



Mississippi Native Plants and Environmental Education

Newsletter of The Mississippi Native Plants Society and the Mississippi Environmental Education Alliance



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Wildflowers are an accoutrement of the soil and its minerals - JWG

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The **Mississippi Native Plant Society** is a non-profit organization established in 1980 to promote the preservation of native plants and their habitats through conservation, education, and utilization.

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MEEA/MNPS Conference Edition by Dr. John Guyton

When I proposed to the boards of MEEA and MNPS that Peg and I would edit a joint newsletter for both organizations I never expected a joint conference. In this case the decision for joint annual conferences was precipitated by time constraints. However, the agenda for this conference clearly elucidates the overlapping interests of native plant enthusiasts and environmental educators. I am excited about the sessions. Sherra's *Growing Native Plants to Stimulate our Senses* easily satisfies native planters and environmental educators. Both will enjoy the close up view of nature provided by Janet's *Private Eye* and the *Scanning Electron Microscope* my students and campers will demonstrate. *Rangeland Ecology* sounds like a native plant topic but will be geared toward assisting Envirothon teachers with essential content. I think those interested in citizen science, phenology, climate change and how to engage youth will find Jennifer's *NOAA new Estuary Education Website* interesting. Dr. Lacefield's *Geology of Northeast Mississippi and Alabama* is a home run for both groups. And since Peg and I have had the pleasure of touring his and Faye's nature preserve we are looking forward to their keynote presentation, *Founding the Cane Creek Canyon Nature Preserve!* All environmental educators and native plant enthusiasts will enjoy Gail and Peter's *Workshop on Plant Propagation*. Victor is the last word in plant ID at MSU, you will enjoy learning a few plants during his *Plant Identification Session!* Mr. Gresham's Nature Trail and Rock Quarry are certainly a highlight as are Glowworms and Cave Salamanders at night! What an agenda! Way to go Lelia, Jennifer, Peggy, Janet, Susan, Sherra, Bill, & Deb!

Musicians United to Sustain the Environment John Guyton

I am just back from the North American Association for Environmental Education and I have brought you a nice gift. A long time NAAEE conference friend, Joyce, Earth Mama, Rouse introduced me to Earthday.fm!

MUSE brings you the best of music inspired by the Earth through Earthday.fm. Available 24 X 7, Earthday.fm is a free online radio station that offers earth-music, both classics and new works, across a wide spectrum of genres. The radio playlist includes many musicians featured on MUSE CDs. For station updates, sign up for Earth Song eNews. See our massive Green Music Library for the many voices singing and working to preserve our environment. Go to www.musemusic.org and click on the start button. From <http://www.musemusic.org/Home.php>.

Plant Spotlight by Lucas C. Majure

As a way of providing our readers with information about some of the really interesting plants that occur in Mississippi, we have decided to start a *Plant Spotlight* column featuring selected plants. We want to share our knowledge of certain species that may be less well known than many of the more common species seen in the state in order to increase everyone's awareness of some of these gems the state has to offer. The first plant we'll cover is *Asclepias humistrata* Walter (pinewoods milkweed).

Asclepias humistrata is a native of the southeastern United States but is relatively uncommon species in the state of Mississippi, known from only 8 or so, mostly southern counties. It is a member of the milkweed family (Apocynaceae) and occurs on very dry (xeric), sandy soils often associated with longleaf pine (*Pinus palustris*), turkey oak (*Quercus laevis*), and species of *Opuntia* (prickly pear cacti), as well as other plants adapted to dry, sandy environments. For instance, it can be found on some of the barrier islands off of Mississippi's coast. The umbel inflorescence consists of numerous flowers that are very attractive to a variety of butterfly species (I just happened to take a photo of a pair of love bugs on this one).

(Continued on Page 2)

Greetings MEEA and Others, by Jennifer Buchanan, MEEA President

What are you waiting for? Sign up today for MEEA's fall conference scheduled for Nov 9-10, 2012. This year we are combining with the Mississippi Native Plant Society to host a joint meeting in Tishomingo State Park. If you have never been to Tishomingo, it is time to go. This park conserves some of the most unique habitat in Mississippi, because it is located in the foothills of the Appalachian Mountains. There are trails to hike that meander along the beautiful Bear Creek or cut through rocky cliffs. Being from the coast where the only hill in town is found where the road crosses over the railroad track, you can imagine how excited I am to be going up to this meeting. We have several interactive sessions planned for everyone and a great field trip to a sandstone quarry. If you are a classroom teacher we are offering some nice stipends on a first come first served basis to help make it easier for you to attend. For more information regarding the conference please contact me at jen.buchanan@dmr.ms.gov. If you are coming up from the coast, shoot me an email. We may be able to carpool in the van I am driving up to the meeting. I hope to see you there!

Greetings Fellow MNPS Members! by Dr. John Guyton for Dr. Lelia Kelly, MNPS President

Tishomingo State Park is such an incredible place we are delighted to be holding our conference there. The field trip earlier this fall was really exciting and it was there we began seriously considering the park for the MNPS annual conference. It is in a remote corner of the state and a long drive for most but we reasoned it is time to return to one of our most special places! The opportunity to have the Mississippi Environmental Education Alliance join us will make this an absolutely incredible conference. Both organizations share a love of the environment, outdoors and sharing their knowledge and experiences with others, including youth. Mr. Bill Brekeen, Park Manager, was an outstanding host for our field trip very accommodating and easy to work with.

The Tishomingo State Park field trip was a youth and adult outing and the weather cooperated. It was well attended (over 50) and a good time was had by all. During that trip a botanist accompanied each hike and a recorder listed the plants encountered. After the hike Edward Entsminger and John Guyton assembled the list and Dr. Victor Maddox checked the scientific names. Then, Lelia and I with a lot of help from Adrian Wilbanks and Carolyn Matthews and others produced booklets with checklist of the plants on three trails in the state park as well as the plants on Mr. Gresham's nature trail near his quarry as an MNPS service project. We also arranged for visitors who find plants we did not see to list the plants in a book at the visitors' center. We plan to periodically check these records and update the trail guides. There is a copy of both of these guides in your conference packet. We will publish these lists in a later edition of this newsletter, when space is available.

Tishomingo State Park, located in the foothills of the Appalachian Mountains, is steeped in history and possibly Mississippi's most spectacular park. The Paleo Indians called the area home as early as 7000 B.C. The park is named for the leader of the Chickasaw nation, Tishomingo who was a war chief during the Red Stick war against the Creeks. The Natchez Trace Parkway originally a Native American trail and now a National Park Service parkway runs from Natchez to Nashville, and through the park. The park was constructed by the Civilian Conservation Corps during the 1930 and many of the original rustic sandstone buildings are still in use.

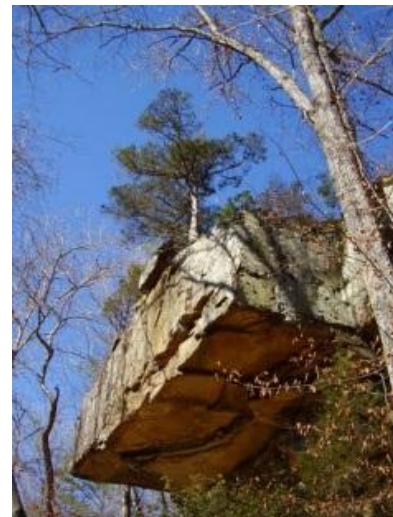
You can find the state park two miles south of Tishomingo off Mississippi Highway 25; at milepost 304 on the Natchez Trace Parkway.

Lelia is on medical leave but she had mentioned what she was going to write and has approved of what I wrote for her. She is planning on being at the conference.

Plant Spotlight (Continued from Page 1)

This species is also closely related to the well-known orange to orange-red flowered butterfly milkweed (*Asclepias tuberosa*). The fruit of this species is a follicle meaning that they are dry at maturity and rupture along one longitudinal suture. You can see some immature fruits on the second photo. Upon opening of the fruit, they release numerous brown flattened seeds that have hairy apices. Those really long hairs on the apex are useful for wind dispersal, as in the common lawn weed, *Taraxacum officinale* (dandelion).

So the next time you are out and about, if you happen upon one of our rare sandhills in Mississippi, keep an eye out for *A. humistrata*.





MS Native Plant Society (MNPS) and MS Environmental Education Alliance (MEEA)

Joint Annual Conference Tishomingo State Park

MNPS and MEAA—Working Hand in Hand to Connect Mississippians **Naturally**

November 9-10, 2012

AGENDA

Thursday November 8, 2012	
5:00 pm	Check in by this time at the park.
Day 1 Friday, November 9, 2012	
8:00 am to 9:00 am	Registration
9:00 am Today to Lunch Tomorrow	Silent Auction—Bid Often!
9:00-10:00 am	MNPS and MEEA Board Meeting
10:00 am to 10:15 am	Dr. Lelia Kelly, President of MNPS & Jennifer Buchanan, President of MEEA — <i>Welcome</i>
10:15 am to 11:15 am	Dr. John Guyton, B. Lyle, E. Entsminger, D. Lyle — <i>Using a Portable Scanning Electron Microscope</i> Interactive Demonstration
11:15 am to 12:15 pm	Sherra Owen— <i>Growing Native Plants to Stimulate our Senses</i>
12:15 pm to 12:30 pm	Bill Brekeen, Park Manager— <i>The History of Tishomingo State Park</i>
12:30 pm to 2:30 pm	Lunch and Botanizing with a Buddy—Educators will pair up with a botanist or plant enthusiast to learn how to ID plants of the park.
2:30 pm to 3:30 pm	Janet Chapman, MSDEQ— <i>How "Private Eye" can be used to teach your audience about a watershed</i>
3:30 pm to 4:30 pm	<i>Speaker to be Announced--Rangeland Ecology, Envirothon 2013 Current Issue</i> <i>How can you help train a local school team?</i>
4:30 pm to 6:00 pm	Explore on your own
6:00 pm to 6:45 pm	Catered Dinner
6:45 pm to 7:45 pm	Keynote Presentation Dr. Jim Lacefield, author of "Lost Worlds in Alabama Rocks: A Guide to The State's Ancient Life and Landscapes"— <i>The Geology of Northeast Mississippi and Northwest Alabama</i>
Day 2 Saturday, Nov 10, 2012	
8:30 am	Registration and Silent Auction Continue
9:00 am to 10:00 am	Jim and Faye Lacefield— <i>Founding the Cane Creek Canyon Nature Preserve</i>
10:00 am to 10:50 am	Jennifer Buchanan— <i>NOAA's Estuary Education Website— Curriculum, Videos and Real-time Data to Enhance Your Educational Endeavors plus Become a</i>

	<i>Citizen Scientist and join the USA Phenology Network to Monitor the Impacts of Climate Change on Plants and Animals</i>
10:50 am to 11:10 am	Break
11:10 am to 12:30 pm	Dr. Victor Maddox, Senior Research Associate, Dept. of Plant and Soil Science, MSU— <i>Plant Identification Session—Bring a sample or a picture of a plant and Dr. Maddox will help you identify it.</i>
12:30 pm to 1:00 pm	Lunch
1:00 pm to 2:00 pm	Gail Barton and Peter Loos— <i>Workshop on Plant Propagation</i>
2:00 pm to 4:00 pm	Educational Adventure to nearby Sandstone Quarry and Native Plant Trail
After Dark	Expedition to nearby small cave located on the Natchez Trace to observe Glowworms and look for Cave Salamanders

We would like to thank the Mississippi Department of Environmental Quality and the Central Mississippi Resource Conservation and Development District for sponsoring the teacher stipends for this workshop!

An Environmental Educator's Dreams of Cleaning a River by Elizabeth Cryan

I've always had the dream of cleaning a river. I know that's pretty vague but dreams inspired from your childhood can be that way. Mine started when I first learned about the Atoyac River. I was about 6 or 7 years old, I was home sick and had stayed in bed all day watching TV. Somehow instead of watching cartoons I ended up watching an interview with some lady talking about environmental awareness and the Atoyac River that flows through Puebla, Puebla, (the city and state in Mexico where I grew up). It was then that I put together the concept of the environment and me as a part of a whole and it felt like discovering that chocolate and vanilla ice cream are awesome together. She talked about the Atoyac being part of our environment, and other things that didn't stick in my young brain as much as the concept of conserving water did.

Now there are few things that I remember vividly: First she was very passionate about the topic. It seemed very important to her that people listen and join the cause. Second she made the mistake of telling the audience, and it felt like she was talking directly and exclusively to me, that we all make a difference. That moment changed my life; I drove my family crazy with my new obsession. I secretly patrolled everyone in the house. I would stand beside my Grandmother while she washed dishes and turn off the water whenever I'd decided she had used enough. I also stopped flushing the toilet every time I went to the bathroom, (gross I know but I was committed to the cause) I often made comments about how the floor didn't need any mopping and I expressed there was no need for showering regularly. My efforts slowly ended with adults monitoring every move I made. I had someone following me whenever I came out of the bathroom to flush and it was made very clear that there wasn't going to be any room for negotiation when it came to showers. I remember trying to be sneaky with all the things I was doing to save the water because nobody was taking a six year old on a quest seriously, and eventually adults and basic hygiene won out.

A few years later that very same lady came to my school to talk about the environment and I was reminded of the mission I had given up on. I learned her name was Amy Camacho, the owner of African Safari a zoo in Puebla. Her story is pretty cool if you have time Google her. She brought in exotic animals and used her lessons on them to create awareness about the environmental issues that concerned us all. Her lessons were very interesting and I noticed that she always brought it back around to helping clean the Atoyac River, we (her and I obviously) could make a change. With my passion renewed I was again patrolling and conserving as much as I could, though I was a teenager by then and on board with bathing. Despite all my efforts I still noticed the horrible smell every time I drove by the Atoyac, and every time it reminded me of my failure to help clean this river that I cared so much about, but worse it made me think how little I alone could impact the river's pollution. Well the years have passed and the pollution has gotten worse. I go back often and every time the smell is stronger, the water muddier, and a solution farther away, or so I thought.

A very exciting thing has happened with the Atoyac lately, it looks like a lot of people have joined the cause and they are reclaiming the Atoyac river and making an effort to address the state we have let it come to. The magnitude of the Atoyac River project has gotten so big in fact that the president of Mexico went this year on May the 5th to inaugurate the project. The completed project involves three different segments; a river information center called MIRA that lets the visitor hear what the river would say if it could speak to us. And hopefully will create a sense of responsibility and compromise to be a part of this process to clean the river, a metropolitan eco-park, and a river walk that connects the two.

The Metropolitan eco-park is, in my opinion, the most ambitious. A mix of guts and vision turned a place that wasn't suited to be a park into a beautiful area that the community can use for all the wonderful things a park should be used for. The river walk, Paseo Rio Atoyac, is a path that follows the river front for 5 kilometers. They recycled the tires that were found in the river and then repurposed them as a cover for the river walk path. Walking the path is a very bitter sweet experience. You see first-hand what happens when we leave environmental issues unsolved but you also see how resilient nature is. The animal and plant life that call the river home have not thrived but they haven't abandoned it either, they've survived the river's transition. Most importantly it lets the community and the river interact; people can see with their own eyes the state of the river and make their own conclusions. You feel hope and pride in what we can do when we decide to work together as a community. We all use it; we should all be responsible for the environment and everything that is a part of it.

Contributing to a better administration of our natural resources should be our goal as a species and making that happen is everyone's responsibility, impressionable six year olds I'm talking to you!

Now for a few stats on the Atoyac project. The park is 21 hectares, over 28 football fields. So far over 4500 trees of different species have been planted, increasing the percentage of plant life in the entire city of Puebla by 11%. That includes a marsh of over 4500 square meters with 100,000 plants and 500 species. They picked up 2,500 square meters of trash, about 625,000 gallons. They used over 8,000 tons of compost, equal to the weight of 1,067 elephants, to restore and enrich the soil. They used 67,000 square meters of ground up used tires, the volume of 27 Olympic swimming pools, for the river walk path. You can see some images here <http://youtu.be/eiR1lOoNp0II>

For me the takeaway has been that there's no silver bullet, I mean we can't get everyone to agree on what the problems are or that they even exist. But small and consistent efforts can turn into big results, using milk jugs as watering cans, composting on an apartment balcony, not bathing (at your discretion) or just talking to any and everyone who will listen about the river that needs cleaning in your own back yard.

"We didn't inherit the earth from our ancestors; we borrow it from our children ." - Native American proverb.

"Impossible" is just a big word thrown around by small men who find it easier to live the world they've been given than to explore the power they have to change it. Impossible is not a fact. Impossible is not a declaration. It's a dare. Impossible is potential. Impossible is temporary. Impossible is nothing." – Muhammad Ali

Editor's note: Dr. Terry Wilson, who I have done many EE workshops and camps with, who lead MEEA's organizational meeting over a decade ago and served a term as NAAEE president called me a few months ago to notify me of a passionate and articulate environmental educator, then in Kentucky, who was moving to Jackson, MS. The fact that she was from Mexico was particularly interesting since Peggy and I have traveled rather extensively in Mexico. I found a kindred spirit in Elizabeth after discovering her passion for a river in Mexico reminiscent of my adventures on the Tombigbee and participation in innumerable river clean-ups.

Please join me in welcoming Elizabeth Cryan to Mississippi as our newest Environmental Educator. She is anxious to get involved in sustainability and other activities. - John Guyton

An Aurora Borealis is Justification for a Night Hike or an Extemporaneous Vacation by John Guyton Only wildflowers approach the aurora borealis in their beauty!

Auroras are caused by the interaction of electrons in the solar wind and atoms in our upper atmosphere within earth's magnetic field. They are most often thought of as a winter event because of the long winter nights while the sun is more overhead in southern hemisphere, but they can periodically be seen during the summer. Every 11 years, or so, solar activity including flares, X-rays and coronal mass ejections reach a peak in the sun's cycle. This is referred to as a solar maximum and we are in one now. The increase in sunspots is a visible diurnal indicator of a possible spectacular nocturnal light show. Often obscured by city lights, you may want to plan a trip to see one of nature's greatest shows before the entire world is littered with light pollution! The northern lights were known to the ancients but sunspots were first observed by the Greek philosopher Theophrastus in 325 BC. They are safe to view through a telescope with a special filter or you can get live images on the internet. And there is an app for that as well!

The northern lights are steeped in legend and lore. Ezekiel of ancient Israel after observing an aurora described it as "...a whirlwind came out of the north, a great cloud, and a fire infolding itself, and a brightness was about it, and out of the midst thereof as the color of amber, out of the midst of the fire" (Ezekiel 1:4). The ancient Greeks called auroras "blood rain" and the Germans "heaven light," the Chinese dragon legends may have originated with the auroras, and in Finland they were thought to be caused by a giant fox waving its tail across snow capped peaks. The Aborigines considered the southern lights to be the gods dancing, and in Estonian legend playing whales cause the auroras. They have been thought a sign of good weather and changing climate. And, evidence indicates that during minimum sunspot activity Carbon-14, produced from cosmic rays, accumulates in tree rings and the weather is cooler. Some believe the steady increase in sunspot activity, since the Maunder minimum (1645 and 1715), is the cause of global warming!

When electrons from the solar storms strike atoms in our upper atmosphere they excite them. Electrons on the excited atoms absorb some of this energy by moving to higher energy levels, a quantum leap for physicists. And, as is the tendency of atoms, they give up this energy in the form of light when the electrons return to their steady state level. The color of this light is characteristic of the atoms and atoms of each element have a different spectral or light signature. If you have ever looked at the light given off by gas discharge tubes through a spectroscope you will likely remember being shown sodium (Na) as two closely spaced yellow lines. Not surprising, sodium vapor lights have a yellow hue. A spectroscope, is essentially a prism similar to ones you have seen used to break sunlight down into its component colors (Remember ROY G BIV?). Gas discharge tubes are similar to plasma spheres except they typically have only one gas in them and are designed for education purposes. You can use a spectroscope to view street lights to figure out what gasses are being ionized in them if you know the spectral signatures of the elements. And you can also recognize the elements in the auroras in our upper atmosphere by their spectral colors. The most abundant gases in our atmosphere cause the most dominant colors: nitrogen produces blue to purple and oxygen produces green-

yellows and red. With the primary colors represented you can expect almost any color but green seems to be the most prevalent. Auroras appear in a variety of shapes including curtains or veils, bands or rays, coronas or patches.

My most vivid observation of the northern lights was a summer night in the Catskills of New York while I was on staff at the Frost Valley YMCA. A close friend, who was on fire guard that night, came to get me at the staff lounge and we roused the children in our cabins for an impromptu night hike. We lead them through the woods to a large open field. As they picked their way through the woods they were preoccupied with avoiding branches and staying on the trail and not looking up. As we emerged onto the field they froze in their tracks and all noise ceased as they marveled at the colors hanging and rippling in the northern heavens. We silently wandered on down to a dry grassy ditch that made the perfect recliner for laying back and reveling in one of nature's most spectacular light shows. The exciting breakfast discussion, that continued throughout the day as they shared their experience with campers who slept through the show, suggested the time spent in the field was not deducted from their lives, since none showed any fatigue!

Oh, it was wild and weird and wan, and ever in camp o' nights
 We would watch and watch the silver dance of the mystic Northern Lights.
 And soft they danced from the Polar sky and swept in primrose haze;
 And swift they pranced with their silver feet, and pierced with a blinding blaze.
 They danced a cotillion in the sky; they were rose and silver shod;
 It was not good for the eyes of man--'twas a sight for the eyes of God.
 Excerpt from The Ballad of the Northern Lights by Robert Service

Traversing Mississippi Backwards through Geologic Time on Your Way to the MNPS/MEEA Conference by John Guyton

When you head for Tishomingo you are driving backwards through geologic time. You pass through Mississippi's geology from the **Recent** formations along the coast, the Pleistocene along the Mississippi River's flood plain (the delta) or the Oligocene around Rosedale to the oldest, the Mississippian and Devonian periods in Tishomingo County. Geologist David Dockery, with the Office of Geology in the Mississippi Department of Environmental Quality, wrote a book (Circular 6, MDEQ Office of Geology, 1997) for students with stories about each period and the Cenozoic epoch represented in the exposed rocks of our state. I extracted just enough from his book to take you in a time machine backwards through geologic time to the Mississippian Period as you head for the MNPS/MEEA conference in Tishomingo County. I arranged the article from the most recent periods to oldest. So, as you read, highlight the paragraphs describing the areas you will be traveling through and then stop and look for a few fossils along the way, if time allows.

Traveling through the **Pleistocene** (2.5 million years ago until 12,000 years ago), between Rosedale in Bolivar County and Tibbee Creek in Clay County, my back yard, you enter the epoch of recent glaciations. Our ancestors weathered the climate but the giant bison, giant ground sloths, horses, mammoths, mastodons, musk ox and sabre-tooth cats succumbed.

South Mississippi was a broad alluvial plane rife with a network of braided streams during the **Pliocene**, 3.5 million years ago. If you have ever canoed southwestern streams or walked on their gravel bars, you are aware of the huge amount of sand, clay and gravel that actually came from the Appalachian Mountains in Tennessee, Alabama and Georgia. You have likely enjoyed picking up agates, carnelian, jasper, petrified wood and quartz crystal. Pliocene animals that you may have seen include armadillos, bears, beavers, coyotes, deer, cats and dogs, camels, horses, llamas, mastodons, opossums, porcupines, rabbits, raccoons, sabre-tooth cats, sloths and tapiers.

Coming through Simpson County during the **early Miocene** you would have encountered a huge amount of eroded materials from the Rocky Mountains that now extend from New Orleans to Mobile! Microscopic glass volcanic beads from the ash that blew across Mississippi contributed to the sandstone that was used in the Old Capitol Building and some of the buildings in Piney Woods School. Silica from this ash became the minerals in petrified palm wood.

A logjam very early in the **Oligocene** (34 million to 23 million years ago) included maples and conifers. These are now petrified and are visible in Mississippi's Petrified Forest at Flora. If you are departing from Vicksburg, you are leaving the early **Oligocene** that is exposed along the Mississippi River banks and you can collect fossil sea shells, bones, coral, oysters and possibly a relative of the modern rhinoceros.

The eastern route to Tishomingo takes you across clear streams with aquatic plants and blue subtropical Seas during the late **Oligocene**, now the Waynesboro area, where you encounter clams and scallops as well as manatees, sharks, large crocodiles and possibly whales. Along the Chickasawhay River, you will enjoy finding fossils in the limestone bluffs.

You will have to cross the **late Eocene** Ocean (55 million to 34 million years ago) on your way north from Jackson. You are about 200 miles offshore with whales and sharks. The 60 foot long *Basilosaurus* from this time was initially thought to have been a reptile, hence the suffix "saurus," but it was later discovered to have been a marine mammal. Jackson was an island. The archaeocete whale, which now hangs in the Mississippi Museum of Natural Science and is the official fossil, was cavorted in the surrounding seas. Volutes, mollusks or gastropods, moon snails, cowrie shells, cone shells, strombus and muricidae can be found

from 40 million years ago. Before you leave Jackson, remember it was a volcanic island and the eroded and buried **Cretaceous** volcano is under the coliseum! Thankfully it has been extinct for 65 million years.

Those coming up the eastern side of the state will enter the **middle Eocene** around Quitman where you will find a great variety of mollusk shells including a large saddle-shaped oyster shell and possible bones from a Titanotheriidae or Brontotheriidae – extinct mammals that were kin to the horse but looked more like a rhinoceros.

Behind the site of the now gone but still famous Red Hot Truck Stop in Meridian, now the bluffs below Wal-Mart, you can enjoy hunting fossils in the **early Eocene** (54.4 million years ago). Among the shark ray and bony fish teeth, leaf and other plant fossils, marine mollusk, clams, marine snake vertebrae, crocodile and land mammal (primates, small horse and creodont) fossils. You might even find some green glauconite, or fossilized fish poop! While you are behind the Red Hot Truck Stop, wander up the diversion creek searching for **late Paleocene** (54.6 million years ago) fossils including horses and primates. Watch for shark and land mammal teeth. Be sure to check out the limy boulder size fossiliferous concretions from the Bashi Formation. You can also find a collection of Meridian's concretions on the frontage road on the east side of I-20/59 Exit 152. If you examine these boulders, you will note they are sedimentary in nature with different fossils at different levels. Of course they have been rolled around a little so they may not be in proper orientation...

A drop in sea level during the **Middle Paleocene** (60 million years ago) in north Mississippi resulted in soil erosion leaving the less soluble silica and aluminum oxide (bauxite) and high quality kaolinitic clays that formed in ancient jungles. When sea level rose it preserved these deposits under sediments. Relatively recent erosion has revealed a notable hill-top deposit, Smoky Top in Pontotoc County. In its day Smoky Top was a thick jungle replete with mosquitoes, crocodiles and large snakes, shy plant-eating sheep-sized pantodonts, birds, lizards, rodents and frogs.

About 3 ½ miles north of Scuba (Hwy 16 intersection) on the east side of Hwy 45 is a road cut where the white chalk of the **Cretaceous** Prairie Bluff Formation with its indicator fossil, the strongly convex oyster *Ostrea pulaskensis*, is overlain with the brown sand of the Paleogene (formerly Tertiary) Clayton formation. The Cretaceous/Tertiary boundary marks one of the earth's five largest extinction events – the one where the non-avian dinosaur's 140 million year history on earth ended – leaving earth to the mammals. Flying reptiles were gone with the mosasaurus, the ammonites and the carnivorous fish, *Xiphactinus*. We are driving deeper into the age of the dinosaurs as we push further north and back in time.

You will be close enough to Columbus to mention Mississippi University for Women's Plymouth Bluff **Cretaceous** fossil beds along a cutoff of the Tombigbee River. The center has excellent exhibits of the fossils found there. Mississippi State has the Dunn-Seiler Museum that is worth a stop as well and they have a crocodile fossil found in Oktibbeha County. You will love the large *Exogyra* (related to modern oysters) shells found in the area.

Entering Franks Town, or anywhere from Saltillo to Corinth, you enter the **late Cretaceous** (75 million years ago) fossiliferous sands, that yield ray and sharks teeth, mosasaur bones, oysters, lobsters, gastropods, annelid worms, sponge, scallops, bony fish, and more rarely, dinosaur and pterosaur bones. The duck-billed dinosaur was prolific. The area was covered by shallow water less than 90 feet deep, and paleontologists hypothesize that rarely a bloated dinosaur carcass floated out to sea before it decomposed to deposit bones on the seafloor.

We have arrived in the **Mississippian Period** at last as we enter the Tishomingo State Park, 330 million years ago. It probably strikes most geology students as interesting how little Mississippian Period geology is in Mississippi – we are lucky to have some! The rectangular sandstone blocks you see on the hillsides and streambeds are of Mississippian age and it is great to see it featured in the buildings of the state park. Fossils of the giant scale tree, crinoid stems, blastoids, ferns, and brachiopods suggesting an ancient shoreline. When I stepped out of the van on my first visit to Mr. Gresham's sandstone quarry I noticed burrowings beneath my feet in the sandstone and boy was I delighted to be allowed to poke around and explore to my leisure! And, my favorite *Lepidodendron* with their clouds of yellow spores! Yep, this is the ancestor of the club moss I enjoy playing with so much. And, yes, I can just imagine jumping into the water repellent spores that have a high oil content, floating on the water and coming out dry and lighting one of those clouds of highly flammable spores. What a bang that would have made!

If time permitted we could go further to the northeast and find the 400 million year old Devonian outcropping on Pickwick Lake and I would have to collect some trilobites and Fort Payne chert to practice making spear points with... Thanks to Dr. Renee Clary for fact checking and editing this article.



The Ackerman Cumberland Fluted Point was collected in July 1983 by J. Guyton. The Paleo-Indian point is made from Fort Payne chert that is of Mississippian age.

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MS Environmental Education Alliance

eeinmississippi.org

The Mississippi Environmental Education Alliance conducts an annual fall conference and occasional workshops.

MNP&EE

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Deadline for Articles
Winter - November 10
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**MEEA & MNPS Working Hand in Hand to Connect Mississippians Naturally
Join us for our first joint conference, Tishomingo State Park, November 9-10, 2012!**

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