



Meeting
Second Tuesday of each month
Van Matre Senior Citizens Center
1101 Spring Street
Mountain Home, AR

<http://www.ozarkearthscience.org/news.htm>
<http://www.ozarkearthscience.org>

November, 2010

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A Member of the Midwest Federation of Mineralogy.

Sharon Waddell: Liaisons Officer - 417-256-8948

MWF Assistant Micromounter: Brenda Johnson

OBJECTS: To study and promote an interest in the earth sciences; Geology, paleontology, mineralogy, archaeology and the lapidary arts.

Meeting: On the second Tuesday of each month at 7:00 p.m. in the Van Matre Senior Citizens Center, 1101 Spring Street (Cooper Park), Mountain Home, Arkansas.

Dues: Active adults \$12.00 per year or family membership of \$20.00 per year. Junior membership is \$4.00 per year. Nonresident membership is \$8.00.

President's Message

What a beautiful time of the year, and a perfect time to start rockhounding.

Sharon Waddell has lined up a field trip to collect geodes the first weekend of November. If you were not at the club meeting and want to go, please call **Sharon** at the above number and tell her. She can give you the information on motels and where to meet.

This is also the time of year when you should be thinking about going to the Dake Auction. It is held each year at the Missouri University of Science & Technology, McNutt Hall, in room 204. This year it is on Saturday, November 13. The check-in is at 7:30 until the auction starts at 10:30 a.m. If you have minerals that are good, yet you don't want in your collection, this is a good

President's message continued –

place to sell them. For information on selling, how many flats is accepted, etc. contact tghfkb@mst.edu for more information.

As lovely as the weather is right now, soon we will have a change and go into our wet and cold season. I encourage you to utilize those days by bringing your books up to date, or putting your books onto a computer program. It is imperative that you catalog your collections in order to make them a scientific collection. If you buy a mineral specimen from someone else, remember to always keep that label with the mineral too. Sometimes the labels are worth more than the specimen, depending upon the owner.

At our last meeting we finally had someone who volunteered to head up the nominating committee. If you are called and asked to take a job, I also encourage you to help out by accepting. Not only is it necessary for the club, you get rewarded by coming in contact with some of the nicest people in the world.... rockhounds.

Our silent auction has come and gone and we had a wonderful time. We had visitors who came and bid, which is always nice, and members brought many nice specimens and items to bid on. I want to thank each of you who contributed for the auction. We only had a couple of items left that weren't sold that will go into our door prizes.

Don't forget that it is flu time, and remember to go get your shot.

Stay safe out there whatever you are doing.

Brenda Johnson

Minutes of the Last Meeting
By Brenda Johnson for Janel Cotter

President **Brenda Johnson** called the meeting to order at 7:05 p.m. for a short business meeting before the silent auction began. **Johnson** reiterated the fact that we had no one to head up a nominating committee and without officers; the club would have no leadership. **Gretchen Neal** volunteered, and **Sharon Waddell** said she would help.

Sharon Waddell proposed a field trip to collect geodes at two geode sites in Illinois for the first weekend in November. She put out a sign up sheet.

Refreshments were provided by **Dorothy Hess** and her granddaughter, **Allison**.

Go It Alone?

from Mel Albright, AFMS Safety Chairman

http://www.amfed.org/news/n2000_10.htm#safety

From Aradasa Johnson, Safety Chair

Recently, a rockhound died. He went alone to the desert and never went home. This caused considerable discussion on the "rockhounds" e-mail swap group. Of course, most said "Never go alone". Others said "tell someone where and when you are going and returning so they can send help if you don't return". A few announced that they went alone gladly and took the risks as just part of the hobby. Some even compared their attitude toward the hobby to the extreme sports you see on TV.

Finally, Ed DeWindt-Robson, a rockhound from North Carolina, ended the discussion with an analysis in depth that every field-tripping rockhound should read. Here it is:

"OK, so maybe it's putting it too strongly to suggest that no one should ever rockhound alone. I've done it myself, though not in situations where I thought I was taking substantial risks by doing so. Please bear with me while I qualify that warning.

As a psychologist, I am keenly interested in the way people make decisions. The real challenge in most therapy is getting people to recognize that they have decisions to make at all. This is one example; I want my fellow rockhounds to be aware that field trips may involve some danger, and to consider how much danger that may be when deciding whether or not to take a trip alone.

Several people have challenged my assertion that a companion is essential equipment in the wilderness. I have no problem with their reasoning, because they are at least taking stock of the risks. That is part of a good decision-making process. I do have a problem with any suggestion that those risks are not real.

An experienced hiker who knows his territory and takes appropriate precautions is generally going to return safely. An expert may be fairly confident even in unfamiliar territory. Does this mean the wilderness is safe for everyone? Of course not!

I have spent enough time in quarries to feel pretty safe even in a new one, but that does not mean they are safe, but only that I am familiar with the dangers and know what precautions to take. I would never advise an inexperienced rockhound to enter one alone.

This list has many subscribers who have joined specifically to learn more about a new interest, as well as novices who lack sufficient experience to know what is safe and what is not. For the benefit of those-and not the experts who have long since learned how to do dangerous things safely-I offer these cautions:

Safety continued --

Consider the risks before you travel alone into undeveloped territory. These questions will help you determine the danger level of a field trip:

1. How well do you know the route and the site? It is easy to get lost in strange surroundings and impossible to evaluate or prepare for the dangers and obstacles until you have seen them.
2. How far will you be from civilization? Could you walk back if your car broke down? How far would you be from help if you got hurt?
3. Will anybody notice if you don't come back at the end of the day? Will they know where to look for you?
4. Can you drive all the way to the collecting site, or will you have to hike some distance? You are obviously much safer as long as you are close to your vehicle, and the hike back (when you are tired and heavily laden) may be the most dangerous part of the excursion.
5. Will you be driving on unpaved roads? Getting stuck in the mud or sand is no joke if you are in the middle of the wilderness.
6. Will there be steep climbs, sharp drop-offs, or uneven ground where a misstep could mean a sprained or broken ankle?
7. Will you be facing extremes of heat or cold, or the possibility of severe weather? The air at the bottom of a quarry can easily be twenty degrees hotter than the air at the surface, presenting a far greater danger than many people realize. Mountains pose the opposite problem, turning a cool day into a threat of hypothermia. A sudden shower may render your exit route impassible.
8. What kind of physical condition are you in? Strength and stamina provide a margin of safety. Do you have any health problems which could turn into emergencies requiring medical assistance?
9. Do you have the proper equipment and supplies? The issue here is preparation; a well planned trip is always safer than a spur-of-the-moment outing. Your basic safety equipment begins with a jug of water.
10. How long will you be gone? After a few hours of strenuous activity, fatigue begins to multiply other dangers. By the end of a day of rockhounding, you will be less sure-footed, less accurate with the hammer, less patient, and less sound in your judgment. This is when accidents are most likely.

If your answers to these questions suggest that the danger level is significant, it is simply common sense to schedule the trip at a time when you can go with another person, preferably

Safety continued --

one who is more familiar with the territory and the risks. The presence of another person cuts the risks substantially. A friend can help you spot dangers, assist or get help if you get hurt, lend a hand at digging, lifting, and pounding, and help you make correct decisions when fatigue starts to affect your judgment.

Yes, people do like to take risks. But extreme sports are for the extremely prepared. The rest of us, especially those with loved ones counting on us to return, had better think carefully about how much risk we want to accept."

The Treasurer's Report
Dorothy Hess, Treasurer

Last report balance: September 13, 2010 \$1,770.24

Transactions for the reporting period of Sept. 14, 2010 to October 11, 2010

Income:

September club raffle sales	25.00
Membership dues	<u>3.00</u>
Total	28.00

Expenses:

Publishing of October newsletter (10 copies)	7.56
October club website fee	<u>29.95</u>
Total	37.51

Check book balance as of October 11, 2010: \$1,760.73

Midwest Federation News

The MWF Convention & Show was put on by the Peoria (Illinois) club and the MWF part (meals, meetings, programs, and field trips) by GESCI. Everything went off very well and if you missed it you really did miss out! Club members in charge of the Peoria show were the Travis's, Dave Fitch, and Mary Bodel.

Those working the MWF side of things were the Moores, the Washburns, the Kaptas, the Gyures, and the Courseys. Ed Wagner and Dean Stone presented programs. Members that were dealers or demonstrators were Gary Peave, Dennis Bomke, the Dennis's, Steve Holley, Kathy Anane and Patrick Mehling, the Albros, Richard Rock, and the Whitlatches.

If your club wishes to honor a member for outstanding service or wishes to send a memorial in honor of a member who has passed, consider the following options of gifts that will keep on giving:

- Donations to the Endowment Fund can be sent to:

Alan Huskill, Treasurer
15785 Park Lake Road
East Lansing, MI 48823

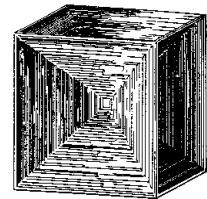
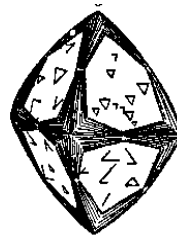
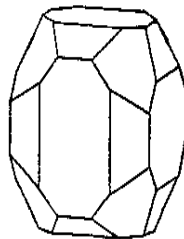
For those of you who know Don Johnson, of Popular Bluff, MO, he had a severe stroke. He is in rehab and recovering. He and his wife just celebrated their 50th Wedding Anniversary on October 1st.

Refreshments will be by Janel Cotter this month.

Our program is will be a 30 minute DVD on Glaciations.

Our Show-and-Tell table theme will center on the Mica and Chlorite groups.

Can you name these mineral shapes?



Citrine is November's Birthstone

by: Sam Serio from www.articlecity.com

If you're still young enough to remember your birthday, you probably also remember the special birthstone assigned to it. But at your age, we bet you don't really know the SIGNIFICANCE of your birthstone and what power the ancients felt would be bestowed about you by wearing it.

November Birthstone: Citrine Birthstone Properties: Increases creativity and feelings of joy
Alternative Birthstone: Yellow Topaz

Citrine is the birthstone for November and the traditional anniversary gemstone for the 13th year of marriage. Its name comes from an old French word for lemon -- "citrin". A variety of quartz and the "sister stone" to the purple variety known as Amethyst, citrine comes in a wide range of colors. Some believe that some citrine may have actually begun as amethyst, but that nearby molten rock changed it to the yellow form of quartz.

Mined mainly in Brazil, but also found in Bolivia, citrines come in vivid yellows and oranges, and also the unusual and extremely popular "Madeira red." (Citrines that are pale yellow or yellowish-brown are often mistaken for yellow or golden topaz.) Natural citrine can also be found in the Ural Mountains of Russia, in Dauphine, France, and in Madagascar

Cure-All - Citrine, like all forms of quartz, was believed to have magical powers. People carried citrine as a protective talisman against the plague, bad skin and evil thoughts. It was also used as a charm against the bites of snakes and other venomous reptiles. Yellow and orange colors of the citrine gemstone were said to offer protection from dangers when traveling, to ward off evil, and to keep sickness away on land or on sea.

Through history, citrine has been used extensively in improving the function of the body's organs including the heart, liver, kidneys and digestive system. It is still used by healing practitioners to remove toxins from the body and to treat muscular disorders, as well as help stimulate healing in general. Citrine is also said to help provide relief from the effects of radiation, and to facilitate absorption of antioxidants.

Mental Health - Citrine is believed to be especially powerful for stimulating one's mental capacities, thereby enhancing creativity and bolstering self-confidence. It is said that wearing citrine will improve memory, make you feel more optimistic, and give you more energy in everything you do. The magnetic powers of citrine are believed to relieve depression, fear, and give you the confidence that you need to continue with success in your life.

Giving citrine as a gift symbolizes wishes for hope and strength. Bursting with sunshine-yellow brightness, it is the ideal gemstone for helping anyone get through tough times!

Birthstone continued --

Buyer's Guide - A tremendous amount of citrine that is available on the market today is heat-treated amethyst. Natural citrine is much lighter than the heat-treated material which is dark orange-brown to reddish-brown in color.

Editor's comment – For many years I have heard that topaz was the birthstone for the month of November. It is even a Biblical stone, having been one of the stones on the original breastplate of the second temple inscribed with the twelve tribes of Israel. John, in Revelations tells us that “topaz was touched by the splendor of the sun,” and he listed it as the ninth foundation stone – each of the stones listed representing Christian values. He went on to say that it is the clearest of stones.

The name topaz comes from the Island of Topazio which is in the Red Sea. Its shape is orthorhombic with three axes radiating toward each other, and according to Kunz is said to represent radiant energy and heavenly connections. The square shape also suggests it has something to do with structure, discipline and building foundations. If you think of how we use squares in our lives, you may agree.

Topaz comes in many colors, but gold is the most beautiful and most sought for stones in jewelry over all, the reason being that gold is associated with the soul and the immortal part of us.

Regardless of which of these beautiful stones you think is the birthstone for this month, both have special qualities and are justifiably worthy of wearing.

Reference: George Fredrick Kunz; The Curious Lore of Precious Stones, New York, N.Y., Dover Publications, Inc., 1913, 1971 edition.

Humor for rockhounds --

There is a scuba diving geologist who measures coral reef structures. He only works summers to avoid frigid winter cold. You might call him a frost-free reef ridge rater.

Male goat quartz is a Billy Crystal.

Paleontologists have an online magazine called e-Bony.

<http://lists.drizzle.com>

Texas Trails: Geologist Intrigued by Texas

By Clay Coppedge, Country World Staff Writer - <http://geologynews.net>

Oct. 21, 2010 - Sometimes, for certain people, wondering about one thing leads to many other things, and maybe even a lifetime or work, discovery and acclaim.

Robert T. Hill was such a person. He was born in Nashville, Tenn. in 1858, but was orphaned by the Civil War and sent to live with elderly and very strict relatives. His brother ran away to Texas, settling in Comanche and working for the local newspaper, the Comanche Chief. Robert dropped out of school in the sixth grade and when he was 15, he lit out for Texas.

Hill's arrival in Texas was a case of coming home to a place he had never been before. He arrived in the midst of a Christmas dance and would for the rest of his life consider Comanche his home. He did a little bit of everything for the Chief and let his driving curiosity run wild. His biggest adventure during his years in Comanche was a trip up the Dodge City trail, where he learned outdoors skills that would serve him well during his future travels.

One day, Hill got to wondering how seashells got into the strata on nearby Round Mountain. He bought a book on geology, but these shells were different from the ones in the book. He suspected he was on to something and left Comanche to enroll at Cornell College in 1882. In lieu of clothes or any formal study, he took along a suitcase full of rocks. He worked his way through college and wrote his graduation thesis on the "Present Condition of Knowledge of the Geology of Texas." Hill was responsible for much of that knowledge, as he would continue to be through a long and productive career. Many of the geographic terms and descriptions that we take for granted today were first coined by Hill: the Balcones Escarpment, Edwards Plateau, Woodbine Sandstone, Trans-Pecos, Lampasas Cut Plain and others.

That Hill is known as the Father of Texas Geology shouldn't suggest that Hill was a provincial local wonder. His work took him from California to Panama, to places that are still among the most remote on earth. He did reconnaissance work in the West Indies and in Central America. His work led him to become an early supporter of the Panama Canal as the site of an interoceanic canal when popular opinion favored Nicaragua.

In 1885, he began his career with the U.S. Geological Survey, which at that time was directed by J.W. Powell. In 1899, he surveyed some 350 miles of the Rio Grande River in Texas, but the wild and treacherous Lower Canyons really caught his attention.

"Hardly had we begun to enjoy the pleasant sensation of drifting down the stream when a roaring noise was heard ahead," he later wrote. "This came from seething and dangerous torrents of water foaming over huge rounded boulders of volcanic rock which everywhere form the bottom of the river."

This is a stretch of the Rio Grande that is immune to the pumping demands that so inhibit the river's flow along most of its course. Here the river is constantly refreshed by thousands of springs, their flow gravitating downward with the geography. The Lower Canyons is part of the

Texas Trails continued -

Rio Grande Wild and Scenic River corridor, which remarkably is as wild and hard to navigate today as it was in 1899.

"Reaching these rapids, we had to get out of the boats and wade beside them, pushing them off or over stones, or holding them back by the stern-lines," Hill wrote. "This process had to be repeated many times a day for the entire distance, and, as a consequence, all hands were constantly wet."

Hill studied and wrote about topics as diverse as artesian water, deserts, paleontology, Native American life, metallic resources, prehistoric peoples, ore deposits, climatology and petroleum geology. It all started with him wondering about those seashells near landlocked Comanche.

When he died in Dallas in 1941, his ashes were scattered over Round Mountain, where his life's work began.

Dinosaur Skull Changed Shape during Growth

ScienceDaily (Apr. 1, 2010) — The skull of a juvenile sauropod dinosaur, rediscovered in the collections of Pittsburgh's Carnegie Museum of Natural History, illustrates that some sauropod species went through drastic changes in skull shape during normal growth.

University of Michigan paleontologists John Whitlock and Jeffrey Wilson, along with Matthew Lamanna from the Carnegie Museum, describe their find in the March issue of the *Journal of Vertebrate Paleontology*.

The fossil offers a rare chance to look at the early life history of *Diplodocus*, a 150 million-year-old sauropod from western North America.

"Adult sauropod skulls are rare, but juvenile skulls are even rarer," said Whitlock, a doctoral candidate in the U-M Museum of Paleontology. "What we do know about the skulls of sauropods like *Diplodocus* has been based entirely on adults so far."

"*Diplodocus* had an unusual skull," said Wilson, an assistant professor in the Department of Geological Sciences and an assistant curator at the U-M Museum of Paleontology. "Adults had long, square snouts, unlike the rounded or pointed snouts of other sauropods. Up until now, we assumed juveniles did too."

The small *Diplodocus* skull, however, suggests that major changes occurred in the skull throughout the animal's life.

"Although this skull is plainly that of a juvenile *Diplodocus*, in many ways it is quite different from those of the adults," Whitlock said. "Like those of most young animals, the eyes are proportionally larger, and the face is smaller. What was unexpected was the shape of the snout –

Dinosaur Skull continued -

it appears to have been quite pointed, rather than square like the adults. This gives us a whole new perspective on what these animals may have looked like at different points in their lives."

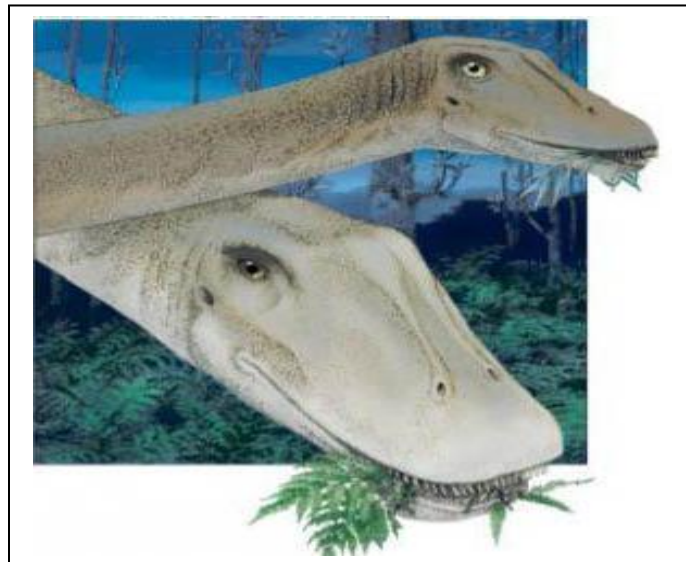
The researchers believe these changes in skull shape may have been tied to feeding behavior, with adults and juveniles eating different foods to avoid competition. Young *Diplodocus*, with their narrower snouts, may also have been choosier browsers, selecting high quality plant parts.

The discovery also highlights the importance of museum collections for paleontological research.

"Fossils like this are a great example of why natural history museums like ours put so much time and effort into caring for our collections, said Lamanna, an assistant curator of vertebrate paleontology at Carnegie Museum of Natural History. "This little *Diplodocus* skull was discovered in 1921, and more than 80 years passed before we recognized its significance. If the Carnegie Museum hadn't preserved it for all that time, the important insight it has provided into the growth and ecology of this dinosaur would have been lost."

The actual juvenile *Diplodocus* skull, as well as a fully restored, mounted skeleton of an adult, is on display in Carnegie Museum of Natural History's "Dinosaurs in Their Time" exhibition.

Funding was provided by the U-M Department of Geological Sciences and the Geological Society of America.



New Bird Fossil Hints at More Undiscovered Chinese Treasures

ScienceDaily (Mar. 25, 2010)

"The study of Mesozoic birds is currently one of the most exciting fields; new discoveries continue to drastically change how we view them," said Jingmai O'Connor, lead author of the study. The article appeared in the March issue of the *Journal of Vertebrate Paleontology*.

The new bird, named "*Longicrusavis houi*," belongs to a group of birds known as ornithuromorphs (Ornithuromorpha), which are rare in rocks of this age. Ornithuromorphs are more closely related to modern birds than are most of the other birds from the Jehol Biota.

"*Longicrusavis* adds to the magnificent diversity of ancient birds, many of them sporting teeth, wing claws, and long bony tails, that recently have been unearthed from northeastern China," said Luis Chiappe, a co-author of the study.

Along with a bird described five years ago, *Longicrusavis* provides evidence for a new, specialized group of small birds that diversified during the Early Cretaceous between about 130 and 120 million years ago.

"The new discovery adds information not only on the diversity of these birds, but also on the possible lakeshore environment in which this bird lived," said co-author Gao Ke-Qin.

The legs of this new species are unusually long, suggesting that it spent much of its time wading in the shallows of ancient lakes. The name "*Longicrusavis*" means "long-shin bird," highlighting this important aspect of the new specimen. The presence of ancient birds in this habitat suggests that modern birds might have originated from an ancestor that was adapted for life near rivers and lakes.

Previously undescribed feather impressions from a closely related species suggest that both it and *Longicrusavis* had a long, fan-shaped tail. These are the oldest species to have such a tail, which likely increased flying performance.

The rocks of the Yixian Formation of northeast China have produced a spectacular array of fossils in recent years including fishes, birds, mammals, invertebrates, and dinosaurs. These fossils are collectively known as the Jehol Biota and they are remarkable because, in many instances, they preserve soft tissues such as feathers or hair in addition to teeth and bones.

"The Jehol Biota never fails to stop giving, and the research to be done on these fossils is virtually endless!" said O'Connor.

Story Source: The above story is reprinted (with editorial adaptations by *ScienceDaily* staff) from materials provided by [Society of Vertebrate Paleontology](#)

Journal Reference: O'Connor, J. K., K-Q Gao, and L. M. Chiappe. A New Ornithuromorph (Aves: Ornithothoraces) Bird from the Jehol Group Indicative of Higher-Level Diversity. *Journal of Vertebrate Paleontology*, 2010; 30 (2): 311-321 DOI: [10.1080/02724631003617498](https://doi.org/10.1080/02724631003617498)

For our juniors

What an Archaeologist Does

From www.army.mil by the U.S. Army Corp of Engineers, Pittsburg District

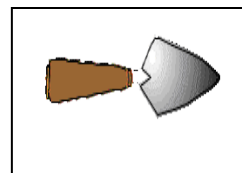
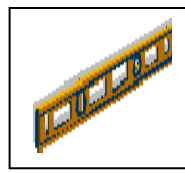
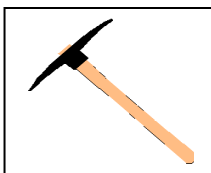
An archaeologist is someone who studies people and what they did in the past from the things they left behind. Archaeologists might study early Native Americans, early European settlers, such as the pilgrims, or old factory buildings.

An archaeologist looks for artifacts (objects made by people) that will reveal more about the past. Artifacts can be many different things. An arrowhead is an artifact, or beads made by Native Americans and so is an old coin.

Archaeologists also look for features. When someone disturbs the ground and there is evidence left from that activity, it is called a feature. A feature can't be moved from the site. One example of a feature is a hearth or firepit, which is like a fireplace. Sometimes an archaeologist might find a hole dug for people to store food or other things. This is called a storage pit. Some storage pits are just trash dumps. Archaeologists may even find the bottom walls of houses called foundations. Some Native American houses were built with tree saplings. They cut saplings and put the bottoms into small holes dug into the ground. These holes are called potholes. Archaeologists working on historic sites even find evidence of a privy. A privy is an outhouse or bathroom. Yuck!

Archaeologists call the place where they find artifacts in the ground a site. If archaeologists are lucky, they also find features at a site. They find artifacts and features by digging into the ground and carefully looking for them.

At a site an archaeologist uses many tools to do his job. He uses maps and compasses to locate the site. Then he uses picks and shovels to dig, and buckets to carry the dirt to a screen. Archaeologists did small amounts of dirt at a time.



Tools of an Archaeologist are picks, buckets, levels, and trowels, among other things.

Archaeologists carefully record where everything is found by making maps and drawings of everywhere they dig. This information helps the archaeologists interpret what happened at that location.

Archaeologists record how much they excavate at a time by using a line level on a string attached to a spike or stake. A level is a metal bar with a glass window in it. In the window is a bubble. When the bubble is in the middle of the window, it is level. A line level is a smaller

For our juniors continued-

version of this which hangs on a string. Archaeologists measure the depth from the level string to the ground before digging. When an artifact or feature is located, the archaeologists use the line level and string to measure again. This tells the archaeologist how deep the find was below the ground surface.

Once an artifact is found, an archaeologist uses a special tool called a trowel. He uses it to carefully dig and scrape around the artifact. To find smaller artifacts, dirt is poured through a screen. The screen is like a net that catches very small artifacts like seeds and bones, which can be hard to see.

**Sifting****Troweling**

Stones for Carving – via Pegmatite Bulletin, June/July/Aug 2010

The following stones may be carved with a file and/or motor tools and a few hand tools;

Sepiolite (Meerschaum): is famous as a material to make pipe bowls. Work and finish with steel wool.

Alabaster (Gypsum): hardness varies. Hard types respond well to hand tools; others with files and wet or dry sandpaper.

Talc (Soapstone): works with files, sandpaper, and carving tools.

Anthracite (Coal Jet): works with files and sandpaper and polishes to a shine equal to hematite.

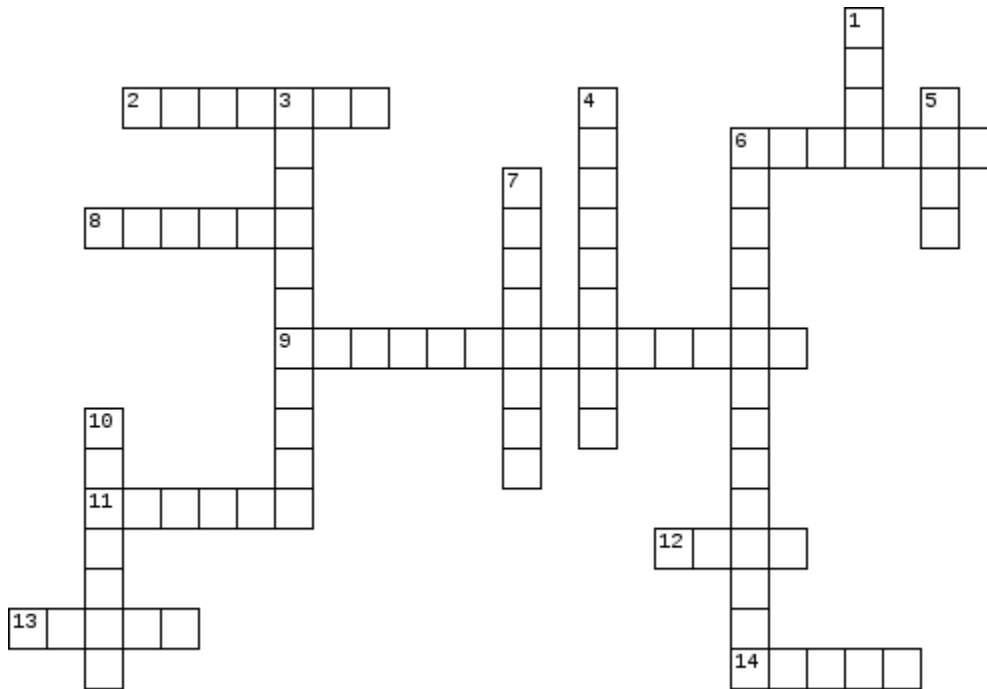
Calcite (Marble onyx): works with hand tools, steel wool and tungsten bits.

Aragonite is similar to calcite and is worked the same.

Howlite is worked with hand tools and has the advantage of being dyed easily.

Most of these can be sawed with a hacksaw. Most can be polished by hand with a piece of leather and tin oxide.

From Rockhound Rambling, via Monrovia Rockhounds, April, 2010



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Across Clues

2. is not a mineral
6. an object that is solid, formed in nature, and has never been a live
8. second layer of the earth
9. formed from material that has settled into layers
11. powder left behind by a mineral when it's rubbed against a rough white tile
12. a naturally formed solid made of one or more minerals
13. third property used to identify a mineral
14. third layer of the earth

Down Clues

1. one layer of the earth
3. a rock that was once melted and then cooled and hardened
4. tells the hardness of a mineral from 1 to 10
5. is formed when mud or minerals fill a mold
6. a rock that has been changed by heat and pressure
7. one property used to identify a mineral
10. remains of a living thing that died long ago is called

Dates to Remember

November

9- Ozark Earth Science Gem, Mineral & Fossil Club Meeting, 7:00 P.M., Van Matre Senior Citizens Center, 1101 Spring Street, Mountain Home, Arkansas.

13 – C. L. Dake Geological Societies Annual Rock & Mineral Auction. Missouri University of Science & Technology, McNutt Hall, Room 204. tghfkb@mst.edu

19-21- St Louis Mo, 53rd Annual Show, St Louis Mineral & Gem Society, Holiday Inn Viking Conference Center, 10709 Watson Road, (I44 & Lindbergh).

**Dorothy Hess
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Mountain Home, AR 72653-6203**

