

THE AGATEER

The Newsletter of the Madison Gem and Mineral Club

Volume 8, Issue 5

May 2008

May 27 Program:

The Tucson Rock and Mineral Show

The May 2008 Club Meeting will be held Tuesday, May 27 at 7 pm at the usual location, Weeks Hall, corner of Charter and Dayton Streets in Madison. The program is "The Tucson Gem Show" by Bill Koch.

The Tucson show is like the Mecca of rockhounding. Every devout rockhound must make it to Tucson at least once in their lifetime; preferably sooner rather than later, so if you like the experience you can go again, and again, and again, ... The Tucson show is really a Show-of-Shows. Every hotel has its own special niche – and there are dozens of them – fossils, cut gems, rough gems, agates, jewelry, beads, crystals, slabs, etc. Each of these individual shows has its own run time, but most cover the first two weeks of February. Some start a little sooner; some go a little later.

With such an enormous offering of material from all over the world, where does one start? Bill attended this year's show will share his experiences with us.

June 21 Field Trip:

Eagle Cave

Ken and Megan Woodford have put together the following field trip to Eagle Cave on Saturday, June 21. We will plan to meet at the US Bank Bldg. at Old Sauk Road and The Beltline at 8:30 am and depart at 8:45 am.

Details for the Eagle Cave Trip:

Time: 8:30am Leave by 8:45 am.

Place: US Bank Bldg...Old Sauk and Beltline

Event: Guided Tour thru Eagle Cave Wis. largest Onyx Cave

Tour: The tour last approx. 1 hr and cave temperature is 52 degrees all yr long, so dress appropriately

Directions: Take hwy 14 west through Cross Plains, Black Earth, Arena, Spring Green, and Lone Rock to Gotham.

• Turn left in Gotham on hwy 60 west. (gas station sits on the corner of hwy 14 and 60)

• Follow hwy 60 alongside the Wisconsin River to the 4-way stop of hwy 60 and 80.

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Next Meeting:

Tuesday, May 27, 7:00 PM

AB20 Weeks Hall

UW Department of Geology and Geophysics

1215 West Dayton Street

Madison. Wisconsin

2008 Member Competition

All members are urged to bring specimens for the monthly competition.

May - self-collected mineral or crystal specimens

June - organic material (amber, ivory, shell, pearl, bone etc)

July - any reddish material (jasper, cinnabar, coral etc)

Questions may be directed to Metje Butler, Education Chairperson, at 244-3659.

Calendar

May 17-18: Wauwatosa, WI. Wisconsin Geological Society 51st Annual Gem, Mineral, & Fossil Show, Mueller Building in Hart Park, 7300 W. Chestnut Street. (The Hart Park entrance is at 72nd & W. State Streets.) Sat. & Sun. 10:00-5:00. Paul Schmidt, (414) 771-8668, pvs@wi.rr.com

May 27: Madison Gem and Mineral Club monthly meeting

May 24-25: Wheaton, IL. Chicagoland Gems and Mineral Association (CGMA) 32nd Annual Gem, Mineral & Fossil Show, DuPage County Fairgrounds, 2015 W. Manchester Road. Sat. & Sun., 10-6 (*Memorial Day Weekend*).

May 31-June 1: Viroqua, WI. Coulee Rock Club 15TH Annual Show, Viroqua Jr. High School, 100 Blackhawk Drive. Sat. 9-5, Sun. 9-4.

June 7: Chicago, IL. Chicago Rocks and Minerals Society Inaugural Geode Fest, Salvation Army - Irving Park Corps, 4056 N. Pulaski. Sat, 1-5.

July 10-13: The Wonderful World of Agates:
What: Agate Experts; Agate Displays; Agate Vendors; Agate Auctions; Agate Photography; Technical Sessions; Author Book-Signings; Agate Adventure Programs **Where:** Weis Earth Science Museum, University Of Wisconsin-Fox Valley, 1478 Midway Rd. Menasha, Wisconsin

Field Trip Info cont'd.

Megan and Ken Woodford – Trip Chairpersons

- . Keep going straight through the intersection on hwy 60 for 6 mi.
- . The EAGLE CAVE sign will be on the left side of the road, take a right at the sign and follow Eagle Cave Rd for about 2 mi.

By lake turn left on Cavern Ln

Any questions, please call 830-3500, ext 3529.

WORDS 101:

Chalcedony

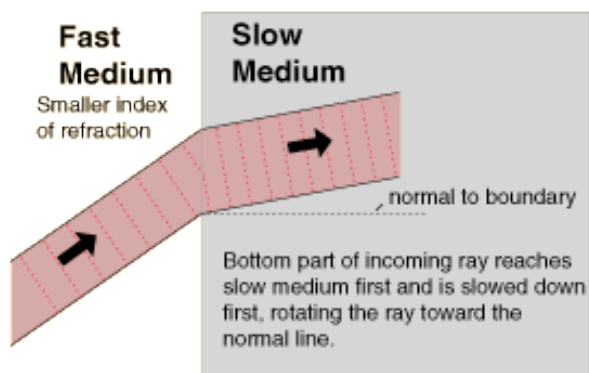
Because man's interest in rocks and minerals stretches so far back in time, we don't always know the origins of geological words commonly used today. 'Chalcedony' is one such word. (The 'chal' in this word is pronounced like 'Cal'ifornia, not like 'chal'ice.) There seems to be no other word in English that has this same root or etymology. It is very much like the word 'quartz' in this sense. There was at one time a town on the Bosphorus called 'Chalcedon'. Today it is part of Istanbul. But, according to the Oxford English Dictionary, despite their similar appearances, chalcedony and chalcedon have nothing to do with one another. The earliest written use of the word appears to be in Revelations xxi.19; but, almost certainly, the word must pre-date this. So how does this word arise? An excellent question, but one without an answer.

Lapidary Science:

Refraction

Whenever light passes from one material into another, it will bend, or 'refract'. This bending occurs whenever light travels at a different speed in the two materials. In a vacuum light travels at about 186,000 miles per second, or 300,000 km per second. But, in all other substances the velocity of light is less than this. One can think of this as the material impeding the motion of the light through it and thus slowing it

down – a little like a crowded mall slows down the speed at which you can walk through it. When a light ray passes from a high velocity medium, like air, into a slow velocity material like a mineral, it will bend so that is more perpendicular to the interface, like below:



Just of the opposite happens when the light passes from a slow material into a faster one. In the above diagram, imagine the black arrows to be pointed in the opposite direction. So when light passes from a slow material into a faster one, it will bend to become more parallel to the interface.

Why should we care about any of this? Different minerals will bend light different amounts. If we can measure the amount of bending we can identify the mineral. The ratio of the speed of light in a vacuum to the speed of light in a material, is known as the ‘index of refraction’ or R.I. for that material. The index of refraction for water is about 1.3 – meaning light travels about 30% slower in water than in a vacuum. The index of refraction for quartz is about 1.46, and for diamond 2.42. As the index of refraction becomes larger, it means the material is more effective at slowing down the light. A refractometer, a gadget for measuring the amount of bending, is an essential instrument in many, many applications from wine making to geology.

Those minerals that have a high refractive index are the ones we find most pleasing when cut into gemstones. This is because these gems allow light to enter the top of the stone, bounce around the stone’s interior a few times, and then emerge from the top of the stone. A gem cutter cuts the gem to maximize the light return out the top of the stone and minimize the amount ‘leaking’ out the bottom of the stone.

It is no accident that the gemstones that look ‘nice’ are

the stones that have a high index of refraction:

<u>Material</u>	<u>R.I.</u>
Diamond	2.42
Cubic Zirconia	2.17
Zircon	1.96
Ruby/Sapphire	1.76
Spinel	1.73
Tourmaline	1.65
Topaz	1.63
Emerald	1.56
Glass (varies)	1.51

Notice from the above that emerald has a refractive index only slightly higher than glass. The attraction of emerald is its color. It does not make a very bright gemstone.

The addition of lead to glass increases the refractive index to about 1.70. So ‘leaded crystal’ which is glass the some lead thrown into the mix, is much brighter than ordinary glass. The ‘lead crystal’ that Waterford and others have made famous is not ‘crystal’ at all, but glass with a high lead content. This gives it the brilliance that we find attractive.

Refractive index is roughly correlated with density – those materials with high densities tend to have a high refractive index. Club members who have attended our fall show no doubt have seen Scot Moss separate sapphires from river gravels making use of their high densities. A scoop of gravel (hopefully containing some sapphires) is placed in a screened box and agitated in a tub of water. The heavier sapphires work their way to the bottom of the box – a little like raisins working their way to the bottom of a box of raisin bran cereal. When the gravel is carefully turned over the sapphires are concentrated in the center. Scot has done this hundreds of times and makes it look easy, but the technique does require a little practice.

Another application utilizing refractive index allows one to see into the inside of a stone that has a frosted exterior. If a stone is immersed in a liquid that has very nearly the same R.I. as the stone, the stone will disappear. The only reason we see anything is because light has either bounced off of it, or has been bent by it. If you surround the stone with the appropriate liquid, you eliminate or greatly reduce these two phenomena. If the stone has internal flaws these will visible when the stone is immersed in this fashion.

The Agateer is the official publication of the Madison Gem and Mineral Club. It is published monthly, and mailed as a benefit of membership to all Madison Gem and Mineral Club members.

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Membership is open to all individuals, and applications for membership will be accepted upon payment of annual dues, which are \$12.00 for adults (18 and older), \$5.00 for junior members (ages 6-17), and \$16.00 for families.

Visit the official website of the Madison Gem and Mineral Club at www.madison.com/communities/madisonrockclub/contact.php for more information

Madison Gem and Mineral Club
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