



# CENTER LINE

A Publication of Waukesha County's Retzer Nature Center

**Spring 2007**

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## SHAZAM !!!

What better subject to explore than a piece of weather. Wisconsinites deal with its seasonal antics in daily conversation. After the "What else is new?" the serious communications begin with ... "Can you believe this weather?" This will be my lead-in to explore a split second of weather, that scared this article onto paper.

Watching a typical Wisconsin thunderstorm with its raindrops, heavy winds, ice balls, lightning — you name it, it fell on my lawn. From dark clouds a bolt of lightning smacked the ground about 50 feet from viewing. The explosive crack, so loud and the flash, so bright, shook my breath away. Too close for comfort, this split second phenomenon needed further research.

Lightning bolts by the millions hit our earth every day. Bolts can travel faster than spaceships, sometimes reaching speeds up to sixty thousand miles per second. Energy travels through twisted paths of air, and bolts can be from six to ten miles long. Resulting flash is brighter than ten million 100-watt bulbs and the pulses can generate hundreds of millions of volts — billions of watts in split seconds. A nature potent power pack!

Lightning begins with movement of ice crystals and raindrops in a cumulonimbus cloud. This movement becomes violent when the instigators rub against each other in the cloud's strong updrafts, and a separation of positive and negative charges become two strong static charges. Positively charged crystals rise to the top of the cloud, to build up positive static charges; negatively charged crystals and hailstones fall to the middle and bottom layers of the cloud, building up negative static charges. While all this charging is happening in the clouds above, the earth below, normally negatively charged with respect to the atmosphere, begins a building up of positive charges beneath the cumulonimbus. Positive charges on the ground gather along the surface for miles along the storm, and become concentrated in trees and tall buildings. Negative charges from the cloud can pull the positive charges inside one's body to the top of one's head, and (lo and behold) your hair will stand on end. There is nothing like a strange hair-do to get you out of circulation!

Streamers of sparks called stepped leaders begin to shoot downward in half-football-field leaps. When the cloud leaders get closer to the ground, they run into the upward streamers from the ground, and paths form channels. The lightning bolt is born. What the observer sees is the return of electricity flashing from ground level. When the leaders strike the ground and tunnels into the soil, heat from the electricity fuses sand particles together in the shapes of its path. This tubular crust is called a fulgurite (Latin word for lightning). Some fulgurites have been found that are longer than ten feet.

There are many types of lightning (and new discoveries are made periodically), but in the interest of simplicity, lightning can be classified into three main types.

1. Intracloud Lightning.
2. Cloud-to-Ground Lightning.
3. Intercloud Lightning.

(Shazam... continued)

Performances in all categories will hold you spellbound. Intracloud lightning is the most common. Lightning arcs between opposite charged centers within the same cloud. Rain clouds suddenly light up and flicker, and there is rumbling of thunder. This stage is above us and we can appreciate the drama of it all. Intercloud lightning occurs when lightning leaps across a gap of clear air between two different clouds. Here again we can enjoy the drama without being intimidated. Maybe!

However, when it comes to cloud-to-ground lightning, where hair can sometimes stand up on end ... look out ... or better yet ... hide out. This is the most dangerous kind of lightning. When lightning strikes, electrical energy changes to heat. Temperatures in its path can reach 50 thousand degrees Fahrenheit. That's five times hotter than the sun's surface. Intense heat beside the lightning channels makes the air expand explosively, and then contract as it cools. Back-and-forth movement of the air particles results in the sound waves called thunder. Close thunder is heard as a single sharp crack. I can testify to that. Distant thunder is heard as a roll or rumble.

Scientists have mixed theories concerning lightning and its cause. Ever since Ben Franklin was told to go fly his kite, man and his experiments have found new forms of lightning—including heat lightning, ball lightning, and streak or rocket lightning, to name a few. Lightning is found on other planets—Jupiter and Venus, for instance. Recently, scientists have investigated upper atmospheric lightning that occurs high above cumulonimbus clouds. Given new names—Sprites, Elves and Jets—collectively they are called megalightning. Sprites are electrical charges high above the cumulonimbus cloud of an active thunderstorm. They glow in reddish-orange neon like flashes. Sprites usually occur in clusters of two or more. Jets differ from sprites. They project from the top of the cumulonimbus cloud, above the thunderstorm, in a narrow cone reaching lower levels in the ionosphere approximately thirty miles above the earth. Jets are brighter than sprites, and are blue in color. Jet activity was first recorded in 1989, on a video taken from the space shuttle as it passed over Australia. Elves, not to be outdone, occur in the ionosphere 60 miles above the ground over thunderstorms. Elves were recorded in October 1990, on a space shuttle mission while passing over French Guiana. Elves are believed to be cast in shades of red.

A few anomalies to be cast into the conversation of weather: lightning is attracted to the common Oak. With its deep central root and water-filled cells

running through the wood of its trunk, it possesses qualities lightning seeks. Oaks are better grounded and are more conductive, and lightning slaps them on the back often. That lightning never strikes twice in the same place is a falsehood. The Empire State Building is hit on an average of 100 times a year! The anomaly known as "A Bolt From the Blue" is when lightning strikes, but the day seems devoid of clouds. This can be explained by the fact that lightning can strike up to 10 miles from a cloud. Lightning strikes the earth about 100 times every second. Sometimes lightning will strike an earthling and they will survive. I call that a miracle. In fact some earthlings have been struck multiple times and have survived. On record, a park ranger named Roy Sullivan, was struck seven times while pursuing his 35 year career. He suffered multiple bodily injuries.

For kids growing up in Wisconsin, reading comic books became the rage. A favorite hero of the comics was Billy Batson who would shout "Shazam" and a bolt of lightning, a bolt from the blue shall we say, would make his transformation into the super hero Captain Marvel. Exciting stuff!

No word was used to bring that bolt of lightning down in my back yard. Several were uttered after the shot was witnessed. But a greater respect for nature's more profane moods was imprinted from this experience.

See you on the trail,

*Shirley Blanchard*

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Google – "Crystalinks.com" – Search web

URL# <http://en.wikipedia.org/wiki/lightning>



# HEARTWOOD



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## Fish!

When I was in fifth grade, I had a goldfish in a bowl on my desk. As I did my homework each evening, the goldfish would occasionally look up at me with a judgmental expression in its bulging eyes, as if to ask what business I had keeping a goldfish, anyway. At the time, I would have had no answer to such a question—but now I know. I was practicing.

In subsequent years, I have presided over a colorful series of fish-and-aquarium arrangements—from the container of incredibly fertile guppies I was responsible for in my high school biology lab, to the Siamese Fighting Fish that my college roommate and I revived and kept alive with shots of whisky, to the piranha I watched over (and sometimes returned to the tank, after bouts of uncontrolled leaping) during a summer of house-sitting for my graduate school professor, to the illegal vat of trout fry I inherited when my sportsman neighbor moved away, to the aquarium of Orinoco River fish I proudly set up in my classroom (only to learn the cost of having Orinoco River water shipped to Wisconsin), to a succession of home aquariums (enjoyed by my children and our cats, and maintained by my wife).

Always, it seems, my fish have been linked with education. This is true on several levels. My fish have tended to be associated with educational venues—high school classrooms, college dorms, or homework desks. Beyond this, my fish have been associated with specific educational lessons—often concerned with their own strange and unexpected behavior, eating habits, parasites, or with the specifics of their care or (if the care was unsuccessful) their disposal. I think it is fundamental to the nature of fish that they are an occasion of learning.

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When the idea of an 800 gallon game fish aquarium first came up, in connection with plans for our expanded Environmental Learning Center, I admit that I was less than enthused. My lack of enthusiasm for the idea was expressed in the most idealistic terms—

- ◆ Our mission at Retzer Nature Center is, after all, to teach about the land community outdoors, especially its locally native components outdoors (never mind that we utilize all sorts of captive non-native teaching animals indoors, such as ring-necked doves, gerbils, and corn snakes, to teach kids about animal adaptations).
- ◆ Retzer is, after all, a terrestrial upland nature center, and we focus on terrestrial upland prairies, forests and oak savannas (never mind the aquatic communities, the streams and ponds, the extensive wetland communities that make up a large portion of our acreage);
- ◆ The recreational activities and interests of our visitors are, after all, dry land activities such as hiking, and snowshoeing, and skiing (never mind the rampant popularity of water activities—fishing, canoeing, and swimming).

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All right, so my reasons for not liking the idea didn't, well, hold water. I suspect that, deep beneath these well-reasoned misgivings, my true resistance to the idea of an 800 gallon game fish aquarium had more to do with a simple, elemental human emotion—fear. You see, a gallon of water weighs 8 pounds. And assuming the responsibility of caring for a very large aquarium seems about like assuming the responsibility of caring for a very demanding new puppy. A very large, very demanding, 6,400 lb. new puppy. The sort of puppy that could require really awesome time-consuming care and feeding and doctoring, could smell really bad, could leave a really huge mess on the floor, could wake you up in the middle of the night with worry, could make you come in to work at an ungodly hour, could make you come home early from a vacation to deal with disaster.

As these comforting thoughts lay quietly in the back of my mind, the value of the new aquarium (as a “grabber” exhibit, and as an educational resource) became apparent to everybody. The value of the new aquarium as a component of our cool exhibit theme “The Unseen World” became apparent to everybody. Even the value of the price tag (which was modest, in comparison to the extravagant indoor museum-scapes we looked at, and rejected as too expensive) became apparent to everybody. Thus it was that this new burden, this new and constant responsibility, was first laid upon my weary shoulders as the Learning Center opened. Maybe my goldfish, all those years ago, was right after all.

But fish are, after all, an occasion of learning.

As the gargantuan tank (with all its specialized gear) was delivered and set up, I became caught up in a brand new learning curve. I found myself becoming a sort of instant expert on such diverse and arcane subjects as the functionality of bio-media wet/dry filters, the plumbing of independent filtration loops, the repair of chiller controls with duct tape, the measurement of progressively reduced nitrogen wastes, the value of redundant check valves, and the life span of low bid pump motors.

As assorted fish began to arrive (thanks to zealous fishermen, friendly bait store owners, DNR electro-fishing forays, and state fair wildlife exhibits), I found myself caught up in yet another brand new learning curve. I found myself becoming a sort of instant expert on the adaptations, habitat preferences, social graces, and, well, personality of Large- and Smallmouth Bass, Crappie, Yellow Perch, Rock Bass, Bluegill, Pumpkinseed Sunfish, Grass Pickerel, Bowfin, Bullhead (both Black and Yellow), Warmouth, Longnose Gar, Lake Chubsucker, and Fathead Minnow.



Photo courtesy of Retzer Camera Club member Pat Fort.

They say that knowledge is power. In this case, knowledge of the aquarium and the fish allowed me to seize power over my apprehensions. A three-ton puppy, yes. But my three-ton puppy.

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So next time you come in to Retzer Nature Center, if I'm out and about, get me talking about my aquarium. Let me take you on a tour, dazzle you

with an explanation of the excellent filtration and water-conditioning system, the carefully engineered gradient of habitat, and the fascinating ways of the different fish. Many of the fish now have names. My familiarity, my comfort, will be apparent to you. It is a comfort level that is hard-won, that I have, well, learned.

Fish. An occasion of learning. Come and see them!

*Larry*



## Change



I looked around for the last time at what we called home for the summer months. Actually, this was about the seventh 'last time', but who's counting? "Are you coming yet? How many times do you have to say goodbye? It's not like everyone doesn't plan to come back every year and... oh heavens, take your time. I don't want to hear about how you were rushed for the next six months!" The caring and yet penetrating voice brought me out of my reverie, and reminded me that someone was counting. My irritation lasted only an instant. When that someone special in your life is as understanding as Sophie, your own insight comes a lot faster. I knew she understood my reluctance, and yet she was right—it was past time to be going. How many times did she put up with this same subject over the last month? It always began the same general way...

"Can you believe how lucky we are? Look at this place! You know what they say..." She rolled her eyes, "Yes, I know what 'they' say. Just don't make me say it again." I continued undaunted. "Location, location, location! And stop mocking me every time I say those three crucial words; they couldn't be more appropriate." "Yes dear." She said. Her 'yes dears' were actually quite refined. The sarcasm was there but you really had to listen for it. "It is a wonderful

home, and it will be here next summer. Now, if you would be so kind as to run to the grocery?"

Sophie turned away, as mirthful as any kid in any candy store. I could tell she thought her joke about the 'grocery' a good one. My normal retort was blocked by something else she said "and it will be here next summer." *Will it?* Everything around was changing so fast. Every summer a new store or subdivision replaced part of my countryside memory, and it was only gaining speed. It was like leaving your favorite photos on an untended hard drive, and coming back to find some of them overwritten with spam. No, this was land being developed. The simile seemed a woeful understatement, and it made my appreciation of our home and good fortune all the more affecting.

Many of our friends who stay in warmer climates year round don't understand this 'retirement lifestyle' (another comical turn of phrase, and an inside joke with us), nor do they understand my need to come up here every spring. Adjectives like 'masochistic,' 'nomadic' and even 'foolhardy' greet us when we finish our trip each fall. All joking is well, good, and very much fair game. I tell them they wouldn't know a change of season if it bit them on the butt. This gets a laugh, but I am laughing at the bitter cold irony of the jest. If any of them actually felt a cool, fall Wisconsin day they would 'head for the hills.' Hopefully 'the hills' come equipped with a heater, fresh fruit and a steel drum band.

Again, Sophie brought me out of my daydream. I had been chuckling to apparently nothing in particular, and her slight change in posture seemed full of mock concern for my sanity. I am sure two words circled her thoughts, 'funny' and 'farm.' "Ready now?" she said; no sarcasm at all this time. I took my last look (I mean it this time), noting the placement of every shrub, slope, stalk, rock, tree, fence post and blade of grass, and fixing them firmly in my mind. This monumentally important task complete, I let out a loud grumble and nodded. Normally when I pull off these overly dramatic displays (I am a drama queen at heart), I am treated to no small amounts of good-natured abuse—but this time all my mate effected was a compassionate cuff with her wing as she left the branch.

"Look to the right of where that one just flew. There's one still sitting on the branch. It may be your last chance to see a Clay-colored Sparrow until next April." The voice startled me as I hadn't heard anyone approach. I looked down and saw a man with binoculars pointing in my specific

direction. There were quite a few others with binoculars as well, good optics too. I made a show of flying directly over the group before turning south and received a few human vocalizations for my efforts. I caught Sophie quickly and never looked back. Some things you just have to take on faith. Besides, what's a sparrow to do?

The **Clay-colored Sparrow** (*Spizella pallida*) is an amazing little brown bird, and was an exciting resident at Retzer Nature Center this past year, among others. Clay-colored birds are more common in the northern two thirds of the state, but south of that there are only a few isolated populations. The largest of these few groups is the Waukesha County "island" (Robbins 1991). Even in this 'largest' population there are few birds, so every chunk of grassland habitat (a few shrubs would also be nice, for this species) still existing in the county is important.



Photo taken by Steve Nanz

Expect to see them as early as mid-April, and expect to say goodbye as they flock-up beginning in late August and gradually depart until mid-to-late October (Temple and Cary 1987). They nest inches from the ground, to about 3 feet at a maximum, in shrubs (Robbins 1991). Like many (most) seed-eaters, they feed their young mainly insects (the adults will take insects on occasion, but feed mainly on seeds). For identification, look for a clean, gray side and back of neck (nape) leading into the gray throat/breast, buffy-to-white eye stripe (supercilium), no streaks or breast spot, and slightly buffy sides (ribs). The eye stripe and side of the throat (malar) regions frame in a defined cheek (Sibley 2001). If the male is kind enough to sing, you may be disappointed by the lack of music. What tends to come out as he throws his head back is an insect-like buzzing. This buzzing trill, usually repeated 3 times, is about 1/2 to 1 second long and sounds like a Cicada that sang too much Karaoke in a smoky bar. Of course, feel free to make your own audio associations.

Even though Clay-colored sparrows are more common north of here, it is still important to protect the genetics of the satellite populations. In this case, 'more common' is still not abundant. In 1987, they scored just below 30 on a scale of 0-100 (100 being the most abundant) on Temple and Cary's "Relative Abundance Graph". By way of comparison, the Red Shouldered Hawk (*Buteo platypterus*), Forster's Tern (*Sterna forsteri*) and Northern Parula (*Parula americana*) warbler scored slightly higher (Temple and Cary 1987). The end



## RETZER NATURE CENTER

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### Return Service Requested

(Change... continued)

result is that the Clay-colored sparrow is not a very common bird; their numbers have even been on a slight decline in recent years. But hopefully they will still be around long into the future, for you to come and see.

### *Mike*

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