



The Exposure

Journal of the Kansas and Missouri Paleontological Society

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October Meeting Announcement

KMPS next regular meeting will be Sunday, October 28th at 2:00 P.M. to 4:00 P.M. at the Science Building, room 005. The building is located in the middle of the campus just east of Parkville, Missouri. Parking on Sunday is free on Sunday and best North of the building along the road off of 6th Street. Our program will be by Craig Sundell on his recent work in Peru. We hope as many members as possible will attend. Don't miss this one as door prizes will be drawn. If you have any spare fossils to add to the drawing please bring them with you.

November Gem and Mineral Show

This November 2nd, 3^r and 4th will again feature the November Gem and Mineral Show by Shows of Integrity. Members of the Kansas and Missouri Paleontological Society will again be admitted free by showing their membership card issued earlier this year with an expiration date of December 31, 2007. If you do not have a card one will be available at the meeting or please call Gil Parker at home 816-373-9453. Leave a message if necessary.

How Do I Know If I Have Found Something Important?

Ron Pridgen

I, perhaps like many collectors, would love to find something that contributes to the science of paleontology. Every once in a while, a collector will find something that is new to science, or is rare enough, that it sort of widens the data base for a species. Paleontology is far from a finished science, with no more discoveries left to be made. Amateur collectors like us, have more time to search, and can cover more ground than the professional paleontologists can dream of. This is why it is important to learn as much as you can about your local geology and paleontology. This is also incentive to share your finds with local collectors, and to become acquainted with local geologists and paleontologists.

This discussion will specifically cover possible finds within a 50 mile radius of the greater Kansas City area. Within 50 miles of Kansas City, most fossil bearing rocks are of late Pennsylvanian age, or about 300 million years old. Most of our local soils are derived from the underlying limestone and shale. From about Kansas City on north, most of our soils are derived from loess, a rich and very fine particle soil, that was once associated with a melting glacial front. These soils are less

than 18,000 yrs. old, as are much of our local stream and river bed sediments. Except for our fairly recently formed soils and deposits nearly all rock younger than 300 million years has been eroded away. Older formations of rock are still buried deep below, as drilled cores have confirmed.

Our Pennsylvanian limestones have a number of hidden treasures in store. Among other more common fossils, the very fortunate collector may find a complete trilobite, a large cephalopod, or a “shark” tooth. Something that could interest a paleontologist, would be most any fish remains other than “shark” teeth. Such remains are exceedingly rare in our limestones. Any fish found in limestone will almost certainly be different from the fish species found in our shales.

Black shales while mostly barren, will yield occasional partial fish or arthropod remains. These are often, hard to identify pieces of the exoskeleton of crustaceans, fish scales and bone fragments. There are also bits of “shark” cartilage, teeth, spines, and dermal ossicles. Any tiny, barely visible whitish speck that you see can be examined with a hand lens. It may be a conodont, a tooth-like jaw element of a little known tiny relative to the ancestry of vertebrates. Some other little specks are scolecodonts, the jaws of annelid worms. Conodonts and scolecodonts are best seen at home with a microscope of 20 to 30 power. All of these fossils found in shale, are actually fairly common. I wanted to list them because many of our members are unfamiliar with them. What fossil would a paleontologist be most interested in? It could be a complete, or even a half complete bony fish, or a cartilaginous fish (“sharks”, chimeras, etc.). It might be possible to find a complete arthropod. A “holy grail” find might be a complete amphibian, but that is unlikely. If you have a serious desire to find something interesting in shale, you will need a pick, to aid you in breaking out large chunks of shale to split. Your odds of finding something large are greatly improved. Since black shale is fairly barren for the most part, expect to have to split a lot of shale. If I begin to find fish parts, or other fossils, and then I leave with the intention of returning, I may discreetly mark the productive layers with a small wooden wedge. Most local shale is fairly stable. When I curate my fossils, I often apply a penetrant/stabilizer, like that available from Paleo Bond. I have encountered shales, where the fossils immediately began to deteriorate and crumble when exposed to air. If I am working some of this type of locally rare shale, I have on hand some penetrant/stabilizer to immediately apply to finds. When I collect shale, I pack newspaper between the sheets. If I have removed something that is very fragile, I can pack it in aluminum foil. It is easy to shape the foil precisely to fit your find. If I have it, I may pack toilet tissue inside the foil as well. This certainly works to protect fossils found in any rock. I can further split shale into thinner sheets at home with a razor blade. I use utility knife blades that I grip in pliers. I can work blades into a layer from 2 or more directions, in an effort aimed at separating fairly large sheets. At home is where I begin to earnestly search for conodonts and scolecodonts.

In the case that you find any fossil that you believe may be rare or new, you will need to decide whether or not, to remove it from the surrounding rock. If it is in a block of shale you have just split, then you must of course, just carefully wrap it. If it is still in place, you may decide that it is too risky to attempt to extract it without help. In this case, I would try to find a piece of plastic wrap to cover it, and cover this with soil. I would carefully take notes on where it is located, and as quickly possible, inform a paleontologist or geologist of what I have found. I should carry a camera. It can be used to document your find, and to help you in relocating the location. If neither type of scientist is available, or unable to investigate, I would seek out another club member whom I trust, to help me to extricate it. Even if I have removed the fossil from its original grave, I will record and discreetly mark the layer that it came from. There may be more specimens to be found in that layer.

Some of our black shales have an abundance of phosphatic nodules that are fun to collect, especially in the Muncie Creek Shale. The nodules are basically roundish, to slightly flattened lumps found between shale layers. They are of BB size, to about 2 ½” across.

The nodules can be split to reveal parts of a group of crustaceans called malacostracans, or various fish parts, both bony and cartilaginous types. The problematic fossil, *Conularia* is sometimes found in the Muncie Creek Shale of Kansas. When you see an example of *Conularia* in a book, it is very often one of our local finds.

The nodule inclusions that will bring the most professional interest, are the exceedingly rare amphibian and reptilian bones. Only with a great deal of experience and knowledge, will you be able to identify various vertebrate remains found in the nodules. These little nodules will sometimes have entire fish skulls inside them. Normally they belong to a palaeoniscoid, a primitive group of bony fish. These are not rare, however, you may find an especially well preserved one, or one of a rarer species. There is potential to find other very rare fossils in these nodules.

If I am able to contain my excitement on finding the nodules, I wait to split them at home. It is easy to find dozens of them at a time. The smallest of these nodules are always empty, I crack open only those about ½” or larger. These nodules are slightly flattened, so we crack them with a hammer on an edge. Be careful to strike it only hard enough to crack it. Some people claim that they have had better success at precisely splitting them, if the nodules were first immersed in water, and were repeatedly frozen and thawed. Perhaps, only one nodule in ten will have an identifiable inclusion. All in all, our black shales probably hold the greatest potential to produce very rare or unknown fossils.

Clay shales can be very productive in producing great quantities of keepable and tradable fossils. A yellowish clay that outcrops in several localities around Independence, Missouri yields many fine plant fossils. This clay shale lies within the Winterset Limestone of the Dennis Formation. A site that no longer exists, had produced some large cephalopods and some fish remains. Maybe you can find a similarly productive site. The Bonner Springs Shale, another clay, outcrops in and around Parkville, Missouri. There is a site in the town that formerly was open to collectors that produces some of the best quality Pennsylvanian plants that I have ever seen. There is also an amazing variety of plants to be found. Some local institutions still collect there. This site has produced a very small amount of partial insect remains. Any insect remains from

this time period can be of great interest to paleo-entomologists. We need someone to find another richly collectable site, which I hope you might share with us.

Trace fossils, or animal tracks and burrows of marine creatures are very common, and can be found in most any local rock unit. Trackways of land animals are rare locally. Any land traces of arthropods, amphibians, or reptiles may well be of interest to a paleontologist. Traces that were formed on land will only be found in our shales. The traces may be in very crumbly rock, so I would use great care in removing slabs, or I would seek assistance. Since a trackway of multiple tracks can tell us more about an animal's locomotion, a trackway is more valuable than single tracks. Therefore, I would remove slabs that are as large as is possible for me to handle. This is where assistance can be appreciated. Picks and crowbars are essential to facilitate the removal of large slabs. Pay close attention to the position of the productive layers. Again, a small wooden wedge driven into the shale will help me to find these layers again. A more secure solution would be to record a measurement from a limestone unit above or below the affected strata.

If you enjoy floating rivers, you may have the opportunity to look for ice age mammal remains. This is a fossil collecting field that I want to go into depth in describing, as I believe that there are too few collectors pursuing this resource. The Kaw River in Kansas is famous for the quantity and variety of mammals that have been found in it, but you can search in many other rivers and streams. Dr. Larry Martin of The University of Kansas, once told me that the rivers of northern Kansas and Missouri have only been lightly collected, and only barely studied for Pleistocene remains. He believes that these rivers hold much potential.

If you have seen large gravel bars on your favorite float and fishing streams, you already know of locations to begin your search. The gravel bars are composed of countless rock types, washed from many rock formations from upstream. Some gravel has been transported here by the glacial ice sheets. There will be many fragments of this transported rock holding fossils of various ages, brought here from just upstream, or perhaps from deep in Canada. The best times to go "buffalo and mammoth hunting," are times of low water levels. Not only is more of the gravel exposed, but the water will be clearer, allowing some submerged bones to be seen. Bones can be found in mud and sand, however, they probably washed out of gravel to end up there. I would investigate even the smallest objects protruding from gravel. I bring along a garden trowel to dig out any potential find. Bone hunters will scour gravel bars both above and below the waterline. You can wade as deep as you dare, whilst feeling about on the bottom with your feet. I am sure that I don't have to tell you this; you must wear shoes! Sharp rocks, metal, and glass are everywhere.

The more usual finds are isolated bones and fragments, plus jaws or teeth. A luckier find might be a nearly complete skull of a bison, horse, deer, or a mammoth tooth. Finds that begin to pique the interest of a paleontologist, include identifiable remains of mammoths, mastodons, musk oxen, glyptodonts, giant sloths, lions, and giant short faced bears. Even human bones can be found, very old ones, and more recent ones that may interest police. An anthropologist or an archeologist may well become interested in old human remains. We would especially pique professional interest if, we were to find associated material. That is, that we find numerous bones obviously belonging to the same individual animal. If you have found associated material, or even a "bone bed", that is a site with an abundance of bones, then you must leave everything in place. It would now be prudent to contact a professional. Give him or her all of the particulars that you can about your find, including all of the possible details regarding the location of the find. This can be difficult on a river. Photos can help to make your case. A GPS reading, though not essential, would help to precisely pinpoint your find.

The bones that you will find, will range from yesterday's cattle bones, to stag moose or camel bones well over 10,000 years old. River bone that is very recent will still be off white in color. Locally collected river bone tends to darken and get heavier as it ages and mineralizes. I have a nice *Bison occidentalis* cranium from the Kaw River. It is dark gray and very heavy. Last year, another club member and I, investigated an enormous gravel bar on the Grand River. The numerous bones that we found, were most all very dark and nearly black. Complicating matters, it appears that bone from this part of the river was mineralizing exceedingly rapidly. My collecting partner found a sawed slice of a femur, from a round steak. This remains from a barbeque certainly less than 170 years old, was already nearly black and fairly heavy. The speed of mineralization and change of color will be dependant on what dissolved minerals are present, and their concentration.

Sub-fossil bone, that is bone that is only partially mineralized, will usually soon badly crack, or flake apart when allowed to dry. Wet bone can be wrapped in damp rags and allowed to slowly dry. When it is dry, it can be painted with shellac, or preferably I would coat it with PaleoBond Penetrant Preservative. Our bones found in river gravel, very seldom will need to be plaster jacketed. Associated material has been found in bottom land soil, and will require special excavation techniques, including plaster jacketing. Otherwise, it is rarely necessary to jacket any local fossil. Applying a plaster jacket, and removing very fragile fossils is something best learned in the field with an experienced helper.

If you collect in winter when the water will be lower, you will naturally want to wear waders. I want to mention a caution. If you wear chest waders, stick to shallow waters or slow current. Hunters and fishermen often drown when their waders fill with cold water, and the current breaks their footing.

I should also mention that Indian artifacts are often abundant along rivers. Sometimes, river bones will preserve butchering cut marks, which under low magnification can be distinguished from other kinds of marks and scratches.

Fissures are worthy of special mention. Fissures are faults or crevasses, which are widened enough that they hold infill from a later time period than the fissured rock. Our rare local fissures are in Pennsylvanian limestone, and the infill is sometimes from the Permian period. To effectively search this rock, it may be necessary to break the rock into small pieces. I would say that if you found a fissure with some bone, and it may be tiny toothpick sized bone, I would stop at this point and seek professional opinion before proceeding. Captorhinid reptile remains are well studied, however, you may chance onto something that is little known, or entirely new.

The phone numbers of our club officers is at the beginning of this bulletin. Any one of them would be a good contact if you find anything interesting, or you would like for something to be identified. We can suggest someone who has expertise in whatever fossil category is involved. I hope that I am not overemphasizing the rare and new. Our personal collections hold very few truly rare specimens. Part of the risk of finding something rare or new to science, is that you may be asked to donate it for study. If what you find does turn out to be something new, you may be rewarded with a new species named in your honor. Even if your intriguing find proves not to be something new, or of other interest to a paleontologist, the whole connected adventure was still very exciting. Something new is lurking out there; your mission is to find it!

KMPS Membership Form

The Kansas and Missouri Paleontological Society would like to have you and your family as members. Memberships are \$12.00 (January to January.) These fees will cover printing and postage for bulletins which will include meeting announcements and news in the field of paleontology and other minor expenses. We hope that you can join us in our exciting and informative new adventure. For more information contact: Gil Parker @ 816-373-9453.

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(KMPS) c/o Gilbert Parker, 15505 E. 44th Ter., Independence, MO 64055.

Kansas and Missouri Paleontological Society
 Gilbert Parker
 KMPS Editor
 15505 E. 44th Terrace
 Independence, Missouri 64055-5255

Dated Material - Meeting Notice