethal deterrent techniques, see the Project Coyote link below.

While it may seem counterintuitive, it is possible that the best way to keep our ecosystems healthy and protect our pets and livestock is to learn to coexist with predators. With education, practice, and dedication, it is possible to do so. 🐿



#### Further Reading:

- Treves et al. "Predator control should not be a shot in the dark." *Frontiers in Ecology and Evolution*. 2016.
- Poessel SA et al. "Environmental factors influencing the occurrence of coyotes and conflicts in urban areas." *Landscape and Urban Planning*. 2016.
- Ripple WJ, Estes JA, Beschta RL, et al. 2014. "Status and ecological effects of the world's largest carnivores." *Science* 343; doi:10.1126/science.1241484.
- Project Coyote Website:  
[http://www.projectcoyote.org/programs/ranching\\_with\\_wildlife/nonlethal-solutions-reduce-conflicts/](http://www.projectcoyote.org/programs/ranching_with_wildlife/nonlethal-solutions-reduce-conflicts/)

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MAY 2015



# Summer 2016 at the Huyck Preserve

So ends another summer season at the Huyck Preserve and we are met once again with the cooler, shorter days of autumn with winter creeping close behind. Before we really say farewell, let us first reflect on all the joyous activities, programs and events that we saw this year in those fleeting hot months, including our first-ever Rensselaerville Ramble Trail Run/Walk, Annual Benefit, numerous education youth programs, and participation at neighboring events like the R'ville Ride at the Carey Institute!



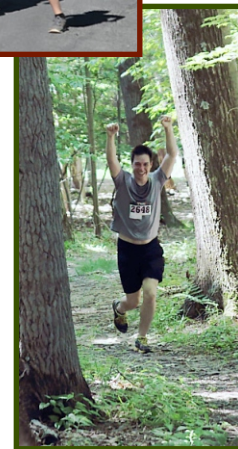
Above: A lucky photographer caught this image of our 2016 Aquatics Director, Evan Place, mid-dive after taking a cooling dip into Lake Myosotis.



Above and left: The first-ever Rensselaerville Ramble Trail run/Walk and Forest Festival was a great success! Major thanks to our partnering organization, The Rensselaerville Library, and to all our participants and event sponsors! Pictured above is our wonderful race director, Linda Styer, passing along instructions to event crew.



Above and right: The Huyck Preserve information station at the Carey Institute and Helderberg Outdoor Club's Rensselaerville Ride event. You could say the hula-hoops were a hit by this talented young lady!



Be sure to mark your calendar for next year's event on Saturday June 17<sup>th</sup>!



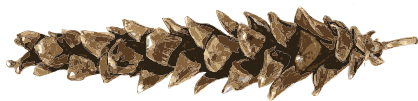
Left and below: "Who loves Science?" "We do!" Nature Study and Natural History Day Program students spent plenty of time outdoors learning about distribution and abundance, and forest floorecology.



Right: We had a special treat of our very own (natural) light show at the 2016 Annual Benefit on August 14 after a striking lightening display finally broke the day's high humidity and heat index. Above, Executive Director Dr. Dawn O'Neal recaps the year and gives thanks to our generous donors, guests and sponsors.







# Sprout Spot



Entertainment for the young and young at heart

Z	L	A	K	E	J	Y	X	F	M	V	R	S	G	H	A	Y	N	W	C
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M	A	X	G	W	Z	O	E	J	T	Z	W	B	A	P	X	T	K	F	U
Y	V	M	T	P	M	R	C	C	F	W	O	X	D	B	K	M	E	Y	H
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Q	F	L	A	A	O	E	J	U	X	I	U	N	B	K	X	G	A	E	U
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Y	N	C	I	L	I	H	O	A	A	Z	R	I	U	U	H	W	A	S	I
Z	C	K	H	K	A	R	U	G	P	N	K	T	N	S	X	O	Q	H	A
M	L	C	I	R	G	U	J	X	M	R	O	A	T	H	N	R	F	Q	P
G	B	A	V	N	E	G	T	N	H	O	A	N	Y	R	M	T	H	W	H
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A	S	F	Z	B	N	D	T	X	X	O	N	M	I	M	W	S	P	L	F

## Autumn Visions Word Search

MUSHROOM  
DECIDUOUS  
PUMPKIN  
LEAVES  
CONIFER  
FALL  
SPIDER  
ACORN  
BOUNTY  
FOLIAGE  
SWEATER  
HIBERNATION  
PINECONE  
MIGRATION  
HARVEST

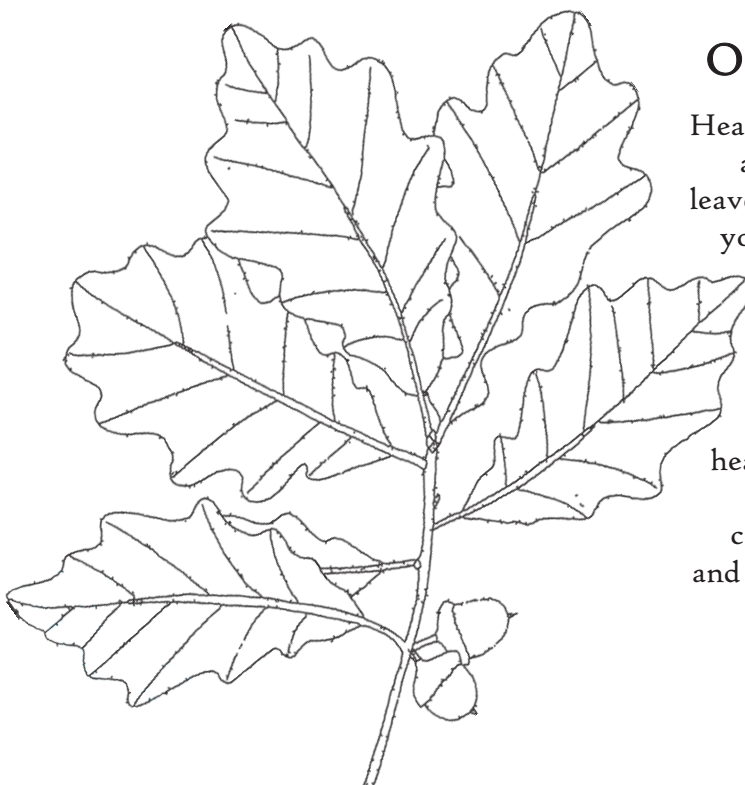
### Did you know...?

...Fungus mycelium has been referred to as 'Earth's living internet' by mycologist Paul Stamets because it "connects the ancient intelligence in the mushroom to all life on earth." The mycelia cover and penetrate roots of plants and provide it with water and minerals in exchange for sugar (food).

Source:  
Stewart, terraBrie. *The Fungus Files*. np, np, nd, page 54. PDF article.

...Fallen leaves provide an excellent (and affordable) alternative to mulch. They also provide shelter to insects in the harsh Winter conditions while also preparing seeds for germination in the Spring.

Source:  
<http://aggie-horticulture.tamu.edu/earthkind/landscape/leaf-management-plan/>

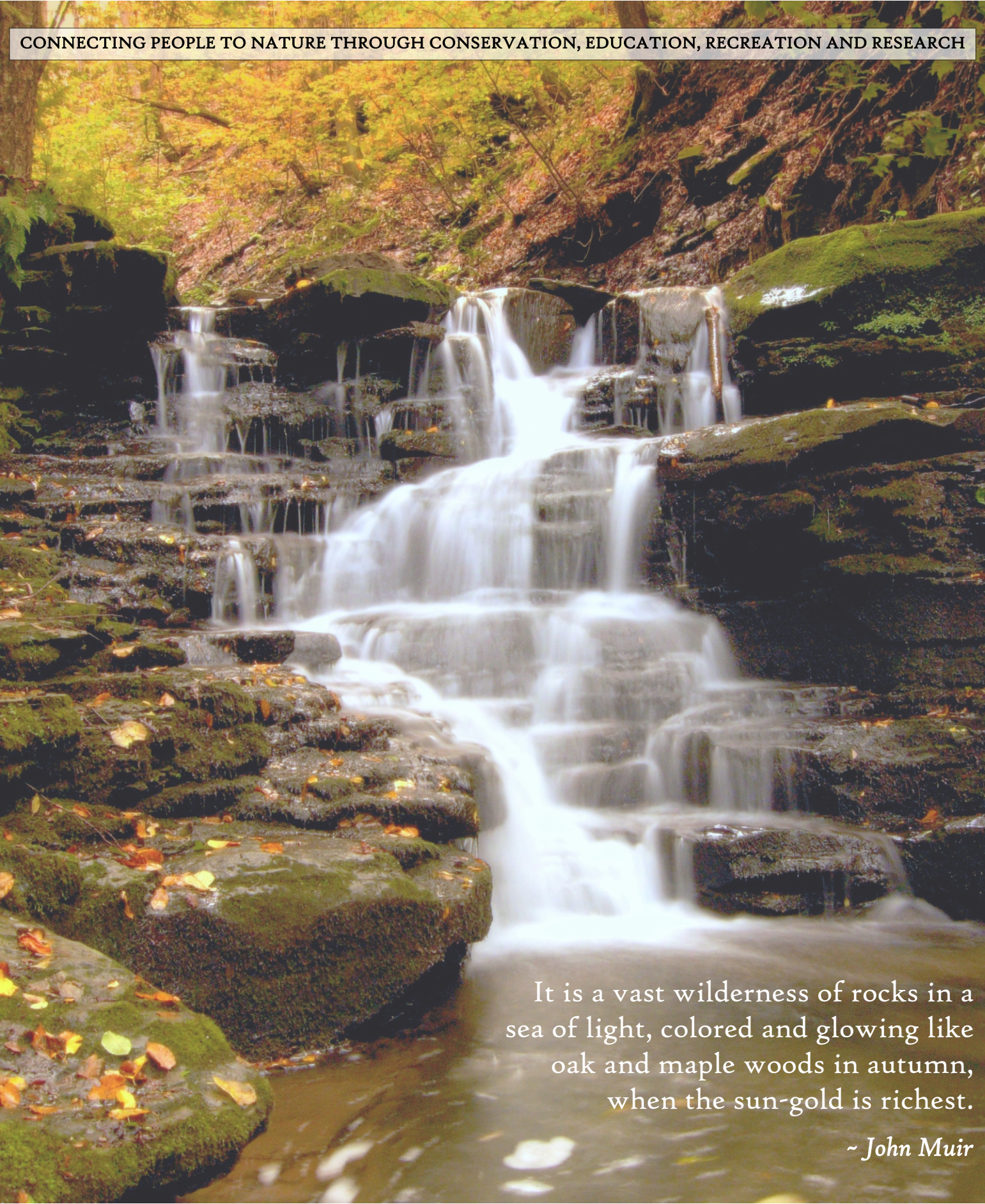


## Oaken Leaves

Head outside and take a look at the fallen leaves. What ones can you see? If there are oak leaves, what colors are they?

After using your observation skills, head back inside and grab your pencils, crayons or markers and color in your own oak leaves!





It is a vast wilderness of rocks in a  
sea of light, colored and glowing like  
oak and maple woods in autumn,  
when the sun-gold is richest.

~ John Muir