

Rock & Gem

SEPTEMBER 2011

THE EARTH'S TREASURES • MINERAL



Tony Znaniecki's
Rock Art

MINERALS & FOSSILS in COLORADO

Plume Agate
from
Graveyard Point,
Oregon

THE 2011
GIA
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Fossils
Underground

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FIELD TRIP:
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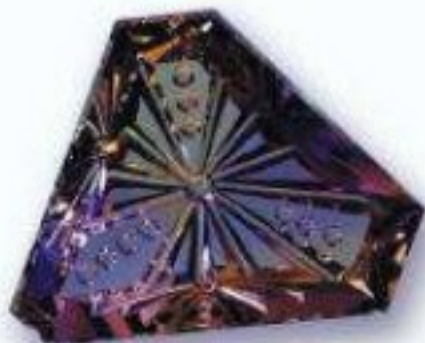


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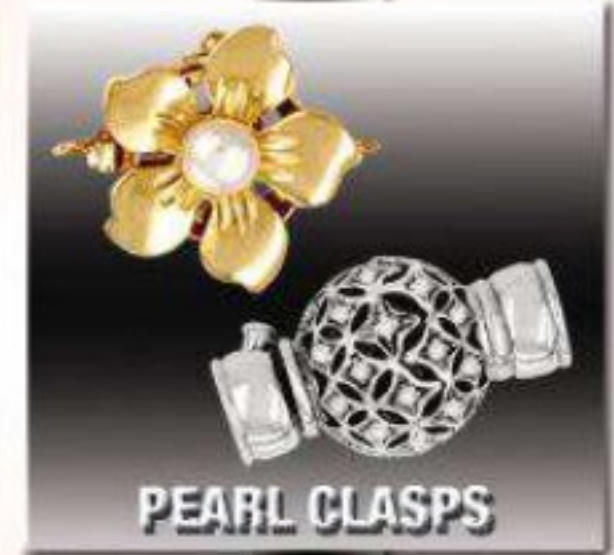
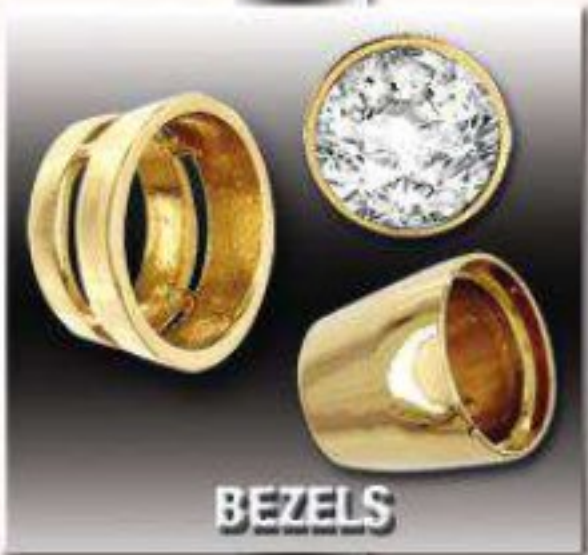
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The 2011 Denver Gem & Mineral Show will feature Minerals of Russia, like this calcite from the Bor Pit at Dalnegorsk (Primorskiy Kray), Siberia. (Jeff Scovil photo/Terry Huizing collection)

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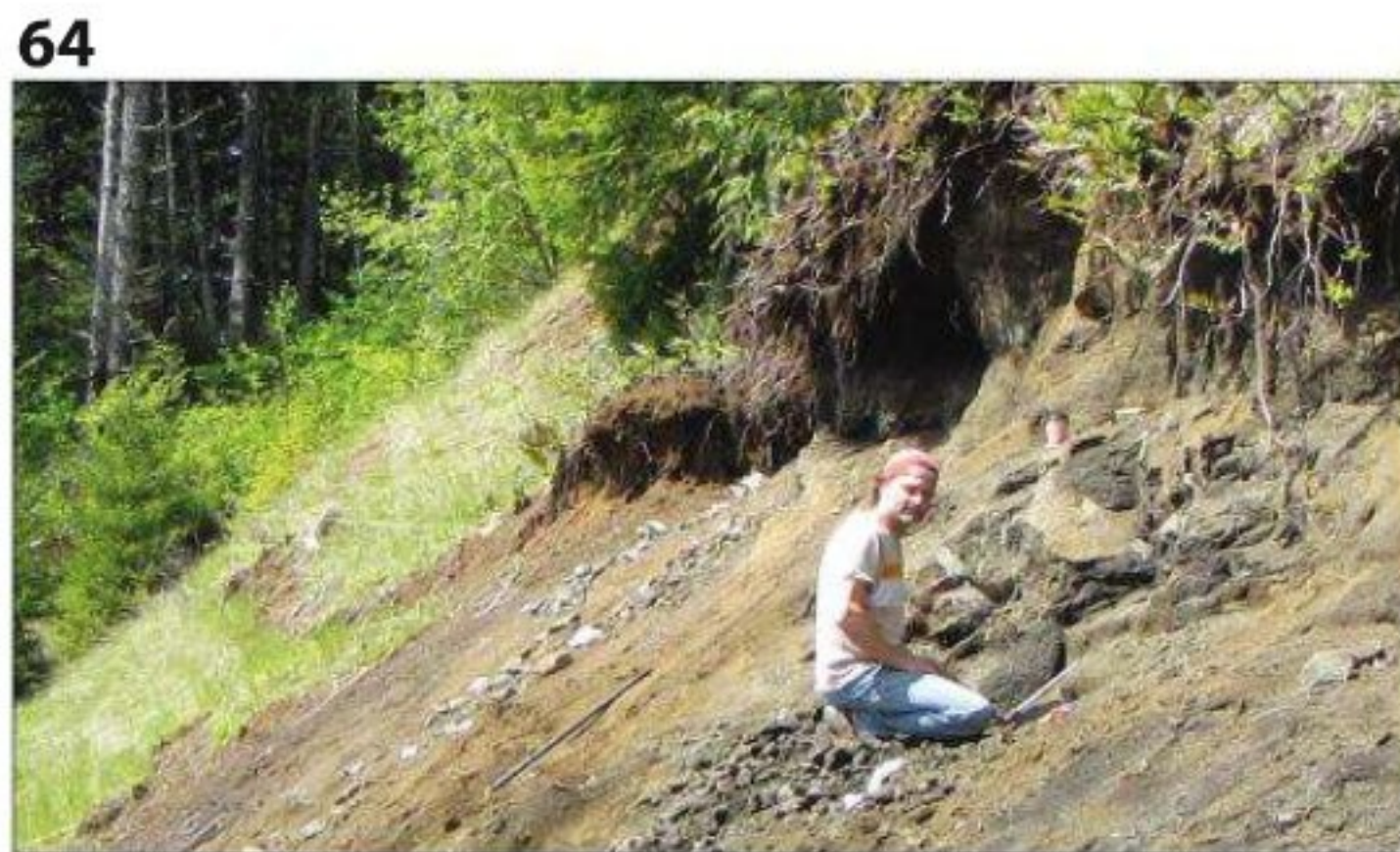
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Notice: On rare occasions, typographical errors occur in prices listed in magazine advertisements. For this reason, advertisements appearing in *Rock & Gem* should be considered as requests to inquire, rather than as unconditional offers to sell. All prices are subject to change without notice.

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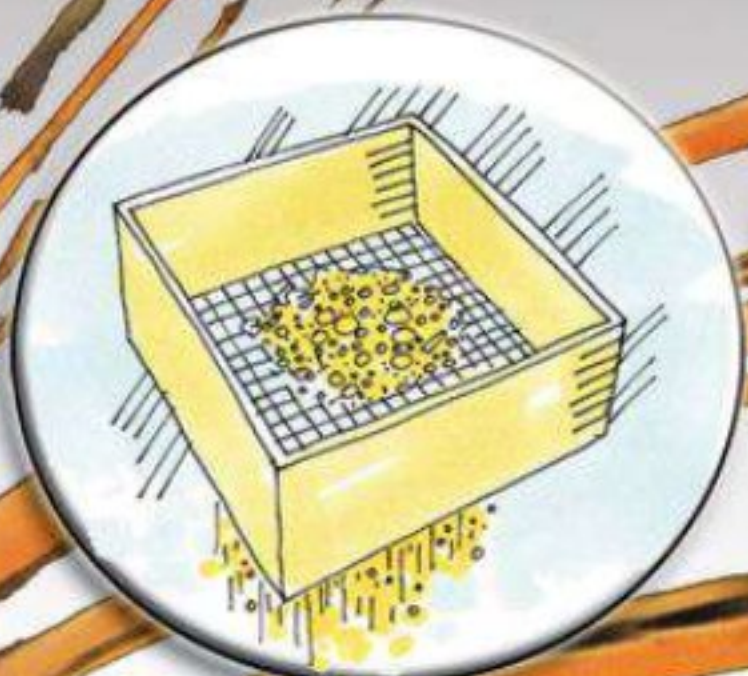
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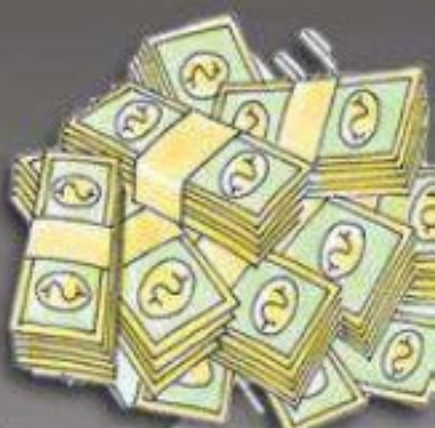
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A Field Guide to Gemstones of the Pacific Northwest
by Rick Hudson
\$7.95

This small pocket guide can be used by rockhounds to sight identify common materials found in the cited region. It provides several dozen full-color photographs of many of the gemstones found in the Northwest, particularly in Canada. The minerals figured include jade, emerald, jasper, agate and quartz. The guide does not give any specific locality directions, but does provide the rockhound with very accurate photographs of the typical materials for comparison with the rocks he might encounter.

The guide is laminated for field use, so it is virtually waterproof. Folded, it measures 4⁵/₈ inches by 9 inches, and it unfolds to 37 inches wide. (Harbour Publishing, 2011)

—Bob Jones

Oregon Underfoot
by K.T. Myers and Richard L. Petrovic

This 15-page pocket guide is intended as a companion guide for the book *Rock Hounding Oregon with Gem Trails of Oregon*. The guide provides brief descriptive information and photographs of the common materials a rockhound will encounter in Oregon. (2011)

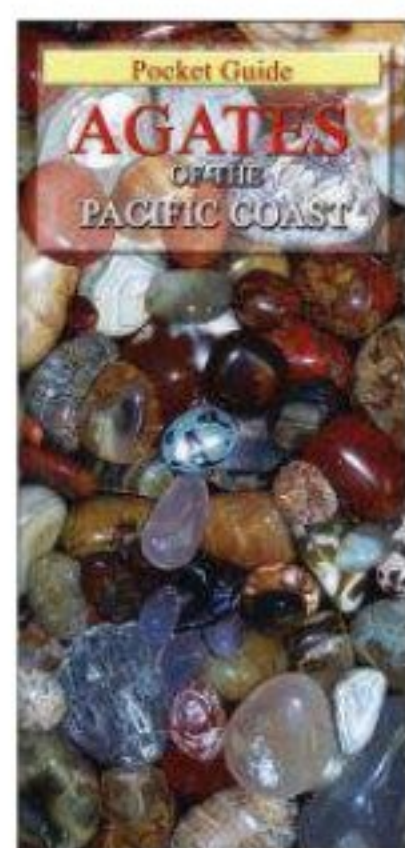
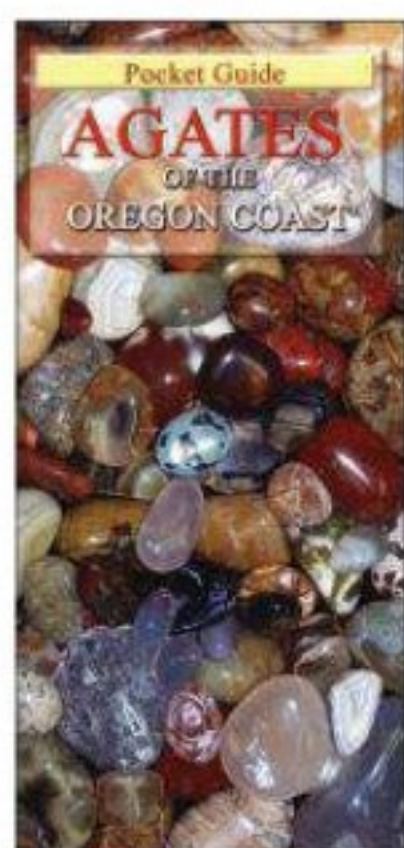
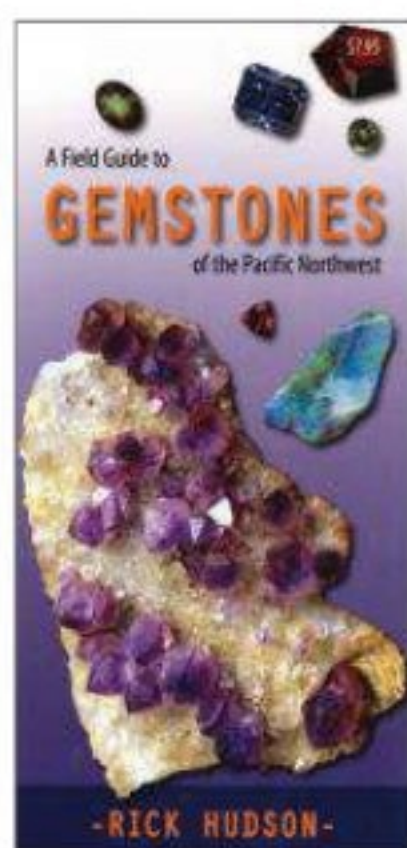
—Bob Jones

Agates of the Oregon Coast and Agates of the Pacific Coast
by K.T. Myers and Richard L. Petrovic

These two pocket guides are closely related, as one provides photographs on the agates found along the Oregon Coast and the other enlarges on that area. The guide *Agates of the Oregon Coast* (2010) contains a small map that indicates a dozen potential beach collecting sites along that stretch. *Agates of the Pacific Coast* (2011) has no such map and does not indicate the parameters of the collecting localities it describes.

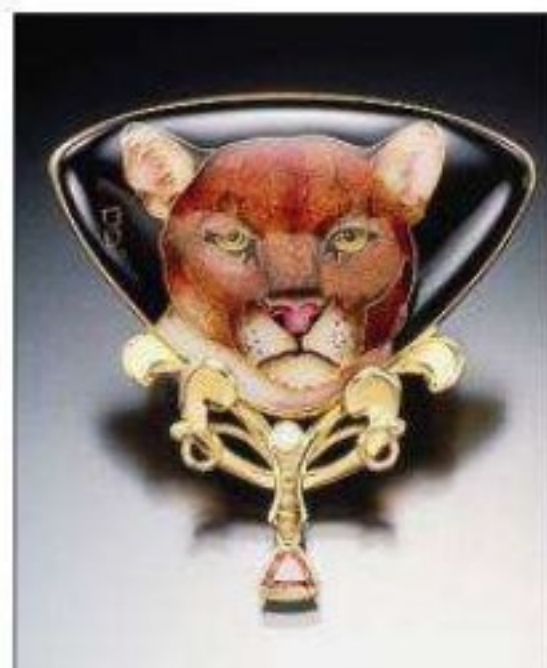
Rockhounds who explore the coastal areas of the Northwest may find these two guides useful. They are convenient to use and are an easy reference while collecting rocks.

—Bob Jones



Wildacres Workshop

The Florida Society of Goldsmiths (FSG) will hold a Modern Masters Workshop Oct. 17-23, 2011 at Wildacres Retreat in North Carolina. Instructors and courses include Chris Darway (Hydraulic Press for Production: Cutting & Forming Dies), Tom Muir (Creative Mechanisms: Hinges, Catches, Swivels, Gears, and More), Merry Lee Rae (Cloisonné: Enameling for Beginners and Beyond), Phil Renato (Polymer Chain Reactions: Firm & Flexible Plastics for Jewelry), and Bill Seeley (Anodizing the Reactive Metals). The cost for five full days of classes, six nights' lodging, and 17 meals is \$800 for FSG members. Visit www.FSG4U.com for further information.



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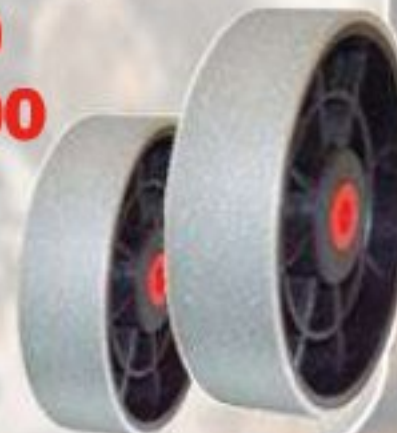
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September Craftsman of the Month Albert Isaac, of Modesto, California, a member of the Mother Lode Mineral Society, is the creator of this nephrite jade and sterling silver knife. "The nephrite is from the Covelo area of California," he says. "The rough jade piece weighed in at 11 pounds.

"The stone was cut using an 18-inch slab saw. The blade piece started as a 3/4-inch-thick slab. A 10-inch trim saw was used to cut that piece into a 9 1/2-inch by 2-inch by 3/4-inch rectangle and a 5 1/2-inch-long by 1-inch-square rectangle was cut for the handle.

"The blade is approximately 7 inches long with a 2-inch hidden tang that goes through the bolster into the 5-inch handle. The handle was drilled using a drill press and both diamond and carborundum 1/2-inch bits to accept the round-cut blade tang through the bolster. The tang is approximately 1 1/2 inches into the handle. I used a 1/2 inch diamond core bit to make the initial hole shape. The initial drilling was done with the piece under water, and at the end water was dripped into the hole. It took many hours of going up and down with the drill bits to complete this hole. This gives strength to the knife.

"An 8-inch Covington lapidary unit was used to shape the blade and handle with 100 and 220 diamond and silicon carbide wheels, used wet. To wet sand the piece, I used 220, 400, 600 and 1200 grit paper. The grooves in the handle were made with the wheel edges. To polish the blade, chrome oxide was used on 12-inch soft and hard leather pads, then Zam was used on a soft muslin 6-inch buff at 1725 rpm to finish. (Zam works on many stones.)



A. MICHAEL BANKSTON PHOTO

"The bolster was carved from Blue Kerr carving wax using a Flex shaft and carving tools and cast from 9 ounces of 925 sterling silver. The pommel was also carved and cast, but sheet and wire wax were also used. All the waxes were cast using a 6-inch flask and a long-arm Kerr centrifuge. The bolster contains 18 4.5mm faceted stones: eight amethysts, eight Mandarin garnets, and two pink tourmalines.

"I used burrs to cut seats for the stones in all the wax pieces. The stones are bead set in the finished metal. The

pommel has a 1-inch by 3/4-inch pentagonal high-domed aventurine cabochon set in a bezel. The pommel is 3 1/2 ounces of .925 sterling silver.

"The handle has sterling silver wire with beads wrapped into the carved handle. These are tucked and held in the pommel and bolster by burnishing the metal. Then a Mizzy wheel was used for the brushed finish.

"The knife is displayed on the remainder of the river-worn nephrite jade from which it was fashioned. It's supported on sterling silver pedestals and the handle is resting on a 14-gauge silver wire. The cast sterling silver back support was also made from Kerr Blue carving wax and shaped with files. It has six round faceted red corundums, each approximately 2.5mm. The sterling silver front support has two oval opal triplets measuring 8mm by 6mm.

"This creation took several months to finish and was planned for about a year. In fact, I have only been doing lapidary work for a little over a year!"



Would you like to be named Craftsman of the Month?

To enter the contest:

- Write a 500-word step-by-step description of how you crafted your lapidary project from start to finish. Save it as a document file.
- Take at least one sharp, close-up, color photo of the finished project. Photographic prints (no laser prints) or high-resolution (300 dpi at 4 inches by 5 inches) digital photos are acceptable.
- Burn your document file and digital photo (.tif or .jpg) to a CD.
- Mail your CD, photo, and a printed copy of your manuscript, along with your name and street address (required for prize delivery), to Craftsman of the Month, *Rock & Gem* magazine, 3585 Maple St., Suite

232, Ventura, CA 93003. Submissions will not be returned, so do not send originals. Only winners will be notified. Contact the editor at (805) 644-3824 ext. 129 or editor@rockngem.com with any questions about these requirements.

Craftsman of the Month winners receive a two-speed Dremel Model 200 N/40 MultiPro kit and a wall plaque in recognition of their creativity and craftsmanship. Winning projects are also posted on our Web site, www.rockngem.com.





*Heliodor,
Ukraine,
Jeff Scovil
photo*

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2011

- Las Vegas, NV.....June 3-4-5
- Detroit, MI.....July 15-16-17
- Franklin, NC.....July 28-29-30-31
- Spruce Pine, NC...August 4-5-6-7
- Tucson, AZ....September 8-9-10-11
- Minneapolis, MN....September 25-26
- Detroit, MI.....Sept. 30-Oct. 1-2
- West Springfield, MA....October 7-8
- Asheville, NC.....October 25-26
- Orlando, FL.....October 28-29-30

2012

- Orlando, FL.....January 6-7-8
- Asheville, NC.....January 10-11
- Tucson, AZ.....Jan. 28-Feb. 10

Tucson

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Gem Mall

January 28- February 10

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February 3 - February 10**

- Minneapolis, MN.....March 25-26
- Detroit, MI.....March 30-31 April 1
- West Springfield, MA....April 13-14
- Orlando, FL.....May 4-5-6
- Franklin, NC.....May 11-12-13
- Las Vegas, NV.....June 1-2-3

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DATES SUBJECT TO CHANGE

SHOW DATES

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Send show information at least four months in advance to *Rock & Gem Show Dates*, 3585 Maple St., Suite 232, Ventura, CA 93003-3517; e-mail: editor@rockngem.com; or use the electronic form at www.rockngem.com.

SEPTEMBER 2011

2-4—SANTA BARBARA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc.; Earl Warren Showgrounds, 3400 Calle Real; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7 weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

2-5—CRAWFORD, NEBRASKA: 25th annual show; Northwest Nebraska Rock Club; Crawford City Park, Main St.; Fri. 8-6, Sat. 8-6, Sun. 8-6, Mon. 8-6; free admission; agate bed field trips, 13th annual Agate Collectors presentations, buy, sell, trade, rocks, fossils, artifacts, jewelry; contact Wade Beins, PO Box 569, 120 Gordon Ave., Chadron, NE 69337, (308) 430-1399; e-mail: agates@bbc.net

2-7—HENDERSONVILLE, NORTH CAROLINA: 30th annual show; Hendersonville County Gem & Mineral Society; Whitmire Building, 301 Lily Pond Rd.; Fri. 10-6, Sat. 10-6, Sun. 10-6, Mon 10-6, Tues 10-6, Wed 10-5; adults \$4, children under 12 free with adult; free Grab Bag for children, free gemstone for adults with paid ticket, Wheel of Gem & Mineral Fortune, dealers, gems, minerals, faceting rough, jewelry supplies, fossils, bench jeweler, educational programs, displays, lapidary demonstrations, door prizes, free shuttle to Hendersonville Apple Festival and Lapidary Museum; contact Steve Kiser, (828) 885-2952

3-4—ARLINGTON, TEXAS: Annual show; Arlington Gem & Mineral Club; Arlington Convention Center, 1200 Ballpark Way; Sat. 10-6, Sun. 10-5; adults \$6, seniors and children \$3, Scouts in uniform free; silent auctions, Gem ID, Kids' Korner, door prizes, gem, lapidary and jewelry displays and demonstrations, Rock Food Table; contact Jack Spinks, 209 Overlook Dr., Midlothian, TX 76065, (214) 335-9452; e-mail: jspinks@sbcglobal.net; Web site: www.agemclub.org

3-4—AUGUSTA, MAINE: 21st annual show; Kennebec Rocks & Minerals Club; National Guard Armory, Western Ave.; Sat. 10-5, Sun. 10-4; door prizes, demonstrations, cabbing, lapidary, mineral displays, dealers, minerals, jewelry, gems, fossils, geode slicing, kids' mineral mine, "Rocky" the rockhound dog; contact KRMCC, (207) 873-6270

3-5—SILVER CITY, NEW MEXICO: 28th annual show; Grant County Rolling Stones Gem & Mineral Society; Grant County Business and Conference Center, Hwy. 180E, next to Ace Hardware; Fri. 10-5, Sat. 10-5, Sun. 10-4; free admission; mineral ID, Wheel of Fortune, silent auction, dealers, rough rock, minerals, handcrafted jewelry, field trips, special exhibits; contact Marcia Andre, (575) 534-0006; e-mail: rollingstonesgmsshow@gmail.com; Web site: <http://rollingstonesgms.blogspot.com/>

9-11—FERNDALE, CALIFORNIA: 7th annual show, "Wildcat Gem Fest"; Wildcat Gem Society; Humboldt County Fairgrounds, 1250 5th St.; Fri. 12-7, Sat. 10-6, Sun. 10-5; free admission; door prizes, games, raffles, silent auction, more than 40 dealers, gems, minerals, fossils, crystals, jewelry; contact Mike Martin, P.O. Box 189, Miranda, CA 95553-0189, (707) 943-1575; e-mail: micknorma@directv.net

9-11—GREENFIELD, INDIANA: Annual show; 500 Earth Sciences Club; Hancock County 4-H Fairgrounds, 620 Apple St.; Fri. 10-7, Sat. 9-7, Sun. 10-4; free admission; silent auctions, door prizes, kids' activities, demonstrations, educational displays and programs, club meetings Sat.; contact Erit Marchani, 1328 S. Buttercup Dr., New Palestine, IN 46163, (317) 370-1008; e-mail: emarchani@sbcglobal.net

9-11—MARIETTA (ATLANTA), GEORGIA: Show; Frank Cox Productions; Cobb County Civic Center, 548 S. Marietta Pkwy.; Fri. 1-5, Sat. 10-5, Sun. 10-5; gems, jewelry, beads; contact Frank Cox Productions, 755 S. Palm Ave. #203, Sarasota, FL 34236, (941) 954-0202; e-mail: frankcox@comcast.net; Web site: www.frankcoxproductions.com

9-11—TOLEDO, OHIO: 40th annual show; Toledo Gem & Rockhound Club; Stranahan Theater Complex, 4645 Heatherdowns Blvd.; Fri. 2-8, Sat. 10-6, Sun. 11-5; adults \$4,

seniors and students \$3, children under 12 free; Midwest Federation of Geologic Societies Annual Convention, more than 22 dealers, minerals, jewelry, fossils, lapidary supplies, silent auction, club sales, scholarship raffle, exhibits, demonstrations, kids' area, mini classes; contact Jerri Heer, 247 Decatur St., Toledo, OH 43609, (419) 389-9204; e-mail: jheerx6@aol.com; Web site: www.rockyreader.com

9-11—WINSTON-SALEM, NORTH CAROLINA: 40th annual show; Forsyth Gem & Mineral Club; Educational Bldg., Dixie Classic Fairgrounds, 27th St., gate #9; Fri. 10-7, Sat. 10-7, Sun. 12-5; contact W.A. Marion, 1163 Bear Creek Church Rd., Mocksville, NC 27028; e-mail: MarionA1@yadtel.net

10-11—DOWNEY, CALIFORNIA: Annual show; Delvers Gem & Mineral Society' Women's Club of Downey, 9813 Paramount Blvd.; Sat. 10-6, Sun. 10-4; free admission; more than 20 dealers, displays, demonstrations, books, grab bags; contact Guynell Miller, 7315 Cloverlawn, South Gate, CA 90280-2819, (562) 633-0614; e-mail: guynellallen@sbcglobal.net; Web site: <http://groups.yahoo.com/group/delvers>

10-11—FAIRFIELD, IOWA: Annual show, "Gold Rush Fever"; Sac & Fox Lapidary Club; Fairfield Arts & Convention Center, Main and Briggs, 1 block north of the Square; Sat. 9-6, Sun. 10-5; adults (17+) \$3, children (6-16) \$1; Winning Wheel, gem panning, Ol' Glory Hole Mine treasure dig, gems, jewels, pearls, geodes, fossils, rocks, minerals, carvings, books, handcrafted jewelry, displays, demonstrations, door prizes, silent auction; contact Betty Morris, (641) 233-1300; e-mail: emorris@lisco.com

10-11—MOUNT PLEASANT, SOUTH CAROLINA: Show; Intergalactic Bead & Jewelry Shows; Omar Shrine Auditorium, 176 Patriots Point Dr.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

10-11—NEW MILFORD, CONNECTICUT: Show; Danbury Mineralogical Society; New Milford High School, Rte. 7; Sat. 10-5, Sun. 10-4; contact John Pawloski, (860) 354-0296; Web site: www.danburymineralogicalsociety.org

10-11—POWNA, VERMONT: Show; Northern Berkshire Mineral Club; American Legion Post #90, Rte. 7, Sat. 10-6, Sun. 10-4; adults \$4, children 15 and under free with adult; minerals, gems, jewelry, gifts, children's fish pond, prizes; contact Larry Michon, PO Box 297, North Adams, MA 01247, (413) 663-8430

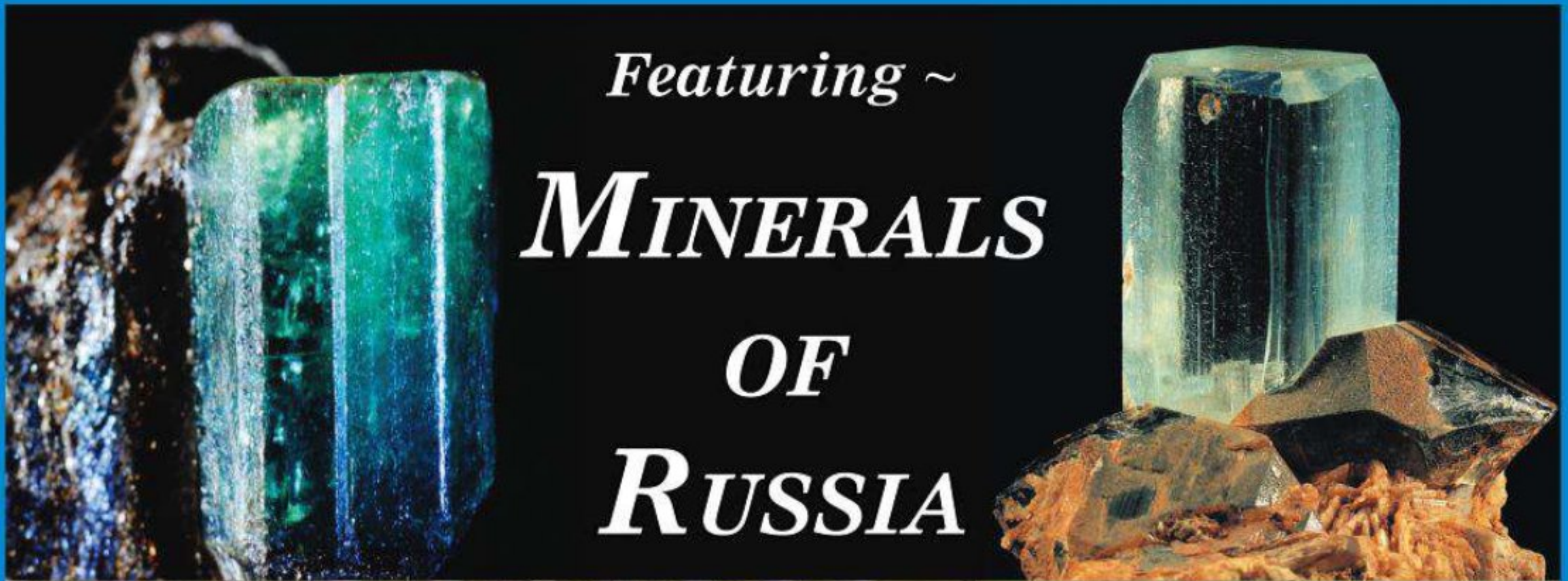
10-11—ROSEBURG, OREGON: Annual show, "Oregon Really Rocks"; Umpqua Gem & Mineral Club; Douglas County Fairgrounds, I-5 Exit 123; Sat. 10-6, Sun. 10-4; contact Eileen Paul, (541) 672-5229; e-mail: beadpatch@cmspan.net

10-11—SILOAM SPRINGS, ARKANSAS: Fall swap; Northwest Arkansas Gem & Mineral Society; clubhouse parking area, Hwy. 43 N; Sat. 9-5, Sun. 10-5; admission free; gem wash, auction Sat.; contact David Leininger, (479) 263-1424; e-mail: hulagrub@aol.com; Web site: www.nwa-rockhounds.org

10-11—WALLA WALLA, WASHINGTON: 42nd annual show; Marcus Whitman Gem & Mineral Society; Walla Walla County Fairgrounds Community Center, 9th St. and Orchard; Sat. 10-5, Sun. 10-5; adults \$2, kids under 12 free; dealers, rough, slabs, gems, minerals, beads, fossils, jewelry, equipment, silent auction, door prizes, raffle, demonstrations, knapping, gold panning, wire wrapping, rock cutting, interactive kids' section; contact Warren Rood, (509) 522-2330; e-mail: warrenrood@yahoo.com

10-18—DENVER, COLORADO: Wholesale and retail show; Eons Expos RLLLP; Denver Coliseum, 4600 Humboldt St.; Sat. 9-6, Sun. 9-6, Mon. 9-6, Tue. 9-6, Wed. 9-6, Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 9-4; free admission; minerals, fossils, dinosaurs, crystals, gems, jewelry, meteorites, children's
continued on page 24

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LEFT: EMERALD, 8 x 335 CM, IZUMRUDNYE KOPY, MIDDLE URALS, RUSSIA
RIGHT: TOPAZ, SMOKY QUARTZ & ALBITE, CRYSTAL 4 x 2.5 CM, MOKRUSHA
VEIN, MURZINKA, MIDDLE URALS, RUSSIA, FERSMAN MINERALOGICAL
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A GEM of a Geology Museum

Minerals and Fossils at the Colorado School of Mines

Story and Photos by Bob Jones

Most collectors know about the Colorado gem, mineral and fossil shows held in mid-September each year. The show in the Denver Merchandise Mart is the lead event, and the nearby Holiday Inn-Denver Central hosts a show that is just as popular. A third event in the area offers mainly decorator minerals, beads, jewelry, and cut stones. These shows have really good attendance, but most of the folks who enjoy them fail to visit the marvelous Geology Museum at the Colorado School of Mines in nearby Golden, Colorado. Perhaps the museum's name does not encourage rockhounds and mineral collectors, but it is surely one of the nicer gem, mineral and fossil museums in the area.

Every visitor to Denver, whether they're attending the shows or just visiting this mile high city, should visit the Geology Museum. If you're planning to attend the mineral shows in September, be sure to get into town a little early because, on the Saturday evening before the Merchandise Mart show opens, the Geology Museum holds an open house that is one of the most enjoyable social events held during the September shows. The purpose of the open house is to education collectors and dealers alike to the wonders of this fine facility. It is also designed to give rockhounds and collectors an enjoyable a social evening in a wonderful museum setting. Many of the leading lights of the mineral hobby attend this evening, so it has emerged as an important part of the Denver September show season.

The museum's exhibits are really special and are far from static. The staff makes sure that at least 20% of the exhibits in the museum are on extended loan. These min-



COLORADO SCHOOL OF MINES SPECIMEN

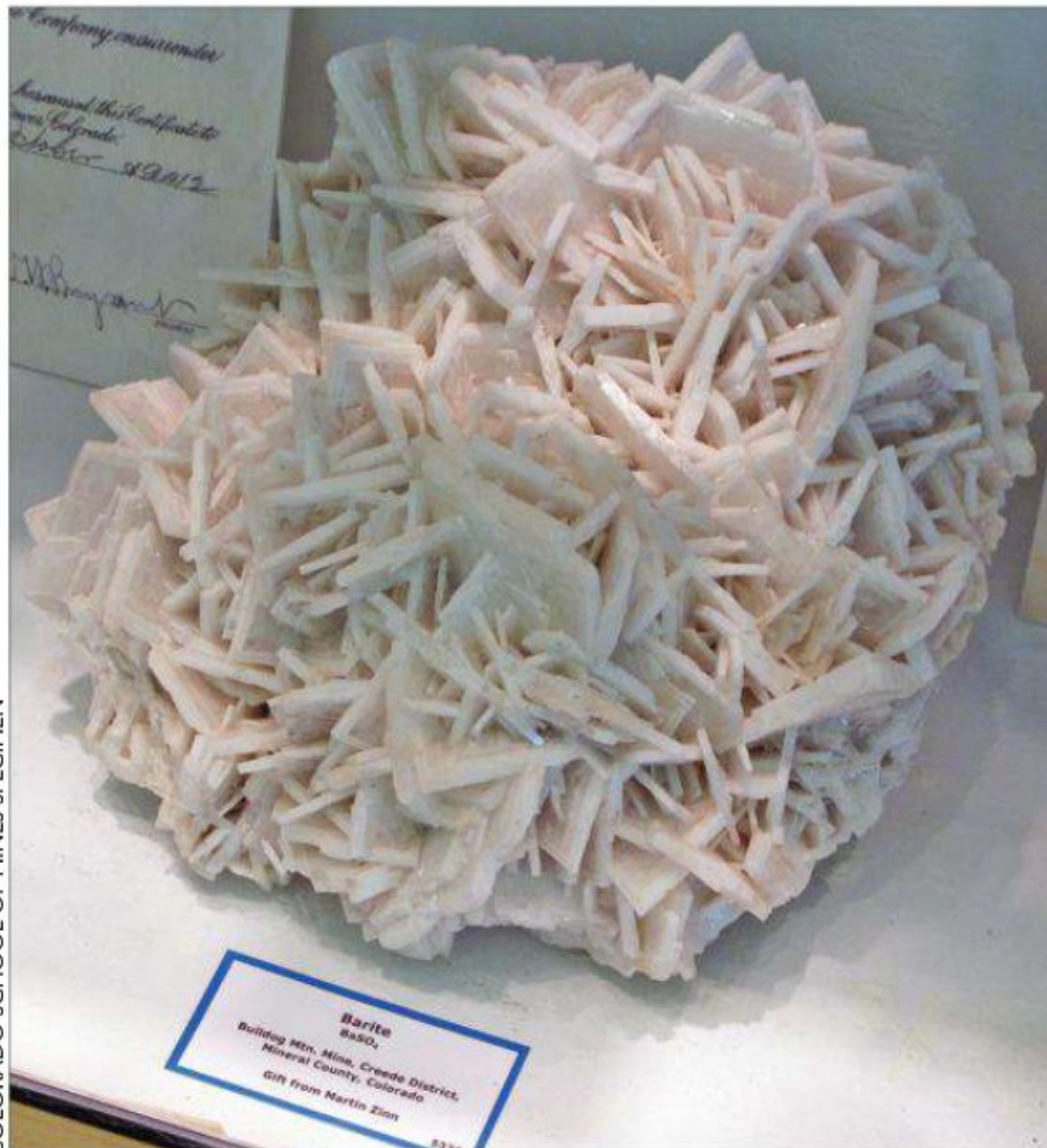
This fascinating example of a cave carbonate is just one of several that are on display in the Colorado School of Mines' Geology Museum.



The Colorado School of Mines, located in Golden, is housed in a recently constructed facility.



One of the more unusual examples of Elk Creek, South Dakota, barites is this oddly shaped mass.



Colorado is famous for its variety of fine barites, like this wonderful group from the silver mines of Creede (Mineral County).

erals come from some of the finest private collections around. Many of the specimens are among the best available and exceed in quality many specimens you would normally see in any other museum. Another 20% of the museum-owned exhibits are changed each year, so that no matter what time of year you visit, you'll find something new! The variety of exhibits at the Geology Museum ranks right up there with many better-known museums. It's no wonder the dual theme of the museum is "Gem of the Colorado Rockies". It does exhibit gems found in Colorado, but the museum itself is a real gem!

The School of Mines opened in 1873, and the Geology Museum was started by Colorado's leading geologist, Arthur Lake, in 1874, two years before Colorado even became a territory! Lake was selected as Curator of Collections, and as such he worked tirelessly to expand and gain support for the new museum.

Keep in mind that, in the 1870s, Colorado experienced a period of exceptional and very fruitful mining activity. Gold was pouring from the San Juans and the mountains west of Denver. Silver, in vast quantities, poured forth from Leadville and a dozen other areas, all of which made the state one of the richest at the time. Thanks to those silver mines, Colorado is now known as "The Silver State".

From Lake's modest beginnings, the museum has grown to boast some 50,000 mineral specimens, fossils, artifacts and gems. Many of these objects are featured in some remarkable special exhibits, including one of meteorites. The school's meteorite

collection holds 214 specimens, many of them from falls within the state. The exhibit also has a nice selection of what they call "Nots"—stones that are easily confused with meteorites, but whose origins are terrestrial, not celestial!

The meteorite exhibit also includes the "Goodwill" moon rock brought back by geologist Harrison Schmitt from his Apollo 17 lunar mission. After this moon rock was presented to the School of Mines, it apparently disappeared. Actually, it was finally found on a college official's desk!

Along with the myriad minerals and other display items at the museum, there is one feature that everyone *must* see and take the time to study. This is a series of

mining murals hanging on the walls above the exhibit cases. The murals were painted by noted Bostonian artist Irwin Hoffman for the 1939 Golden Gate International Exposition, held in San Francisco. His work won an award, and today it represents an excellent history lesson of evolution of mining through the ages!

Hoffman started his murals with a depiction of the early Iron and Bronze ages, then moved through the Egyptian and Greek mining periods and on to California's '49ers. Hoffman did justice to the rich mining period of the 1800s. The final panel really sets the tone for understanding how important mining is to all of us. Set in the 1930s, the mural depicts how mining helps



The main hall at the Geology Museum combines wall cases and free-standing cases filled with minerals.

meet many of life's needs. This is a point often missed by today's overly enthusiastic environmentalists.

Entering the museum, you walk into the main gallery. It features superb Colorado Minerals and equally fine specimens from a variety of global sources. The display cases are new and well lighted. Specimens are not jammed together, but are spaced out a bit, and an easy-to-read label accompanies each specimen.

The museum's collection is organized geographically by state and other world locations. Some of the cases feature one region, such as Europe, the Tri-State area of the Central United States, the Comstock silver find, and so on. One of the cutest exhibits features three red, white and blue Colorado minerals: rhodochrosite, Yule marble, and Mount Antero aquamarine. The Yule deposit is renowned as the source of the huge block of white marble used for the Tomb of the Unknowns in Arlington National Cemetery.

One display that is of particular interest to visiting rockhounds is probably the least colorful. It is a small, flat case of mostly zeolite minerals that have been collected on nearby Table Mountain, which is well known for its fine zeolite specimens. The significance of studying this display is that any rockhound can get directions from museum staff to collecting spots on Table Mountain. There are areas open for digging on this volcanic outcrop. Not many museums offer such a treat for rockhounds! Imagine, being able to see what you want to collect, get directions on where to collect, then go out and have a successful dig!

Just off the main room is a very special room named for Betty Llewellyn, a well-known collector and benefactor whose son, Martin Zinn, memorialized her with this room. If you are short on time, be sure to devote some of it to this room, for it houses a variety of important exhibits. Here you'll see a gold collection, a meteorite collection, and privately owned collections that are invited into the Museum, particularly during the September show period.

Betty was much loved and admired by rockhounds and collectors. She was socially active in the mineral hobby, very generous, and well known for her support of mineral projects, particularly the publication of fine books. She was a regular at all the mineral shows, and her friends in the hobby are legion. Many of us in the hobby really miss her!

The Llewellyn Special Exhibit Room houses some very important exhibits of superb privately owned mineral specimens that are seldom seen in public, placed on extended loan by local collectors. Displays



COLORADO SCHOOL OF MINES SPECIMEN

A collecting site that is still accessible is Muddy Creek, at Summittville, Colorado, which produces fine tabular barites.

are changed regularly. One of the permanent displays in the Llewellyn Room features more than 120 gold specimens, a remarkable assemblage of fine, historically important specimens.

The gold collection has an interesting history. Assembled by one person, it was shifted about and ended up in a pawn shop some years ago. It was finally rescued and has ended up at the School of Mines. The variety of localities represented by this nice collection makes it well worth studying.

The meteorite collection is excellent, as it offers fine examples from some of the better known meteorite falls, as well as the aforementioned moon rock.

The current director, Dr. Bruce Geller, was kind enough to take me on a "Cook's Tour" of the museum. Bruce deserves credit for inviting one or more advanced

collectors to display exhibits in advance of the September open house. These rotating special exhibits are refreshing and encourage people to come to the museum again and again. In today's specimen market, few museums can compete for spectacular specimens with private collectors, so it is a treat to see some of these top-drawer specimens that seldom make it into the public domain.

The museum has far more than just a mineral gallery. One floor down from the main exhibit hall is a whole battery of special exhibits and interactive displays. I particularly liked the fluorescent mineral display equipped with daylight and ultraviolet lights on timers. There are also plenty of fossils exhibited. This should not be surprising since, Colorado holds some of the richest deposits of fossils, particularly from the Mesozoic



Editor Bob Jones checks out the Geology Museum display case set aside for European specimens.

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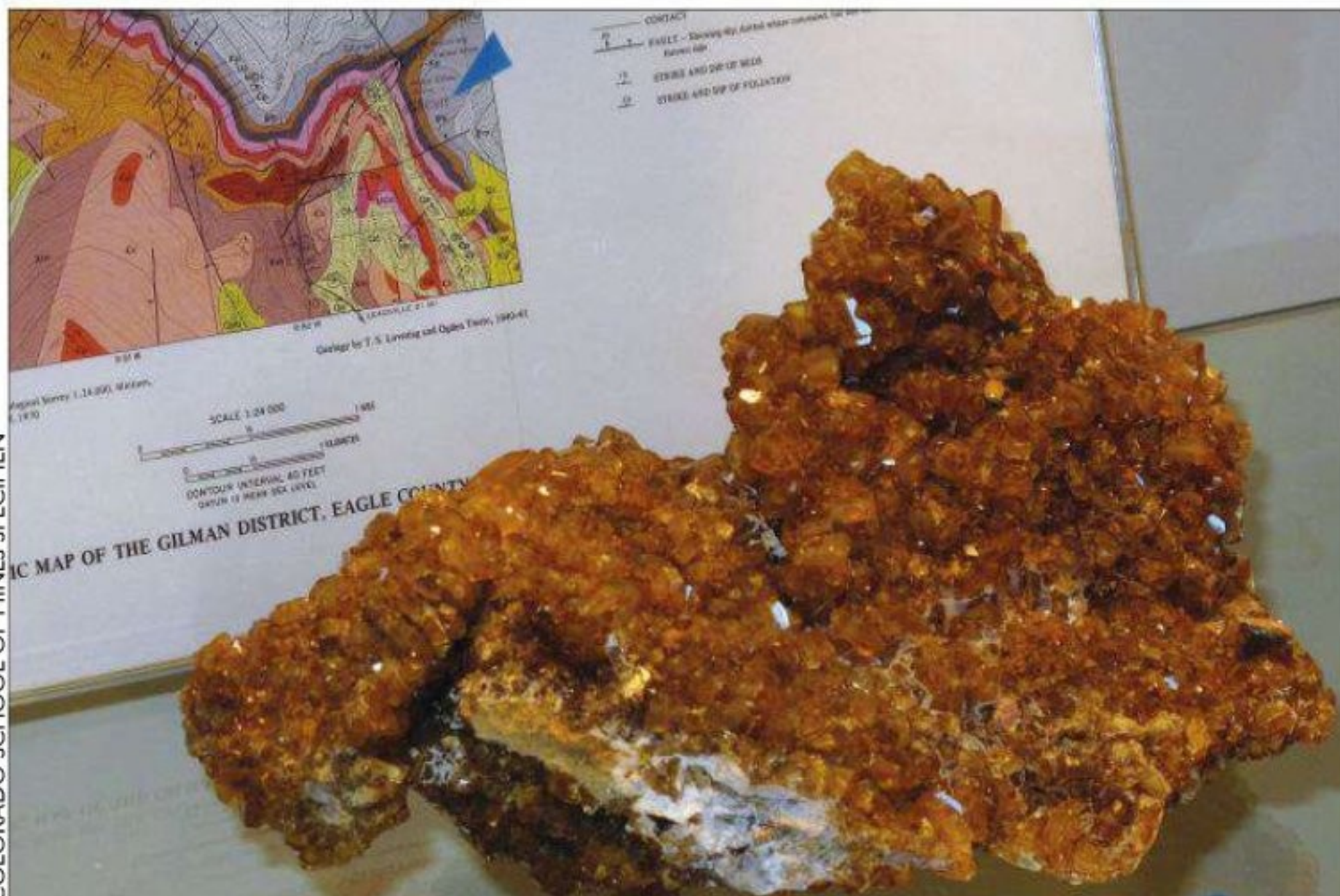
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The mines of Gilman, Colorado, once produced huge quantities of fine golden barite. This display combines a fine barite with a geologic map of the Gilman district.

Era. In fact, the first American dinosaur fossil find was made in Colorado.

Today, you can visit Dinosaur National Monument in the western part of Colorado. So many fossil remains of dinosaurs were found here that the place was declared a National Monument. Workers then proceeded to excavate fossils, leaving some in place, partially exposed, so visitors can see and identify the remains. Excavation is still ongoing here, making Dinosaur National Monument an exciting place to visit.

Actually, you don't have to go to western Colorado to see dinosaur evidence. Just take the Geology Museum's walking tour! The tour, which begins at the museum, leads past seven different types of rock formations, some of which contain exposed dinosaur footprints, fossilized palm trees, and other evidence of ancient life. You can take the tour on your own or, for a more detailed tour, make a reservation for a guided tour.

In the area of fossil instruction, the museum provides teachers with well-assembled fossil kits, very much like the mineral kits that are also available. These kits can be taken on a three-week loan for use in the classroom. As a former teacher, I can appreciate the value of this effort. The mineral and fossil kits are assembled by student volunteers. In fact, on my fall visit, a couple of students were busy stocking a couple of kits with good rock samples, teaching guides, a useful lens, and a book titled *Stories in Stone*. This is just one way the museum fulfills one of its missions: to promote education and inspire curiosity of the world around us! The museum is open seven days a week. For hours of operation and to get more information about the mineral or fossil kits, visit www.mines.edu or e-mail geomuseum@mines.edu.

The September mineral shows in Denver have become one of the more significant mineral events in this country. Some consider them more relaxing and enjoyable than the great Tucson, Arizona, event in February for the simple reason they are more concentrated and the pace seems less frenzied.

The main Denver show is the three-day Denver Gem & Mineral Show in the Merchandise Mart, put on by the eight member clubs of the Greater Denver Area Gem & Mineral Council (www.denvermineralshow.com). Folks like the free parking and the variety of museum displays. Of particular interest to rockhounds are the exhibits of personally collected minerals put in by the members of local mineral clubs and other local rockhounds. These are very encouraging to those of us who enjoy doing our own digging! The Colorado Fossil Expo, put on by Martin Zinn Expositions (www.mzexpos.com), is part of this show.

Starting earlier and running through the same time period as the Denver Gem & Mineral Show is the fall Colorado Mineral & Fossil Show, held by Martin Zinn Expositions in the Holiday Inn-Denver Central, just a few blocks from the Merchandise Mart. These shows are connected by a shuttle service, so parking is not a bad problem. Martin Zinn Expositions is well known for hosting a fine dealer expo.

The open house at the Colorado School of Mines Geology Museum is now a significant part of the overall September event in the Denver area. Many collectors arrive early to include a museum visit in their Denver stay. You should, too, the next time you are in the Denver area. You won't regret your visit, and if you bring a rock hammer, you can always challenge nearby Table Mountain for a good zeolite specimen or two! ♥



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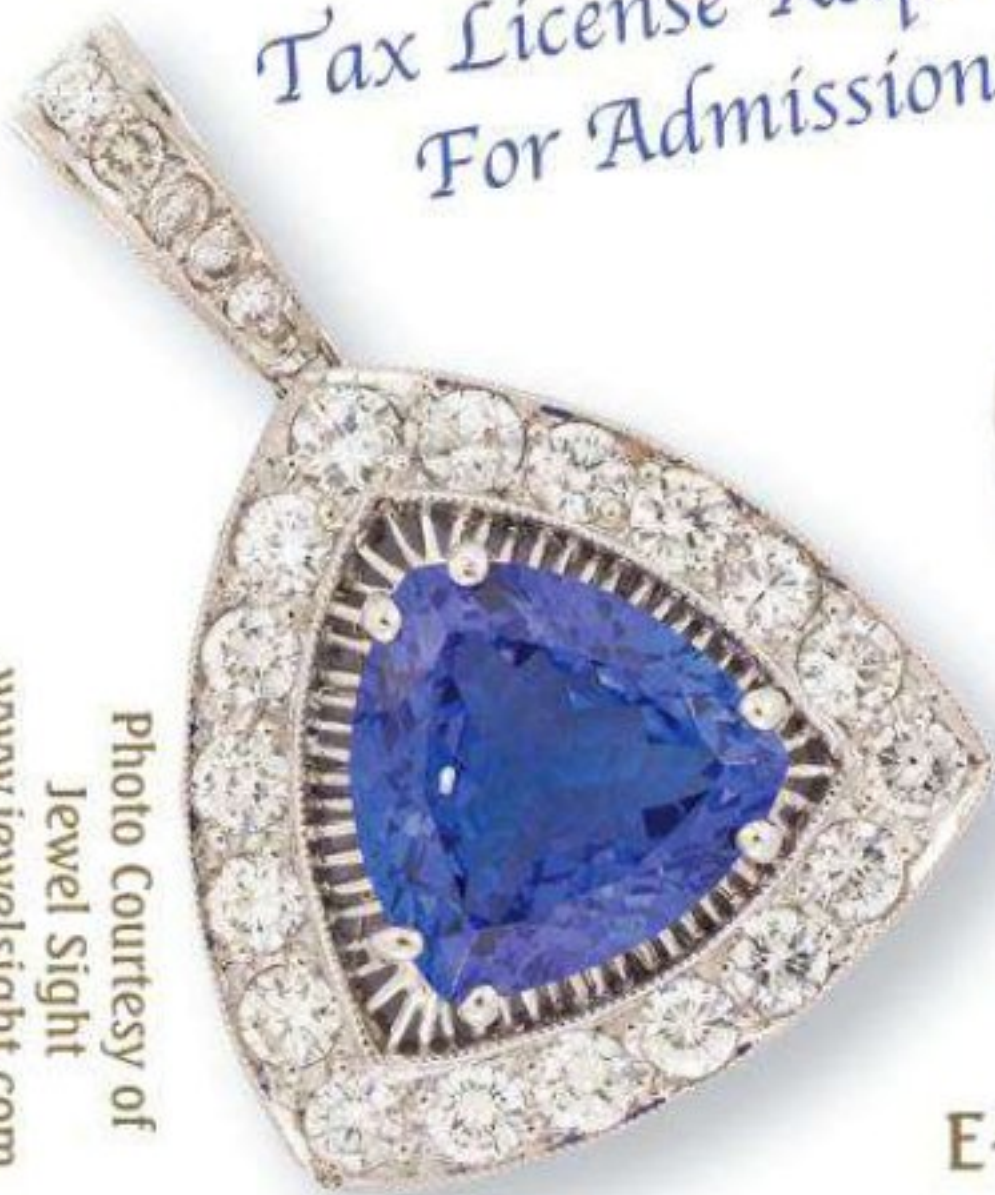


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by William A. Kappelle

Machine Maintenance and Repair

Lapidary machines, which include slab saws, trim saws, capping machines, tumblers, flat laps, and even faceting machines, are all subject to normal wear and, if they are treated badly, may have major or premature wear. All will, at some time in their life, need repair parts. Fortunately, most lapidary machines are built like battleships and, with just normal maintenance, will last for generations. Even when they are badly neglected, some of these machines just run and run.

Years ago, when I was the principal of a continuation high school, I placed an advertisement in a local rock club's newsletter for donations of any lapidary equipment that someone might have lying around unused. I really didn't have high hopes that I would get any, but lo and behold, a local lady who had been a rockhound and lapidary for many years was blind sided by time and had to move into a rest home. Her family saw my request in the newsletter and generously donated a slab/trim saw, a flat lap, miscellaneous parts and tools, and two old World War II foot lockers full of cutting material to the school.

Unfortunately, the machines had not been cleaned or serviced in what looked like two centuries. They were suffering from advanced gunk disease and rust. Amazingly, after just a little scrubbing to get the gunk off and a little oil on the motor bearings, both machines were running like Swiss watches.

Perhaps the biggest problem with old machines that are in need of repair is finding parts to fit them. Because these machines last so long, it is very common for the original manufacturer to be out of business. Often, though, another company will have bought out the first company and may still have the parts you need squirreled away. If this is your problem, you might try the following Web site <http://tomaszewski.net/Kreigh/Minerals/Home made.shtml>. Scroll down to the "What ever happened to" section and see if your manufacturer is listed.

Often, the bearings are the part of the machine that go first because the owner neglects to oil them. Fortunately, very few manufacturers have had custom



bearings made for their machines, so they can very often be replaced with standard-size bearings. Try the Web site www.bearingsdirect.com for bearings.

If they have been allowed to rust badly, the arbors, arbor shafts and spacers are also prime candidates for replacement. Look for new ones online at www.covington-engineering.com.

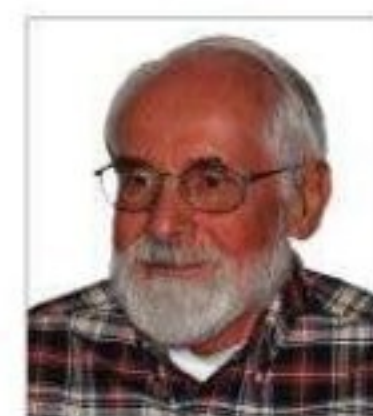
Motors are another lapidary machine part that last a long, long time. They can fail, though. If yours has, check with www.surpluscenter.com and www.e-motorsonline.com for a new one.

V-belts and pulleys can also wear out. V-belts can usually be found at an auto parts store. For pulleys, look at www.amazon.com or <http://brands.hardwarestore.com/chicag-die-casting.aspx>.

These Web sites should get you in the ballpark of what you're looking for, but if they don't help you, just try a search engine like Google and type in what you're looking for. You will be deluged with sources and prices. Don't forget that many of these parts can be found in local hardware stores or home centers, too.

I hope you don't have any of these problems with your lapidary machines, but if you do, help is just a click away. 💎

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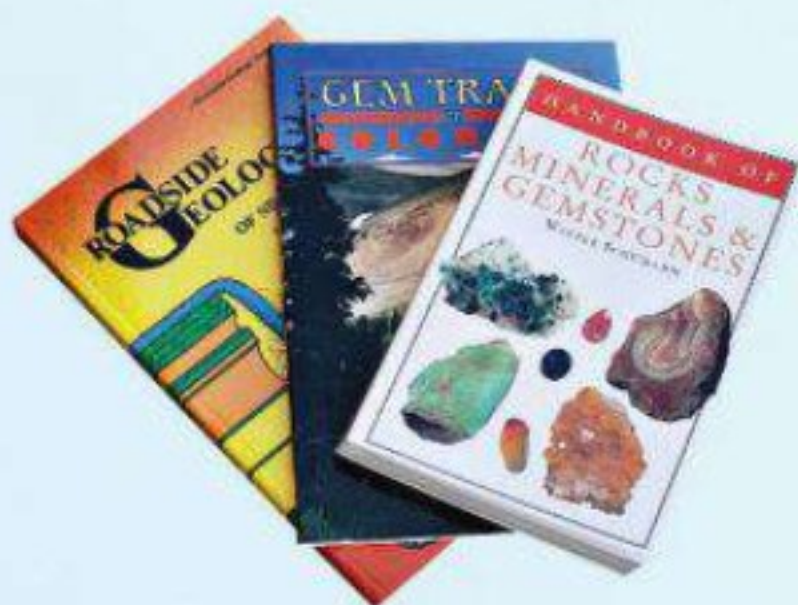
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GRAVEYARD POINT PLUME AGATE

Fee Collecting in East Central Oregon

Story and Photos by Jim Landon

Graveyard Point, in east central Oregon, is a collecting area I have heard about for many years. The plume agate from this locality is very distinctive and probably resides in the collections of many rockhounds in the country. This past winter, when I had some down time, I was checking out rock-related Web sites and came across one for The Gem Shop in Cedarburg, Wisconsin. The owner, Eugene Mueller, was familiar to me, for he had written articles for *Rock & Gem* magazine in the past that featured some of his adventures collecting rare Mexican agates

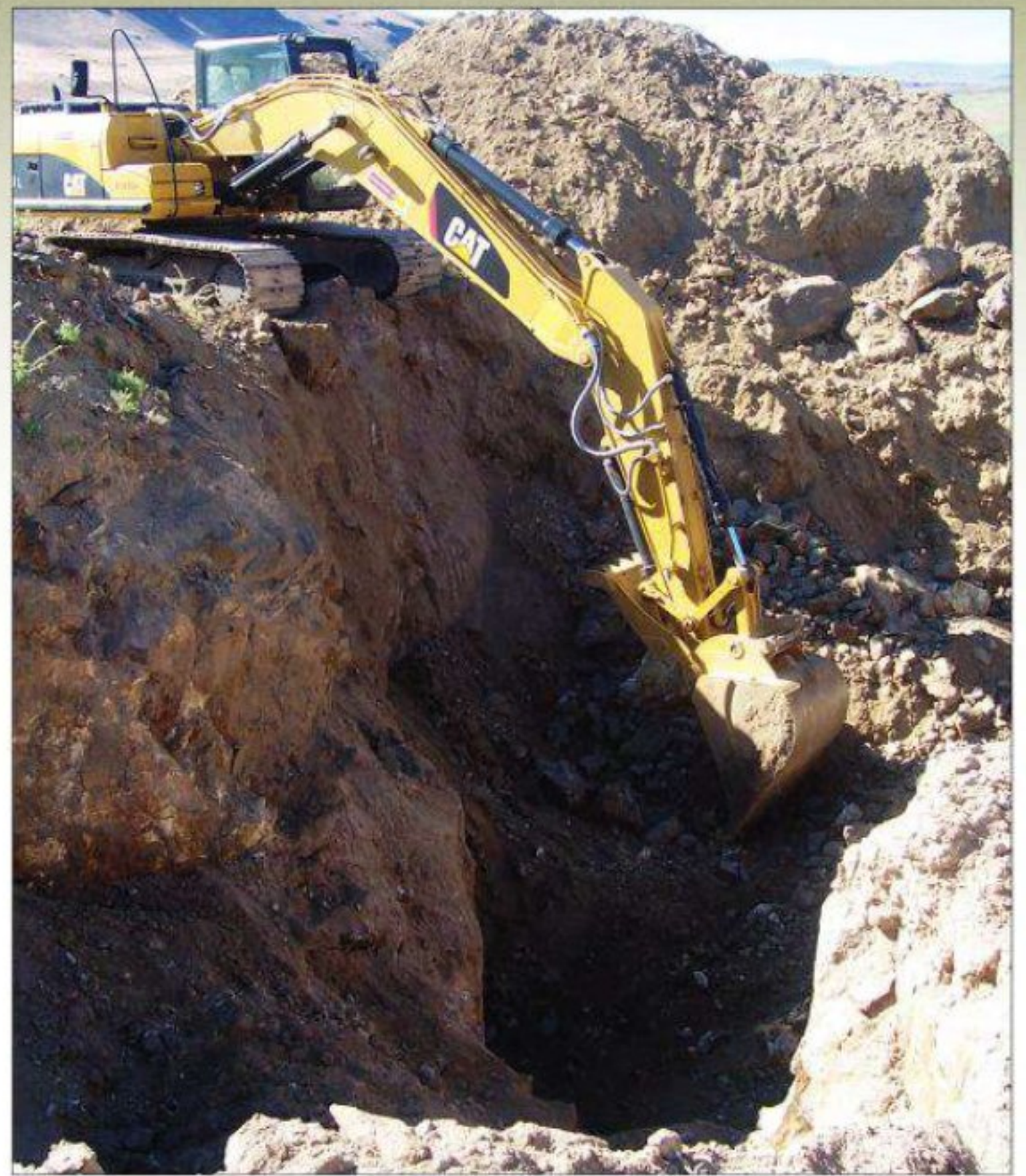
and Oregon jaspers. On his Web page, www.thegemshop.com, I found that he was planning to lead a collecting trip to his Graveyard Point plume agate claim, the Beverly Marie, in June 2011, so I contacted the shop to see if it was possible for me to come down for a visit. I was not only granted permission, but was also provided with detailed information on collecting rules and directions to the claim.



This newly exposed seam in the pit at Graveyard Point contains the less desirable blue and gray agate, which constitutes the bulk of the agate found on this claim.



Gene fashioned a muck bucket out of a 55-gallon steel drum and used it to help dig out backfill from the cave he had discovered in 2007.



The reach of the trackhoe allows Gene to excavate the pit from all angles. He removes loose rock and dirt from the quarry walls to make it safe to work in.



This agate seam has a void in it with delicate chalcedony stalactite formations projecting down from the walls.



Gene and his long-time collecting partner, Jake Jacobitz, had frequent conversations about how to extract agate from seams without damaging it.

I packed my truck and headed out of Yakima, Washington, early on the morning of June 12. The drive down Interstate 84 and then Interstate 82 through Oregon was familiar to me, as I had made the trip many times in the past. I continued south past Pendleton, Oregon, where wheat fields stretch to the horizon to the north and west, into the Blue Mountains. When I left Interstate 82 at the Payette/Parma exit and headed south toward Homedale, Idaho, I

was entering uncharted territory for me. I was surprised to find that it very closely resembled the Yakima Valley in Washington, where I am from, in many ways. Irrigated orchards and hop yards, along with wheat and corn fields, covered the whole area.

I had heard stories about Graveyard Point from members of my Yakima rock club who had collected there in the past, but no one had been there in many years. I knew it was seam agate and that the

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A several hundred-pound mass of welded agate and opal was encountered during mining that yielded several buckets of good agate when it was broken up.

seams were difficult to follow, as most were vertical in the basalt country rock, but that was about all the information I had to go on.

The directions given me were very detailed and I had no problem finding the claim, and when I rounded a point the directions described, I could see Gene's camp on a hill off in the distance. It was evident that the unusually persistent rains we had been getting all spring in the Northwest had at some point made the road to the claim nearly impassable. There were numerous deep ruts that could high center most vehicles if their drivers were not careful. When I arrived at the camp there was no one around, so I walked over to where a large pit had been excavated and found Gene and a couple of his mining buddies busily working at exposed agate seams. After introductions were made all around, I went back up to get changed into my digging clothes.

Gene and his crew had already been on site for a week and the CAT 320 D trackhoe he had rented had been used to open up a large area in the basalt country rock. He told me that the Bureau of Land Management requires him to fill in his excavations each year, so as mining progresses, he has to spend quite a bit of time opening up a new area each season.

A miner is like a rockhound on steroids. I was told the economics of the business require the use of heavy equipment and that production is directly proportional to the amount of rock that is moved. At Graveyard Point, digging by hand really limits what can be recovered. The vertical nature of the agate seams makes it very difficult to follow them downward for any distance. On top of that, nearly half the agate seams encountered are predominately blue-gray and opaque, with few—if any—plumes. The effort and expense of extracting and transporting lower-grade agate doesn't pencil out when no one will buy it or spend what

it would take to make a profit; therefore, this material is just thrown back into the pit and buried.

On the morning of my second day, I watched Gene operate his trackhoe. In some ways, he resembled a surgeon with a scalpel. He would deftly extend the bucket up to the wall of the pit and use only one tooth of the bucket to strip the rock off in layers. Everyone else served as spotters, checking for any agate seams that might be encountered. Each pull made the ground shake, and plumes of rock dust burst from the exposed basalt and hung in the pit like white fog. During this process, several seams of agate were exposed, some of which had voids with crystals or chalcedony stalactite formations in them. Occasionally, the miners would run into formations in the voids that they were calling "angel wings". These were quite delicate and required careful extraction. Most of the agate encountered was blue, gray or clear and was discarded, while anything with color or plumes showing was placed in 5-gallon buckets after the basalt country rock had been trimmed off.

Distinguishing the quality of the agate often required the tried-and-true lick test. This was usually followed by the spitting out of grit that was still adhering to the rocks. Some of the chunks recovered had delicate pink plumes in them, while others were gold, yellow, red, black and cream. The area Gene was working is known for this multi-colored plume agate. Although lots of agate was uncovered, only a portion was deemed good enough to save. I was told later that a miner named Bill Tallman, who is now deceased, was the first to refer to this material by the name Regency Rose.

As the morning progressed, the agate seams gave out and we hit an area of barren basalt with just a few thin agate stringers running through it. Later in the day, Gene had progressed enough to reach



Agate from the 2011 dig season is sorted into piles of multicolored plume agate (foreground) and blue agate with white and black plumes from another pit on the claim.

an area of the pit in which his long-time collecting buddy, Jake Jacobitz, had been recovering good agate. This exposure consisted of a large silicified mass of mixed agate and opal surrounding chunks of basalt. After considerable digging and maneuvering of the trackhoe, Gene was able to pull free a several hundred-pound mass. Most of the rest of the day was spent trying to break up this mass with hand tools to extract the usable agate.

One of the things I found most interesting about this trip was a cave that Gene had exposed in the basalt in 2007. I had read about this discovery on the running blog Gene keeps on his Web site (www.thegemshop.com) and was delighted to see that he had exposed it again this year. A lot of agate plates had been removed from it in the past, but there was a smaller side chamber that was still intact. The walls and floor of this cavity were covered in a layer of agate several inches thick. The opening was large enough to crawl into and my 6-foot-plus frame could easily stand up in the cave. It was quite impressive.

Gene told me that the main part of the cave, from which the plates of agate had been removed, extended to an unknown depth below where we were standing and the plan was to remove all of the backfill dirt and rock from the previous year to see where it went. He and his crew rigged up a 55-gallon steel drum with chains to use as a muck bucket. We tried it out the evening before I left and it worked pretty slick. Gene told me that the agate plates he had removed and taken back to his shop in Wisconsin were not of high enough quality to warrant removing any more at this time. Perhaps some museum might want to acquire the contents to make a reconstruction of the cave some day. It would be a natural wonder that could and should be preserved for posterity.

On my last day at the claim, Gene, Jake, and the rest of his crew headed for the pit to continue mucking out the bottom of the cave. Economically, it wasn't a venture that was going to produce capital, but it sure was great seeing these long-time miners down in a hole, exploring. I guess, ultimately, this is what mining and rock hunting in general are all about: the thrill of discovery and wanting to know what might be lying just below that next shovelful of dirt and rock. I could hear the sounds of their conversation and laughter emanating from the pit as they jostled the drum around with the bucket of the trackhoe. I look forward to reading about the results of this venture on future blogs on Gene's Web site.

Gene allows collecting on his Beverly Marie plume agate claim and another claim he owns called the Blue Mustang. Anyone wishing to do so must first contact The Gem Shop to obtain and fill out a letter of agreement, which outlines the rules and regulations. A copy of this document must be on file at The Gem Shop before you can enter any of the claims. Send an e-mail to mail@thegemshop.com or call (262) 377-4666, or visit www.thegemshop.com. I recommend that you visit the Web site, as it has lots of information on past digging seasons and shows material Gene has for sale. The Mexican agates are quite tempting.

All material removed from the claims costs the digger 50 cents per pound. Gene operates on the honor system, which I found to be quite refreshing. There are numerous veins of agate exposed or lying just below the surface on his claim, so the diligent collector should be able to do quite well. I came home with a bucket of tumbling material and a great specimen that shows agate veins and the country rock it is found in. The Graveyard Point plume agate claim is a great place to visit in late spring before the heat of summer. The views are spectacular. 💎

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14-18—DENVER, COLORADO: Show, "Denver Coliseum Show"; Eons Expositions LLC; Denver Coliseum, 1900 44th St.; Wed. 9-6, Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 9-4; free admission; minerals, fossils, rough, gems, jewelry, amber, meteorites; contact Lowell Carhart, 7514 Antelope Meadows Circle, Peyton, CO 80831, (516) 818-1228; e-mail: lowellcarhart@yahoo.com; Web site: www.DenverColiseumShow.com

14-18—DENVER, COLORADO: Fall wholesale/retail show, "Colorado Mineral & Fossil Show"; Martin Zinn Expositions; Holiday Inn - Denver Central, 4849 Bannock St.; Wed. 10-6, Thu. 10-6, Fri. 10-6, Sat. 10-6, Sun. 10-5; free admission; 200 wholesale and retail dealers, free shuttle to Merchandise Mart; contact Martin Zinn Expositions, PO Box 665, Bernalillo, NM 87004-0665; e-mail: mzexpos@gmail.com; Web site: www.mzexpos.com

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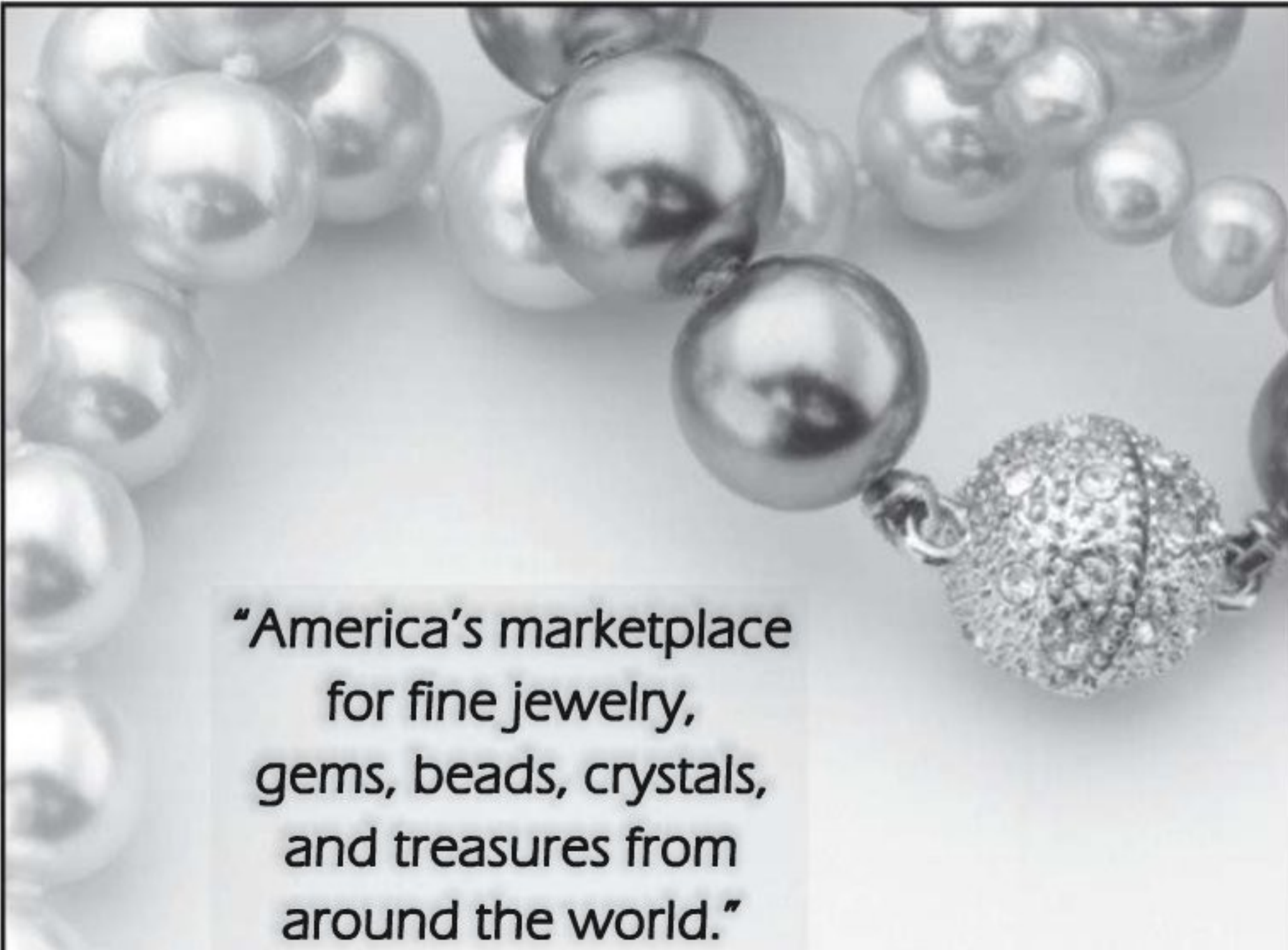
16-18—BEREA, OHIO: Show and sale; GemStreet USA; The Cuyahoga County Fairgrounds, 164 Eastland Rd.; Fri. 10-6, Sat. 10-6, Sun. 11-5; adults \$7, seniors (60+) and students (12-17) \$5, children under 12 free; gems, jewelry, beads, fossils, minerals; contact Jane Strieter Smith, (216) 521-4367; Web site: www.gemstreetusa.com

16-18—DENVER, COLORADO: Show, "Colorado Fossil Expo"; Martin Zinn Expositions; Denver Merchandise Mart Plaza Annex, 451 E. 58th Ave.; adults \$6, seniors and teens \$4; Fri. 9-6, Sat. 10-6, Sun. 10-5; 50 dealers, fossils, meteorites, petrified wood, amber, paleontological exhibits, part of the Denver Gem & Mineral Show; contact Martin Zinn Expositions, PO Box 665, Bernalillo, NM 87004-0665; e-mail: mzexpos@gmail.com; Web site: www.mzexpos.com

16-18—DENVER, COLORADO: Annual show, "Minerals of Russia"; Greater Denver Area Gem & Mineral Council; Denver Merchandise Mart, 451 E. 58th Ave. (I-25 Exit 215); Fri. 9-6, Sat. 10-6, Sun. 10-5; adults \$6, seniors and students \$4, children under 13 free with adult; dealers, demonstrations, speakers, exhibits, free gem and mineral identification, kids' activities, free gold panning, Colorado Fossil Expo; contact Larry Havens, Greater Denver Area Gem & Mineral Council, c/o Denver Museum of Nature & Science, 2001 Colorado Blvd., Box 4, Denver, CO 80205, (303) 233-2516; e-mail: info@denvermineralshow.com; Web site: www.denvermineralshow.com

16-18—ENID, OKLAHOMA: Annual show and sale; Enid Gem & Mineral Society; Oak Wood Mall, 4125 W. Owen K. Garriot Rd. (Hwy. 412W); Fri. 10-9, Sat. 10-9, Sun. 12-6; free admission; rocks, gems, minerals, jewelry, beads, fossils, rock food table, junior activities, grab bags, demonstration, door prizes; contact Billy Wood, (580) 234-5344 or (580) 402-5568; e-mail: baronladiislaus@att.net

continued on page 34



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ROCK SCIENCE

by Steve Voynick

Hübnerite, Wolframite and Tungsten

Of the many base metals that are vital to science, industry and society, tungsten is among the most valuable—and among the least familiar. Elemental tungsten is a heavy, brittle, silvery-white metal with a bright, metallic luster. Its unusually high specific gravity of 19.5 makes it even denser than gold. Ranking 59th in crustal abundance, tungsten is about as common as silver.

Hardness and thermal properties set tungsten apart from all other metals. At Mohs 7.5, elemental tungsten is substantially harder than quartz. Yet, it is so brittle it can be cut with a hacksaw.

Tungsten's melting point of 6,170°F (3,410° Celsius) is by far the highest of all metals, more than twice that of iron. Its boiling point of 10,220°F (5,660° Celsius) actually approaches the temperature of the surface of the sun. Much of tungsten's value lies in its ability to impart some of its hardness and thermal properties to steel alloys.

Although it was recognized as an element in the 1780s, tungsten remained a laboratory curiosity for more than a century. Then in 1900, when metallurgists were seeking a suitable filament material for newly developed incandescent light bulbs, tungsten's extremely high melting point, high output of light per watt of electricity, and excellent electrical conductivity at elevated temperatures made it ideal.

At that time, metallurgists were also introducing the first "high-speed" tungsten-steel alloys that retained sharpness and rigidity even at the elevated temperatures encountered in high-speed machining. Researchers next developed tungsten carbide, a synthetic tungsten-carbon compound with a hardness approaching that of sapphire (Mohs 9.0). By sintering powdered tungsten-carbide particles together, metallurgists produced an extraordinarily hard, tough solid called "hardmetal" that revolutionized the metalworking industries.

Tungsten's story actually began in the 1500s, when German tin miners noted that a strange mineral associated with tin ores formed a surface smelter scum that reduced tin recovery. German scholar and mining author Agricola (Georg Bauer) named this unknown mineral *volfram*, an allusion to the troublesome smelter froth that "devoured tin like a wolf". This name was later Anglicized



Dark crystals of hübnerite associated with clear quartz prisms make interesting specimens.

to wolfram, from which tungsten's chemical symbol (W) was taken.

Mineralogists initially assumed that wolfram was a single mineral, a manganese iron tungstate. But in the 1860s, they learned that wolfram was actually a solid-solution series with hübnerite (manganese tungstate) and ferberite (iron tungstate) as end members. The intermediate grades of this series became generally known as "wolframite" (not a formal mineral name).

Today, wolframite is the primary ore of tungsten, while hübnerite is a minor ore. The only other tungsten-ore mineral is scheelite (calcium tungstate). Three-quarters of all tungsten goes into hardmetal and tungsten-steel alloys. Another 12% is used to manufacture tungsten filaments for light bulbs and X-ray and electron guns. The remainder is used in welding electrodes and electrical components for high-temperature ovens, and in chemicals for catalysts, pigments, and special lubricants.

The most collectible tungsten-bearing mineral is hübnerite. Its dark, striated, bladed crystals, sometimes with subtle hints of red, make intriguing specimens, especially when associated with clear quartz prisms. And no less interesting is the remarkable metal within those crystals. ♦

Steve Voynick is a science writer, mineral collector, former hardrock miner, and the author of books like *Colorado Rockhounding* and *New Mexico Rockhounding*.



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The 2011 GIA SYMPOSIUM

Renowned Speakers, Fantastic Exhibits, and Once-in-a-Lifetime Field Trips

Story by Helen Serras-Herman

The Gemological Institute of America (GIA) held its 5th International Symposium at its World Headquarters in Carlsbad, California, May 29-30, 2011. Titled “Advancing the Science and Business of Gems”, it was an exceptional event, full of incredible lectures, renowned speakers, fantastic exhibits, and

once-in-a-lifetime field trips, that attracted 710 attendees from 35 countries. This diverse audience consisted of researchers, jewelers, gemologists, appraisers, miners and students, as well as 200 GIA staff members. My husband, GIA graduate gemologist Andrew Herman, and I attended the symposium as Poster Session presenters.

The 2011 GIA Symposium actually started on May 28 with the pre-symposium optional events. There were three workshops—an Advanced Diamond Grading Workshop, a Pearl Grading Workshop, and a Gem Identification Challenge—and two important field trips. One went 35 miles south to San Diego to visit the exhibit “All that Glitters: The Splendor and Science of Gems and Minerals” at the San Diego Natural History Museum, and the other went to three pegmatite mines, located near the town of Pala, California.

We opted for a once-in-a-lifetime field trip to the tourmaline mines, since we had visited “All that Glitters” before we headed into Carlsbad. This fabulous exhibit, which runs through Apr. 8, 2012, features mineral specimens, jewelry and objects d’art, all marvelously displayed. The museum is located in Balboa Park, in San Diego. Hours, ticket prices, and more information can be found at www.sdnhm.org.

The symposium was carried out in three forums: the Research and Business lecture tracks and the Poster Session. It was really hard to decide which lectures to attend. The Research session topics included diamond identification, ex-



The 2011 GIA International Symposium began with a keynote session on global finance and commerce presented by businessman and publisher Steve Forbes.

ploration and development of new gem deposits, testing of lead-glass treated rubies and beryllium-treated sapphires, identification of natural and treated nephrite from China, detection of naturally colored tanzanite, pearl identification, and new technologies and instrumentation. A very informative lecture that we attended on Australian opal, presented by Australian gemologist and appraiser Helen Levonis, covered a new proposed nomenclature and assessment system for all precious opals, including Mexican Fire opals and Ethiopian opals. The system gives points to Three Cs—Category, Color and Cut. Depending on the total number of points, opals are classified in five groups, from Exceptional to Promotional. Levonis distributed a great informational package.

A great session titled “Masterminds and Thieves: Tales of Intrigue, Swindles and Heists”, presented by Patrick Peys, of the Belgian Federal Police in Antwerp, was about the real-life adventures of the Diamond Squad in trying to recover gems stolen in one of the biggest jewelry and gem heists in history. They were able to follow a meager trail of evidence, connect the thieves and bring them to justice, but have not yet been able to find any of the stolen diamonds.

The first group of lectures in the Business session covered the topic “Where Is Luxury in This Brave New World?” Presentations were about the luxury markets and how companies have succeeded in them. Jeweler Amit Dhamani, CEO of Dhamani Jewels, stated that “luxury is a symbol of indulgence”. Vice President of Van Cleef & Arpels Nicolas Luchsinger gave a brief overview of the company, and Ulkir Thyssen, Vice President of Pandora discussed their “affordable luxury” products and their meteoric rise to success worldwide.

The second group of lectures discussed “Jewelry Design: From the Masses to Museums”. Martin Katz talked about his jewelry designs worn by the stars on the red carpet; Shivan Sarna, a 12-year veteran Show Host at the Home Shopping Network, gave out advice on the power of the word “now” and the positive effect of smiling and eye contact in sales; and Wallace Chan, an amazing jewelry and gem artist internationally recognized for his revolutionary designs and techniques, elaborated on his work and style and the importance of the “ergonomics of a piece of jewelry, of how well it sits on the body”.

In another group, discussing the “Future of Gems and Gems of the Future”, was Stuart Robinson, Research Director of Gemworld International Inc., who talked about minerals rights and how to protect consumer confidence with disclosures about treated, blended and coated gems. Martin Rapaport, Chairman of The Rapaport Group, followed with a stimulating and entertaining presentation about how important it is to “tell the truth” about treatments and that, despite all the treated and low-grade stones on the market today, “thirst for the real thing is still there”. He said, “people want what they can’t have, and what they treasure most about what they have is that other people don’t have it”. Douglas Hucker, CEO of the American Gem Trade Association, talked about the importance of color trends in fashion and jewelry, and how to follow the two-years-out projections by Pantone, the leading company in color trends.

In the “Everything Old Is New Again” group topic, Gary Schuler, Senior VP of Sotheby’s New York Jewelry Department, talked about 2010 being a record year for Sotheby’s auction house, showcasing the large diamonds and jewelry that set records. The last presenter was the very charismatic Rick Harrison, star of the History Channel’s series “Pawn Stars” and owner of The Gold & Silver Pawn Shop on the famed Las Vegas strip, telling his story of how he started on TV with a PBS documentary and developed his current show, which now brings about 4,000 visitors a day to his store. He

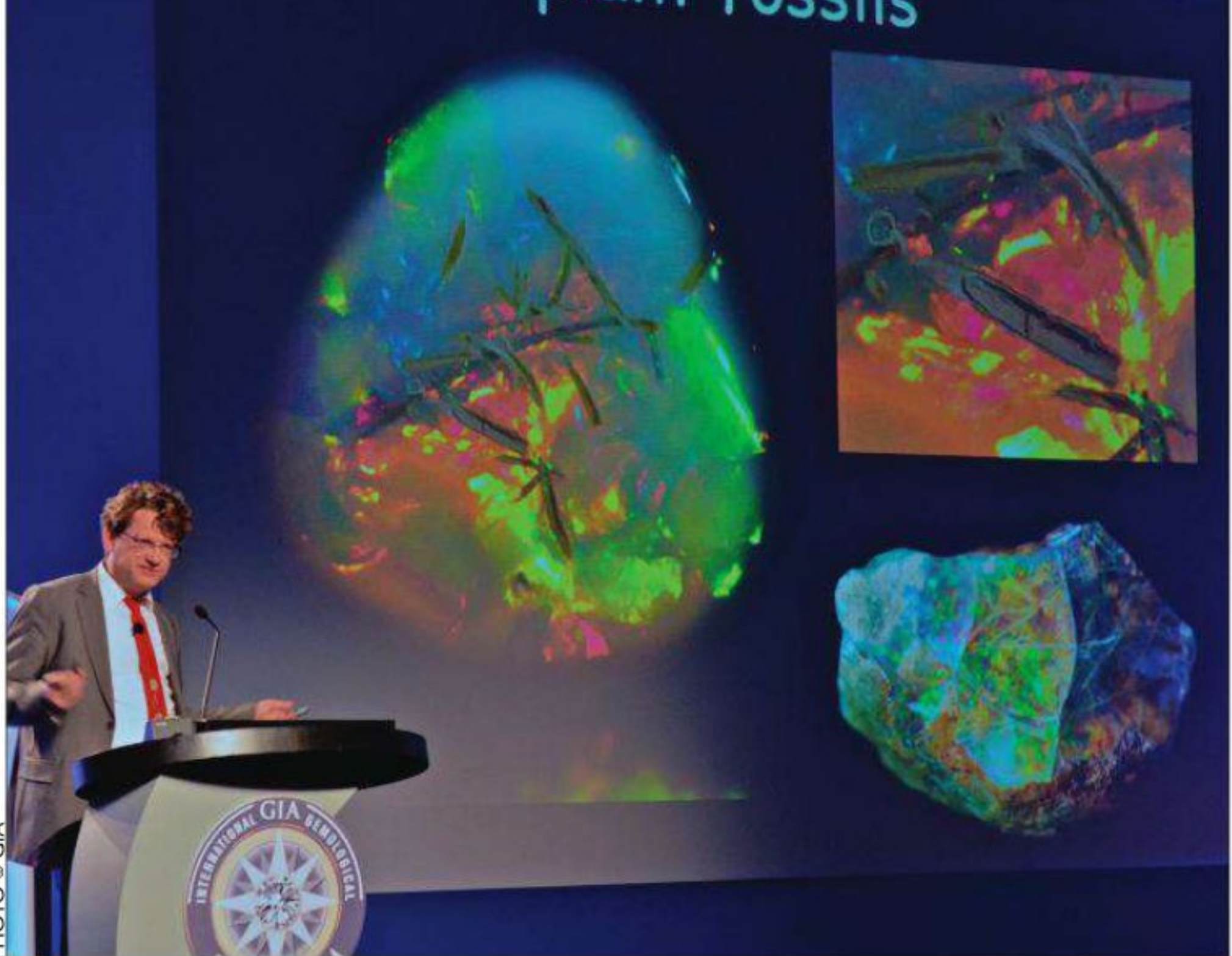


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Dr. Emmanuel Fritsch, of the Institut des Matériaux Jean Rouxel, University of Nantes, France, presented “Advancing the Understanding of Luminescence in Gem Materials” as part of the Research track.

pointed out the importance of weaving the story into the item being sold.

The topics that attracted a lot of online media attention during and after the symposium were social behavior, social media, and digital marketing. Ken Royal, senior client service manager at Gallup, presented hard facts from the company’s polls, including daily surveys about spending habits and the effect of spending experiences on our well-being, and questioned whether selling is a purchase or a relationship. One of the polls that dumbfounded the audience was “Which professionals are mostly trusted by the public?”, in which firefighters and clergy came out on top and jewelers placed in the bottom 20%, along with lawyers and members of Congress—below journalists and just above lobbyists and car dealers!

Scott Galloway, Clinical Associate Professor at New York University’s Stern School of Business, showed an overcrowded room



HELEN AND ANDREW HERMAN PHOTO

Beautiful tourmaline specimens from San Diego County are on display in the “All that Glitters” exhibit.



HELEN AND ANDREW HERMAN PHOTO

My 2011 Poster Presentation was titled “Lectures: An Inspirational Way for Artists to Communicate”.



HELEN AND ANDREW HERMAN PHOTO

The exhibit "All that Glitters" at the San Diego Natural History Museum is a marvelous display of mineral specimens, jewelry, and objects d'art.



HELEN AND ANDREW HERMAN PHOTO

A statue of GIA founder Richard T. Liddicoat stands tall at the entrance to the Robert Mouawad Campus.

how Facebook is fast becoming the portal for the Internet, stating that "the Web is dead, the Internet is thriving", and explaining how jewelry businesses are not in the forefront of Digital IQ as other fashion companies are. The last presentation was about sustainable business practices, by Dr. Brian Natrass from Sustainability Partners. He spoke about the importance of a "green" and sustainable company and the success of global brands that have embraced such strategies.

The lecture sessions ended with a lively question-and-answer six-panel forum titled "Shipwrecked!", in which participants discussed the fair trade market and the importance of trust and verification for diamonds and colored stones.

At the Poster Session, held on two floors, 64 large-panel displays presented the results of the latest scientific, technical and business research. The posters were open for viewing at all times during the symposium, and audience members were able to engage in direct discussion with the poster presenters. It was a great honor for me to participate in the 2011 GIA Symposium with a Poster Presentation titled "Lectures: An Inspirational Way for Artists to Communicate", under the Business track theme "How to Find and Keep Customers in the 21st Century".

Last, but definitely not least, was the optional tour of the GIA lab. As we were informed, most stones arrive at this facility



HELEN AND ANDREW HERMAN PHOTO

Lunch and dinner, which were served on the Ocean Terrace, were great opportunities for seeing old friends, meeting new people, and networking.

by mail, and there is not too much foot traffic, compared to the New York lab, where people go in and out all day, often cutting their diamonds, grading them, and re-cutting them in the same day!

We were a small group, escorted by two GIA staff members and a security guard to every lab station, from the place the stones arrive by mail and are logged in the system

to where they are packaged for return to the clients. We heard brief presentations on all steps of diamond grading and colored-stone grading, weighing stones, mapping the inclusions and grading for clarity, grading of very complex cuts, and the very sophisticated gemological testing equipment. A highlight of the tour was when Shane McClure, head of Research, showed us a variety of colored

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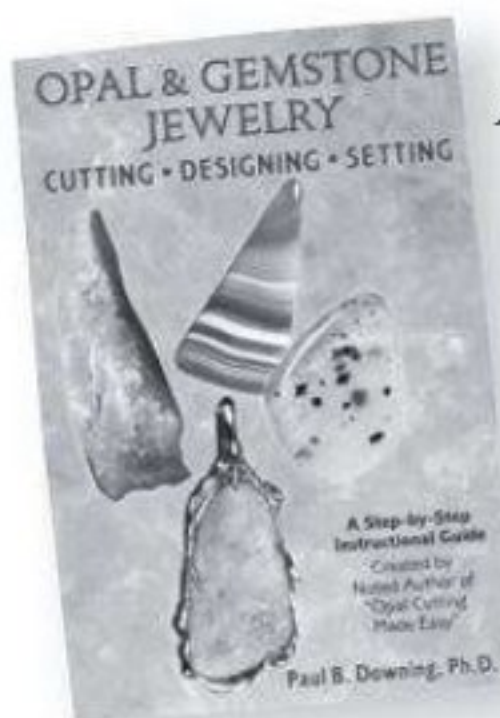


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stones and objects just sent in to the GIA for identification: a beautiful bracelet with Imperial jade teardrop cabs, a treated jade bangle, a dyed green quartzite carved bangle imitating nephrite jade, a large oval faceted peridot, and a very unique little Buddha sculpture carved from purple cubic zirconia and painted over with gold leaf to look antique. I think all the participants on the tour wanted to take that Buddha home! The tour was supposed to have lasted about an hour and a half but, maybe because we were the last tour of the day or maybe we asked a lot of questions, it lasted two and a half hours! It was simply amazing. For more information about the reports and services and how to submit stones, visit www.gia.edu/lab-reports-services/index.html.

The 2011 GIA Symposium was a fabulous event. If you have the opportunity to attend one in the future, you should not miss it. There was time for seeing old friends, meeting new people, and networking during lunch and dinner, served on the Ocean Terrace. And if your senses are not accentuated enough from all the amazing lectures, there are some fantastic GIA Museum exhibits around. Cases filled with mineral specimens, contemporary jewelry and objects d'art, Colombian emeralds, and gem sculptures, and the large gem sculpture "Bahia" suspended from the ceiling supply their own brand of inspiration.

My husband and I were also invited to take a brief but rare tour of the Richard T. Liddicoat Library and Information Center. Director Donna Mary Dirlam and librarian Peggy Street took the time to show us

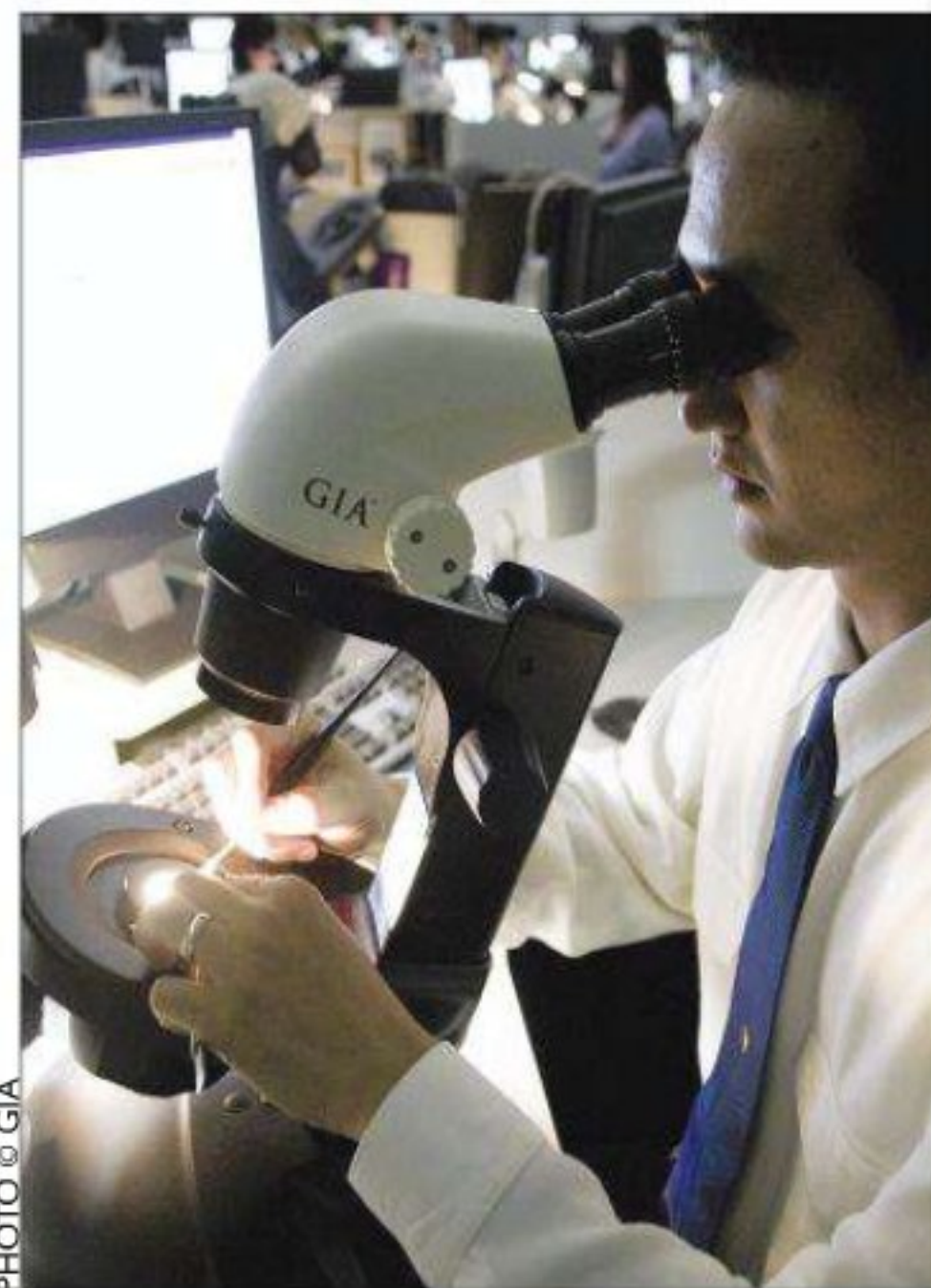


PHOTO © GIA

On our tour of the GIA lab, we heard brief presentations on all steps of diamond and colored-stone grading and the lab's very sophisticated gemological testing equipment.

around this remarkable collection of books, magazines, videos and DVDs. Members of the trade and the public are welcome to use the library's resources for on-campus research. The GIA library is a closed-stack library, meaning that patrons are helped at the front counter.

The GIA World Headquarters is open Monday through Friday. For more information, visit www.gia.edu or call (800) 421-7250. 💎

Helen Serras-Herman is a gem sculptor with over 28 years of experience in unique gem sculpture and jewelry art. She was inducted into the National Lapidary Hall of Fame in 2003.



PHOTO © GIA

Discussing the "Future of Gems and Gems of the Future" were (left to right) Douglas Hucker of the American Gem Trade Association, Robert Wan of Tahiti Perles and Robert Wan Tahiti, Stephen Lux of Gemesis Diamond Co., Martin Rapaport of The Rapaport Group, and Stuart Robinson of Gemworld International Inc.

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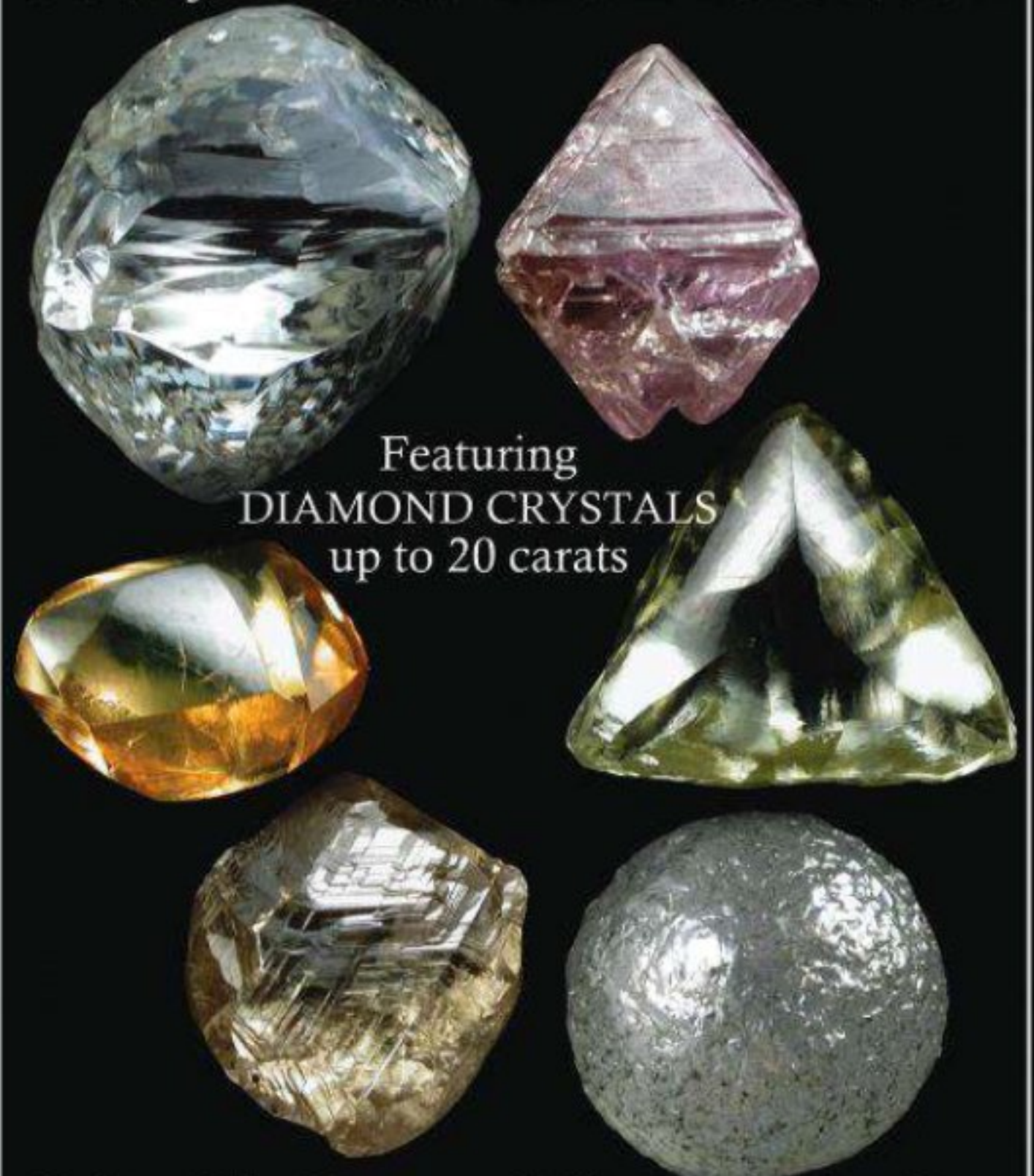
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16-18—HOLLAND, MICHIGAN: Annual show, "Petrified Wood: Ancient Forests"; Tulip City Gem & Mineral Club, Holland Recreation Department; Holland Civic Center, 150 8th St., between Pine Ave. and Maple Ave.; Fri. 9-8, Sat. 9-7, Sun. 11-5; adults \$2, students 50 cents, Scouts and military in uniform free; more than 50 collection displays, fluorescent mineral display, interactive touch rock display, lapidary demonstrations, Petoskey stone polishing, children's games, silent auction, club sales, door prizes, eight dealers, fossils, minerals, geodes, jewelry, lapidary equipment; contact Patty Valentine, 3880 M-40, Holland, MI 49423; e-mail: valentin-eoak@hotmail.com; Web site: www.tulipcity.org

16-18—JACKSONVILLE, FLORIDA: Annual show; Jacksonville Gem & Mineral Society; Morocco Temple, 3800 St. Johns Bluff Rd. S; Fri. 1-6, Sat. 10-6, Sun. 10-5; adults \$3, children 12 and under free; exhibits, Gems, Minerals, Fossils, Jewelry, lapidary arts, competitive displays, demonstrations, silversmithing, cabbing, faceting, beading, wire wrapping, chain making, glass bead making, door prizes, Kids' Education and Fun Zone; contact Tom Frame, 3133 Chapelwood Ln., Jacksonville, FL 32216; e-mail: JGMS_SHOW@hotmail.com; Web site: jaxgemandmineral.org

16-18—LINCOLN, MISSOURI: Show and sale; Mozarkite Society of Lincoln; Lincoln City Park, Lamine St. and Benton St.; Fri. 9-5, Sat. 9-5, Sun. 9-4; free admission; dig for mozarkite; contact Robin Kimber, 907 W. 4th, Sedalia, MO 65301, (660) 827-2538; e-mail: robin480@att.net

16-18—SAN RAFAEL, CALIFORNIA: Wholesale and retail show; Gem Faire Inc.; Marin Center, 10 Avenue of the Flags; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7 weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

17—GRAND RAPIDS, MICHIGAN: Show; Rings & Things; Prince Conference Center, 1800 E. Beltline SE; Sat. 12-4; free admission; gemstones not available in our catalog or online store, bead strands, 15% off many gemstone and bead strands, findings and stringing supplies; contact Dave Robertson, (800) 366-2156; e-mail: drobertson@rings-things.com; Web site: www.rings-things.com/Show/index.html

17—TWO HARBORS, MINNESOTA: 12th annual show and sale, "Agate City Rock Show"; Agate City Rock Shop; 721 7th Ave.; Sat. 9-5; free admission; show, "Agate City Rock Show" Agate City Rock Shop; 721 7th Ave. (Hwy. 61); Sat. 9-5; free admission; dealers, collectors, buy, sell, trade, Lake Superior agate, agate, thomsonite, fossils, crystals, rough and polished rocks, flintknapping, marbles, spheres; contact Bob Lynch, 721 7th Ave., Two Harbors, MN 55616, (218) 834-2304; e-mail: bob@agatecity.com; Web site: www.agatecity.com

17-18—CASTLE ROCK, WASHINGTON: 46th annual show; Southern Washington Mineralogical Society; Castle Rock Fairgrounds, A St. and Cowlitz River; Sat. 10-6, Sun. 10-4; contact Dave Furuli, (360) 430-4092, or Jackie Furuli, (360) 431-0059; e-mail: jfuruli@yahoo.com

17-18—CLARKSVILLE, INDIANA: Annual show; Falls of the Ohio Foundation; Falls of the Ohio State Park, 201 W. Riverside Dr.; Sat. 9-6, Sun. 10-5; free admission, museum admission separate; tours of fossil beds, fossil and mineral collecting, guest speakers, resource tent, children's geo-craft area; contact Alan Goldstein, Falls of the Ohio State Park, 201 W. Riverside Dr., Clarksville, IN 47129, (812) 280-9970; e-mail: park@fallsoftheohio.org; Web site: www.fallsoftheohio.org

17-18—HAMPTON, VIRGINIA: Show; Intergalactic Bead & Jewelry Shows; Howard Johnson Plaza & Conference Center-Regency Ballroom, 1815 W. Mercury Blvd.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

17-18—HARRISBURG, PENNSYLVANIA: 46th annual show; Central Pennsylvania Rock & Mineral Club; Zembo Shrine Center, 2801 N. Third St.; Sat. 10-6, Sun. 10-5; contact Betsy Oberheim, 7953 Appalachian Trail E., Harrisburg, PA 17112-9409, (717) 469-2243; Web site: webmaster@rockandmineral.org

17-18—MORGANTOWN, WEST VIRGINIA: 20th annual show and sale; Sunset Fossils & Minerals, WV Geological Survey; WV Geological Survey Research Center & Museum, 1 Mont Chateau Rd., I-68 Exit 10 and Cheat Lake; Sat. 10-6,

continued on page 40

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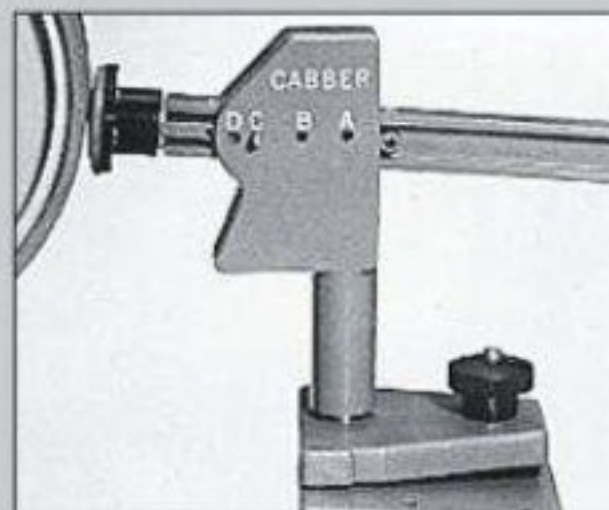
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PENNSYLVANIA'S Coral Caverns

Devonian Fossils Make an Underground Appearance

Story by Deborah Painter



KENWERT PHOTO

Coral Caverns' modern entrance was constructed by the current owners, Mr. and Mrs. Bill van Deventer, to provide a safe and easily accessible way to tour the caverns.

What is a coral reef doing inside a cavern under a hill in south-central Pennsylvania? My good friends Richard Hedges and David Hawk and I wanted to know the answer. We had seen the Web site for Coral Caverns on the Internet (www.coralcaverns.com), which describes an amazing commercial cave with one wall composed of fossil corals, brachiopods and crinoids. This was as interesting as the mine in Utah that had dinosaur tracks on the ceiling (William Peterson, "Dinosaur Tracks in the Roofs of Coal Mines", *Natural History*, 24:3, 1924, pp. 388-391). Earth certainly has hidden surprises. The three of us were already planning a weekend trip to Pittsburgh, Pennsylvania, to go to a conference, and Coral Caverns, just off the Pennsylvania Turnpike, seemed a perfect stop to make on the way home.

We had seen the Web site for **Coral Caverns** on the Internet (www.coralcaverns.com), which describes an *amazing commercial cave* with one wall composed of *fossil corals, brachiopods and crinoids*.

We checked the Web site for directions to the little hamlet of Manns Choice. We tried calling (814) 623-6882 beforehand to find out if we needed reservations, but all we got was a friendly voice on an answering machine. The cavern, we had read, was open on weekends only in May, June, September and October, and seven days a week during the months of July and August. We were going in June, so we were in good shape.

We took the Pennsylvania Turnpike (Interstate 76) east from Pittsburgh. A prominent sign points out the exit for Manns Choice. No signs for Coral Caverns were posted on the Turnpike, but the beautiful old stone Jean Bonnet Tavern, a landmark for Manns Choice, was quite near the Turnpike.

We took Exit 11, which does not take one directly to Manns Choice, even though the hamlet and state Route 31, can be clearly seen from the multilane highway. Instead, the rural route took us south to Bedford, a very pretty town. We turned right at the first light (Pitt Street/U.S. Highway 30) and continued west to the Jean Bonnet Tavern. Then we bore left onto state Route 31 West. We drove three miles and then saw the signs for the tiny settlement of Manns Choice. The sky was darkening and rain threatened. It was nearly 5 p.m. and we still were not sure what to expect.

We turned right onto Main Street, passed an ice cream parlor, and made a sharp left turn onto a small street named Cavern Street, where a 2½-foot-tall polished red granite sign read "Coral Caverns". From there, we took a steep drive up a narrow gravel path to the top of a hill, where we saw a parking area and a rustic cabin with what looked like a man standing rigidly on the front porch. Drawing nearer, we saw that what we thought was a man was a life-size mannequin of a miner whose concrete overalls were smeared with yellowish paint to look like he had just emerged from a mine covered with yellow clay. He was a silent reminder of the past and of the mine that had once been here.

We were worried that we had arrived too late and that the cavern had just closed for the day. Owners Bill and Kris van Deventer and their young son, Max, greeted us in the parking lot.

"Are we too late?" we asked.

"No," Bill replied, "we have time. Come on!" And Bill proceeded to give us a tour of the van Deventers' own personal cavern.



A coral reef forms an entire wall of part of Coral Caverns. Horn corals, brachiopods, stromatoporoids and crinoids in this old reef lived 370 million years ago.



Individual fossils are visible in the reef, which formed when the rocks forming the Allegheny Mountains were at the bottom of a shallow sea. It is the Devonian Helderberg formation, which is over 370 million years old.

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MCC/BTC Exhibit Hall

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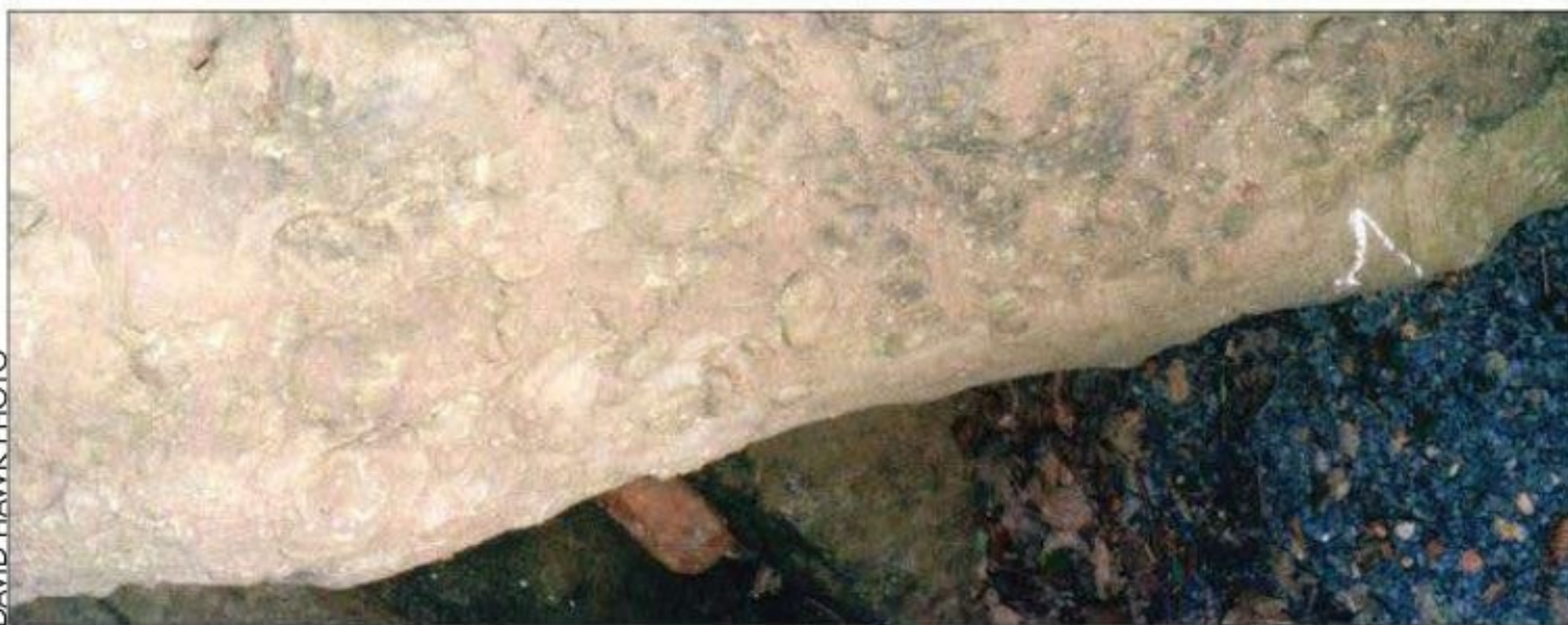
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This limestone overhang protects a deposit of deep azure minerals (bottom right) that are rich in Devonian horn corals, some of which were over 6 inches long.

Old, blackened lanterns lined the cave walls near the entrance. Railroad ties formed a frame, bringing to my mind the original industrial use of the cave as a limestone quarry. Several shafts opened up on the floor of the cave very near our walking path and barriers had been erected to prevent accidental falls. A recessed room contained a "cave chimney" and a very narrow cement staircase. It was here that, in 1928, three intrepid Boy Scouts used ropes to lower themselves into the cave. They reported to the quarry company that they had found a wall composed of a huge fossil coral reef, fossil trilobites, black volcanic rock, helictites (gravity-defying cave formations), large calcite crystals, cave popcorn (fossil brachiopods), and a multitude of "cave straws". Since the natural entrance was so steep and difficult to access, Native Americans did not use this cave for shelter from the elements, there were no artifacts or evidence that a fire had been built.

Wonderland Coral Caverns, as it was originally called, opened for business in 1932 using a narrow, extremely steep and slippery cement stairwell. Fortunately, no accidents ever resulted, but the cave was closed to the public in 1985 to avoid pushing the owner's luck any further. Bill purchased the property and constructed a new and safe entrance in 1999. The stairwell still stands as a reminder of an era when tourists were expected to be willing to take a chance if they wanted to enter this cave.

Unusual features in the cave include the presence of tiny 2- or 3-inch-long, nearly perfect, clear calcite crystals. They are the result of past flooding in the cave. It's obvious why one flowstone formation came to be called "Little Town of Bethlehem", but the "Tibetan Temple" formation looked more like a very small, squashed ice cream cone. I liked the "whirlpool" pattern scoured into one side of the cave by groundwater rushing through when the very new cave was partly above and partly below the water.

The owner of Coral Caverns during the 1980s was Steven Hall. He chose his own cave to get married in back in 1984. He and his bride took their vows in the Cathedral Room with the wedding party in

attendance. Their wedding photos are still on display in the gift shop.

Some of the attractive cave decorations included multicolored ribbons, which formed when calcite-laden water ran along cracks and seams in the ceiling and deposited its mineral load. Over time, this created a ribbon effect. The cream- and light-brown-striped "cave ribbons" running along the ceiling really do resemble bacon strips. These, combined with cave formations called "soda straws" and "cave popcorn", made the cave begin to remind us of a diner! We learned that new cavern guides are initiated by being made to drink soda through a calcite soda straw. One can imagine what the teenagers say to their friends about that experience afterward!

But the coral reef was what excited me most. We could see the individual brachiopods, crinoids, horn (rugose) corals, and stromatoporoids in the slightly inclined wall. Due to iron, some of the reef was colored a dark brown-red. Horn corals were horn-shaped coral animals that grew to large sizes; some were over 6 inches in length. The stromatoporoids are a variety of sponge, now rare, that have a very hard external structure. In fact, zoologists once wrongly classified stromatoporoids as corals (Ralph W. Stone, "Pennsylvania Caves", Pennsylvania Geological Survey Fourth Series, Bulletin G 3, 1932, pp. 13-18). This underground coral reef is a dramatic demonstration of the fact that, millions of years ago, the rocks forming the Allegheny Mountains were at the bottom of a shallow sea. This is the Devonian Helderberg formation, over 370 million years old. The Devonian was not the first time that central Pennsylvania has ever been a shallow sea and coastal plain; that had happened once before, millions of years previously, during the Cambrian Period. Nor, in all likelihood, will it be the last time this area will be underwater. Earth has a way of revamping the landscapes that are so familiar to us.

Many stages of earth dynamics had to take place in order to turn a coral reef into the wall of a cave. After the reef was dead, it was covered in sediment. Then the tectonic forces of a continental collision pushed



DAVID HAWK PHOTO

A little imagination will help the viewer understand why this formation is referred to as "Bossy the Cow".

up the shallow sea-bottom limestones and formed the Acadia Mountains during the later Devonian, 270 million years ago. The Acadia range extended south to Virginia. As time passed and the Permian period saw the closing of the proto-Atlantic Ocean, the appearance of this land that would one day be called Pennsylvania began to take on more of its modern appearance. It became an Eastern Seaboard coastline and mountainous area. More erosion and then uplift occurred. The most recent mountain-building episode was the one that formed the modern Allegheny Mountains. The limestone was partly dissolved by natural carbonic acid in the groundwater. Next, groundwater being drained off by tectonic uplift created the cave and its formations. The results of that immense force that formed the Alleghenies is vividly shown in the nearly 90° inclined strata near the new entrance to the cavern. This 30-foot-tall slab really gave us a sense of the immense span of time that had elapsed between the existence of the coral reef and the present, when all that was left of the coral reef was gray, brown and white rock.

The Coral Caverns site dates from an early time of the Devonian. About 200 miles due east of Manns Choice by way of the Pennsylvania Turnpike and off Interstate 476, near Quakertown, is Red Hill, a world-class late-Devonian fossil site under private management. It represents a freshwater lake environment teeming with fish from the lineage that gave rise to amphibians.

The entire Coral Caverns tour lasts about 20 minutes. "If you arrive in the spring, fall and winter," Bill explained, "the cave is only open on weekends, when I or my wife will give a tour. During the summer, college students assist with tours on weekdays, since I have a career that keeps me busy during the week."

After the tour, check out the geological stuff for sale in the gift shop. We purchased a cave tour DVD with wonderful photography by Ken Wert. But we were not done yet. We had to purchase some genuine tiny Pennsylvania fossil corals and small calcite crystals direct from Coral Caverns! That was a treat. Then, it was time to leave in our rented car for climes to the south. 💎



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24-25—OSHKOSH, WISCONSIN: Annual show; Oshkosh Earth Science Club; Sunnyview Expo Center, 500 E. County Rd. Y; Sat. 9-5, Sun. 10-4; adults \$2, students with ID \$1, children under 12 free; Rocks, Minerals, Fossils, Lapidary Arts, Jewelry, more than 80 dealers, demonstrators, exhibits, kids' events; contact Wanda Timm, (920) 231-2332; e-mail: wjitt656@msn.com; Web site: www.oesclub.org

24-25—POMPANO BEACH, FLORIDA: Show; Intergalactic Bead & Jewelry Shows; Emma Lou Olson Civic Center, 1801 N.E. 6th St.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

24-25—RICHARDSON, TEXAS: Wholesale and retail show; The Bead Market; Richardson Civic Center, 411 W. Arapaho; Sat. 10-5, Sun. 10-4; free admission; gemstones, glass beads, lampwork, vintage beads and buttons, Swarovski Elements, crystals, pearls, bone beads, jewelry, books, tools; contact Rebekah Wills, (903) 240-7198; e-mail: rebekah@thebeadmarket.net; Web site: www.thebeadmarket.net

24-25—SHARONVILLE, OHIO: Show and sale; BeadStreet USA; Sharonville Convention Center, 11355 Chester Rd.; adults \$5, children under 12 free; vintage beads, lampwork, gemstones, Swarovski crystals, seed beads, fibers, precious metal findings, jewelry, tools, equipment, educational materials; contact Jane Strieter Smith, (216) 521-4367; Web site: www.gemstreetusa.com

24-25—SOUTH SIOUX, NEBRASKA: 46th annual show; Siouxland Gem & Mineral Society; South Sioux City Senior Center, 1501 W. 29th St.; Sat. 9-6, Sun. 10-4; adults \$1.50, students 12 and older 50 cents, children under 12 free; exhibits, four dealers, agates, rough and polished specimens, gems, beads, geodes, minerals, faceted jewelry, fossils, door prizes, spin the wheel, silent auction, displays, Siouxland dinosaur hunters exhibits; contact Bob Powell, (712) 378-2775

24-25—TRAVERSE CITY, MICHIGAN: Annual show; Grand Traverse Area Rock & Mineral Club; History Center of Traverse City, 322 Sixth St.; Sat. 10-5, Sun. 11-4; dealers, rocks, gems, minerals, jewelry, demonstrations, jewelry making, rock cutting and polishing, kids' area; adults \$2 (includes Con Foster Museum entry), children under 12 free with adult; contact Lauren Vaughn or Cynthia Vaughn, (231) 276-6150; e-mail: Maple2b@aol.com

SEPTEMBER-OCTOBER 2011

27-2—IDABEL, OKLAHOMA: Show and sale; McCurtain Gem & Mineral Club; Museum of the Red River, 812 SE Lincoln; Tue. 9-5, Wed. 9-5, Thu. 9-5, Fri. 9-5, Sat. 9-5, Sun. 11-4; free admission; contact Henry Moy, 812 Lincoln Rd., Idabel, OK 74745, (580) 286-3616; e-mail: motrr@hotmail.com

30-2—ANCASTER, ONTARIO, CANADA: Annual show; Robert Hall Originals; Ancaster Fairgrounds, 630 Trinity Rd.; Fri. 9:30-6, Sat. 10-6, Sun. 10-5; adults \$6, children under 12 free; jewelry, crystals, fossils, rock specimens, more than 30 dealers, free seminars on rocks, fossils and crystals, jewelry class signups; contact Robert Parry, 138 Sugar Maple Rd., St. George, ONT N0E 1N0, (519) 448-1236; e-mail: robert@roberthalloriginals.com; Web site: www.roberthalloriginals.com

30-2—DALLAS, NORTH CAROLINA: 34th annual show; Gaston Gem, Mineral & Faceters Club; Gaston County Park (Biggerstaff Park), 1303 Dallas-Cherryville Hwy./Hwy. 279, just past Gaston College; Fri. 9-6, Sat. 9-6, Sun. 9-5; free admission; minerals, fossils, cutting material, gemstones, wire wrapping, stone setting, geodes, jewelry, raffles, sluice, gem sand; contact Jackay McDaniel, 2631 W. Franklin Blvd., Gastonia NC 28052, (704) 865-6748; e-mail: Jackaythegrizz@aol.com

30-2—DEL MAR, CALIFORNIA: Wholesale and retail show; Gem Faire Inc.; Del Mar Fairgrounds, 2260 Jimmy Durante Blvd.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7

continued on page 46



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ROCK & GEMKIDS

Malachite



While color may be misleading when it comes to identifying some minerals, with malachite, it's a sure bet! All malachite is green, often a bright emerald green. It also leaves a green streak on a ceramic streak plate.

Malachite, a hydrous copper carbonate, is part of the large family of carbonate minerals. It's very close, chemically, to azurite, $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$, which forms when copper weathers. When cool, oxygen-rich groundwater seeps into rocks (particularly limestone) that contain copper, it creates an "oxidation zone" that alters the copper, changing it to azurite.

If weathering continues, azurite turns into malachite. Therefore, both these minerals are referred to as "secondary ores of copper" and can be mined for their copper content. Malachite most often occurs as crusts or botryoidal (bubbly-looking) masses with swirling bands of different shades of green. It sometimes forms as velvety fibrous masses, stalactites and, rarely, small crystals.

Famous sources of malachite include copper-mining districts in Zaire and Namibia and the Ural Mountains of Russia. It's also found in copper-producing regions of the American Southwest and Mexico.

While it is relatively soft (Mohs 3.5-4) and often has an earthy or silky luster, malachite can take a fine polish and makes beautiful banded green cabochons, beads, inlay and sculptures. I have a malachite dolphin on my desk, and there's a "Malachite Room" with huge green pillars in the Hermitage Museum in Russia. However, malachite dust can be toxic if it's breathed in. When grinding and polishing malachite, keep the rock wet to reduce dust and wear a face mask.

—Jim Brace-Thompson



Botryoidal malachite



Banded malachite

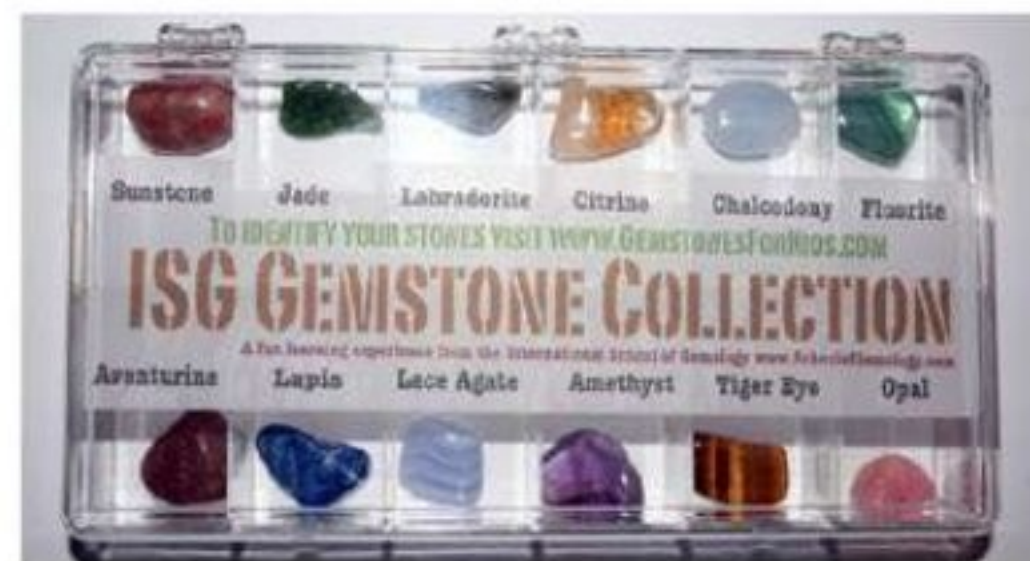
Smithsonian Museum Day at the Lizzadro

As a Smithsonian Affiliate, the Lizzadro Museum of Lapidary Art will feature a special exhibit from the Smithsonian Museum of Natural History on Sept. 24 from 10 a.m. to 4 p.m.

Children and adults can participate in "Stone Hunt", searching for gemstones among more common rocks and minerals, have their finds identified, and take them home. Visitors presenting a Museum Day Ticket, available online at smithsonianmag.com/museumday, will receive free admission for themselves and one guest. The event is free for museum members. (www.lizzadro-museum.org)



PHOTO COURTESY THE LIZZADRO MUSEUM



ISG Gemstone Hunt for Kids

The International School of Gemology (ISG) has launched an interactive Web site that is designed to help children learn to identify common gemstones. The Gemstone Hunt for Kids, at www.gemstonesforkids.com, is "guided" by ISG president Robert James. E-mail links allow participants to contact Mr. James with questions about gem identification.

The Gemstone Notes page contains information on and photos of two dozen precious and semiprecious gemstones. Children "hunt" for gems by comparing gem specimens to the photos. There is also a slideshow of specimens from James' personal collection that includes some very unusual material.

To participate, order a bag of 12 gemstones and a showcase box from the Web site. The sets cost \$24.95, plus \$7.95 shipping. (The photos and gemstone information can also be viewed without making a purchase.) **Ask a parent or guardian to order for you and use the Web site with adult supervision.**

How Do Fossils Form?

A fossil is the remains of a living organism or the indications of living organisms that have been preserved in the rock record. The word "fossil" is from the Latin word *fossus* which means "having been dug up".

Most fossils are found in sedimentary rocks like limestone, dolostone, coal and sandstone. Rarely, fossils are found in metamorphic rocks, and some extremely rare fossils are found in igneous rocks.

"Fossilization" is the process by which a living organism becomes a fossil. Here are a few of those processes:

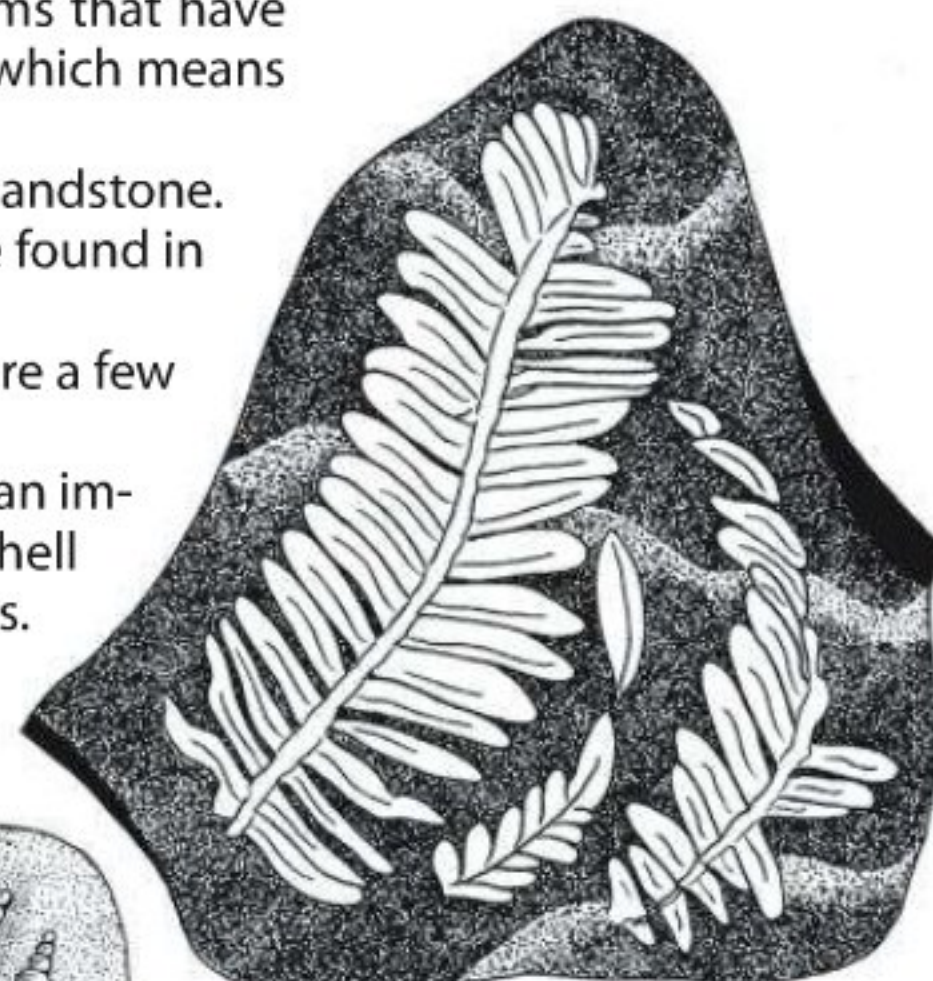
Mold and Cast: An organism, like a clam, dies and settles into the mud, leaving an impression in the mud in the shape of the shell (the mold). The mud hardens and the shell dissolves away. Later, the impression is filled up with new mud, which then hardens. This new mud has the shape of the original shell, which is called the "cast".

Petrifaction: Suppose a tree is suddenly buried by sand. Water that is carrying minerals flows through the wood. Microscopic pieces of the wood are washed away and are replaced by a mineral, like silica in the form of agate. This continues until the entire log has been transformed from wood to mineral. This process is also called "silicification".

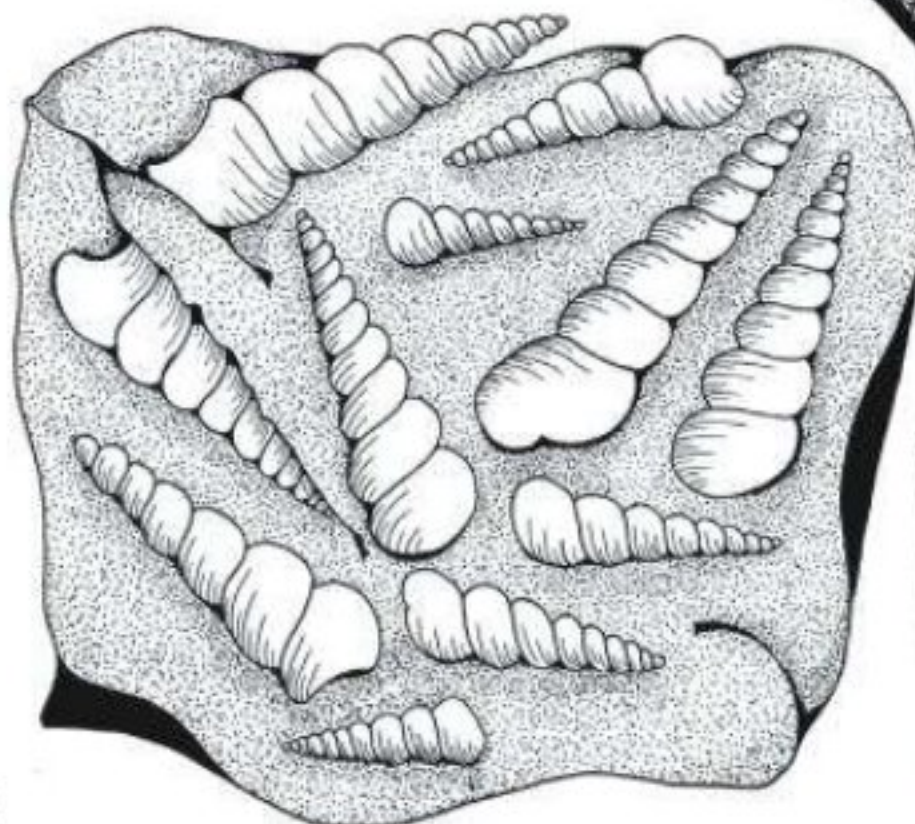
Original Material: In rare situations, the original material of an organism can be preserved. Examples include frozen mammoths, insects in amber, and seashells that are preserved in their original form.

Pyritized Fossils: When an organism like an ammonite dies and settles into mud that contains a lot of iron, but no oxygen, the iron can combine with sulfur from the decaying animal and create the mineral pyrite (also called "fool's gold"), which replaces the carbonate shell material. This is called "pyritization".

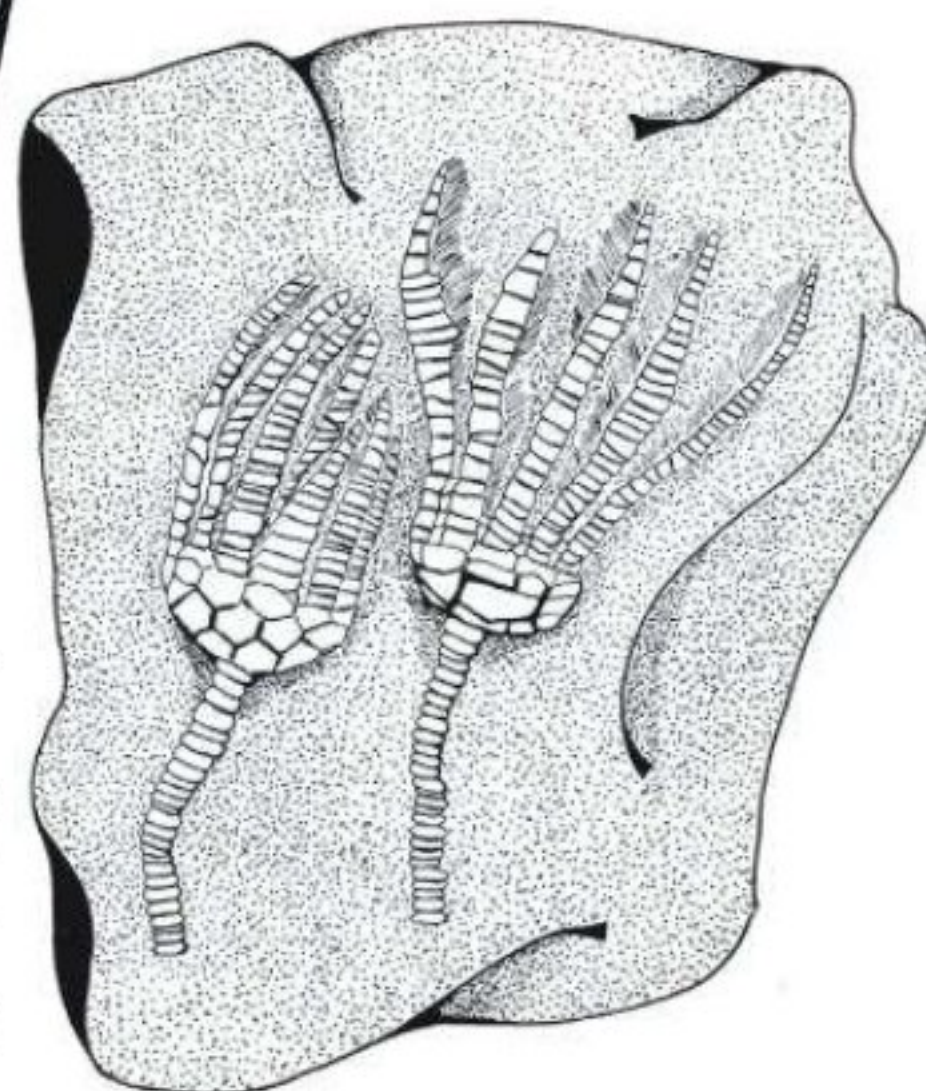
Carbonization: Plant fossils typically form this way. When plants die and are buried, they rot away, but when all the conditions are right, they leave behind a very, very thin film of carbon, usually in coal or shale. This film preserves the shape of the plant, often including the leaves and the stems.



Ferns

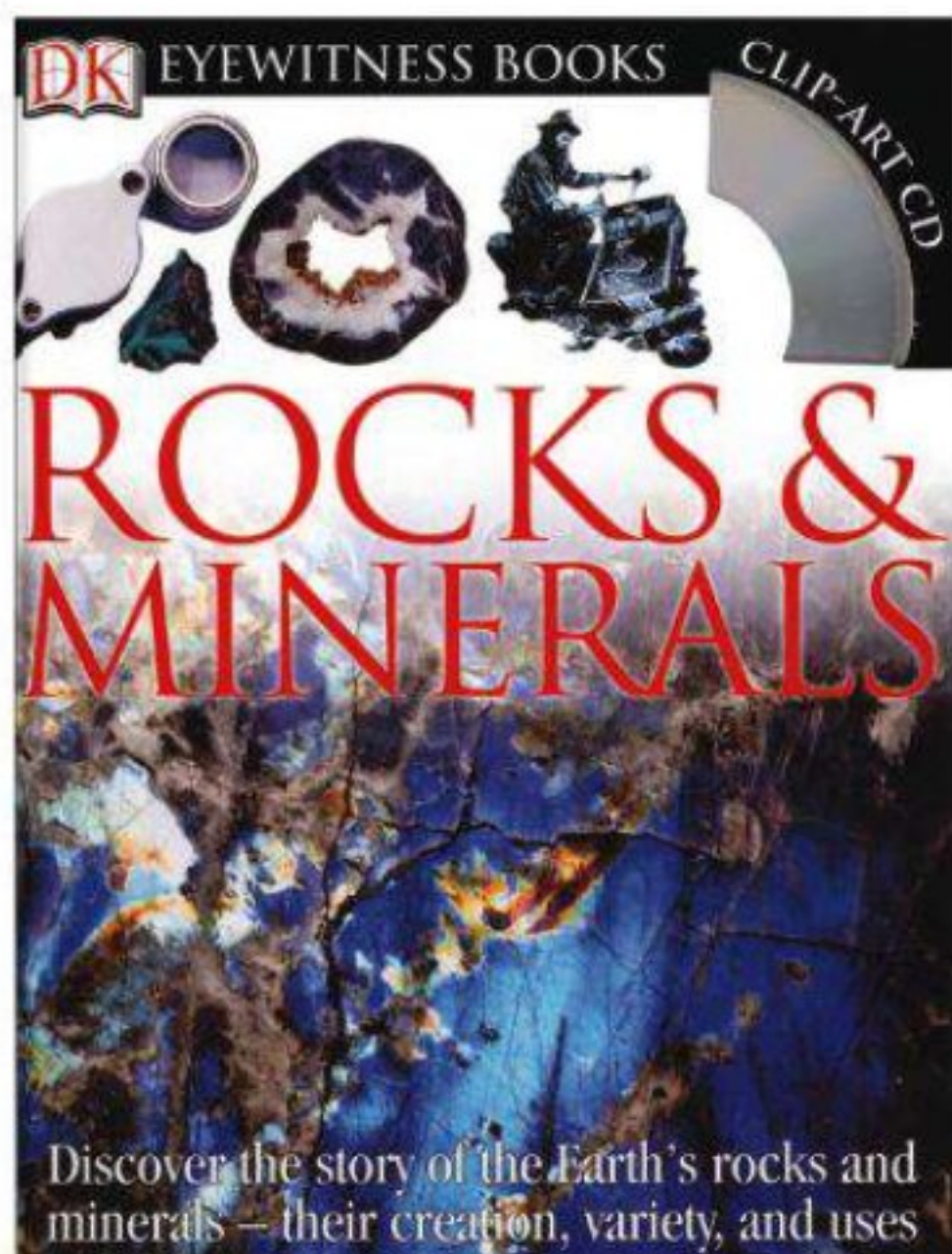


Gastropods



Crinoids

—Darryl Powell



The Quiz is open to U.S. residents 17 and younger. Mail your answers to **September Quiz, Rock & Gem magazine, P.O. Box 6925, Ventura, CA 93006-9899**. Five winners will be drawn from the valid entries received by **Sep. 31, 2011**. Valid entries must include the correct answers, the entrant's name, age and address, and the signature of a parent or guardian. This month's prize is a copy of the DK Eyewitness Book *Rocks & Minerals*, which includes a CD of mineral clip art.

The Quiz

1. Malachite is a _____ copper carbonate because its chemical formula contains water.
2. Malachite and azurite form in an " _____ " where cool, oxygen-rich water alters the copper.
3. You are least likely to find fossils in _____ rocks.
4. Pyritization requires the elements _____ and _____ to take place.
5. Plant fossils typically form through the process of _____ .

Check your answers at www.rockngem.com beginning October 1.



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September 11 - September 18 Denver, CO; Colorado Mineral & Fossil Show - Summer; Holiday Inn Room 200, 4849 Bannock St.; Sun. - Sat. 10am - 6pm, Sun. 10am - 5pm

October 2 Fallbrook, CA; Fallbrook Gem & Mineral Club Show; 123 W. Alvarado St.; Sun. 10am - 4pm; Free Parking & Admission

October 15 & 16 Placerville, CA; El Dorado County Mineral & Gem Society's 28th Annual Gem Show; El Dorado County Fairgrounds 100 Placerville Drive; Both Sat. & Sun. 10am - 5pm

November 5 & 6 San Diego, CA; Gem Diego Show; Al Bahr Shrine Center; 5440 Kearny Mesa Road; Sat. 9:30am - 5pm and Sun. 10am - 4pm

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RNG 08: 1.25 Inch diameter Break Your Own Mexican Trancas Geode	75 cents each
RNG 09: 10.5 X 9 inch, 24 pound Amethyst Cathedral Geode, Brazil	\$240.00
RNG 10: 1-2 all natural Pyrite cubes in 3.5 Inch host matrix - Spain	\$20 each

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Show Dates from page 41

weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

30-2—WHEELING, WEST VIRGINIA: Show and sale; SMART Centre Market, Prehistoric Planet; St. Alphonsus Parish Center, 2111 Market St.; Fri. 10-6, Sat. 10-6, Sun. 11-5; free admission; dealers, rocks, minerals, gemstones, jewelry, fossils, mineral and gem "sluice"; contact Ray Garton, PO Box 200, Barrackville, WV 26559, (304) 282-2306; e-mail: garton@prehistoricplanet.com; Web site: www.prehistoricstore.com

OCTOBER 2011

1-2—JACKSONVILLE, ARKANSAS: 39th annual show; Central Arkansas Gem, Mineral & Geology Society; Jacksonville Civic Center, 5 Municipal Dr.; Sat. 9-5, Sun. 9-5; free admission; more than 20 dealers, demonstrations, exhibits, door prizes, Kids' Dig, geode cracking, Rock Spin, mineral identification, grand prize; contact Lenora Murray, 218 Old Hwy. 11S, Hazen, AR 72064, (870) 255-3679; e-mail: lenoramur@aol.com; Web site: centralarrockhound.org

1-2—JEFFERSON, WISCONSIN: 39th annual show; Rock River Valley Geological Society; Jefferson County Fair Park, Jackson Rd. and Peurner Rd.; Sat. 10-5, Sun. 10-4; dealers, minerals, rocks, fossils, gems, jewelry, demonstrations, wire wrapping, faceting, cabochon cutting; contact Robert Schweitzer, (920) 674-2544

1-2—LEXINGTON, KENTUCKY: 21st annual show; Rockhounds of Central Kentucky (ROCK); Kentucky National Guard Armory, 4301 Airport Rd.; Sat. 10-6, Sun. 12-5; adults \$1, children 6-12 50 cents (\$3 per family), Scouts in uniform free; dealers, minerals, jewelry, equipment, club sales and exhibits, Kentucky agate, door prizes, kids' quarry, silent auctions, fluorescent display, grand prize; contact Allen Ferrell, (859) 277-2469; e-mail: kyrock2010kentucky@yahoo.com; Web site: www.lexingtonrockclub.com

1-2—OMAHA, NEBRASKA: 56th annual show; Nebraska Mineral & Gem Club; Westside Community Center, 108th and Grover St.; Sat. 9-6, Sun. 10-5; contact Tim Kautsch, (402) 397-9606; Web site: www.nerockgem.us

1-2—OROVILLE, CALIFORNIA: 4th annual show; Feather River Lapidary & Mineral Society; Oroville's Municipal Auditorium, 1200 Myers St.; Sat. 10-5, Sun. 10-4; adults \$2, children 12 and under free; dealers, exhibits, demonstrations, door prizes, silent auction, geode cutting, 3rd Annual World Rock Tumbling Championships; contact Tammy Scism, 675 Mitchell Ave., Apt. G4, Oroville, CA 95965, (530) 693-1304; e-mail: tammyscism@yahoo.com; Web site: www.oroville-rocks.com

1-2—RALEIGH, NORTH CAROLINA: Show, Intergalactic Bead & Jewelry Shows; Lighthouse Convention Center-Auditorium, 326 Tryon Rd.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

1-2—ROSEVILLE, MINNESOTA: Show; Anoka County Gem & Mineral Club; Har Mar Mall, 2100 Snelling Ave.; Sat. 10-6, Sun. 12-5; free admission; gems, minerals, jewelry, fossils, agates, collectibles, contact Martha Miss, 8445 Grange Blvd., Cottage Grove, MN 55016; e-mail: rockbiz@cs.com

1-2—ROSWELL, NEW MEXICO: Annual show, "Gems from Heaven in 2011"; Chaparral Rockhounds; Roswell Convention & Civic Center, 912 N. Main St.; Sat. 9-5, Sun. 10-4; adults \$3, children under 12 free; contact Diane Weir, 2300 S. Union Ave., Roswell, NM 88203, (575) 622-5679; e-mail: dcweir@dfn.com

1-2—STAFFORD, TEXAS: Wholesale and retail show; The Bead Market; Stafford Centre, 10505 Cash Rd.; Sat. 10-5, Sun. 10-4; free admission; dealers, glass beads, seed beads, gemstones, pearls, lampwork, PMC, Swarovski Elements, crystals, jewelry, vintage beads and buttons, books, tools; contact Rebekah Wills, (903) 240-7198; e-mail: rebekah@thebeadmarket.net; Web site: www.thebeadmarket.net

1-2—WALNUT CREEK, CALIFORNIA: Show, "Contra Costa Crystal Fair"; Pacific Crystal Guild; Civic Park Community Center, 1375 Civic Dr.; Sat. 10-6, Sun. 10-4; adults \$6, ages 12 and under free; 30 dealers, minerals, gems, crystals, beads, metaphysical healing tools; contact Jerry Tomlinson, PO Box 1371, Sausalito, CA 94966, (415) 383-7837; e-mail: jerry@crystalfair.com; Web site: www.crystalfair.com

1-2—WAYNESBORO, VIRGINIA: Annual show; Shenandoah Valley Gem & Mineral Society; Kate Collins School, 1625 Ivy St.; Sat. 10-6, Sun. 12-5; adults \$1, children under 6 free; jewelry, amber, gemstones, cutting rough, slabs, cabs, crystals, display pieces, beading material; contact Roland Stetler, 73 Avalon Ln., Lexington, VA 24450, (540) 463-6098; e-mail: svgem-min-club@live.com

2—WEST HENRIETTA, NEW YORK: Show; Rings & Things; RIT Inn & Conference Center, 5257 W. Henrietta Rd.; Sun. 12-5; free admission; gemstones not available in our catalog or online store, bead strands, 15% off many gemstone and bead strands, findings and stringing supplies; contact Dave Robertson, (800) 366-2156; e-mail: drobertson@rings-things.com; Web site: www.rings-things.com/Show/index.html

5—DENVER, COLORADO: Retail show; Rings & Things; Ramada Plaza Denver North, 10 E. 120th Ave.; Wed. 12-5; free admission; gemstones, bead strands, 15% off many gemstone and bead strands, findings and stringing supplies; contact David Robertson, PO Box 450, Spokane, WA 99210, (800) 366-2156; e-mail: drobertson@rings-things.com; Web site: www.rings-things.com/Show/city.php?city=Den

7-9—BIG SUR CALIFORNIA: 20th annual show, "Big Sur Jade Festival"; South Coast Community Land Trust, Pacific Valley PTO; Pacific Valley School; Fri. 12-5, Sat. 10-5, Sun. 10-5; contact Kirk Brock, (831) 659-3857; Web site: www.bigsurjadefestival.com

7-9—INDIANAPOLIS, INDIANA: 13th annual show, "Fall Indianapolis Gem, Mineral & Jewelry Show"; Treasures Of The Earth Gem & Jewelry Shows; Indiana State Fairgrounds, Ag/Horticulture Bldg., 1202 E. 38th St.; Fri. 10-6, Sat. 10-6, Sun. 11-5; adults \$5 (3-day ticket), children under 16 free; jewelry makers, goldsmiths and silversmiths size, reconstruct, repair, design or make original jewelry from customer-selected gems, stones, opals and crystals, wire wrap, wire sculpture, stone beads, pearls, stone setting, dealers, amber, opal, fossils, minerals, door prizes, grand prize, 500 Earth Science Club display, silversmithing demonstrations and classes, lampwork bead demonstrations, wire wrapping classes; contact Van Wimmer Sr., 5273 Bradshaw Rd., Salem, VA 24153, (540) 384-6047; e-mail: van@toteshows.com; Web site: www.toteshows.com

7-9—PLEASANTON, CALIFORNIA: Wholesale and retail show; Gem Faire Inc.; Alameda County Fairgrounds, 4501 Pleasanton Ave.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7 weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

7-9—SEQUIM, WASHINGTON: Show, "Nature's Treasurers"; Clallam County Gem & Mineral Association; Boys & Girls Club, 400 W. Fir St.; Fri. 10-5, Sat. 10-5, Sun. 10-2:30; contact Terry Stockman, PO Box 98, Sequim, WA 98382; e-mail: terlin@wavecable.com; or Foster Thompson; e-mail: fostert@olympen.com

7-10—MOAB, UTAH: Annual show; Moab Points & Pebbles Rock Club; Old Spanish Trail Arena, 3641 S. Hwy. 191; Fri. 10-7, Sat. 10-7, Sun. 10-4; free admission; dealers, field trips, spin wheel, door prizes, displays; contact Jerry Hansen, PO Box 186, Moab, UT 84532; e-mail: moabrockclub@live.com; Web site: www.moabrockclub.net

8-9—AUSTIN, TEXAS: Wholesale and retail show; The Bead Market; Travis County Expo Center, 7311 Decker Ln.; Sat. 10-5, Sun. 10-4; free admission; dealers, lampwork, glass beads, vintage beads and buttons, bone beads, PMC, silver, findings, books, tools, jewelry, Swarovski Elements, crystals, pearls; contact Rebekah Wills, (903) 240-7198; e-mail: rebekah@thebeadmarket.net; Web site: www.thebeadmarket.net

8-9—BILLINGS, MONTANA: Annual show; Billings Gem & Mineral Club; Billings Hotel & Convention Center, 1123 Mallowney Ln.; Sat. 10-5, Sun. 10-4; contact Lynn Edwards, (406) 855-3675; e-mail: bentlyn77@yahoo.com

8-9—FORT WORTH, TEXAS: Annual show; LMRA Stone Steppers; Lockheed Martin Recreation Association, 3400 Bryant Irvin Rd.; Sat. 9-6, Sun. 9-6; free admission; rocks, gems, minerals, flinters, prospecting equipment, GPAA, jewelry, pottery, stained glass, children's activities; contact Steve Shearin, 860 Stafford Station Dr., Saginaw, TX 76131, (817) 733-5368; e-mail: steve.l.shearin@lmco.com

8-9—MARYSVILLE, WASHINGTON: 37th annual show, "Rocktoberfest"; Marysville Rock & Gem Club; Totem Middle School Cafeteria, 7th St. and State Ave.; Sat. 10-5, Sun. 10-5; free admission; contact Bill Moser, (425) 238-8222; e-mail: bill-jj@comcast.net; or George Haage, (425) 339-2272; e-mail: haag@frontier.net

continued on page 52

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The DINOSAUR MINES of MOROCCO

No Other Country Produces As Many Fossils for the Commercial Market

Story and Photos by Bob Farrar

Ask any fossil collector what the most popular fossils are, and the answer will most likely be “dinosaurs”—though shark teeth may come in a close second. Dinosaurs are wildly popular, not only among fossil

I have had the opportunity to travel to Morocco several times over the past few years and to visit some of the famous mineral and fossil localities there, including some of the fossil localities around Erfoud, a town in eastern Morocco, on the edge of the Sahara Desert. Among those localities was the area near Taouz, a town about 35 miles southeast of Erfoud, where numerous dinosaur fossils are found.

I had read about Taouz and perused its fossils [at dealers] in Morocco, but it was only recently that I was able to see the locality in person. For many years, a lack of good roads discouraged visitors from trying to go there. Now, however, there is a good two-lane paved road to Taouz. The group I travel with had attempted to visit the site in October of 2008. Getting to the digging area requires leaving the paved road and crossing the bed of the Ziz River. Normally, the riverbed is bone dry in that area, but in 2008 a freak storm and flash flood had left it muddy and impassible. Disappointed, I had to wait for another time. That time came in October of 2010.

My travels to Morocco are arranged by tour leader Sara Mount of Silver Spring, Maryland. In Morocco, Sara works with brothers Adam and Aissa Aaronson. In addition to serving as tour guides, the Aaronsons are in the fossil business and have developed connections with fossil and mineral dealers all over Morocco. It is through their contacts that we are able to see many of the geological riches of Morocco. Travel to Morocco is not difficult for Americans. The people are always friendly, and we have never felt threatened in any way.

collectors, but with the general public. (Witness the success of the *Jurassic Park* movies, for example.) It is therefore no surprise that most fossil collectors desire to own dinosaur specimens, if not through their own collecting efforts, at

least by purchasing them on the commercial market. And, as anyone who regularly peruses the wares of fossil dealers will know, no other country produces as many dinosaur fossils for the commercial market as Morocco.



Carcharodontosaurus teeth are serrated and bladelike and were handy for cutting flesh.

Practically all the Moroccan dinosaur fossils on the commercial fossil market come from a geological formation known as the Kem Kem beds, also called the Tegana Formation. This formation dates from the Cretaceous period, and is between 94 million and 100 million years old. It consists mostly of sandstone, clay, and loosely consolidated sandy layers, and is as much as 600 feet thick. These sediments are thought to have originally been deposited in a river delta environment. The formation outcrops along an escarpment southeast of Taouz, and northwest of Erfoud, as well as across the nearby border in Algeria. Most of the fossils we see on the market come from near

Taouz. However, some also come from a place called Jorf, which is northwest of Erfoud, and some may come from Algeria.

Mineral collectors may also recognize the name of Taouz; old lead mines in the area are a source of vanadinite and cerussite. While they are not as productive as those in the Mibladene area, Taouz does produce some very nice vanadinite. There are also barite mines in the area that sometimes produce some good crystals.

The most common—and most familiar—dinosaur from the Kem Kem beds is *Spinosaurus*, which must surely have been one of the most spectacular of dinosaurs. It was a member of the theropod group, which con-

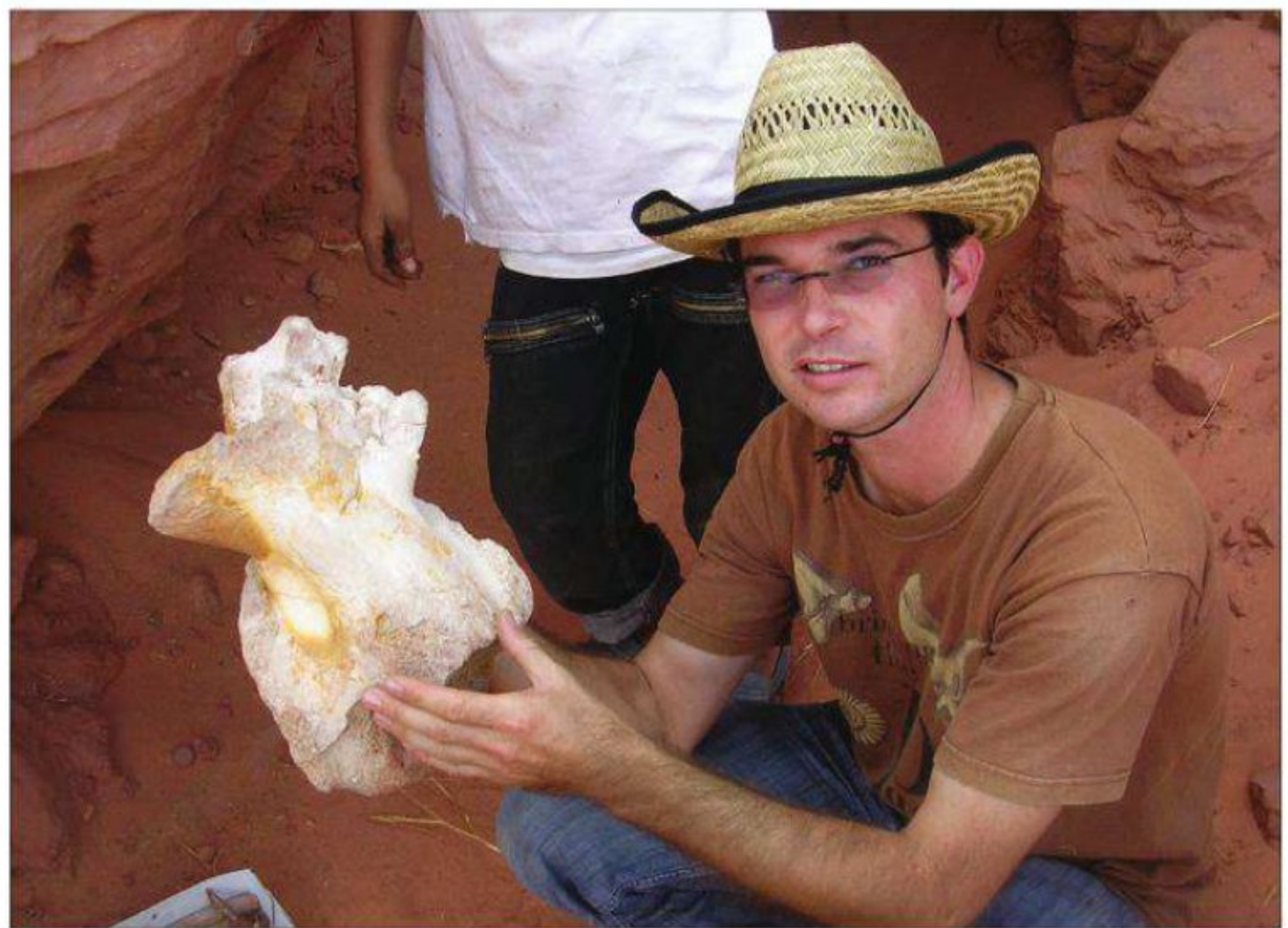
sists of the meat-eating dinosaurs, such as *Tyrannosaurus rex*, and their descendants, the birds. *Spinosaurus* walked on two legs and had long spines on the vertebrae along its back. These spines may have supported a sail fin or possibly a fatty hump like a bison has. It grew to be over 50 feet long and weighed up to 9 tons, making it the largest known theropod. By contrast, the biggest *T. rex* ever found was 42 feet long and weighed 7 tons. *Spinosaurus* teeth were conical rather than bladelike, as in most theropods, and could be over 6 inches long. The shape of its teeth leads paleontologists to believe that *Spinosaurus* ate mostly fish. It also had long claws on its hands. Bony claw cores over 8 inches long have been found; in life, these would have had a horny sheath, like a cat's claw, that would have added several more inches. The animal may have used these claws to snatch prey.

While *Spinosaurus* is the most common dinosaur of the Kem Kem beds, another is less common, but more sought after by collectors. The name of this beast is a mouthful: *Carcharodontosaurus saharicus*, or "Carch" for short. This animal was named for the resemblance of its teeth to those of the great white shark, *Carcharodon carcharias*, and the place in which it was found, the Sahara Desert. It was a predator similar in size and build to *T. rex*. Its teeth are usually thin and bladelike, serrated like steak knives, and can be several inches long.

Teeth of smaller predatory dinosaurs are fairly common in the Kem Kem beds. Most of these are thought to belong to an animal called *Deltadromeus*. The teeth are blade-like and usually under an inch long. On the commercial market, they are commonly called "raptor" teeth. Personally, I think this may be a marketing ploy, as it causes some people to think of the *Velociraptor* of *Jurassic Park* fame. *Velociraptor*, though, was a different animal and has never been found in Morocco. In a more general sense, "raptor" can refer to any of a variety of smaller, presumably fleet-footed predatory dinosaurs.

Plant-eating dinosaurs are also found in the Kem Kem beds, though, curiously, they are less common than the meat eaters. Teeth have been found that are pencil-shaped and up to about 2 inches long. They are thought to come from *Rebbachisaurus garasbae*, which was a sauropod, one of the large, long-necked dinosaurs. Without a skull to go with them, however, it is difficult to know for sure which dinosaur these teeth actually came from; *Rebbachisaurus* is just the most likely candidate. The same can be said for the raptor teeth.

Of course, these dinosaurs did not live in a world by themselves. Fossils of a variety of other creatures are found in the Kem Kem beds. Teeth from several different types of crocodile are fairly common. Slender, curved teeth up to 2 inches long are thought to come from *pterosaurs* (flying rep-



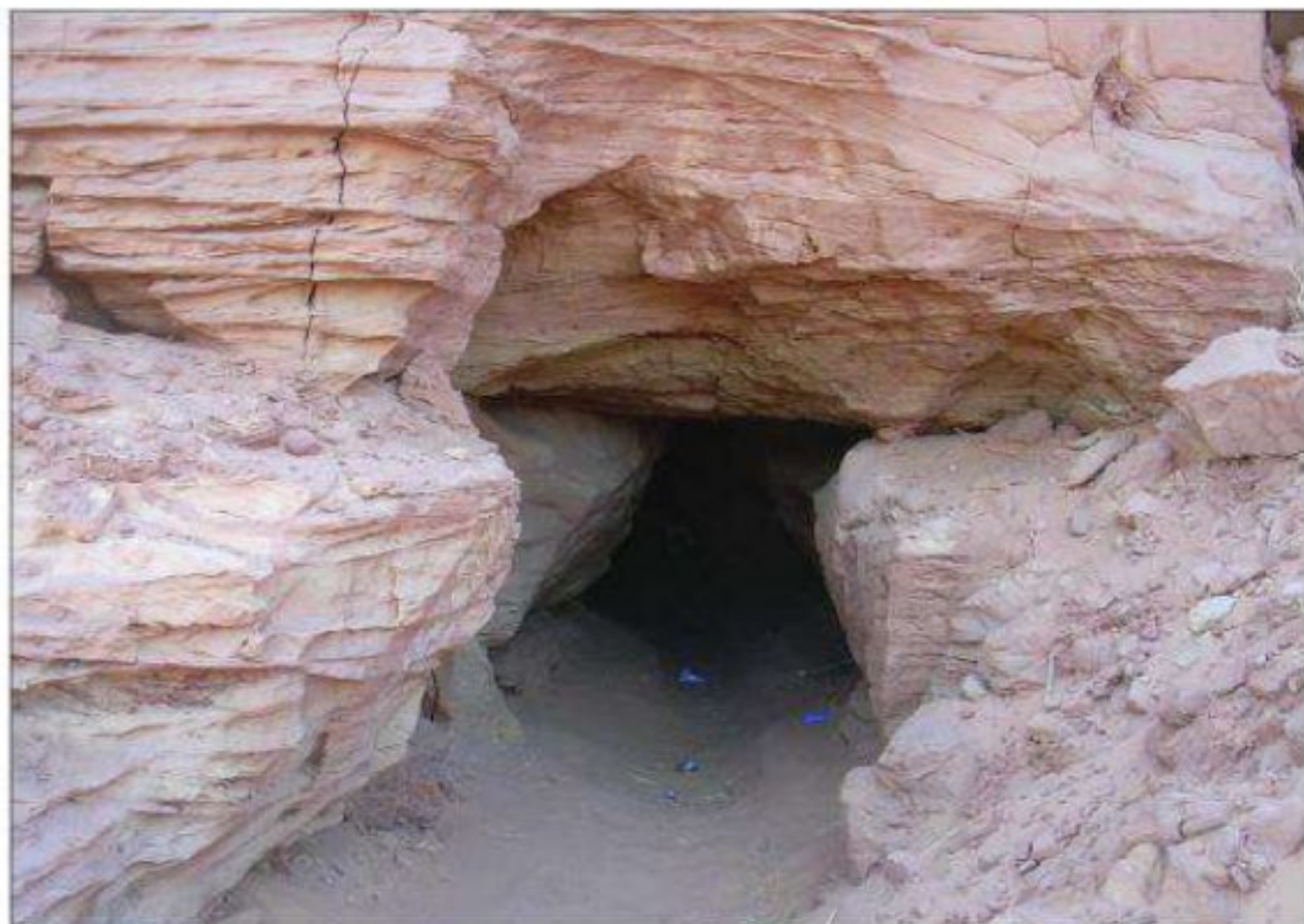
Tour guide Aissa showed off a large dinosaur bone that had recently been found.



Two fossil dealers named Mohammed (sitting) spread their fossils on the ground for us to peruse.



The view from the top of the hill was spectacular, making us realize how high up we were.



A series of small tunnels had been dug near the top of the hill, following the dinosaur layer. Barbed “teeth” like this one are from the sawfish *Onchopristis numidus*.

tiles). There are sawfish teeth with wicked barbs, fossil dorsal spines of the shark *Hybodus*, lungfish tooth plates, and gar scales.

How the dinosaurs of the Kem Kem beds actually lived is something of a mystery. As I mentioned, the plant eaters seem to be less common than the meat eaters. In most ecosystems, plant eaters far outnumber the meat eaters. There will, for example, generally be many more deer than cougars. Part of this discrepancy may be related to [collector bias]. Moroccan collectors concentrate on large, spectacular species, such as *Spinosaurus* and *Carcharodontosaurus*, which bring premium prices on the fossil market. Another part is the abundance of *Spinosaurus*, which, although it was a theropod, probably ate fish. It is easy to speculate that *Spinosaurus* was, in turn, eaten by other predators. However, chemical characteristics of the fossil teeth indicate that *Spinosaurus* spent most of its time in or near the water, as would be expected of a fish eater. *Carcharodontosaurus*, on the other hand, spent most of its time on land. The two would have thus largely avoided each other. Titanic battles between a 50-foot *Spinosaurus* and a 40-foot *Carcharodontosaurus*, while great to imagine, would have been unlikely. The scarcity of plant eaters, nevertheless, has not been entirely explained.

Most of the dinosaur fossils found in the Kem Kem beds consist of single teeth. Dinosaurs would constantly shed teeth and replace them with sharper, larger teeth as they grew. Shed teeth are without roots; those with roots were deposited when an animal died and are much less common. Teeth were also the hardest part of the animal's body, and thus the most likely parts to be preserved. The result is that teeth outnumber bones in the deposit. When bones are found, they are generally found one at a time. Because the Kem Kem sediments were originally deposited in a river delta, the fossils were scattered, so whole skeletons from single animals are not found.

I have read a lot about the Kem Kem beds and talked to people about them, but there is nothing like seeing a place for yourself. I was, therefore, excited about being back in Morocco in 2010 with plans to visit the beds. My group began its excursion from Erfoud, where there are very nice hotels. We were traveling in two off-road SUVs. We turned off the road shortly before reaching Taouz itself and continued to the point at which we had been thwarted by the muddy riverbed in 2008. Luckily, this time it was dry, and we made it across in fine shape.

The trip was not without incident, though; shortly after the riverbed, one of the vehicles got a flat tire. Adam and Aissa soon had it changed. The next day, before we could get the first tire fixed, we got another flat on the same vehicle. Adam had to leave us by the side of the road while he went into town to get another tire. This is why it's important to have two vehicles; so that if one has a problem, the other can go for help. While Adam and Aissa worked on the vehicle, the rest of us amused ourselves by looking at “ventifacts”, rocks that had been sculpted into interesting shapes and polished by wind-blown sand. We also picked up what appeared to be a stone artifact, a primitive flaked projectile point.

Soon after getting back on the road, we passed the small village of Begaa, which Adam called “the last village of Morocco”, as there were no more towns before Algeria. Not far past Begaa, we reached the base of the Kem Kem beds. At that spot, the formation is a hillside a couple hundred yards high. No sooner had we gotten out of the vehicles than we were joined by a man and a boy from Begaa, both named Mohammed, on motor scooters. Both had fossils for sale, and began to spread them out on the ground. They both had nice material, and we later bought several pieces.

The digging area was located near the top of the hill. Before striking out up the hill, we had a picnic lunch consisting of fresh bread, canned tuna, and fruit. Sara's

groups frequently do this when they are out in the field in Morocco and far from any restaurants. Once again, there were interesting rocks around. We found concretions up to 3 or 4 inches across, occurring singly, in pairs, and in clusters.

Finally, it was time to see where the dinosaur teeth were coming from. It was a short, though challenging, hike up the hill. I wished that I wore hiking boots instead of sneakers. The two Mohammeds were both wearing flimsy rubber flip-flops, but they scampered up the hill like goats. The hillside was an escarpment, the edge of a vast plateau known as Hamada du Guir. Near the top, there was a bowl-shaped depression a few yards deep extending a couple hundred yards back from the edge.

The dinosaur-bearing formation was a sandy layer about 4 to 12 inches thick, exposed around the edge of the depression a few yards below the top. It was bounded on the top and bottom by sandstone. A series of tunnels had been dug following this layer. Most were perhaps 4 or 5 feet high—not high enough to stand up in—and 3 feet or so across. Some tunnels extended back into the hill as far as 50 yards. These tunnels were all dug with hand tools by the light of carbide lamps. The Kem Kem formation is not the most stable of formations in which to tunnel. We were told that about one person per year is killed in a cave-in while digging for fossils.

We were there on a Friday, the Moslem holy day, so no one was working. The two Mohammeds took us to a tunnel they said was being actively worked. They offered to let us go in and do some digging, but we lacked proper lights, having only a small flashlight with us. I went in a few feet but, concerned about safety and the lack of light, I quickly retreated. The Mohammeds, though, went deep inside and brought out a large dinosaur bone that had been found recently by the younger Mohammed's father. I couldn't tell what bone it was or from what kind of dinosaur.



Interesting concretions could be found at the base of the Kem Kem beds.

We spent the rest of our time at the site taking pictures and picking around on the dumps. We found several broken teeth and shards of bone, though the miners clearly would not have left anything valuable just lying about. The climb down the hillside was tricky, as there were a lot of loose rocks, but the view was spectacular, making us realize just how high up we were.

On our way back, we stopped at the younger Mohammed's house in Begaa to see some of his father's fossils. Among his finds was a section of a large leg bone, perhaps 2½ feet long. He spread his material out on a table for us to peruse and passed around glasses of tea. This is how a lot of both fossils and minerals are sold all over Morocco—in people's houses over a glass of tea. He had some nice fossils, and more business was done.

Much of the preparation on fossils from the Kem Kem beds is done in the homes of diggers like those in Begaa. The layer that most of them come from is very sandy, so most come free from the matrix. Many of the fossils are rather fragile and get broken

in the collection process. These are usually glued back together, and sometimes a bit of plaster is used to fill in cracks. As many readers know or suspect, fake fossils are a huge problem in Morocco, particularly in the case of trilobites and some of the shark and marine reptile fossils. I've written about this before. However, there seems to be less outrageous fakery in the dinosaur material. The worst that I have heard of is claws that were carved out of pieces of bone, though I don't know that I've ever actually seen one. Sometimes, broken pieces are mismatched when they are glued together. In most cases, though, the worst is some minor repair work, which is not too bad to deal with, in my opinion. Remember that most dinosaur skeletons in museums have undergone extensive repair and restoration.

My visit to the Kem Kem beds certainly increased my appreciation of the fossils that are found there. *Spinosaurus* teeth are widely available on the fossil market through the efforts of people like those we met, who risk their lives digging them out of the ground. It is truly remarkable that most serious fossil collectors can own a piece of what is possibly the largest predatory dinosaur that ever lived for a reasonable price. *T. rex* teeth are precious and few, and many rightly reside in museums. However, teeth of a very similar animal, *Carcharodontosaurus*, though more expensive than *Spinosaurus* teeth, can commonly be had on the fossil market. In addition to collectors, museums and professional paleontologists benefit from finds made in the Kem Kem beds. These beds are vast and contain abundant fossils. Production seems to be limited only by the number of skilled diggers mining them. Let us hope that the diggers continue their efforts and keep on supplying both collectors and museums for years to come. ♦



The meat-eating dinosaur *Spinosaurus* had huge claws to which a horny sheath would have added several inches.

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8-9—TEMPLE, TEXAS: Annual show; Tri-City Gem & Mineral Society; Mayborn Convention Center, 3303 N. 3rd St.; Sat. 9-6, Sun. 10-5; adults \$3; silent auctions, raffles, door prizes, grand prize, demonstrations, dealers, rough, slabs, cabs, faceted gems, equipment, finished jewelry; contact Chip Burnette, 2630 Polk St., Killeen, TX 76543, (254) 630-3573; e-mail: burnette@aceweb.com

8-9—TOPEKA, KANSAS: Annual show; Topeka Gem & Mineral Society; Kansas Expocentre AG Hall, 17th and Topeka Blvd.; Sat. 10-6, Sun. 10-5; adults \$4, ages 13-17 \$1, under 13 free with adult; demonstrators, displays, dealers, lapidary supplies, rough rock, beads, jewelry; contact M. Mowry, 1934 SW 30th St., Topeka, KS 66611, (785) 267-2849; e-mail: rock2plate@aol.com

8-9—TRONA, CALIFORNIA: 70th annual show, "Gem-O-Rama 2011"; Searles Lake Gem & Mineral Society; Lapidary and Show Bldg., 13337 Main St. (at Trona Rd.); Sat. 7:30-5, Sun. 7:30-4; free admission; more than 20 dealers, 50 exhibits, geode cutting and sales, demonstrations, gem dig, door prizes, field trips; contact Jim or Bonnie Fairchild, (760) 372-5356; Web site: www.iwvisp.com/tronagemclub/

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8-9—WORTHINGTON, PENNSYLVANIA: Show; Kit-Hanne Rock & Gem Club; West Franklin Fire Hall, Linton Alley and Cherry St.; Sat. 10-5, Sun. 10-5; donation requested for admission; six dealers, silent auction, displays, kids' gem mine, door prizes; contact Albert Zabinski, PO Box 456, East Vandergrift, PA 15629; e-mail: kithanne@facetersco-op.com; Web site: www.facetersco-op.com/zabinski/club.htm

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13-16—FRANKLIN, NORTH CAROLINA: Annual show; South East Gems & More; Whistle Stop Mall Parking Lot, 1281 Georgia Rd. (Hwy. 441N); Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 9-4; free admission; dealers, silver and goldsmithing, rough, slabs, fossils, minerals, metaphysical, findings, gemstones, custom jewelry and repairs; contact Mark or Patricia Smith, 751 Hutto Pond Rd., Aiken, SC 29805, (706) 490-4550; e-mail: segems@ymail.com

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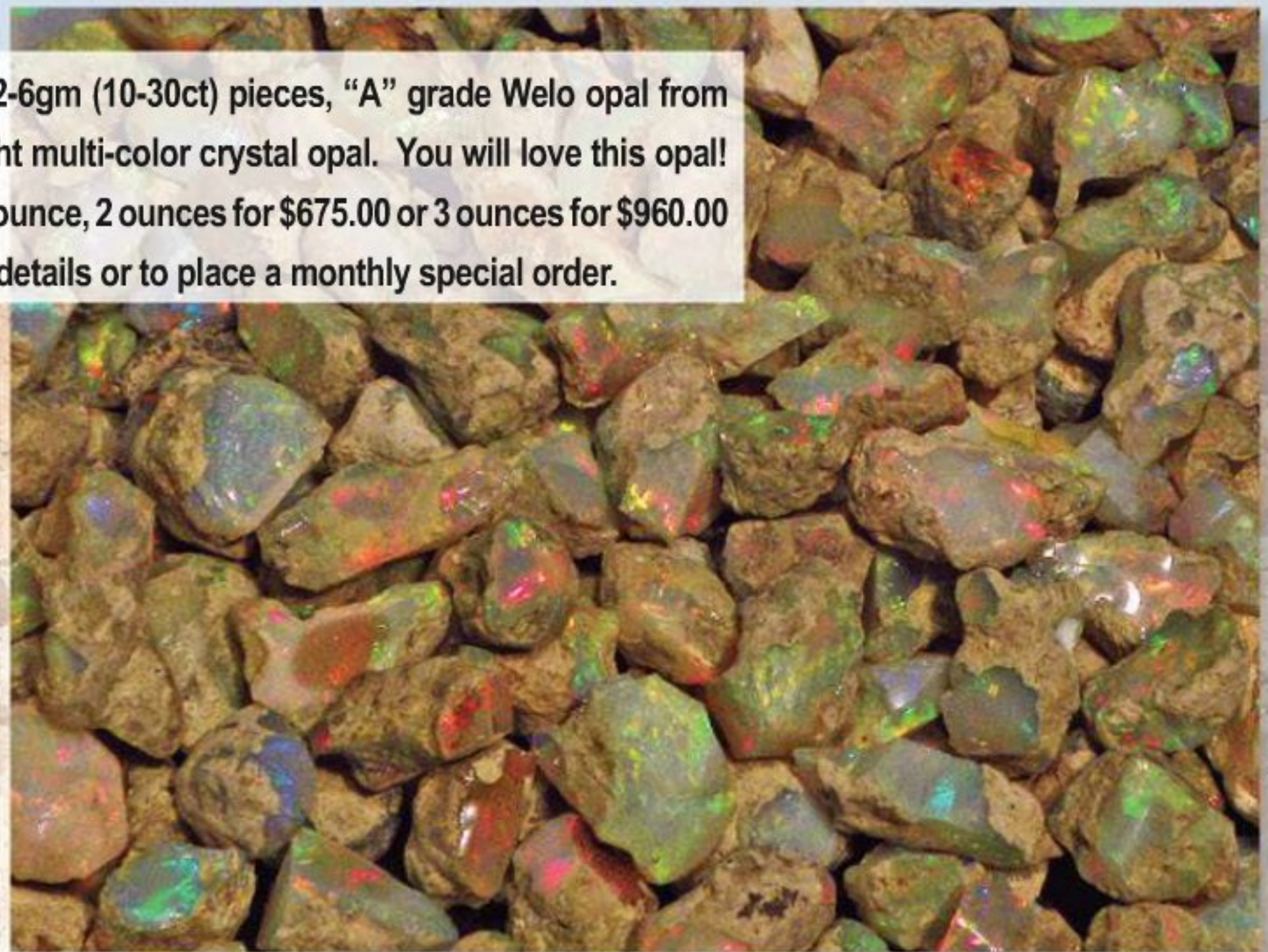
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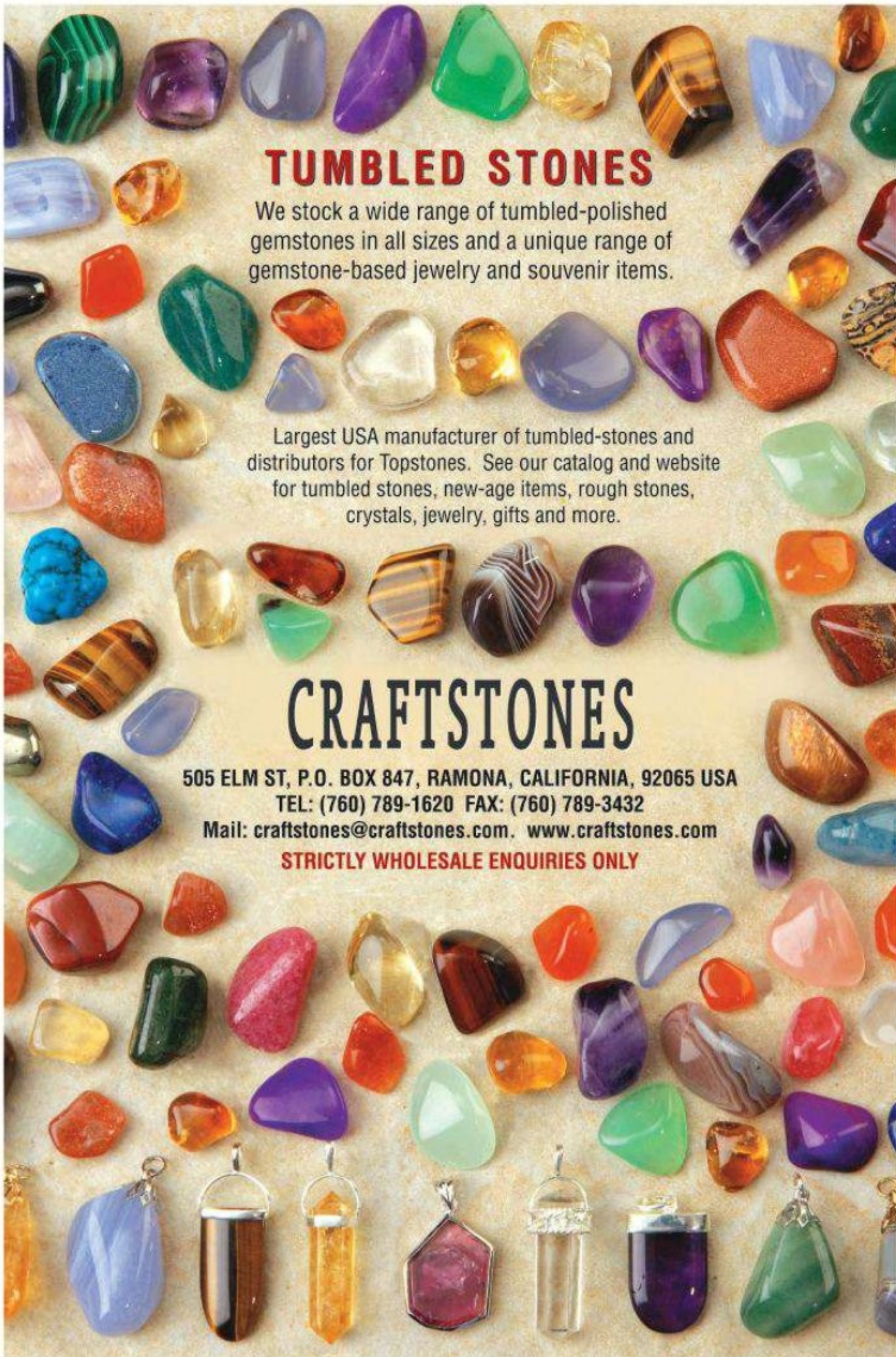
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14-16—MOUNT IDA, ARKANSAS: Show, "Quartz, Quiltz and Craftz Festival"; Mount Ida Area Chamber of Commerce; Montgomery County Fairgrounds, Fairgrounds Rd.; Thu. 9-6, Fri. 9-6, Sat. 9-6, Sun. 10-4; free admission; dealers, minerals, jewelry, quartz crystals, quilts, crafts, children's digging contest Sat.; contact Maureen Walther, Mount Ida Area Chamber of Commerce, Mount Ida, AR 71957, (870) 867-2723; e-mail: director@mountidachamber.com; Web site: www.mountidachamber.com

14-16—WARREN, MICHIGAN: Annual show; Michigan Mineralogical Society; Macomb Community College Expo Center, South Campus, 14500 E. 12 Mile Rd., Bldg. P; Fri. 9-7, Sat. 10-7, Sun. 11-5; adults \$8 (3 days \$12), seniors (62+) \$5, children (5-17) \$4, Scouts in uniform \$3; Ice Age woolly rhino and giant ground sloth skeletons, school groups Fri., exhibits from Smithsonian Institute, Carnegie Museum, A.E. Seaman Museum, Lizzadro Museum, Royal Ontario Museum, Cincinnati Museum, University of Waterloo, Wayne State University, Cranbrook Institute of Science, lectures, dealer displays, free mineral identification; contact Carol Werner, 3401 Briarhill Rd., Hartland, MI 48353-2406, e-mail: briarhillwerner@comcast.net; Web site: <http://michmin.org/>

15—MOUNTAIN HOME, IDAHO: Show; Eureka Rock & Gem Club; Senior Citizen Center, 1000 N. 3rd E.; Sat. 9-4; contact Margaret Stallknecht, (208) 740-0937; e-mail: mestallknecht@yahoo.com

15—SEATTLE, WASHINGTON: Show; Rings & Things; Seattle Center Pavilion, 305 Harrison St.; Sat. 12-4; free admission; gemstones not available in our catalog or online store, bead strands, 15% off many gemstone and bead strands, findings and stringing supplies; contact Dave Robertson, (800) 366-2156; e-mail: [drobertson@rings-things.com](mailto:d Robertson@rings-things.com); Web site: www.rings-things.com/Show/index.html

15—WEST HILLS, CALIFORNIA: Annual show; Woodland Hills Rock Chippers; First United Methodist Church, 22700 Sherman Way; Sat. 10-5; free admission; gems, minerals, rocks, fossils, displays, dealers, silent auctions, demonstrations, hands-on activities; contact Mary Beth Pio, (818) 349-9163; e-mail: info@rockchippers.org; Web site: www.rockchippers.org

15-16—BRISTOL, CONNECTICUT: Annual show; Bristol Gem & Mineral Club; Beals Community Center, 240 Stafford Ave.; Sat. 9:30-5, Sun. 10-4; adults \$5, seniors \$4, children under 12 free with adult; gems, jewelry, mineral specimens, crystals, hands-on educational exhibits, grand door prize, free children's games and activities; contact Dave Korzendorfer, 208 Westledge Rd., West Simsbury, CT 06092, (860) 651-9980; e-mail: Bristolgem@hotmail.com; Web site: www.bristolgem.org

15-16—CLIO, MICHIGAN: Annual show; Flint Rock & Gem Club; Carter Middle School, 300 Upland Dr., off Vienna Rd./M-57; Sat. 10-5, Sun. 10-5; adults \$3, children (6-18) \$1.50, Scouts in uniform free; displays, minerals, crafts, lapidary demonstrations, children's activities, dealers, jewelry, gems, minerals, rough specimens, door prizes, raffles; contact Mary Poma, 806 Homedale St., Saginaw, MI 48604; Web site: www.flintrockandgem.org

15-16—COTTAGE GROVE, MINNESOTA: Annual show, "Great Lakes, Great Rocks 2011"; Minnesota Mineral Club; National Guard Training and Community Center, 8180 Beldon Blvd.; Sat. 10-5, Sun. 10-4; adults \$2, children \$1; exhibits, tailgate sales, dealers, programs, kids' corner, demonstrations; contact Phil Gotsch, (763) 717-1641; e-mail: agatephil@earthlink.net; Web site: www.minnesotamineralclub.org

15-16—DAHLONEGA, GEORGIA: Retail show; Committee for the Restoration of the McDonald House; Historic Smith House on the Square, 84 S. Chestatee St.; Sat. 9-6, Sun. 9-5; free admission; cut stones, cabs, slabs, specimens, jewelry; contact Tommy Folger, PO Box 216, Dahlonega, GA 30533, (706) 973-0003; e-mail: tfolger@windstream.net; Web site: www.dahlonega.org

15-16—DES MOINES, IOWA: Annual show; Des Moines Lapidary Society; Paul R. Knapp Animal Learning Center, Iowa State Fairgrounds, E. University Ave. Gate; Sat. 10-5, Sun. 10-4; adults \$5, children 12 and under free; dealers, minerals, fossils, gems, crystals, beads, jewelry, books,

continued on page 60

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TONY ZNANIECKI'S Wildlife on Rocks

Nature Provides the Background for His Paintings

Story and Photos by Bob Jones

It's always interesting to meet someone the phrase "Jack of all trades" fits like a glove. Such people are fun to talk to, as you learn what adventures and creations their multi-talented life has wrought. Tony Znaniecki of Cottonwood, Arizona, is one such person. I ran into Tony at the 2011 Flagg Foundation show in Mesa, Arizona, an outdoor show held in early January each year. He was sitting under a canopy, brush in hand, doing some of the most amazing wildlife paintings I had even seen. Instead of using canvas—which he had actually used for over 20 years—Tony was painting on large, colorful, polished slabs of every type of rock you can image. I immediately stopped to admire his work and to learn more about this very obviously talented guy!



Tony Znaniecki prefers not to overpaint, but to allow as much of the natural rock to show as possible.



Tony likes to choose slabs that have a nice rim of rock that frames the scene, like this quartz agate slab.

Oddly, in spite of his consummate skill in portraying wildlife on rock, Tony's formal training was in geology and geography, with a strong emphasis on ecology and botany. Just how all those disciplines combined soon became obvious as Tony described his master's thesis work, done in California, in identifying the types of plants that could develop based on elevation, rock type, and climate. He could rattle off the Latin names for plants faster than I could recite the Periodic Table of Elements!

Tony's knowledge of plant life, geography, and related issues proved to be important later in life when he was commissioned in the Army. He was sent to Vietnam to do aerial studies and reconnaissance missions, but there were times he was asked to help find and rescue prisoners of war. His work was secret and important, and at times he was flown back to Washington, DC, so he could report directly to the Pentagon—sometimes being taken right off the line and sent back without even a change of clothes!

After his stint in the service, Tony ended up in Alaska, an ideal place for someone who had a hankering to paint wildlife. Even though he'd had only a couple of painting lessons, he began putting brush to canvas, painting the wildlife he saw around him. True, his mother had been an artist, which is probably where he got the idea to paint. He might have even, through casual observation, seen some of the methods his mother used, but he had little formal training. Still, Tony became a professional freelance artist in 1976. His paintings sold well, and for years he has made a living painting. He work has received many awards, including the important Colorado Ducks Unlimited Artist of the Year in 1986, 1987 and 1988.

Tony showed me one of his paintings on canvas, and I was really impressed. It is a magnificent wilderness scene with mountains, a flowing river, and an eagle in full flight. I thought the bird was going to depart the canvas and pass overhead. That's the real beauty of Tony's work; it appears to be three-dimensional. Now, he has transferred that skill to rock art!

Naturally, painting on rock is not the same as working on canvas. When I asked Tony what was the most important thing about rock painting. His answer really surprised me: "Windex® and paper towels." Then he pointed out that every slab of rock has been cut on a diamond saw, often with some form of oil as a lubricant. Then the piece is handled again and again by potential buyers and the dealer who is offering the slice for sale, so oily fingerprints are all over the piece. If the rock is the least bit porous, those oils, regardless of their origin, have penetrated the surface, so even if the piece has been polished, it is not clean. Tony sprays the slice with Windex and wipes it clean again and again until his is



To paint grass in the foreground, Tony uses an odd, fanlike brush that does the job quickly and easily.



Tony prefers a "double O" brush for the job of replicating feathers on this ring-necked pheasant.



The rock slice provides an attractive setting, with the animal adding to the overall beauty of the piece.

absolutely sure the surface of the rock is spot clean. Unlike some of the other rock artists I've talked to, Tony does not seal his "rock canvas". He takes his rock straight, but absolutely clean!

Tony uses acrylics for all his work, but he does *not* use acrylics squeezed from a tube. He prefers to use acrylics in small jars for two reasons: The liquid from the jars tends to be a little more fluid, and as he draws his brush across the rock surface, the acrylic flows more easily. The acrylic in tubes tends to be a bit less fluid and does not flow as readily. But even using jar acrylic can have a small problem. Two jars that are labeled as the same color might be just slightly different in tint.

Because much of his work involves painting feathers and fur, Tony prefers a very tiny brush known as a "double O". He gets them from stores that sell all sorts of interior decorator and hobby items. I thought he would probably prefer expensive, high-quality brushes, but he uses cheap nylon brushes because they last as long as the more costly brushes and work as well.

With a practiced hand, Tony can skillfully draw the fur of a mountain lion using that very fine brush and do it quickly. Now, if I was drawing a furry animal—which I can't—I'd try to paint each hair or bit of fur one at a time. Imagine how tedious and time consuming that would be. Tony simply moves that small brush quickly over the rock surface, and somehow the fur just appears. If he wants to paint something that is a bit wider or coarser, like clumps of dried grass for the foreground, he uses a really odd brush that looks like a hairy fan. With this he can stroke clumps of grass seemingly instantly.

Tony's paintings are detailed, with foreground and background images and one or more animals fully featured in the painting. But he advises not to over paint; paint only what is necessary to complete the work and allow as much of the natural rock to show as you can. After all, nature can be quite beautiful by itself, and the idea of the rock slice is to provide an attractive setting, with the animal adding to the overall beauty of the piece. Tony's philosophy is that his painting should blend with the natural pattern that can be seen in the rock and not seem forced.

The paintings look like they must take several days to accomplish. I asked Tony how long it takes him to paint one of the beautiful renditions that are pictured in this article. He actually looked a bit sad when he said, "It takes me a day and a half now, and I used to do several in a day!" That is nothing short of amazing!

When he sets up at a show he often sells more paintings than he carries with him. Though he may take 50 paintings, he may sell 60 or more, so he is constantly painting during the show and in his motel at night.



Tony lets the pattern of the rock suggest a potential scene, using his vast experience to guide him.



Since the majority of Tony's paintings feature wildlife, you can imagine how well they sell at gun shows.

Do you get the idea he is a workaholic? He is! If you'd like to see him work, go to the Denver Gem & Mineral Show at the Merchandise Mart in September, the Electric Park show in Tucson in February, or any one of some 30 other rock, mineral and gun shows. Just ask for "the Grouch", which happens to be the name on his Arizona license plate! Since the majority of his painting features wildlife, you can imagine how well his work sells at gun shows!

When buying a rock slice for his work, Tony looks for a couple of things. Most importantly, the rock has to be colorfully

patterned in a way that suggests a natural scene that could be interpreted as a wildlife setting. He has no preconceived notions of what he wants in a slice of rock. He lets the rock suggest a potential scene, using his vast lifelong experiences to guide him. After all, he has lived on every continent except South America! He does not paint any background on most of his work, preferring that nature provide the colorful and patterned setting he sees in it.

He also likes slices of rock that have what he calls a "frame". This is the outer rind or rim of the piece that serves as a natural framing



Tony's paintings are detailed, with foreground and background images, and feature one or more animals.



Tony can skillfully draw fur using his tiny brush, and do it quickly, completing a painting in a day and a half.

of his painting. He tries not to allow any part of the painting to run into that frame, though sometimes the extended tail of a bird in flight will spill over onto the frame a tiny bit.

Tony doesn't really have a preference when it comes to the types of rock he paints on. He takes whatever nature creates: agate, petrified wood, jasper, even rocks whose origins are unknown, as long as they are hard, patterned and colorful. He buys slices from dealers from all over the world: Afghanistan, China, Africa, South America, you name it. The slice dictates whether he buys it or not.

There is one other criterion he insists on: The slice cannot have even the suggestion of a crack in it. He showed me one piece of quite lovely jasper that was smooth and polished on one side, with no cracks visible—perfect for his work. Turning it over, he pointed out the tiniest crack along the rim of the piece. He refuses to use that slice.

The work that Tony Znaniecki does is truly breathtaking. I hope you have a chance to see his work in person and also have a chance to visit with "the Grouch" a gregarious guy whose life has been exciting, adventuresome, and certainly productive! ♥

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15-16—GRAND JUNCTION, COLORADO: 64th annual show; Grand Junction Gem & Mineral Club; Two Rivers Convention Center, 1st and Main; Sat. 9-6, Sun. 10-5; adults \$3, children 12 and under free with parent; dealers, demonstrations, children's corner, special attractions; contact Wayne McMackin, 191 Lumley, Grand Junction, CO 81503, (970) 640-9271; e-mail: wcmackin@msn.com; Web site: www.grandjunctionrockclub.org

15-16—JOHNSTOWN, NEW YORK: Annual show; Fulton County Mineral Club; Johnstown Moose Lodge, Rte. 30A; Sat. 10-5, Sun. 10-5; adults \$3; contact Bob Hartig, (518) 842-5948; e-mail: rockbob@nycap.rr.com

15-16—LAKESIDE, CALIFORNIA: Annual show, "Rock and Gem Roundup"; El Cajon Valley Gem & Mineral Society; Lakeside Rodeo Grounds, 12584 Mapleview; Sat. 10-5, Sun. 10-5; free admission; rocks, minerals, gemstones, jewelry, fossils, beads, handcrafted items, demonstrators, displays, kids' activity area; contact Patrick Smock, 10852 S. Samuel Rd., Hereford, AZ 85615, (619) 719-3444; e-mail: cprpsm@yahoo.com; Web site: www.ecvgms.com

15-16—LEWISTON, IDAHO: Annual show; Hells Canyon Gem Club; Nez Perce County fair Bldg., 1229 Burrel Ave.; Sat. 10-6, Sun. 10-5; adults \$2, students free with ID, children under 12 free; contact Rick Westerholm, (208) 746-2101; Web site: hellscanyonclub.com

15-16—NASHVILLE, TENNESSEE: Show; Intergalactic Bead & Jewelry Shows; Al Menah Shrine Temple, 1354 Brick Church Pike; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

15-16—PLACERVILLE, CALIFORNIA: Annual show; El Dorado County Mineral & Gem Society; El Dorado County Fairgrounds, 100 Placerville Dr.; Sat. 10-5, Sun. 10-5; adults \$4, children 12 and under free; dealers, displays, minerals, gems, jewelry, beads, fossils, petrified wood, amber, opals, meteorites, geodes, carvings, tools, books, lapidary and jewelry-making demonstrations, amber exhibit and presentations, free rocks and activities for kids; contact Karen Newlin, (530) 676-2472; e-mail: info@rockandgemshow.org; Web site: www.rockandgemshow.org

15-16—SOUTH CHARLESTON, WEST VIRGINIA: Annual show; Kanawha Rock & Gem Club, South Charleston Lions Club; South Charleston Community Center, 601 Jefferson Rd.; Sat. 9-6, Sun. 10-5; adults \$3.50, children 12 and under free with parent; dealers, gems, minerals, fossils, rocks, beads, jewelry, demonstrations, kids' corner, displays; contact Kanawha Rock & Gem Club, PO Box 252, Farmington, WV 26571, (304) 657-7089; e-mail: frankoz@juno.com

15-16—WHITTIER, CALIFORNIA: Annual show; Whittier Gem & Mineral Society; Whittier Community Center, 7630 Washington Blvd.; Sat. 10-5, Sun. 10-5; free admission; dealers, minerals, jewelry, gems, collectibles, lapidary demonstrations; contact Marcia Goetz, 755 W. Dike St., Glendora, CA 91740, (626) 260-7239; e-mail: joenmar1@verizon.net

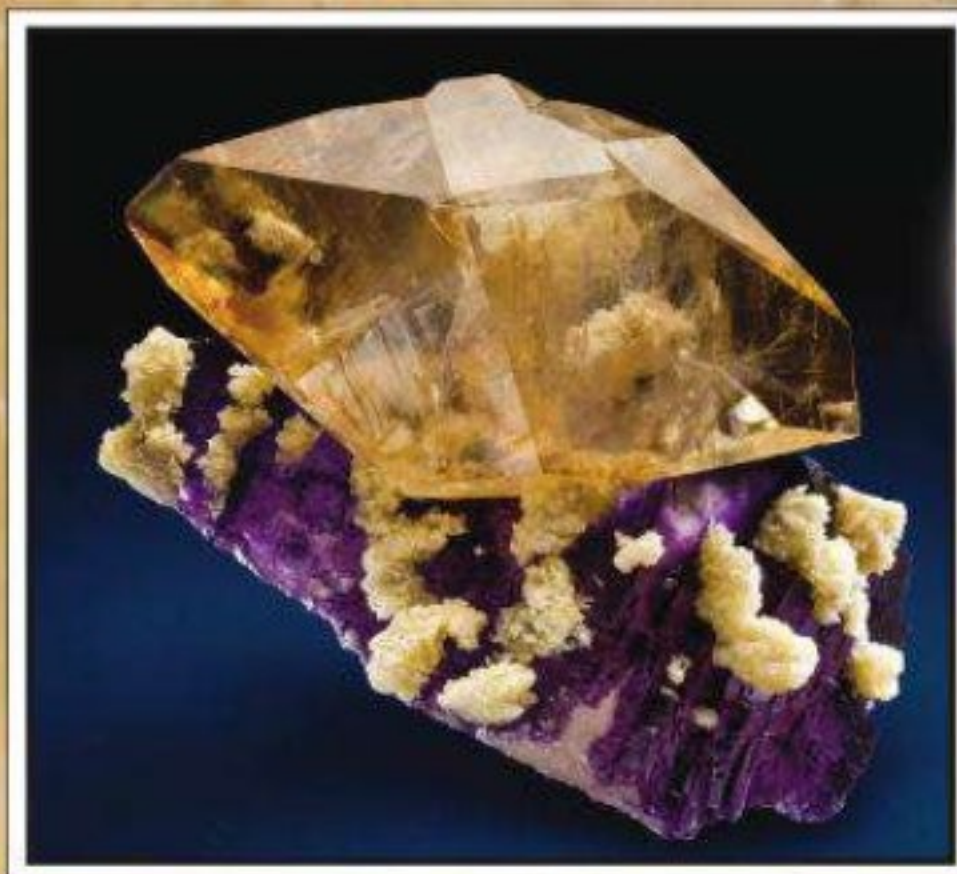
21-23—AUSTIN, TEXAS: Annual show, "Gold"; Austin Gem & Mineral Society; Palmer Events Center, 900 Barton Springs Rd.; Fri. 9-5, Sat. 10-6, Sun. 10-5; adults \$5, seniors (60 and over) \$4, students (13-18) \$1, children (6-12) 50 cents; more than 30 dealers, jewelry, beads, gemstones, mineral specimens, crystals, fossils, spheres, lapidary equipment, exhibits, "Rock Food" table, touch table, fluorescent minerals, member collections, silent auction, demonstrations, faceting, capping, fossil cleaning, polymer clay, "Youth Education Day" Fri., Gem Mine, Wheel of Fortune, Jewelry Making, door prizes, grand prize; contact Susan Postlethwait, 6719 Burnet Ln., Austin, TX 78757, (512) 458-9546; e-mail: showchariman@austingemandmineral.org; Web site: www.gemcapers.com

21-23—FORT WAYNE, INDIANA: Annual show; Three Rivers Gem & Mineral Society; Allen County Fairgrounds in 4-H & Home Loan Bank Bldgs., 2726 Carroll Rd.; Fri. 10-7, Sat. 10-7, Sun. 11-5; adults \$3, seniors \$2, students \$1, children free; Golden Show anniversary, dealers, demonstrators, kids' games, silent auction, touch 'n' feel table, door prizes, fluorescence room, speakers, displays; contact Michele Yamanaka, 4336 Charter Lane, Fort Wayne, IN 46815

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by Bob Jones, Senior Consulting Editor, Rock & Gem

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21-23—INDIANAPOLIS, INDIANA: Show; Indiana State Museum, 650 W. Washington St.; Fri. 9-5, Sat. 9-5, Sun. 11-4; adults \$7, seniors \$6.50, children \$4; dealers, regional clubs, adult and kids' activities; contact Peggy Fisherkeller, Indiana State Museum, 650 W. Washington St., Indianapolis, IN 46204, (317) 232-7172; e-mail: pfisherkeller@dnr.in.gov; Web site: www.indianamuseum.org

21-23—MASON, MICHIGAN: Annual show; Central Michigan Lapidary & Mineral Society; Ingham County Fairgrounds Main Arena, 700 E. Ash St.; Fri. 6-9, Sat. 10-7, Sun. 11-5; adults \$3, students \$1, children free; Petoskey stone polishing, fluorescent booth, Touch and Feel table, demonstrations, door prizes; contact Roger Laylin, (517) 349-3249; e-mail: show@michrocks.org; Web site: www.michrocks.org

21-23—SACRAMENTO, CALIFORNIA: Wholesale and retail show; Gem Faire Inc.; Scottish Rite Center, 6151 H St.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7 weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

22-23—BELLEVUE, WASHINGTON: Show; Bellevue Rock Club; Vasa Park, 3560 W. Lake Sammamish Blvd. SE, I90 Exit 13, 1 mile north; Sat. 10-5, Sun. 10-5; contact Bruce Himko, PO Box 1851, Bellevue, WA 98009-1851; e-mail: Bellevuerockclub@comcast.net; Web site: www.bellevuerockclub.org

22-23—CANBY, OREGON: Show, "Rock & Gem Heaven in 2011"; Clackamette Mineral & Gem Club; Clackamas County Fairgrounds, 694 NE 4th Ave.; Sat. 9-6, Sun. 10-5; free admission; dealers, demonstrations, raffle, silent auction, Kids' Korner, door prizes, fluorescent show, displays, slabs; contact Rick Mauer, (503) 691-6395; e-mail: tallerricardo@juno.com; or Bea Settle, (503) 631-3128; e-mail: rockhound@clackamettegem.org

22-23—CUYAHOGA FALLS, OHIO: Show and sale; Akron Mineral Society, Summit Lapidary Club; Emidio & Sons Expo Center, [Gemboree] 48 E. Bath Rd.; Sat. 10-6, Sun. 10-6; adults \$5, seniors and students \$4, children \$1; dealers, door prizes, silent auction, lapidary demonstrations, gem mine, children's activities; contact Evelyn Tryon, 2028 Tallmadge Rd., Kent, OH 44240, (330) 673-9664; e-mail: gemboree76@yahoo.com; Web site: www.lapidaryclubofohio.org

22-23—DENISON, TEXAS: Annual show; Texoma Rockhounds; Senior Center (Snap Center), 531 W. Chestnut; Sat. 9-5, Sun. 10-4; free admission; contact Rosemary Siems, 91 Country Hill Circle, Sherman, TX 75090, (903) 647-5590; e-mail: ramblingrosetoo@yahoo.com

22-23—GURNEE, ILLINOIS: Annual show; Wrap-N-Rock Gems; Key Lime Cove, 1700 Nations Dr.; Sat. 10-6, Sun. 10-4; free admission; door prizes, dealers, jewelry, opals, gemstones, wire-wrapped jewelry demonstrations, geode cutting, amber, fossils, minerals, quartz crystals, faceted stones, custom jewelry and cabochons; contact Gere Bunnell, PO Box 7584, Gurnee, IL 60031; (847) 336-1270; e-mail: gerewb@gmail.com; Web site: www.lakecountygemshow.com

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continued on page 72



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OFF THE DOP

Iolite, aka "Water Sapphire"

According to *Descriptions of Gem Materials*, 3rd Edition, by Glenn and Martha Vargas, iolite has a Mohs hardness of 7 to 7.5 and a refractive index of X-1.544, Y-1.548, Z-1.550. It has strong trichroism (blue, yellow and clear), is transparent to translucent, and had a vitreous luster. Cleavage is distinct in one direction, according to the Gemological Institute of America (GIA). This tells faceters that it can be faceted; however, because of the possibility of cleavage problems, it may shatter during the grinding process without warning.

In every regard, iolite is a good candidate for faceting; however, what I believe prevents it from being more popular with faceters is the potential cleavage issues, which could create problems when a jeweler sets the stone or a consumer wears it. Therefore, you may see this gem occasionally in jewelry stores, but it is most likely to be found as a collector gem.

Mineral collectors may be familiar with this mineral by a different name: cordierite or dichroite. Faceters prefer the strong blue color to the yellow or clear, so the stone must be oriented properly. Since it has a refractive index near that of quartz, any design suitable for quartz will work with iolite. I prefer the angles 43° (pavilion) and 37° (crown).

According to my reference materials from the GIA Colored Stones Course, the mineral cordierite was named after geologist Pierre Cordier, while the gem became known by the trade name iolite, which comes from the Greek word *ion*, meaning "violet". Some older jewelry references call iolite "water sapphire", which was another trade name referring to the stone's color.

When tanzanite was first discovered, gemologists initially thought it might be cordierite. Unlike tanzanite, which was discovered in 1969, however, iolite has a very long history. Early sailors used thin pieces of iolite as a filter so they could clearly see the location of the sun for navigation. Unlike tanzanite, blue topaz, sapphires, and many other blue gems, iolite is not treated beyond normal cutting and polishing. From a consumer point of view, the lack of treatment or enhancement may be a positive point.

Sources for iolite occur in Sri Lanka and several African countries, including Kenya, Tanzania and Madagascar. The



gem is also found in alluvial deposits in India, Brazil, Norway and Finland. Faceted iolite is commonly found in 1- to 10-carat gems, and prices range from \$5 to \$75 per carat for commercial cut stones depending on the size and quality. The only source for iolite facet rough I have found is New Era Gems (www.neweragems.com), which had some pieces up to 9 carats for approximately \$6.34 per carat.

While cutting my iolite, I found it had a softer feel against the grinding wheel compared to quartz and it ground very easily using 360, 600 and 1200 diamond laps. I polished the stone first using a Spectra Ultra Lap and water; however I found that my Darkside Lap™ and a thin cerium oxide slurry provided a better polish, flatter facets, and sharper meets.

Iolite is known to have many inclusions, veils, and, of course, a distinct cleavage plane. In general, however, I found iolite easier to polish than quartz, right up to the end of my stone, when a small cleavage showed up across one of my crown girdle facets and a star facet. The money I spent for rough was more than I could sell the finished stone for, which was very disappointing after all that work, but that is a chance we take when we cut some stones that I think are better suited for mineral specimens rather than gems. ♦

Send your comments and questions about any of my columns to Off the Dop, P.O. Box 1041, Medina, OH 44258, or e-mail me at jimperkins@zoominternet.net.





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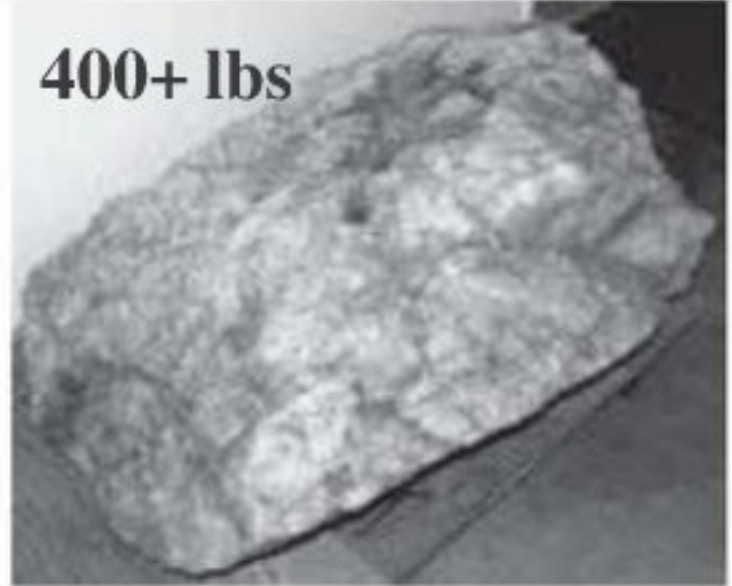
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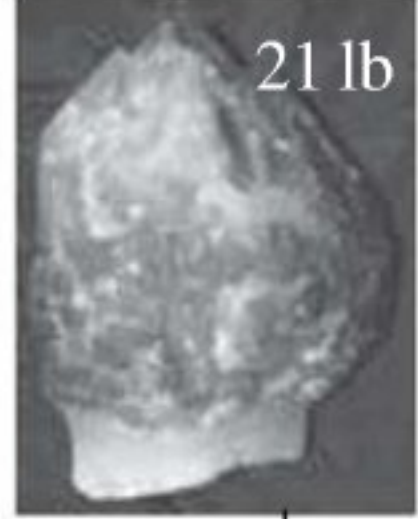
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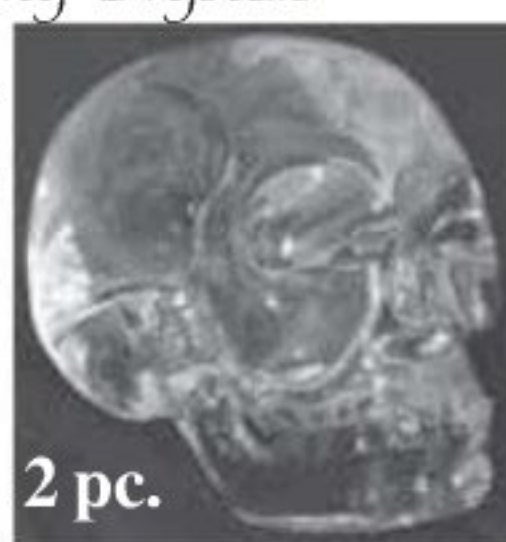
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COLLECTING AUGITE CRYSTALS in the DOTY HILLS

There's a Wealth of Minerals in
Washington State

Story and Photos by Stuart "Tate" Wilson



A large augite crystal is sticking half out of its fine-grained lithic tuff matrix.

Just when you thought you've seen all there is to see in the way of minerals coming out of Washington State, I would like to share with you a mineral called augite. There is only one known augite deposit in Washington in which perfect crystals form. It occurs at the base of the McIntosh Formation, located in the Doty Hills in Lewis County. The next closest occurrence is down in Tillamook County, Oregon. If you are a mineral collector and happen to be near this locality, you must stop by to add this gem to your collection.



A nearly 1-inch-long augite crystal remains half embedded in the fine-grained lithic tuff matrix.

If someone were to ask me to recommend a good Washington rockhounding spot, the Doty Hills location would be at the top of my list because of the ready access and the ease of extracting the crystals. These conditions also make it a great idea to bring younger children along. They will enjoy themselves, guaranteed. The site is on Department of Natural Resources (DNR) land.

The mineral name augite comes from the Greek word *auge*, which means "luster" or "shine". Abraham G. Werner, a German geologist who is famous for some of his theories on geological formations, named the mineral in 1792. Augite, $(Ca,Na)(Mg,Fe,Al)(Si,Al)_2O_6$, a single-chain inosilicate mineral, can be found in many igneous rocks such as gabbros and basalts, as well as some hydrothermal metamorphic rocks. It is part of the solid solution series of the pyroxene group and contains large amounts of iron, magnesium and aluminum.

I am attracted to augite's range of crystal habits. At this locality, the mineral forms perfect euhedral phenocrysts, which are defined with sharp, clean edges, up to 1 inch tall and $\frac{3}{4}$ inch wide. Augite crystals are especially attractive when they occur in their twinned form. To me, these twins appear to be "horned". This mineral is brown-green, black, green-black, or purplish brown in color and is 5.5 to 6 on the Mohs Scale of Hardness.

Rock & Gem gives locality information for reference purposes only. Readers should never attempt to visit any of the sites described in this publication without first verifying that the location is open to collecting and obtaining the permission of the land and/or mineral rights holders.



The Doty Hills collecting site is situated at the side of a busy logging road. While it is easy to free the augite from its matrix, care must be taken not to roll rocks down the slope and into the roadway.



On the way to find augite we stopped at the bridge to go down below and look for more crystals.



These augite crystals seem to be covered by a layer of tan calcite overgrowth.



RIGHT: Pieces of the augite containing lithic tuff are broken free from the wall so they can be broken down even more in an attempt to find the small crystals.

In the Doty Hills, augite occurs in a plagioclase porphyry lithic tuff. If you are like most people, you will have no idea what that even means! "Plagioclase" refers to the series of tectosilicate minerals of the feldspar family to which augite belongs. "Porphyry" refers to igneous rocks that contain large crystals in a fine-grained matrix. A "lithic tuff" is a hardened deposit of volcanic ash that contains many fragments of other previously formed rocks. If you look carefully you will notice that some lithic fragments have been replaced by light-green prehnite and pumpellyite. You will also notice late calcite-lined fractures that run through the tuff. Now you should be able to imagine what must have happened thousands of years ago to bring the local geology to its present condition.

I am not aware of any commercial uses for the mineral augite. There are, however, three uses for this mineral in the field of geology. One is to determine the magmatic chemical composition of local geology. It is also used in isometric radiometric dating and as a marker mineral for iron- and magnesium-rich ore bodies. Since augite contains high levels of these minerals, chances are good that ore bodies that also have high levels of iron and/or magnesium can be found nearby.

Augite's shiny little black crystals will satisfy the mineral enthusiast's desire for discovery and will hold a special place in any collection. Those who collect stones for healing and metaphysical purposes may find augite to be

useful; it can be called upon during times of transformation, for guidance through times of uncertainty, or for assurance with a life choice. Some say that, by keeping this stone close to your body, you will be in the right place at the right time.

THE DOTY HILLS SITE

The first time I came to this location some years ago, I was using vague directions that left me confused. Looking for new localities is always challenging. Trying to find a single outcrop of crystals amongst a vast stretch of forest can leave one frustrated. I remember taking three separate trips and driving around for hours each time before I finally found the right spot, so I know how important clear directions are.

From Interstate 5, take Exit 88 to U.S. Highway 12 and drive west about 12 miles to Rochester. Take a left at Albany Street SW. Two blocks later, turn right at 185th Avenue SW, which will curve southwest and become Marble Street SW and, eventually, Independence Valley Road SW. Cross over the Chehalis River and after 0.1 mile turn left onto Michigan Hill Road SW. Take a right at the intersection with Lincoln Creek Road.

When you pass Lepisto Road, pay attention. Go one mile farther down Lincoln Creek Road, then turn right when you see a logging road going up into the hills. About one more mile up that logging road, veer left when you notice a Y in the road. About 2 miles farther on, you will come

to the locality on the righthand side of the road. If you have a quadrangle map, search for the L-1000 road in NE ¼, sec.15 T14N, R5W. Do not take any of the roads that branch off from L-1000.

This area sure has changed throughout the years. Sixty years ago, when mineral collectors first started poking around up here, logging roads were fresh and access was good. A few decades later, the road had become overgrown with alder trees and the area was no longer exposed. In 1996, a landslide wiped out the entire hillside. You'd be disappointed in trying to find these shiny black crystals had you not realized the area had gone through so much change. When you visit this locality now, the land has been clear cut again, the roads rebuilt and freshly graded. Everything is once again exposed and accessible to the curious.

The augite crystals occur in a tuff that is very easy to work and sift through. A basic rock pick will be perfect for breaking up the host rock, and a small screwdriver or even a dull knife will help in plucking out the crystals. Many crystals are small and tend to break up. Occasionally, though, you will find shiny, intact single crystals up to 1 inch tall and ¾ inch wide. Even if you happened to get all the way here and forgot your rock-digging tools, you are fine; it is easy enough to find these crystals with just your hands. Or you could load a big piece of host rock into your vehicle and break it up when you get home.

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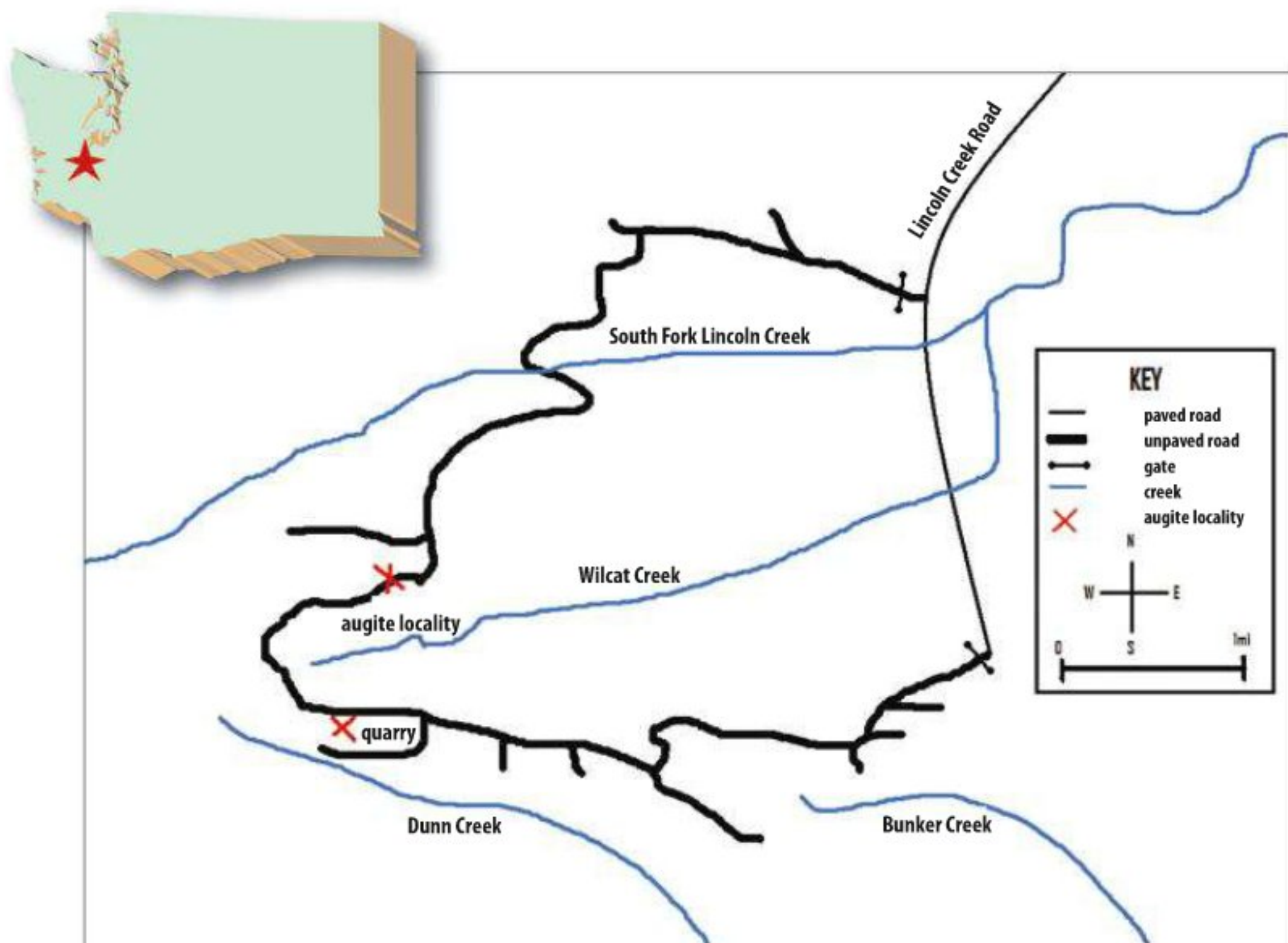
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The lithic tuff will look different than most other areas you have driven along to get to this spot. Most rocks in the area are black basalt, while the lithic tuff looks like a deposit of compacted gray ash. Keeping your eyes to the right side of the road, you will see evidence that others have been digging here. On the other side of the road is a steep hill that collapsed in a small landslide a few years ago. You can search the landslide for augite, all the way down to where it ends at the creek.

I would stop at bridges along the way to the augite locality, walk down to the creek, and look around there, as well. I noticed that some of the big boulders under the bridge had nice sprays of natrolite crystals on them. It was easy enough for me to use my rock pick to obtain a sample. These boulders come from the nearest rock quarry.

ROCK QUARRY ZEOLITES

Since you are already down in the Lincoln Creek area, there is a rock quarry that is in close proximity to the augite location that you should check out if you are feeling adventuresome. You may find an assortment of zeolites, calcite, and other minerals here. In the past, a major crystal find was made here by Rudy Tschernich. Some of the pieces from this find are housed at the Rice Northwest Museum, of which Rudy is a curator, in Hillsboro, Oregon.

This location is great because you can drive your vehicle straight to the spot. It is very important to park your vehicle where it is not blocking the road because, when the surrounding commercial forest is being felled and the logging trucks come barrel-

ing around the corner with full loads of fresh cut-timber, you do not want to be in their way.

For the first few years of coming to this locality for augite crystals, I did not think too much about what I could do with the crystals I was taking home. They were definitely fun to find, they were interesting to look at, and they looked good in a little pile sitting inside a seashell on the windowsill. My interest in collecting this mineral didn't go much farther than the sheer fun of collecting.

Now, however, I look forward to coming to this spot for the chance to collect perfectly formed shiny, greenish-black crystals for more reasons than before. I have given some thought to how to preserve the specimens and present them so they look nice. One way to preserve augite is to soak crystals in a solution of equal parts white Elmer's® glue and water for a week, stirring the solution up a few times a day. This will make your crystal more stable. A light coating of mineral oil will bring out the luster of the stone more. The oil is absorbed into the stone, maintaining hydration and preventing crumbling. However, you may find crystals that are already solid enough and need no treatment.

To display my augite crystal specimens, I stick a piece of mineral tack, which is like poster putty, to a polished acrylic stand. Then I press my augite crystal into the mineral tack at the desired angle. I can control exactly how I want the crystal to be displayed on the stand. Whether I am presenting my augite specimens in a home mineral exhibit or at a gem show, they look good to whoever is viewing them.



Looking up toward the augite locality from the creek below, you can see where a small mudslide containing crystals occurred.

Since this locality is on DNR forestland and is being used constantly for sustainable purposes, the rockhound code of ethics must be followed to maintain a positive relationship with them. The DNR keeps the land open for public use. If people abuse their right to collect, the agency will have no choice but to close the locality to rockhounds. Because this spot is in a roadcut, it is important to keep rocks from falling into the road. A safe rule to follow is to take only what you can carry away in your hands.

I cannot emphasize enough how much mineral wealth resides here in Washington State. Just in the vicinity of the augite location, there are various sorts of crystals to be found. Dig a hole in the ground, look in the creek or a clear-cut or a road cut, and sure enough there will be crystals worth keeping. Again, show respect for the area you are collecting at. It is a privilege to be able to collect these minerals and we want to keep this possible. Pick up your trash, do not leave a mess, and wave at the locals. Do not go here and start a full-scale mining project. With all that said, enjoy your time out there! 💎

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22-23—ST. ALBERT, ALBERTA, CANADA: Show and sale; Edmonton Tumblewood Lapidary Club; St. Albert Senior Citizens' Center Gym, 7 Tache St.; Sat. 11-6, Sun. 12-5; adults \$4, students (13-18) with ID \$3, children 12 and under accompanied by an adult free; dealers, rocks, fossils, jewelry, gems, crystals, lapidary demonstrations, faceting, gemstone beading, wire wrapping, chain mail, displays, educational activities, hourly door prizes; contact Pauline Zeschuk, (780) 430-6694; e-mail: paulinez8@shaw.ca; Web site: http://rme.tcor.ca/cms/tumblewood

22-23—WARWICK, RHODE ISLAND: Show and sale; Rhode Island Mineral Hunters; CCRI Knight Campus, 400 East Ave. Rte. 113; Sat. 10-5, Sun. 10-5; adults \$6, seniors and children under 10 \$5; contact Robert Sproule, 40 Paullette Terrace, Plymouth, MA 02360; e-mail: jsproule@comcast.net

28-30—SANTA ROSA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc.; Sonoma County Fairgrounds, 1350 Bennett Valley Rd.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7 weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

29—FAIRLESS HILLS, PENNSYLVANIA: Annual show, "Ultraviolation"; Rock & Mineral Club of Lower Bucks County; First United Methodist Church, 840 Trenton Rd.; Sat. 9-5; adults \$2, children 12 and under free; all-fluorescent mineral show; contact Chuck O'Loughlin, 130 Maple Terrace, Merchantville, NJ 08109, (856) 663-1383; e-mail: ultraviolation@yahoo.com

29-30—DULUTH, GEORGIA: Show; Intergalactic Bead & Jewelry Shows; Gwinnett Center-Hall C, 6400 Sugarloaf Pkwy.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

29-30—EVANSVILLE, INDIANA: 45th annual show; Evansville Lapidary Society; Washington Square Mall, Green River Rd. and Washington Ave.; Sat. 10-9, Sun. 12-5; free admission; gems, jewelry, minerals, fossils, geodes, silent auction; contact Ruth Reisinger, (812) 424-7618

29-30—FREEPORT, NEW YORK: Show and sale; Kaleidoscope Gem Shows; Freeport Recreation Center, 130 E. Merrick Rd.; Sat. 10-5, Sun. 10-5; adults \$5.50 (\$5 with this ad), children 12 and under free with adult; dealers, gems, minerals, beads, meteorites, fossils, handcrafted jewelry; contact Ralph Gose, P.O. Box 1418, Melville, NY 11744, (631) 271-8411; e-mail: ralph_gose@kaleidoscopegemshows.com; Web site: kaleidoscopegemshows.com

29-30—STUART, FLORIDA: Annual show; St. Lucie County Rock & Gem Club; Martin County Fairgrounds, 2616 SE Dixie Hwy. (A1A); Sat. 10-5, Sun. 10-5; adults \$3, children under 12 free with adult, coupon on Web site; demonstrations, displays, silent auction, raffle, about 24 dealers; contact Norman Holbert, 455 SW Balfour Ave., Port St. Lucie, FL 34953 (772) 873-0787; e-mail: normholbert@bellsouth.net; Web site: slrockandgem.org

NOVEMBER 2011

4-6—BLACK CANYON CITY, ARIZONA: Annual show, "Rock-A-Rama"; Braggin Rock Club; High Desert Park, 19001 E. Jacie Ln.; free admission; gems, rough, slabs, minerals, crystals, jewelry, equipment; contact Don, (623) 374-0202, or Braggin Rock Club, PO Box 308, Black Canyon City, AZ 85324

4-6—EUGENE, OREGON: Wholesale and retail show; Gem Faire Inc.; Lane County Events Center, 796 W. 13th Ave.; Fri. 12-6, Sat. 10-6, Sun. 10-5; adults \$7 weekend pass, children 11 and under free; jewelry, gems, beads, crystals, silver, rocks, minerals; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: www.gemfaire.com

4-6—EUREKA, CALIFORNIA: Show and sale; Humboldt Gem & Mineral Society; Redwood Acres Fairgrounds, 3750 Harris St.; Fri. 9-6, Sat. 10-6, Sun. 10-5; adults \$2, children \$1; flint knapper, live demonstrations, geode cutting; contact Toni Tyson, 82787 Charlestown Ave., Indio, CA 92201, (707) 502-9574; e-mail: rockchick9233@aol.com

4-6—GOLDEN, COLORADO: 5th annual show; Denver Area Mineral Dealers; Jefferson County Fairgrounds, 15200

W. 6th Ave.; Fri. 10-5, Sat. 10-6, Sun. 11-4; free admission; annual show and sale; 18 dealers, minerals, fossils, gems, jewelry; contact Pat Tucci, (303) 279-5504; e-mail: ptucci@sprintmail.com; Web site: geodydessey-rocks.com

4-6—KANSAS CITY, MISSOURI: 33rd annual Wholesale and retail show; Shows of Integrity; MCC/BTC Exhibit Hall, 1775 N. Universal Ave.; Fri. 10-7, Sat. 10-7, Sun. 10-5; adults \$6, 3-day pass \$10, ages 5-12 \$2, children under 5 free; more than 80 dealers, jewelry, beads, beading supplies, findings, gemstones, minerals, cabochons, gold, silver, diamonds, charms; contact Terry James, 18362 S. Hwy. 78, Leonard, TX 75452, (903) 587-2543; e-mail: info@showsofintegrity.com; Web site: www.showsofintegrity.com

5—TUCSON, ARIZONA: 10th annual silent auction; Old Pueblo Lapidary Club; 3118 N. Dale; Sat. 9-2; free admission; contact Danny Harmsen, (520) 323-9154

5-6—AMARILLO, TEXAS: Annual show; Golden Spread Gem & Mineral Society; Amarillo Civic Center-Regency Room, 401 S. Buchanan St.; Sat. 10-6, Sun. 10-5; adults \$3, children under 12 free; prehistoric, outer space, down under, precious, unusual, cheap, artifacts, valuable, jewelry, Indian jewelry, beads, displays; contact Wanda Finley, 9170 FM 1151 Claude, TX 79019, (806) 944-5464; e-mail: finfran@midplains.coop

5-6—BREWER, MAINE: Annual show; Penobscot Mineral & Lapidary Club; Brewer Auditorium, Wilson St.; Sat. 10-5, Sun. 10-4; adults \$1, children under 12 free; silent auctions, door prizes, demonstrations, children's activities; contact Lance Shope, 38 Sunset Strip, Brewer, ME 04412, (207) 989-3342; e-mail: lshope67@yahoo.com; Web site: penobscotmineralapidaryclub.com

5-6—CINCINNATI, OHIO: Show; Intergalactic Bead & Jewelry Shows; Sharonville Convention Center-West Hall, 11355 Chester Rd.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

5-6—CONCORD, CALIFORNIA: Annual show; Contra Costa Mineral & Gem Society; Centre Concord, Clayton Fair Shopping Center, 5298 Clayton Rd. (near Ygnacio Valley Rd.); Sat. 10-5, Sun. 10-5; adults \$5 (discount on Web site), children under 16 and Scouts in uniform free with adult; fluorescent room displays, 21 vendors, minerals, fossils, gems, crystals, jewelry, books, tools, equipment, lapidary supplies, 60 exhibitors, 12 demonstrators, beading, wire-wrapping, faceting, stone carving, youth activities, silent auction, prizes, raffle, woolly mammoth skull, giant jade, giant cave bear, giant auction; contact Harry Nichandros, P.O. Box 4667, Walnut Creek, CA 94596, (925) 289-0454; e-mail: bob@ccmgs.org; Web site: ccmgs.org

5-6—LANCASTER, CALIFORNIA: 10th annual show; Palmdale Gem & Mineral Club; Antelope Valley Fairgrounds, Van Dam Pavilion, 2551 W. Ave. H; Sat. 9-5, Sun. 9-5; free admission; gemstones, minerals, beads, lapidary, jewelry, display supplies, dinosaur program with Richard Wade, petrified wood programs with Walton Wright, kids' scavenger hunt, silent auction, demonstrations, raffle; contact Cheri George, 2255 W. Avenue O, Palmdale, CA 93551, (562) 243-8470; e-mail: lizardwoman3@yahoo.com; Web site: www.palmdalegemandmineral.com

5-6—GREENWICH, CONNECTICUT: Annual show; Stamford Mineralogical Society; Eastern Greenwich Civic Center, 90 Harding Rd.; Sat. 9:30-5, Sun. 10-4:30; contact Howard Heitner, (914) 779-2041; Web site: www.stamfordmineralsociety.org

5-6—MELBOURNE, FLORIDA: 37th annual show, "Parade of Gems"; Canaveral Mineral & Gem Society; Melbourne Auditorium, 625 E. Hibiscus Blvd.; Sat. 10-5, Sun. 10-5; adults \$4; displays, demonstrations, door prizes, children's corner, "Rock Food" display, dealers, minerals, fossils, gems, beads, cabbing and faceting rough, finished jewelry, books, tools; contact Dave Wayment, (772) 532-6432; e-mail: cmgs.show@att.net

5-6—MIDLAND, MICHIGAN: 17th annual show; Mid-Michigan Rock Club; Midland Resort Hotel Convention Center, 1500 W. Wackerly; Sat. 10-6, Sun. 10-4; free admission; rocks, minerals, jewelry, fossils, Kids' Korner, fossil dig; contact Deborah Acord, (989) 430-4471; e-mail: jackdanred2@aol.com; Web site: www.midlandrockclub.com

5-6—RIDGECREST, CALIFORNIA: 56th annual show; Indian Wells Gem & Mineral Society; Desert Empire Fairgrounds, Mesquite Hall, 520 S. Richmond Rd.; Sat. 9-5, Sun. 9-5; free admission; contact John DeRosa, (760) 375-

continued on page 79

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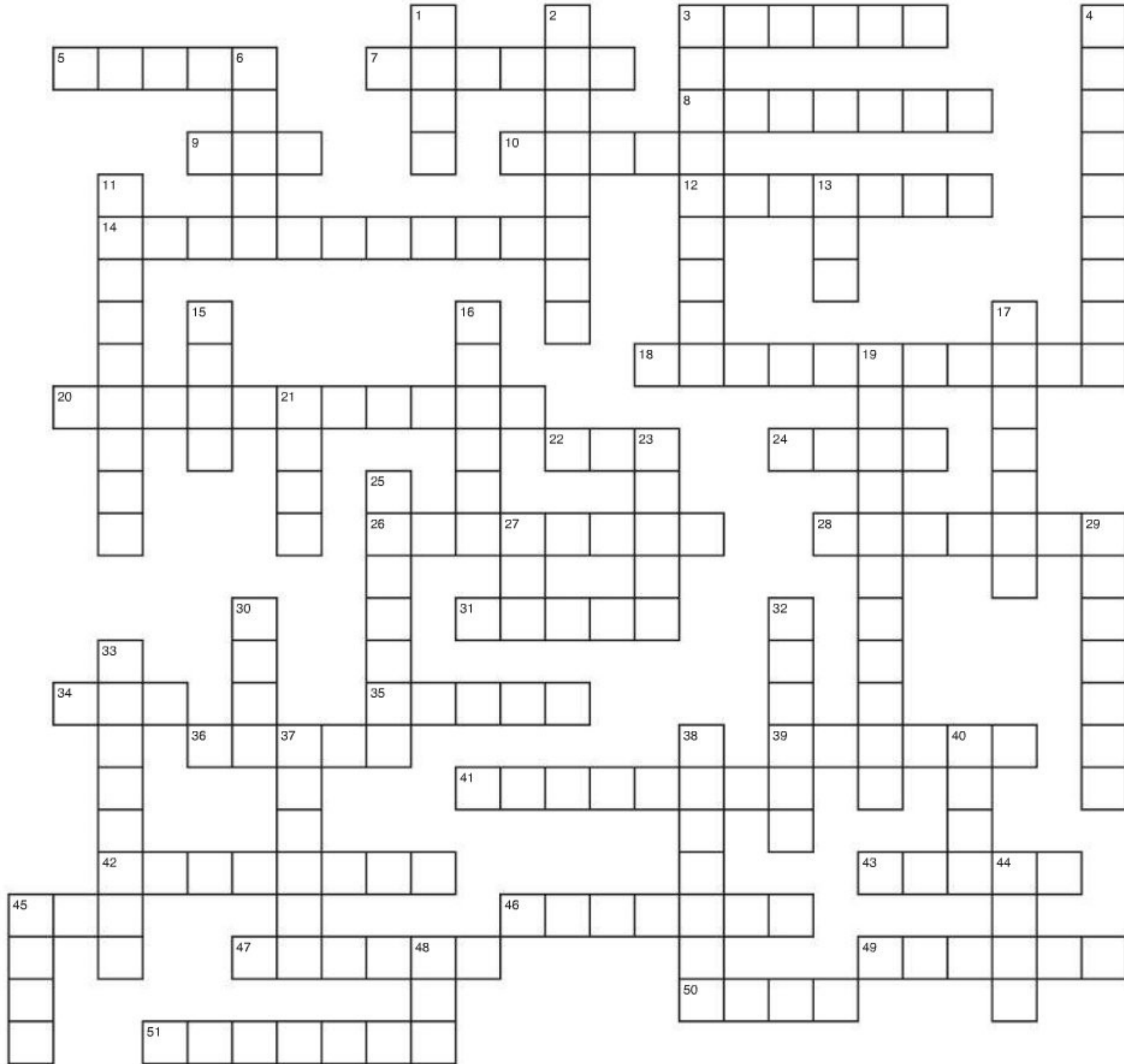
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- 7. Element/mineral, means "goblin"
- 8. Pure carbon gem
- 9. Color associated with Russia
- 10. Organic gem with inclusions
- 12. Blue copper mineral
- 14. Leads to mineral discovery
- 18. Beryllium sorosilicate hydroxide mineral
- 20. Chlorite group mineral with manganese
- 22. Precious or semiprecious
- 24. Source of energy
- 26. From the Greek "dateisthai" and "lithos"
- 28. Stable calcium carbonate polymorph
- 31. Morganite is a variety
- 34. Liquid used for fuel
- 35. Silicate gem with aluminum and fluorine

- 36. Unwanted mine production
- 39. Potassium carbonate
- 41. Potential ore
- 42. Deposited by a river
- 43. Clear product of sand
- 45. Not solid or liquid
- 46. "Island of Elba rock"
- 47. Northern Circle
- 49. Mineral extraction
- 50. Sheet silicate mineral
- 51. "Peacock ore"

DOWN

- 1. Make a hole by drilling
- 2. Can, foil metal
- 3. Garnet species, includes demantoid
- 4. Mined for phosphorus
- 6. Alloy of iron and carbon
- 11. Crude liquid fuel

- 13. Unrefined
- 15. River with mineral-bearing basin
- 16. Gem group, includes uvarovite
- 17. Central and eastern region of Russia
- 19. A czar's gem
- 21. Combustible sedimentary rock
- 23. Conductive chemical element
- 25. Zinc arsenate hydroxide mineral
- 27. Rock with mineable minerals
- 29. Management of wealth and resources
- 30. Murmansk Oblast peninsula
- 32. Red metal
- 33. Copper cyclosilicate mineral
- 37. Sterling element
- 38. Radioactive heavy metal
- 40. ____ ash (sodium carbonate)
- 44. Dirt
- 45. Sunny metal
- 48. Water crystals

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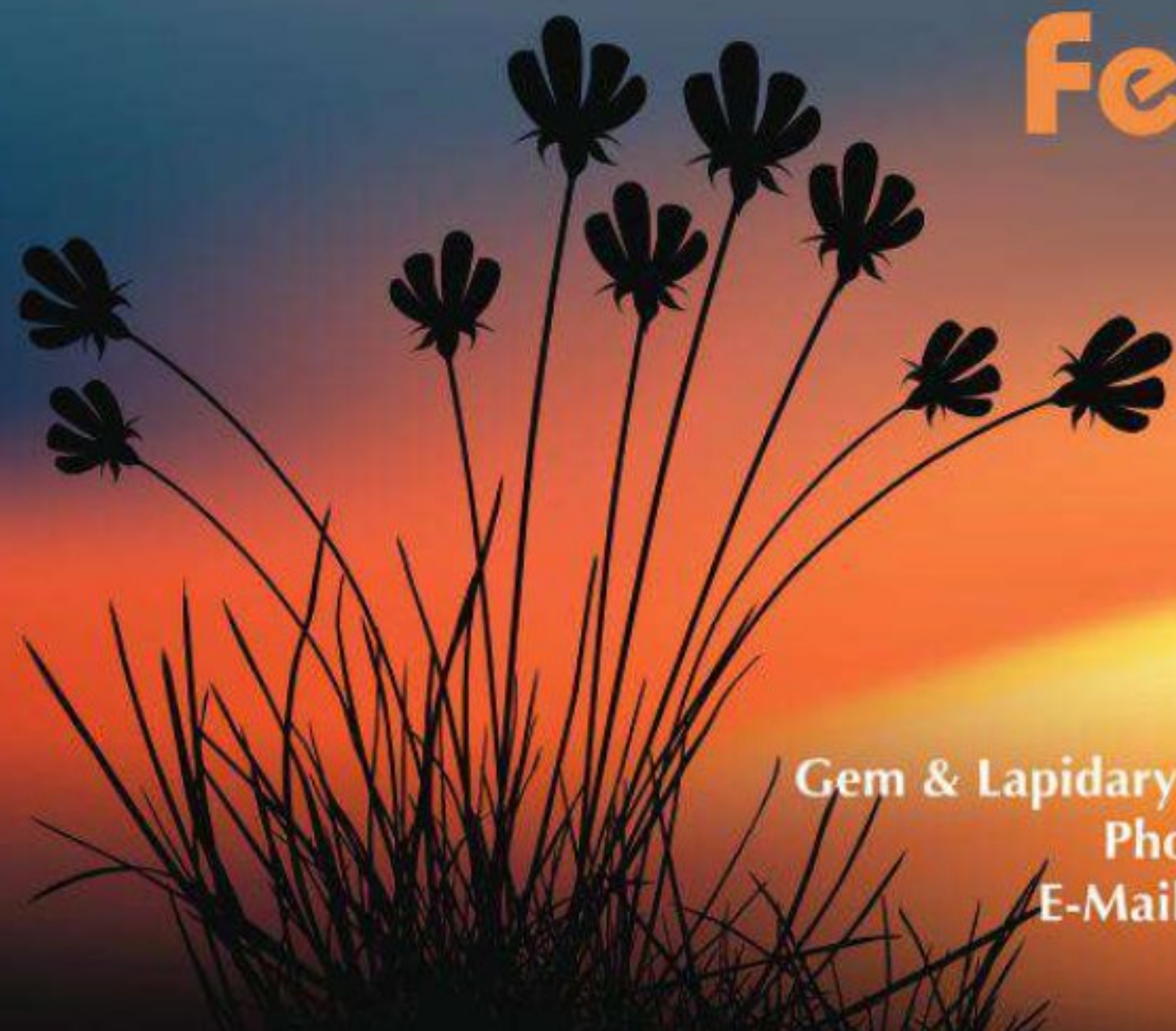
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5-6—STURTEVANT, WISCONSIN: Annual show; Racine Geological Society; Fountain Banquet Hall, 8505 Durand Ave.; Sat. 10-5, Sun. 10-5; free admission; club displays, silent auction, rock identification, door prizes; contact John Lowman, 3223 Spruce St., Racine, WI 53403, (262) 554-5370; Web site: rgs-wi.tripod.com

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11-13—ORLANDO, FLORIDA: Fall show; Central Florida Mineral & Gem Society; Central Florida Fairgrounds, 4603 W. Colonial Dr.; Fri. 1-6 Sat. 10-6, Sun. 10-5; adults \$5, seniors and students \$2, \$1 off with ad; minerals, metaphysical stones, beads, jewelry, cabochons, sterling silver, demonstrations, faceting, cutting and polishing cabochons, silver smithing, children's sluice table, Scout merit badge help; contact Gordon Oakley, 5032 Lido St., Orlando, FL 32807, (407) 592-4358; e-mail: oakleysmall@gmail.com; Web site: www.cfmgs.org

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12-13—CORDOVA, TENNESSEE: Show; Intergalactic Bead & Jewelry Shows; Woodland Hills-Grand Ballroom, 10000 Woodland Hills Dr.; Sat. 10-5, Sun. 10-5; dealers, precious and semiprecious gemstone beads, sterling silver, findings, freshwater pearls, hand-blown glass beads, vintage beads, crystals, demonstrations, jewelry classes; contact Angela, (888) 729-6904; e-mail: angela.couch@beadshows.com; Web site: www.beadshows.com

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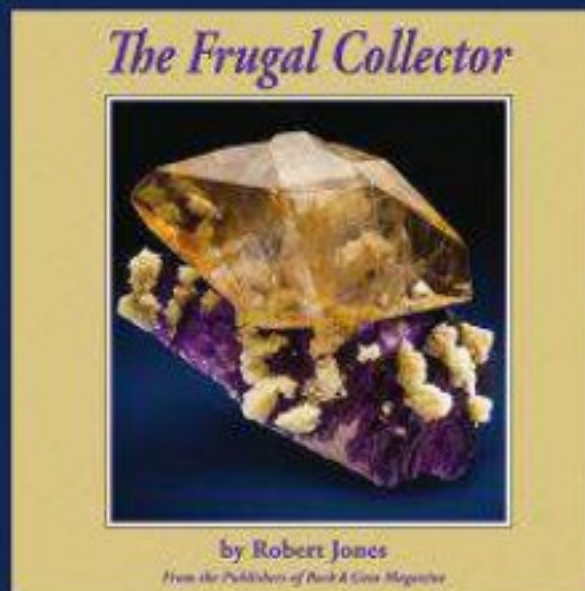
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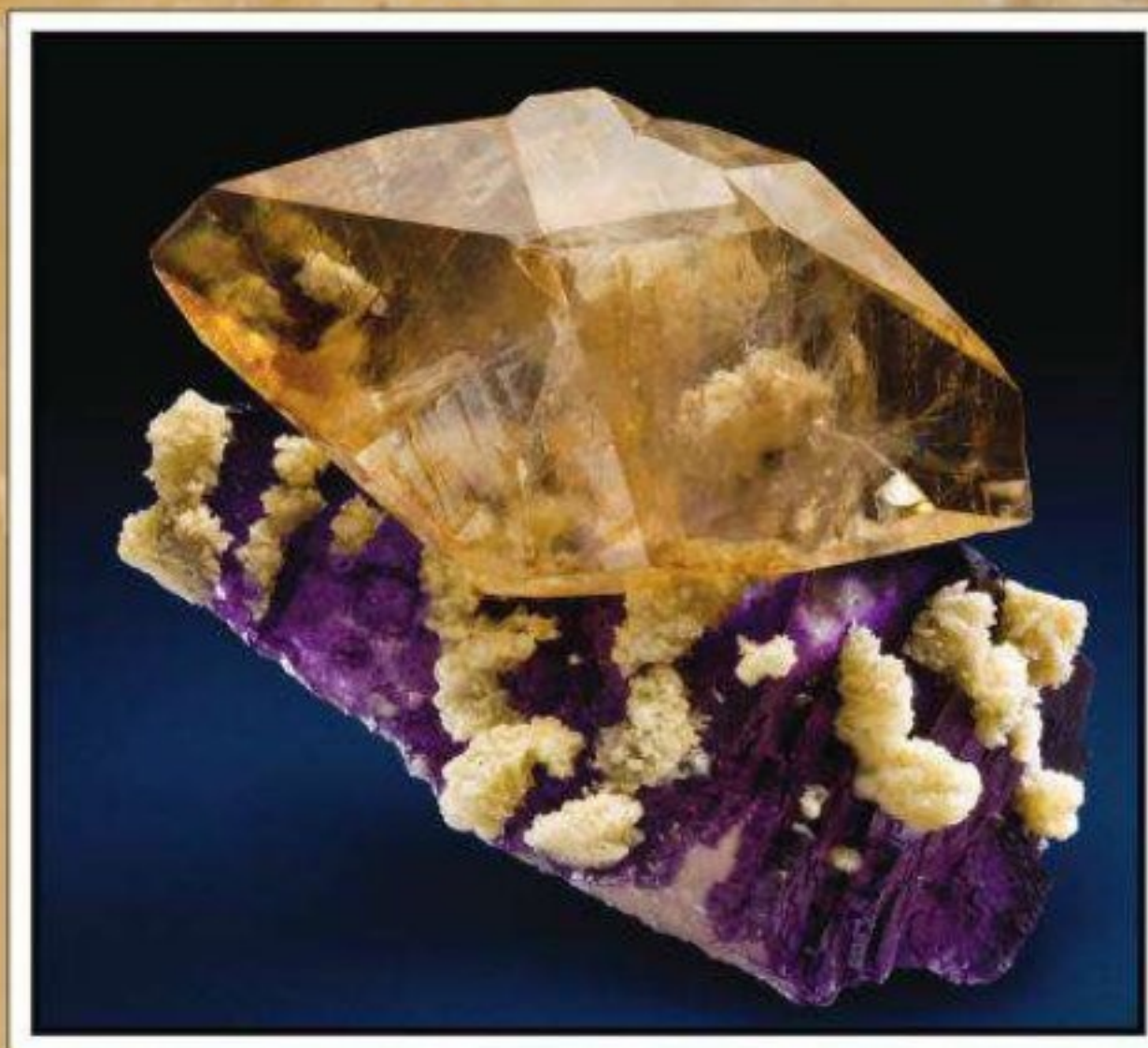


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What's Hot on DVD

The Frugal Collector



by Bob Jones

From the Publishers of Rock & Gem Magazine

My long-awaited book, *The Frugal Collector, Volume I*, is hot off the press and can now be purchased at www.rockngem.com or at major mineral shows.

Those of you who could not visit Tucson in February 2011 to enjoy one of the world's great mineral events can still see some of the exhibits and some of the minerals brought to Tucson by dealers. After several months of careful editing, the DVD "What's Hot in Tucson: 2011" is out. The film is narrated by host David Wilber, who does a fine job of interviewing a number of dealers and collectors. Bryan Swoboda's camerawork gives you a clear view of some of the finer minerals offered for sale at that world-renowned show.

Standing by as co-host with David, I learned a lot and you will, too, by watching this DVD. I worked with Dave and Bryan only briefly, but I greatly enjoyed the experience. Bryan has exhibited great expertise in developing and editing the annual "What's Hot" DVD, which is most enjoyable and informative. Keep in mind that several hundred hours worth of tape are shot at Tucson each year. Out of all that, Bryan puts together the best footage into a great Tucson review.

This column ought to be subtitled "A Book Report" if you accept the notion that the DVD "What's Hot in Tucson" is a kind of book. After all, it is certainly a valuable reference. For a copy of "What's Hot in Tucson: 2011", visit www.whats-hot-in-tucson.com.

One of the exhibits Bryan filmed was one I had a personal interest in documenting. It was intended as a superb glimpse of what's coming to Tucson in 2012, which happens to be the 100th anniversary of Arizona statehood. Originally, Arizona and New Mexico were one territory, but on Feb. 24, 1863, President Abraham Lincoln signed a law that split the two territories.

In those days, the Territory of Arizona wasn't much more than a wilderness, but prospectors and soldiers soon began finding reasons for people to migrate into the region. The reasons were free land and

minerals, especially copper! As Arizona's population grew and its mining interests were joined by cattle ranching and other economic generators, the move toward statehood grew more aggressive. Arizona was inducted into the Union on Feb. 14, 1912—Valentine's Day! Is it a coincidence that these important events both happened in February, the same month we enjoy the great Tucson Show?

That preview exhibit of Arizona minerals was put together by my son Evan Jones and consisted of minerals selected from his personal collection. They included superb wulfenites, Arizona's better azurites, fine cuprite, colorful vanadinite and even some very simple species like calcite and selenite in exceptional crystal form. This remarkable display was very well received by those who appreciate Arizona's array of mineral wealth. And it served as an exciting preview of Tucson 2012!

Of all the states in the Union, Arizona has long been considered a premier source of collectible specimens. The state's early development in the late 1800s owes much to mining development. In much the same way, California's gold rush gave that state an important financial start, and Michigan

got an economic boost from its rich copper belt.

The discovery of silver and copper in Arizona, however, was the start of a long and lucrative marriage between the state and mining. Tombstone, Bisbee, Morenci, Ajo and Globe/Miami were the sites of important mines. Though Bisbee is closed, some mines that started in the 1800s are still producing today and have been joined by other copper producers like Ray and the mines south of Tucson. These continue to contribute to the state's wealth.

The economics of Arizona are based on what we call the "Five Cs": cotton, cattle, citrus, climate and copper. For mineral collectors, climate and copper are of particular interest. A rockhound can actually collect min-

erals in Arizona all year long. How about the summer heat? you ask. In mid-July, the surface temperature is over 110°F. The heat can be easily beaten by collecting underground in one of hundreds of old mines, where the temperature is most likely under 60°F. Once it cools off in the fall, winter and spring, we surface collect. And considering the hundreds of collecting sites that are still accessible, the potential for finding good minerals is still there. The old, abandoned mines are proven collecting sites. Small mining operations involving two or three miners have also been very productive. Even some of the operators of the larger mines realize there is money to be made by executing specimen collecting contracts with private groups, which increased the supply of specimens.

CAERHAYS MINERALS

Evan's Arizona exhibit at the 2011 Tucson Show was just one of several dozen superb assemblages, most of them featuring California minerals in accordance with the show's theme. Among the exhibits of minerals from other parts of the world was one historically important display of rare and unusual minerals from Cornwall, Eng-

land. That display contained wonderful specimens from one a great Cornish collection that has been hidden from view for decades.

The collection is the property of the Williams family of St. Austell. They were among the most important mining families in Cornwall in the 1700s and 1800s, particularly in the Gwennap area. In the mid-1800s, the Williams collection numbered nearly 15,000 specimens, almost all of which came from mines the family either owned or had an interest in operating. The Williamses also owned a smelter and developed a shipping industry for hauling ore to smelters at Swansea, Wales.

Today, because of the generosity of the Williams family, their mineral collection is perhaps one-tenth the size it once was. Thousands of specimens were donated to the British Museum of Natural History (now the Natural History Museum, London), the Cambourne School of Mines, and other facilities. The specimens that were retained in the collection housed at Caerhays Castle, the Williams family estate, amount to an important glimpse of the historically important and noteworthy species from the great copper and tin mining era of Cornwall.

That the Caerhays Castle collection is historically important is a story that needed to be told. So In 2003, Charles Williams invited Courtenay Smale, a noted mining engineer from Cornwall, to unpack the collection, which had long been in storage, document it, and prepare it for public display at the castle. Williams also intended to develop a record of his family's past mining activities and their place in Cornwall today. The result of this effort is *Caerhays Castle*, a book I reviewed in the August 2011 issue of *Rock & Gem* (p. 6).

The Williams family's involvement in mining started in the late 1700s. Eventually, they owned a cluster of mines and controlled as many as 22 mines. These mines—Wheal Hope, Wheal Gorland, the Old Gunnislake mine, Wheal Jewel, and others—are now world famous for their fine arsenate and carbonate minerals. (Note that "wheal" means "mine".) These mines were among those in high production during the halcyon days of copper and tin mining in Cornwall. At one time, this region was the world leader in copper production!



Prominent at the 2012 Tucson Show will be Arizona's fine and varied wulfenite crystal specimens, like these seen in a 2011 display by Evan Jones.

To re-introduce the world to the Caerhays Castle collection, Courtenay brought a select exhibit to Tucson. He did an admirable job of informing visitors about the collection and its history. Be sure to check out Courtenay's article on the Caerhays Castle mineral collection in the May-June 2011 issue of *The Mineralogical Record*, available at most major shows and at www.mineralogicalrecord.com.



Bisbee, Arizona, is world famous for its choice azurite crystal specimens, and a lot of them will be on display at the 2012 Tucson Show.

THE FRUGAL COLLECTOR

While on the subject of books, I should remind readers that my book *The Frugal Collector*, Volume I, has finally been published. I really should apologize to readers for the protracted delay in getting this work into print. Blame it on my travels. There have been times when I've been away from home a month or more at a time, during which time the book languished for attention.

Many times, people have asked me if I would write a book about minerals and my travels. My rather facetious answer has always been, "When they put me in wheelchair and I can't do anything else, I'll write a book!" Well, I'm not in a wheelchair and am still traveling whenever I can, so the book missed its intended release date of Christmas 2010! In spite of all that, the book is now available from

Rock & Gem. *The Frugal Collector*, Volume II, is already written and will be prepared for press during the coming months.

The *Frugal Collector* volumes are a compilation of the several dozen articles of the same title that appeared in *Rock & Gem* over a period of five years. Based on my personal adventures and mainly about the minerals I personally find interesting, the books are not the usual recitation of dry facts. I weave useful information into each chapter describing a mineral or a group of minerals, along with related information about minerals I found of interest. After collecting and writing about minerals for over 60 years I've had a few adventures, which I've shared on these pages. I trust you will find them interesting and informative reading.

As mentioned, 2012 is the 100th anniversary of Arizona becoming a state. While copper and its minerals were extremely important to the economy of Arizona, the state also is known among collectors for its phenomenal wulfenites, fine vanadinites, and a bevy of other attractive species. To honor this great occasion in Arizona's history, the Tucson Show theme in February 2012 will be "Minerals of Arizona". There is even going to be a book about those minerals. I've been lucky enough to share a couple of my collecting experiences in the book. Be sure to attend the 2012 Tucson Gem & Mineral Show™ and pick up a copy of this book and one of my *Frugal Collector* books, as

well. I'll even sign them for you! 💎

Bob Jones holds the Carnegie Mineralogical Award, is a member of the Rockhound Hall of Fame, and has been writing for *Rock & Gem* since its inception. He lectures about minerals, and has written several books and video scripts.



Field Notes submissions are subject to editing. Address questions to "Editor" for a private response or to "Readers" and provide the contact information you'd like published. Send to Field Notes, *Rock & Gem* magazine, 3585 Maple St., Ste. 232, Ventura, CA 93003.

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We need your help to keep our monthly faceting column going! *Rock & Gem* is always accepting submissions of original faceting designs for Many Facets. Encourage the faceters in your club to check out the Many Facets submission guidelines posted on our Web site, www.rockngem.com. Before submitting, e-mail editor@rockngem.com for a Contributor Agreement. Send your materials to Many Facets, *Rock & Gem* magazine, 3585 Maple St., Ste. 232, Ventura, CA 93003. All submissions are taken on speculation.

Enjoy Elements

I really enjoyed the article "Collecting the Elements", by Jake Gorczyca (May 2011 issue). Nice job!

—Julia Wigent
via e-mail

Saw Restoration Help

I have recently acquired an 18-inch Great Western Equipment Co. slab saw (model 18-S SN# H168) and would like to find someone who has a manual or any information that would help me through a restoration of this saw.

—Samuel Greene
Kingsport, TN
greenes1564@embarqmail.com

Price Check

My August copy of *Rock & Gem* arrived yesterday. While the editorial content is usually excellent, I was really impressed by this issue. In particular, the article "Pricing Your Gem Artwork", by Helen Serras-Herman, addresses a subject that is part voodoo and equally intimidating to anyone trying to place a value on their lapidary work. However, I'm not certain the paragraph about product markup and keystone is explained correctly.

If a 100% markup (i.e. a doubling of costs or a doubling of the wholesale price) is referred to as "keystone", shouldn't a 200% markup or increase in the price be referred to as "triple keystone" (i.e. the tripling of the wholesale price)? It may have been more accurate to state that the markup for jewelry findings from wholesale to retail is three times the original cost.

In business school, I was taught that the terms "single keystone" and "double key-

stone" were either misleading or incorrect, since the term keystone itself refers to the doubling of wholesale prices. The term "double key" is simply redundant.

—Richard Kocurek
via e-mail

In my original manuscript, I used the term "times" rather than percentages, as follows: *"Start with the basic expenses—the materials—and multiply three or four times to end up with a retail price. Two times will go for your wholesale price, another percentage will possibly go for a discount, and the rest will cover all the overhead costs we just discussed and, most importantly, your labor. If you believe there is room for more profit, or that you can raise your hourly labor, go for it! Three times markup from wholesale to retail is common in jewelry findings, usually referred to as triple key (double key = double price, triple key = triple price)."*

In retail jewelry catalogs, you will find two key symbols (S) or three key symbols on the bottom of the page indicating the type of markup from the original wholesale price.

The term "double key" refers more to two keys (two times the original cost) and the term "triple key" means three times the original cost. As far as the term "keystone", in the trade it usually refers more to a 50% reduction of the original price rather than the doubling up. You usually buy at wholesale prices at "keystone" from retail prices.

—Helen Serras-Herman
Freelance Contributor

Belated Birthday

I love your magazine; it's very informative. However, I caught something reading the July 2011 issue: the story on page 14 ("Central Arizona Gold", by Helen Serras-Herman) states that the "Dutchman", Jacob Waltz, was born in Wurtemberg, Germany, in 1908, immigrated to America in 1845, and died in 1891. How did he travel back in time to die in the late 1800s? Good one!

—Gary L. Lawless
Greenbank, WA

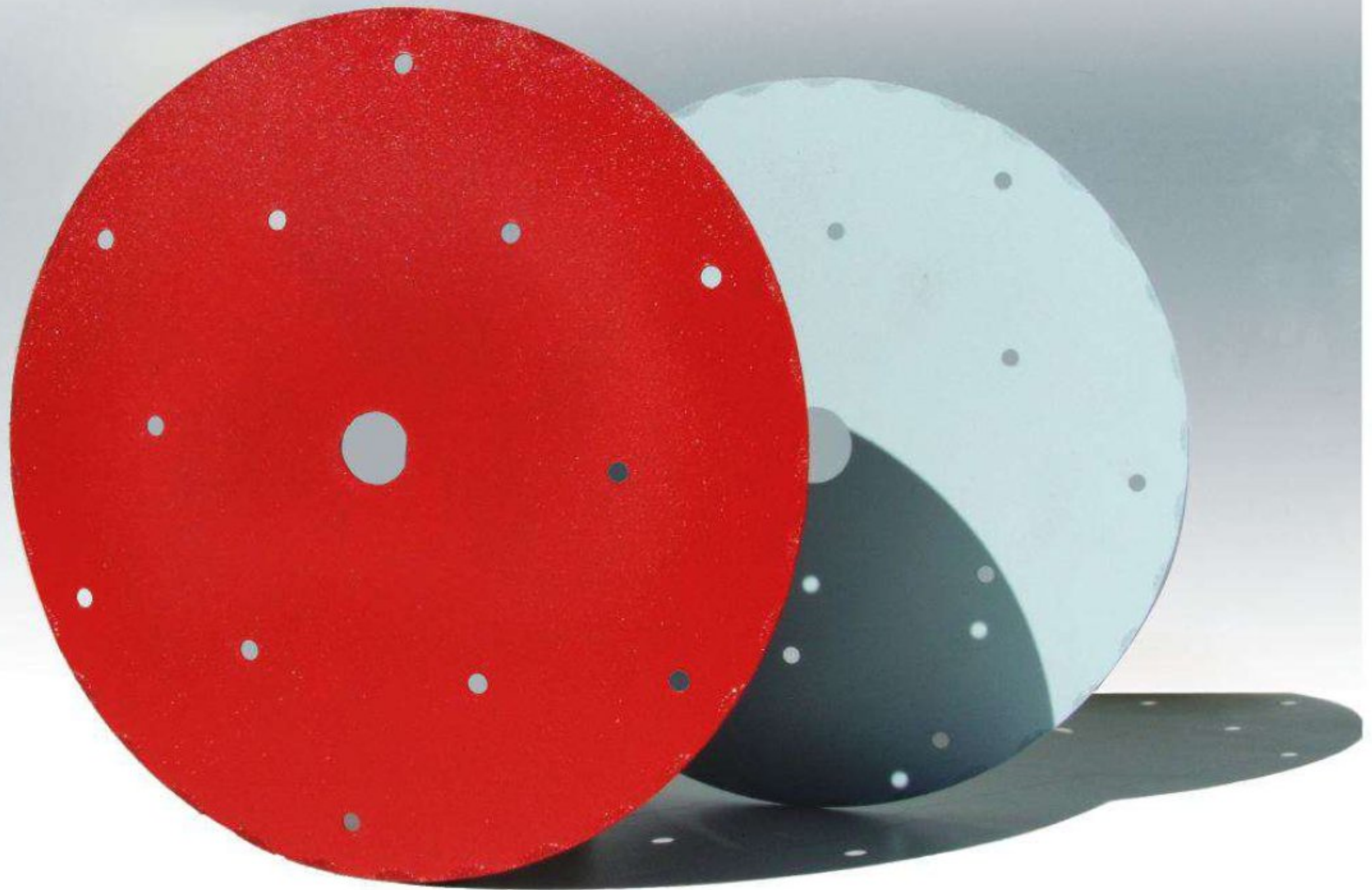
Good catch, Gary! That one slipped by us. Various sources disagree about the year of Waltz's birth, but it was apparently somewhere between 1808 and 1810.

—Editor

JEWELRY Making a Statement

Wear jewelry and make a big statement,
But please be sure you say just what is meant.
For jewels symbolize so many things.
Just consider friendship and wedding rings.
Gems can hide you like armor or disguise,
Or they can show refinement, which is wise.
They are a special recognition "flag,"
And so don't hide them within your handbag.
They're your badge of superiority.
Share beauty and show generosity.
Display your sentimental gifts and style.
Show what is new and what you find worthwhile.
Also, women yearn to be glamorous,
And have sparkle, glow and look fabulous.
Gems are no redundant accoutrement,
But are meant to bring out a compliment.
They're sumptuous and they're magnificent.
Let folks guess how much money you have spent.
Supply is always meeting great demand.
There's not enough natural pearls on hand.
The terms "faux" and "costume" can be abused.
Sometimes you'll find these terms not being used.
Decorative art is self-expression.
It can become for some an obsession.
Jewelry is your self-presentation.
It's influenced by the latest fashion,
Along with clothes, makeup, shoes and your hair.
All jewelry sales always have girls there.
Gems are you, they can't just be simply worn.
You must choose and coordinate each morn.
It's not just becoming, but you become.
And that's why everyone they would like some.
Jewelry reveals who you really are,
Or who you'd like to be in life so far.
It's what artists want to speak in their art.
Your jewelry speaks truth and takes your part.
Dressed to kill, not over decorated,
You want to be remembered and feted.
Your shine and luster can't help be noticed.
You're psychologically rich and kissed.
But no matter how the gems make you feel,
And how to vanity they make appeal,
What you possess should never possess you.
What's inside you means more, keep that in view.

—Ronald J. Yadusky



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