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The Magazine Written by Rockhounds for Rockhounds



North Carolina Amethyst



AMERICAN ROCKHOUNDS



Based in Asheville, North Carolina, **American Rockhound** is a quarterly magazine focused on promoting the hobby of rock, gem, mineral and fossil collecting. Featuring the latest information on North Carolina mineral collecting and rockhound news across the country. Sponsored by the **Mountain Area Gem and Mineral Association (M.A.G.M.A.)** and **Jacquot & Son Mining**, we have a wealth of information and content supplied by our members and independent rockhounds from all over the United States.

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Contributors

Richard Jacquot, North Carolina



Rick began collecting rocks and minerals at an early age. For the past 26 years he has been mining and collecting in the southeastern US, specifically in the area of Western North Carolina. In 2006, he took up SCUBA diving for fossils and artifacts to expand his collection even further. Rick has had numerous articles and books published on mineral and fossil collecting. Today he is the Owner/Operator of Jacquot & Son Mining, President of the Hiddenite Gems Investment Group LLC, President of the Mountain Area Gem and Mineral Association (MAGMA) and the Owner/Editor of American Rockhound magazine.

Rob Whaley, North Carolina



Rob began collecting minerals in 1967 in Franklin, NC. He became a serious digger in 1980 by striking a major quartz/anatase pocket at Shingletrap Mountain in Montgomery County, NC. For the past 34 years he has made significant finds in Montgomery, Randolph, Stanley, Catawba, Guilford, Rutherford, Chatham, Henderson and Cleveland counties in North Carolina as well as Anderson, Union and Abbeville counties in South Carolina. Rob is a member of MAGMA and the Hiddenite Gems Investment Group LLC.

Steve Barr, North Carolina



Steve is a well known cartoonist and author. His cartoons have appeared in a wide array of publications, including the Complete Idiot's Guides and the Chicken Soup for the Soul series. It may sound crazy that someone who earns his living with his hands would risk injury to them by constantly digging for rocks and gems, but he just cannot help himself, he's addicted! Whenever he can slip away from his drawing table and computer, you'll find him out digging for minerals and searching for new locations to explore. Steve is a member of MAGMA and his art and wit is present in each issue of American Rockhound on the *Rockhound Kids' Pages*.

Jim Landon, Washington



Jim began rockhounding at the age of five or six when he used to pick through the gravel on the streets near his house, or explore a creek where he would find random cow and horse bones to drag home. As the years passed, his interests centered on mammal fossils that are so abundant in Nebraska. Infrequent trips to the University of Nebraska State Museum fueled this growing passion with their extensive displays of vertebrate mammals. Later, trips to the White River Badlands in NW Nebraska gave him the opportunity to roam the ravines and gullies in search of a whole range of fossils. When he started his teaching career in Seward, Nebraska, he established close ties with researchers from the vertebrate paleontology department at the University of Nebraska, which led to many opportunities to participate in digs they would conduct in the summer. Later still he developed an interest in collecting Fairburn agates. After moving to Washington State, his interests expanded to pretty much anything that dealt with rock collecting. When writing, Jim enjoys sharing the excitement of the hunt and telling stories about what it is like to experience nature at its best. Not only what can be found, but how it got there. Jim has been fortunate to be able to travel to many famous collecting localities in the US, with most being in the Midwest and Northwest. Jim has over forty published articles to date and is constantly on the search for more topics to write about.

Gary Nielson, Tennessee



Gary served in the US Navy Submarine Service for eight years. After the Navy, he attended Johnson & Wales Culinary Institute in Rhode Island for two years. He worked as a chef at the Hilton and Wyndham hotels in Orlando, Florida for four years. Currently, Gary is the Meat/Seafood dept supervisor (Publix Supermarkets) for thirty stores in the Nashville area. Gary and his wife Vickie started competing in professional BBQ competitions in 2010 as a "hobby". They did very well, and now they compete in KCBS (Kansas City Barbecue Society) sanctioned events in TN, GA, KY, and AL. They compete in approximately 6-8 competitions a year. They also cater BBQ as a side business, with 2 large smokers and a 20 ft enclosed BBQ trailer. They do a lot of outdoor cast iron/dutch oven cooking as well. Gary has been interested in and collected rocks and minerals since he was a child. His

AMERICAN ROCKHOUND

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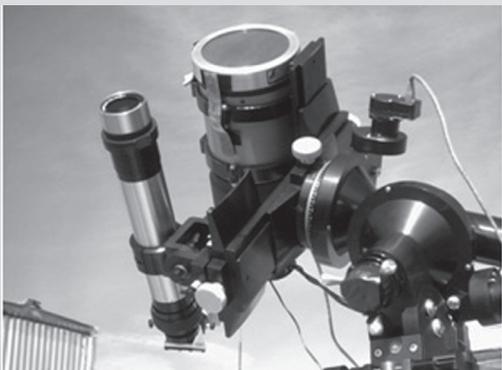


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main collecting interest is in specimens from the Elmwood Mine, but he loves to find and collect anything, as he and Vickie love to be outdoors and camp. He also metal detects (mostly civil war sites), and loves old trains!

John Lichtenberger, Kentucky



Prior to retirement, John was engaged for over four decades in a wide range of R&D in aerospace, chemical, electrochemical, medical management, engineering, and consulting industries, including the National Radio Astronomy Observatory, Bell Aerospace, and several others. He formed his own company, Meta-Plate Inc. in 1976. He invented a process for electroplating radioactive technetium 99 for R&D biofouling and medical uses, and was granted patents for other work, including US Patent 6607614 - Amorphous non-laminar phosphorous alloys; US Patent 5032464 - Electrodeposited amorphous ductile alloys of nickel and phosphorus; US Patent 4801947 - Electrodeposition-produced orifice plate of amorphous metal. John's interest in rocks and minerals dates back to his childhood, when a neighborhood friend gave him some amazonite from Amelia, Virginia at the age of 8. At age 12, he found quite a bit of crystallized turquoise in Lynch's Station, VA. and has been hooked ever since. He still enjoys collecting and sharing with other rockhounds, though at a slower pace than in his youth. He and his wife, Sue, reside in Kentucky, where they are avid lapidarists and gemstone faceters.

Dan Cathey, North Carolina



Dan began his career teaching biology classes at Western Piedmont Community College in Morganton, NC. While there, he expanded a program in environmental science and was recruited to Raleigh to work with the Division of Water Quality. Dan spent a couple years there but it turned from a training position to one in which he gave state exams. He moved to the Division of Environmental Health and ended up developing tests again. Missing the classroom, Dan found that middle school science was an interesting challenge and taught seventh and eighth grade science for over a decade. Dan is now retired and spends all his time talking about rocks, at least that is what his wife says. Dan and his wife began collecting in Franklin, NC at the Gibson Ruby Mine about 30 years ago. From there, he has gone from sluicing for rocks, to mineral shows, to field collecting.

Carl and Sandee Barton, Virginia



Carl is a retired 30 year Navy veteran from Paul, Idaho. When he is not out in the field collecting, he is busy in his wood working shop making things for family and friends. Sandee Barton received her B.S. degree in Geology from the University of Wisconsin-

Oshkosh, her M.S. in Geology (micropaleontology) from Florida State University, and her Ph.D. from Southern Illinois. She is semi-retired and now only teaches during the "official" school year, for Saint Leo University and Tidewater Community College. Both Carl and Sandee spend their free time traveling the United States visiting National Parks and rockhounding for the treasures Mother Nature has to offer.

John Sinclair, North Carolina



As a native of North Carolina, John learned at a young age that the ground beneath him held natural treasures. He's been an avid gem and mineral collector since the 1980s and a meteorite collector, hunter and dealer since 1996. John has an IT degree from Guilford Tech and is

trained as a bench jeweler. He enjoys hunting for rocks and minerals most everywhere he travels and meteorites when he gets in a good area for them. John works at the Pisgah Astronomical Research Institute (PARI), just north of Brevard, North Carolina, as the Curator of Meteorites and Minerals. His current project is helping build a meteorite and mineral museum on the PARI campus.

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CONTENTS

APR/MAY/JUN 2015 VOLUME 2 ISSUE 6



40



10



REGULAR COLUMNS

- 8 THINKING OUT LOUD: The Future of Rockhounding**
Richard Jacquot
- 40 AMERICAN ROCKHOUND: Kenneth Hart Kyte**
Richard Jacquot
- 44 FAMOUS AMERICAN METEORITES: Weston Meteorite**
John Sinclair
- 48 ROCKHOUND ART: Giant Bismuth Crystals**
Tom Leary
- 58 KIDS' PAGES**
Steve Barr
- 60 ROCKHOUND NEWS**
Richard Jacquot
- 64 ROCKHOUND RECIPES**
- 65 ROCK SHOPPER & SHOWS**
- 66 CONTRIBUTOR'S GUIDELINES**
- 67 ADVERTISING GUIDELINES**

FEATURES

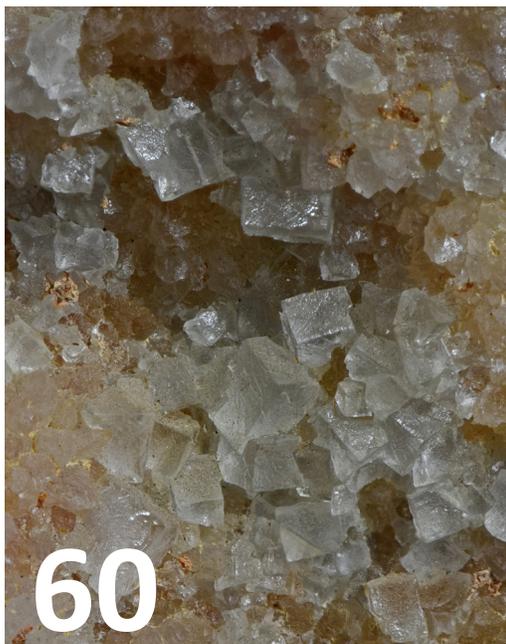
10

32

51

On the front cover: Close-up of a double terminated, multi tipped crystal on matrix from the Reel Amethyst Mine, Lincoln County, North Carolina. 1½" x 1¼" (3.81 cm x 3.2 cm).

On the back cover: Layla the rockhound looks on as we remove numerous museum quality amethyst specimens from a pocket at the Reel Amethyst Mine, November, 2012.



NORTH CAROLINA AMETHYST

Rob Whaley Richard Jacquot

A ROCKHOUND'S GUIDE TO TUCSON, 2015

Jim Landon

ALL THAT GLITTERS...

John A. Lichtenberger

FAVORITE FINDS

30, 31

Thinking Out Loud

The Future of Rockhounding

Richard Jacquot

What is the future of our hobby? Many people say it lies in our youth. Families join clubs and bring their children along to try and get them interested in the hobby. I have observed this for over fifteen years with our club (Mountain Area Gem and Mineral Association). There is usually about a 50/50 chance that I will see these children again once they become adults and can make their own decisions. I believe the future lies not only with them, but with us as well.

The children can't be the path to our future if we leave it blocked at every turn. This path involves many things: good relationships with mine and property owners, better education for new rockhounds, better education for the general public on what our hobby is about and what we do and building better relationships with government agencies that have control over some of the lands that we collect from. These are just a few things that we, as adult, veteran rockhounds, need to work on, if our children will ever have the same collecting opportunities that we have had. In just the past year we have seen numerous rockhounds indicted for violating the collecting rules set by the Forest Service here in North Carolina. Charges ranging from illegal digging and collecting to the selling of gems and minerals collected from Forest Service managed land. While none of us feel that it is fair to prohibit us from collecting as we like, the rules are still there, and because of repeated abuse, the rules are only getting stricter with each coming year. Forest Rangers can interpret these rules differently from one district to the next. It has gotten so bad that I have not organized an official club field trip to a Forest Service site since 2006. In my opinion, it is better to find productive private property sites for collecting.

Unfortunately, there are many new to this hobby, young and old, that feel they were left out of the "good old days" of collecting. They often violate Forest Service rules, trespass on

private property, sneak into active quarries and basically steal whatever they can. When they get caught, it not only makes them look bad, it makes our hobby look bad. Many of the property owners and managers see this and lump us all into one category, criminals! It's not a matter of the old seasoned rockhounds teaching the newer rockhounds the rules and the dos and don'ts of the hobby, sometimes it is the seasoned rockhounds that are encouraging the new hounds to break the rules. While the bad apples come in all ages in this hobby, I have met many young hounds in their teens and twenties that are very responsible, want to learn as much as they can about rockhounding and would never even think of doing something to damage the hobby. I believe there are more of these good hounds than there are bad.

Educating the public about the rockhound hobby is important. Our club conducts three gem and mineral shows per year. These shows are not just for the members to make money, many of our vendors have displays and conduct demonstrations of lapidary arts to show people what can be made from the stones they find. Some, like me, try to bring a display of exceptional pieces from our collections to share and show what can be found in the earth. Almost all vendors have a selection of free stones to give to children to get them interested in rocks. I try to promote all the local gem and mineral museums near where I live in North Carolina. Many people that visit these museums and see what can be found develop an appreciation for the beauty of the minerals and gems and a better understanding of what we do and why we do it. I know a lot of people don't like the salted mines that place foreign material in buckets of dirt for tourists to find. I don't visit these mines and we never conduct club trips to places like that, but I know a lot of tourists that visit places like Franklin, NC. Franklin has numerous sites

that offer “enriched” buckets of dirt. While the seasoned rockhound would turn up their nose at something like this, a five year old may find a shiny stone that could lead to a lifetime of collecting, a career in geology, or them becoming a professional treasure hunter. You never know.

I have talked at length in previous issues about treating mine and property owners fairly. Pay them a reasonable amount for the resource they are offering, respect their land, leave no trash and never trespass without an invitation. These few simple steps will help build a good relationship between the rockhound and owners that can last for years. But one bad apple can ruin it for everyone.

There are many things that we can do to keep this hobby alive and well long into the future. I have covered just a few of them here. Educating new rockhounds has to be the most important thing. Teach them ethical collecting and respect for land owners and their land. Tell them that even though they are new, they are not missing out. If they work hard, do their research, make friends that are like minded good rockhounds, the rewards will come. Take younger children to club meetings, especially clubs that have a special program for kids. Get them out in the field collecting as often as possible. Being outdoors and in nature is one of the highlights of this hobby. Teach them proper collecting techniques and how to clean and display their collection so they can appreciate what they have found and share it with their friends. Show them various ways to enjoy and use the minerals they collect, making

ornamental objects, jewelry, rock gardens. Have them label and catalog their specimens in the winter to keep the interest alive. Try to incorporate their hobby into school projects to get other kids involved. Get them to keep a diary of their collecting trips and what they found. There are numerous ways to get kids interested and keep them interested in rockhounding. Don't let them slip away to video games and TV. Listen and learn from the older veteran rockhounds. But, if someone tries to get you to sneak into a quarry or privately owned land, or dig illegally on Forest Service land, ignore them. Even if that person is a known and respected individual by some in the rockhounding community, they are only doing harm to our hobby by encouraging illegal activity. These actions will eventually ruin it for us all and earn you an unwanted reputation with your peers in the hobby.

When I started collecting here in the mountains of Western North Carolina, I also had the attitude that I had missed out on the better days of rock hunting. I would look at local museums and see the fantastic specimens from the 50s and 60s and think I would never find anything like that. It wasn't until I started finding my own great locations and specimens that I realized the earth is large and the minerals and gems run deep. To quote Crosby, Stills, Nash and Young, “Teach your children well.” “Have a code that you can live by”, that benefits this hobby and the great things it can bring. We will never run out of specimens to collect, just opportunities to collect them if we aren't careful! 🏔️



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NORTH CAROLINA AMETHYST

Rob Whaley
Richard Jacquot

Given the well-known occurrences of amethyst in Virginia, the Carolinas and Georgia, it seems apparent there is an amethyst belt about 100 miles wide running NE to SW on a line from central Virginia (Amherst, Scufflin Acres) through the Carolinas to Jackson's Crossroads in Georgia. The trend conforms to the piedmont regions of each state, with amethyst occurrences nonexistent in the coastal plain and quite scarce in the mountains. The locations in Virginia, Georgia and South Carolina will be discussed in future articles. Here we will look at North Carolina with an emphasis on several locations familiar to many collectors of southeastern minerals: Reel Mine, Lincoln County; the Hiddenite area mines, Alexander County; and the mines and prospects in the Blue Valley area, Macon County.

In North Carolina, I have seen good specimens from Warren County, Davie County, Gaston County, Guilford County (Oak Ridge Military Academy), Montgomery County (undisclosed location dug by Archie Craven of Troy, NC), Iredell County (A.E. Brown Farm in Amity Hill, Minor Lentz Farm near Statesville and a prospect near Troutman), Alexander County (the mines at Hiddenite), Lincoln County (Reel Mine, Friday's property at Alexis), Catawba County (Tate Blvd. in Hickory, Crabtree Subdivision off Hwy. 10 West in Conover), Macon County, Blue Valley (Gnat Ridge area and Wagner Mine).

REEL MINE IRON STATION, NORTH CAROLINA

Some collectors may insist that Jackson Crossroads, Georgia amethyst is superior to that from the Reel Mine; truly, there are some amazing crystals from the Georgia location. However, in terms of sheer productivity, historic interest, size of crystals and clusters, and

ultimately, value of specimens, the Reel Mine is unsurpassed. I would challenge anyone who thinks there is a better location than Reel in North America or South America (unless you think huge amethyst lined geodes are the greatest). The gem grade 165 lb cluster of amethyst at the museum on Grandfather Mountain, found at the Reel by Lewis Sigmon in 1972, was called the finest amethyst cluster ever found in North America by John White, former curator of minerals for the Smithsonian Institution. There are specimens from the Reel on display at all the important natural history museums in the U.S.

Historically, George Kunz in *History of the Gems Found in North Carolina* (1907) and June Culp Zeitner in *Appalachian Gem Trails* (1965) described high-quality amethyst discoveries in the area of the Reel under various names (Goodsen Place, Randleman Farm, etc.) all of which were located south of Hwy 73 and west of Leeper's Creek. A site on Leeper's Creek and one on the Lynch Property are in the vicinity. If numerous old-timers are to be believed, Tiffany & Co. mined the property currently known as the Reel for gemstones way back when. I have not been able to verify this in the literature.

I arrived to collect at the Reel in 1974, just in time to miss out on the discovery of the 165 lb cluster. I wouldn't have found it anyway, since, as a newbie rockhound, I couldn't tell the difference between mine dumps and untouched ground. In 74, Bud Sigmon, of High Shoals, told me he had found the cluster right at the creek. Later I heard it was his cousin, Lewis, who made the discovery and sold it to Bud for \$1,000. Somehow the

Opposite page: Close-up of a double terminated, multi-tipped crystal on matrix from the April, 2013 dig at the Reel Amethyst Mine, Lincoln County, North Carolina. 1½" x 1¼" (3.81 cm x 3.2 cm). Richard Jacquot collection.





cluster ended up decorating a jewelry store west of Spruce Pine for some 30 odd years. I have been told it was then sold to Grandfather Mountain for \$100,000.

In the 1970s, I was happy finding small clusters of smoky and amethyst in the dumps. All this changed around 1980 when lapidary, Henry Underhill of Charlotte, led a small group on a collecting trip after he had a bulldozer cut a swath through the mine. There were excellent clusters in the floor and banks of the roadway he had cut. Following the source of these through the decayed pegmatite, I learned to trace veins at the Reel.

This education continued when Steve Whitlow, of Charlotte, agreed to take me on a day's tour of the mine. He showed me where he had found great clusters and taught me that the most narrow

Opposite page:

Top left: This gem grade 165 lb (74.84 kg) cluster of amethyst at the Grandfather Mountain Mineral Museum, was found at the Reel Mine by Lewis Sigmon in 1972. This piece was considered to be the finest amethyst cluster ever found in North America by John White, former curator for the Smithsonian Institution. Grandfather Mountain collection.

Middle left: This pineapple amethyst cluster was found at the Reel Mine in 1997 by Bill and Margaret Johnson. It is now on permanent display at the Mineral and Lapidary Museum of Henderson County, Hendersonville, NC. 5¼" x 4¾" x 2¼" (13.34 cm x 12.1 cm x 5.7 cm).

Top right: The 1990s produced numerous "pineapple" clusters of amethyst that were a medium to dark purple color. This piece was offered at a local North Carolina gem show for \$5,000 and similar pieces command high prices. This piece measures approx. 16" (40.64 cm) long. Bruce Caminiti collection.

Bottom: This twin set of crystals were two of the first (quality) crystals that Sandy and I dug at the Reel Mine in 2010. The pieces were dug from a kaolin clay pocket that was first explored by a club member during a dig, then expanded by member Mark Randle, then Sandy and I and Steve Barr finished it off. The two crystals were actually found about 2 ft apart in the clay, I was later able to reconstruct the specimen. Found only a few feet from the Troy Lancaster Pocket, it has the same deep purple color and red flash. 4¾" X 4¾" X 3¼" (12.1 cm x 12.1 cm x 8.3 cm). Richard Jaquot collection.

clay seam, even less than an inch wide, can open up into large pockets of choice amethyst. Steve had dug at the Reel in the 1950s, using serious tools and dynamite to get at the pockets. To give you an idea of Whitlow's success in the 50s, he showed me some softball sized gem clusters at his house, that he said were so common when he collected that he left them on a table in his yard and allowed neighborhood children to take them at will; these would be \$2,000 specimens today.

The 1980s saw a steady stream of visitors to the mine, many of whom found nice specimens, but none found huge ones such as Sigmon's. This situation changed in the 90s after a newcomer to collecting from Gastonia, NC opened up a huge pocket adjacent to Underhill's old road going down from the crest of the hill where most people collected. This individual had never collected rocks anywhere, but on his earliest trip found dozens of football sized "pineapple" clusters of a beautiful medium lavender-tinted sort. He was a hardworking digger, courageously tunneling 20 ft long holes parallel to the surface. Sadly unfamiliar with the hobby and the value of what he had found, the young man sold most of his discoveries to mineral dealer Bud Sigmon for minor sums. An average one of these pineapple clusters sells for \$1,000 to \$2,000 these days.

Another newcomer to the hobby, Doug Suggs, from Cabarrus County, also hit it big during the bonanza of the 90s. He was poking about in a hole when the roof of it collapsed and many fine clusters of amethyst literally fell into his lap. It seems almost a tradition at the Reel that beginning rockhounds make great discoveries on their first trip to the mine. During a club trip (Mountain Area Gem and Mineral Association or MAGMA) in 2011, Troy Lancaster made his first ever mineral exploration, in a previously dug hole, and finished up that weekend with some of the finest gem clusters of deep purple ever found at the mine. The hole he extended started just four feet under the surface.

Back in the 90s, it was only a matter of time before such wealth in the ground drew undesirable elements to spoil everything. To start with, a number of diggers failed to pay the ridiculously low \$5 collecting fee (sound familiar?)

I will not name the people who got into various conflicts and bad behavior at the site resulting in closure of the Reel Mine by its owners. As the greed reached its height, individuals and even a family tried to stake claims and reserve holes for lengthy periods of time on the property, despite the mine being open to the public. Confrontations among collectors at the site grew in intensity to a point where people were being threatened with guns and the county sheriff had to be called to subdue some individuals. At that point, the mine was closed to all collecting.

Except for an interlude in 2005, when a single collector was allowed to dig with a track hoe for a short period, the mine stayed closed. Numerous mineral clubs are in the vicinity of the Reel, but it wasn't until 2009, when Steve Barr, of the MAGMA club took some initiative and persuaded the owners to allow the club to manage the site and organize collecting trips. Once again, the Reel was open to rockhounding!

After over 10 years of closure, MAGMA members enjoyed great success in collecting amethyst at the Reel for four years (2009-2013), while the club held Lincoln County Conditional Use Permit (CUP #291). This permit allowed the club to conduct and manage digs up to four times per year. All clubs and rockhounds were invited to the MAGMA digs.

Rob has laid out an excellent and thorough history of the Reel here, I want to elaborate on the history of the MAGMA club at the mine. The first digs that MAGMA conducted were done with a small track hoe and hand digging by rockhounds that attended. The grand re-opening of the Reel Mine took place on February 20th-22nd, 2009. Over 150 people attended the dig which produced numerous crystals and clusters of amethyst and smoky quartz for the rockhounds. Nothing big, but enough to keep people interested in coming back for another dig.

Successive three day digs took place in March, June and November of 2010, May 2011, May 2012 and May 2013. There were also some one day digs that took place during the Rockhound Roundup put on by MAGMA that takes place every summer in Asheville, NC. You will notice, after the three initial digs took place in 2010, there

was only one dig scheduled per year for 2011–2013. There was a good reason for this. We were only allowed to use a small, 13,000 lb track hoe to prepare the site before each dig. This machine was like using a Tonka Toy to play in a sandbox. It was too small to break through the 3-5 ft thick rocks to get at any possible crystal pockets. We did find some low grade amethyst in one section of the mine, but nothing really approaching the pieces that had come out in the glory days. Other than the fantastic finds that were made by Lancaster in 2011 and a few sporadic finds by various members, only small, mostly low grade specimens were being produced. This caused the attendance to drop considerably at the field trips.

We were finally able to bring in a large track hoe to do some serious exploration in November, 2012 and April, 2013. Our crew consisted of Steve Barr, Richard Jacquot, Ron Koenig, Mark Randle,

Opposite page:

Top left: The beginning of the mother lode pocket! November, 2012. Crew member Jesse Sackett was operating the track hoe when we noticed a steady stream of water pouring out from a crack in the rock. We knew immediately that we had discovered a pocket, we never dreamed it would contain so much amethyst.

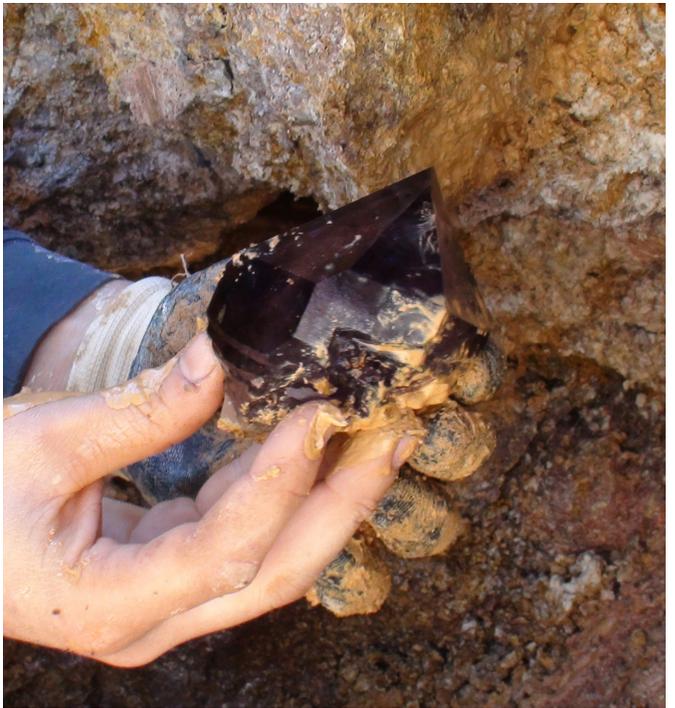
Top right: After removing some outer matrix to better expose the pocket, the first crystal appears! November, 2012.

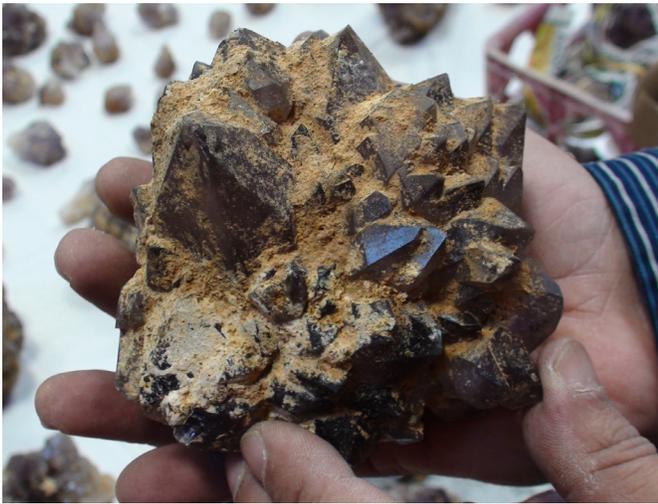
Middle left: Fresh out of the pocket, a perfect deep purple amethyst crystal. November, 2012.

Middle right: Add a little water to bring out the shine. November, 2012.

Bottom left: As the dig progressed, half the crew worked an amethyst vein we had discovered in another area of the mine, the rest took turns working the pocket. Here Jesse Sackett examines a freshly dug pocket specimen while Andrea Sackett waits to wrap it up. November, 2012.

Bottom right: April, 2013, 15 ft down. The crew watches as Mark Randle uses hammer and chisel to expand the opening of the pocket. Left to right: Jesse Sackett, Rick Jacquot, Mark Randle and Andrea Sackett. The pocket ended up being approx. 12 ft deep with room for two diggers and a propane heater to keep warm. Rob Barr photo.





Jesse and Andrea Sackett, Dave Swearingin and Rob Whaley. During the first dig in November, we hit a pocket that was located under a cap of 4 ft thick solid rock. Our crew member, Jesse Sackett, was operating the machine at the time and prying at the rock when we observed a steady stream of water begin pouring from a crack in the rock. We knew immediately that we were about to open a pocket, we never dreamed we'd find the treasure trove of amethyst that the pocket contained. We had also uncovered a large vein of amethyst and smoky crystal specimens in another area of the mine. Half the crew was working the vein, while the other half was either working the pocket, or wrapping specimens from the pocket as they were removed. In April, we conducted the second of two large machine digs and continued to work the pockets and veins we had discovered. Those two digs produced some of the finest amethyst specimens we had ever seen from the mine.

We also had the advantage of having a gas powered diamond saw with us. This was used to trim out crystals while still attached to the matrix rock. Matrix specimens from the Reel are fairly scarce, but we recovered quite a few excellent pieces. Unlike the "pineapple" clusters from the 90s that were typically a medium color with fairly small crystals up to 1" in size, many of the crystals and clusters we found were a deep dark grape jelly color. Some have the red "Siberian" flash in them, some were large, up to 4" in

Opposite page

Top left: This palm size crystal cluster was collected from a vein we had uncovered in another area of the mine, away from the main pocket we were working. November, 2012.

Top right: A 10 lb (4.5 kg) crystal cluster collected from a vein we were working at the mine. April, 2013.

Middle: A small portion of the total haul from the pocket. April, 2013. Lots of crystal clusters and points. We also had an excellent selection of matrix specimens thanks to a gas powered diamond saw that was used to remove the matrix intact with the crystals.

Bottom: A few crystal clusters and matrix specimens we had to choose from. Some still needing cleaning. April, 2013.

diameter, some transparent, some translucent and almost all had a shiny gloss natural finish. There were phantom crystals and enhydro inclusions. There was also an unusual number of double terminated specimens. Almost every matrix piece I collected had double terminated crystals attached. The double terminated crystals tend to be white or pale lavender at the center, graduating to a dark purple at the terminations. A few specimens have a micro quartz overgrowth on them that looks like "confectioners" sugar sprinkled over the amethyst crystals.



Large double terminated crystal cluster. November, 2012. This piece now resides in the Mineral and Lapidary Museum of Henderson County, Hendersonville, NC. 6" x 5 7/8" x 2 3/8" (15.24 cm x 13.7 cm x 6 cm).



Matrix specimen with doubly terminated crystal cluster attached. April, 2013. 5" x 3 1/2" x 2 1/8" (12.7 cm x 8.89 cm x 5.4 cm). Richard Jacquot collection.



One of the largest and finest matrix specimens recovered from the pocket. Covered with perfect amethyst crystals. April, 2013. Collected by Jesse and Andrea Sackett, trimmed out with the diamond saw. 16" x 8" x 5" (40.64 cm x 20.32 cm x 12.7 cm). Jesse and Andrea Sackett collection.



Three matrix specimens with double terminated amethyst crystal clusters attached. Almost all the matrix pieces had double terminated crystals, very few had singly terminated crystals. April, 2013. Left: 4³/₈" x 3⁵/₈" x 3³/₄" (11.11 cm x 9.2 cm x 9.5 cm); Middle: 7" x 5¹/₂" x 2¹/₂" (17.78 cm x 13.97 cm x 6.35 cm); Right: 5⁷/₈" x 4" x 3¹/₂" (14.9 cm x 10.16 cm x 8.89 cm). Richard Jacquot collection.

Left: This is a sleeper piece we had. While sorting and splitting our rocks, no one really paid much attention to this 30+ pound hunk of matrix rock with little crystals on it. April, 2013.

Right: I picked the rock and trimmed it down with the diamond saw. It turned out quite nice! April, 2013. Finished product is 15 lbs (6.8 kg), 11½" x 9⅝" x 4½" (29.21 cm x 24.45 cm x 11.43 cm). Richard Jacquot collection.

Bottom: Close-up of the double terminated crystal clusters on the 15 lb (6.8 kg) matrix specimen. **Left:** 2⅛" x 2" (5.4 cm x 5.08 cm) **Right:** 2" x 2¼" (5.08 cm x 5.7 cm). Richard Jacquot collection.





Two exceptional specimens from the April, 2013 (left) and November, 2012 (right) digs at the Reel Mine. The matrix specimen on the left has three individual amethyst clusters and measures: 6¼" x 5¼" x 3¾" (15.9 cm x 13.33 cm x 8.26 cm). The specimen on the right is unusual in that it has a cluster of crystals attached to a single large point with a couple of small riders. 5⅝" x 3" x 2⅞" (14.29 cm x 7.62 cm x 7.3 cm). Ron Koenig collection.



Big smoky/amethyst crystal cluster. November, 2012. 8½" x 5" x 4½" (21.6 cm x 12.7 cm x 11.43 cm). James Hall collection.



The Reel also has some nice specimens of drusy quartz. This cluster in a vug resembles the material from the Jackson Crossroads Amethyst Mine in Georgia. Field of view approx. 2" (5.08 cm). Richard Jacquot collection.



Amethyst crystal cluster with micro crystalline quartz overgrowth which resembles confectioners sugar sprinkled over the amethyst crystals. November, 2012. 4¼" x 3½" x 2" (10.8 cm x 8.89 cm x 5.08 cm). Richard Jacquot collection.



Amethyst crystal cluster with micro crystalline quartz overgrowth which resembles confectioners sugar sprinkled over the amethyst crystals. November, 2012. 5¾" X 4¾" X 3½" (14.6 cm x 12.1 cm x 8.89 cm). Sandy Jacquot collection.



Another interesting quartz/amethyst cluster from the Reel. This piece came out during the April, 2013 dig. It has mud inclusions and phantoms with multiple crystal tips. 7" x 3¾" x 3½" (17.78 cm x 9.84 cm x 8.89 cm). Andrea Davis collection.



We collected dozens of perfect multi faceted, multi tipped crystal clusters from the large pocket. April, 2013. Left: 3⁷/₈" x 2" x 2" (9.8 cm x 5.08 cm x 5.08 cm). Middle: 3⁵/₈" x 2¹/₂" x 2" (9.21 cm x 6.35 cm x 5.08 cm). Right: 3¹/₂" x 1³/₄" x 2" (39.37 cm x 4.45 cm x 5.08 cm). Richard Jacquot collection.



MAGMA member Troy Lancaster, shows off two freshly dug specimens from the 2011 dig at the Reel. Troy's pocket produced some of the finest crystals ever found at the mine. His was the only significant pocket found until our November 2012 and April 2013 explorations.



Amethyst crystal with riders from the Troy Lancaster Pocket of 2011. This piece has phantoms and some internal inclusions which gives the appearance of stars in a night sky. It also shows the red "Siberian" flash when held in the proper light. Deep grape jelly color. 2¹/₈" x 2³/₁₆" x 1³/₄" (5.4 cm x 5.6 cm x 4.45 cm). Richard Jacquot collection.



The May, 2013 MAGMA club dig was the most productive dig we had since re-opening the mine in 2009. Our preparation work paid off with trenches and pits left open for the members to collect. Many people went home with excellent shelf specimens after that three day weekend.



Ray Glave and his wife Jeri collecting at the Reel, May, 2013 MAGMA club dig. Ray opened a fantastic pocket of amethyst. It took him a few hours to collect all the pieces that the pocket contained.



Within 15 minutes of the beginning of the May, 2013 MAGMA dig at the Reel, club member Ray Glave pulled out this fantastic specimen. Ray was just one of a number of members that went home with museum grade specimens for their collections.



Top left: Amethyst/quartz sunburst crystal cluster. Collected by Clifford Glenn at the Rist Mine (N.A.E.M.), Hiddenite, NC in the 1960s. $5\frac{3}{4}'' \times 5'' \times 2\frac{1}{4}''$ (14.6 cm x 12.7 cm x 5.7 cm). Richard Jacquot collection.

Bottom left: This example of amethystine quartz is from a new find on the old Warren/Adams property. This specimen is a secondary (or later) growth on top of an earlier quartz crystal. Often, the amethystine quartz presents as a scepter or inverse scepter growth, typically with light color and exceptional clarity. Collected by Mark Randle. $1.2'' \times 0.3''$ (3.1 cm x 0.8 cm). Mark Randle collection.

Bottom right: Smoky quartz crystal with amethyst overgrowth. The amethyst is a pale lavender color. Collected by Clifford Glenn at the Rist Mine (N.A.E.M.), Hiddenite, NC in the 1960s. $4\frac{5}{8}'' \times 3\frac{1}{8}'' \times 2\frac{3}{4}''$ (11.75 cm x 7.9 cm x 7 cm). Richard Jacquot collection.





Amethyst crystal cluster collected by John Denev in 2000. The crystals from this site can reach up to several inches in size and are a pale to medium violet color. 3⁷/₈" x 3⁵/₈" x 3¹/₂" (9.84 cm x 9.2 cm x 8.89 cm). John gave me this specimen when I first met him in 2003. Richard Jacquot collection.



Amethyst crystal cluster collected by John Denev in 2000. The crystals from this site can reach up to several inches in size and are a pale to medium violet color. 4¹/₂" x 3¹/₂" x 3" (11.43 cm x 8.89 cm x 7.62 cm). John Denev collection.

The results of these digs were beneficial to many. Several beautiful specimens were placed in local museums. Private collectors were able to enhance their collections, and our club members were able to recover more amethyst in one dig than they had in all the previous digs together. Our next three day club dig took place in May of 2013. Within 15 minutes of the beginning of the dig, club member, Ray Glave from Florida, pulled out a museum quality amethyst specimen that led to a few hours work as he removed piece after piece of top quality amethyst from an in-situ pocket. As the day wore on, members found excellent crystals and clusters of amethyst and smoky quartz in the veins and pockets that were left open for easy access to the diggers. Our prep work paid off for the people that attended that weekend, as almost all went home with top quality cabinet specimens for their collections.

CHARACTERISTICS OF REEL SPECIMENS

Occurrence

The host rock for Reel Mine amethyst is a decaying pegmatite, some of which has become sand and kaolin; less decayed pegmatite still has segmented constituents but is relatively soft;



Rockhound John Denev at Blue Valley, Gnat Ridge, 2003.



The twin horizontal mine adits at the Wagner Amethyst Mine located in Blue Valley, NC. The mine is off limits per the NC Forest Service, both for safety reasons and the “White Nose Bat Syndrome” that has affected millions of bats in the southeast US. If collecting on NC Forest Service managed land, be sure to contact the local ranger for current rules and regulations.

finally, there is almost intact pegmatite which forms a very hard matrix. Specimens on intact matrix are quite scarce in the general scheme, but some outstanding examples of amethyst on matrix were found in the period MAGMA worked the mine. This is likely so because of the depth which MAGMA reached with a huge track hoe (and the help of a gas powered diamond saw).

Color

Probably the most descriptive thing you could say about the color of Reel Amethyst is that it is diverse. It ranges from a pale lilac shade to a deep purple with reddish highlights you would have to call “Siberian”. Sometimes within a cluster you can see individual crystals that are diverse in color. Crystals with color zoning are not unusual. Then there is the smoky amethyst, which is brown with hints of purple. Phantoms are not unusual, with the phantom crystal usually darker than the enclosing crystal.

Habits

It is unheard of to find longer, tapering crystals (like those of Hiddenite) at the Reel; they tend to



Three small specimens of amethyst from the Wagner Mine, Blue Valley, NC. Collected by Troy Dill in 2005. Left: 1¼" x 1" x 1" (3.2 cm x 2.54 cm x 2.54 cm); Middle: ¾" x ⅝" x ½" (1.9 cm x 1.6 cm x 1.3 cm); Right: ⅝" x ⅝" x ½" (1.6 cm x 1.6 cm x 1.3 cm). Richard Jacquot collection. If collecting on NC Forest Service managed land, be sure to contact the local ranger for current rules and regulations.

be more wide than long. Typically, there is parallel growth of crystals in a cluster and a skeletal pattern on the sides of crystals. Most clusters are combinations of larger and smaller crystals. The scepter pattern is not unusual, with color zoning between the tip and shaft. Some clusters have a bouquet habit, with large crystals at the top and smaller crystals forming shafts tapering up from a central location at the bottom. If a large cluster is formed this way it often resembles a pineapple.

Sizes

The largest Reel specimen I have seen is the 2' x 2' x 1' (60.96 cm x 60.96 cm x 30.48 cm) cluster at Grandfather Mountain. The great majority of specimens fall into the cabinet and small cabinet categories. Obviously quite common are the thumbnails, some of which may be a single crystal while others are perfect little clusters. I have not seen amethyst in a micro size at the Reel.

Inclusions

Enhydros, or water inclusions, are found fairly often in Reel Mine amethyst. I saw one crystal from there that had a sand inclusion, you could tilt it back and forth and the sand would move like that of an hourglass. Inclusions of other minerals are nearly nonexistent. I have seen one example that had enclosed needles of rutile.

In its heyday, the mine was owned and operated by Fred Sanders. Today, the site is open sporadically by his relatives. It is reported that no equipment is used and collecting is done by hand digging only. I hear it is a good site for Boy Scout groups and amateur collectors as there is always a crystal or cluster to be found for the determined rock hunter. We are glad that the MAGMA club was able to work with the owners to bring back the "thrill of the old days" of rockhounding for our members and others who chose to join us on our digs, if only for a short time. We have a lifetime of memories of those pockets and veins we discovered, and shelves full of fantastic amethyst specimens to show off and hand down to future rockhounds.

In conclusion, the Reel Mine has produced some of the best, most interesting specimens of Amethyst found in North America, if not the world. Given the current status of the mine, a whole new generation of collectors may

eventually have access to the high quality zone of the mine. Based on the experience of MAGMA club diggers, superb amethyst awaits discovery in the depths when they are probed once more.

To purchase excellent specimens of Reel Mine amethyst and smoky quartz visit www.reelmineamethyst.com.

AMETHYST IN THE HIDDENITE MINING DISTRICT

I have seen fine specimens of amethyst as scepters and elongated crystals in clusters and as overgrowth on quartz and other minerals. The color is pale to medium and the specimens are sporadic and fairly rare. Excellent scepters have come from the Adams Farm. Pale amethyst crystals forming "sunburst" patterns and clusters, and quartz crystals with amethyst overgrowth have been found at the Rist Mine (Currently North American Emerald Mines) in the early days of mining. Recently (2014-2015), specimens of small amethysts atop calcite and dolomite have been collected at the North American Emerald Mines.

AMETHYST LOCATIONS IN THE WESTERN NORTH CAROLINA MOUNTAINS

Rob stated at the beginning of this article that amethyst locations in the mountains were quite scarce. This is true, but there are a handful of collecting sites that have been accessible in the past, and some on Forest Service land that are still accessible to collectors. (Note that any collecting on Forest Service land is to be "surface collecting only", absolutely no digging or surface disturbance).

The Kunz book *History of the Gems Found in North Carolina* (1907) mentions amethyst found in Haywood County—"A number of crystals of amethyst have been secured"; the town of Webster in Jackson County—"A piece of amethyst found at Webster". A commercial scale operation was located at Tessentee, on Tessentee Creek in the Smith Bridge Township in Macon County. At the Tessentee site, "A large vein of crystalline quartz occurs in an altered pegmatite", "No finer amethysts have been discovered in this country, and several thousand dollars worth of

crystals were sold as the proceeds of the first development work". The Tessentee, and other sites listed in Kunz's book have been closed or lost long ago. As far as I know, no collecting has taken place at any of these locations in years.

A location I have visited is the Wagner Amethyst Mine, also in Macon County. I cannot find any reference to this site in old reports, though it is said to have been mined by Tiffany & Co. While there, I and some of my club members, were able to find several small specimens of amethyst. The Wagner Mine and another site known as "Gnat Ridge" were both made known to me by my friend, John Deney, in 2003. In 2000, John had collected a number of fine, medium colored amethyst crystals up to several inches in size. He gave me a few of these specimens for my collection. The pieces from the Wagner were much smaller, but darker in color than the Gnat Ridge pieces. Both the Wagner and Gnat Ridge are located in an area known as Blue Valley. Blue Valley is located several miles south of Highlands, NC in the Nantahala National Forest. The Wagner Mine is an underground shaft mine and is posted "No Trespassing" by the Forest Service for safety reasons, and the ongoing ban by the Forest Service from entering old mines and caves due to the "White Nose Syndrome", which is infecting millions of bats in the southeastern US. In the past, amethyst could be found in the area of the mine near the creek. I will not include directions to this site due to the above mentioned ban. Gnat Ridge actually has three main locations to collect along with area creeks and ridges.

If you would like to visit the Gnat Ridge sites, follow these directions and GPS coordinates:

GPS Coordinates for site 1: 35.01537 N, 83.22407 W (parking area), 35.01472 N, 83.22578 W (collecting site). GPS Coordinates for site 2: 35.01285 N, 83.22394 W. GPS Coordinates for site 3: 35.01269 N, 83.22362 W.

Directions: From downtown Highlands, North Carolina, take Hwy. 28 South, drive 5.9 miles. Turn right onto Blue Valley Road (SR 1618, RD 5969). Drive 1.3 miles, turn right onto Forest Road #301 (Copper Road). Drive 0.7 miles, park at pull off on right, across the road from a Forest Service gate.

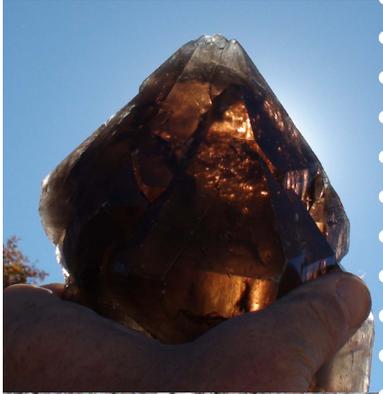
Gnat Ridge Site 1: From the parking spot, walk approximately 60 yards back down Road 301 (back towards Blue Valley Rd.) Follow a rough trail into the woods to the right and up the mountain. You will hike approximately 200 yards and it will appear that the trail ends, the site is in a patch of laurel bushes and is hard to spot. This site produced some very large medium to dark colored amethyst crystals up to 4" in diameter.

Gnat Ridge Sites 2&3: To get to site 2, hike back down the mountain to your vehicle. Drive 0.2 miles back down Road 301 (towards Blue Valley Road) and park at a small pull off on the left. From the parking spot, walk approximately 30 yards back up the road (away from Blue Valley Road). Follow the rough trail to the left into the woods up the mountain. Hike approximately 200 yards and the trail forks. The right fork will take you to site 2, the left fork will take you to site 3. The two cuts are only about 30 yards apart on the ridge, but produced different material. Site 2 produces mostly small clear quartz crystals, every time I have visited this site I have found dozens of them laying on top of the ground. Site 3 has produced nice gem clear amethyst crystals of various size.

Once you return to your vehicle, you can hike down the hill into the woods to a creek at the bottom of the hill. Amethyst crystals have been found in the creek in the past. If you are adventurous and want to do some exploring, I suggest checking out all the ridgelines in the area. The amethyst tends to run in a east to west trend and occurs at locations other than those listed here. I would also spend time checking out the numerous creeks in the area, I bet all of them may have some amethyst in them.

As stated earlier, collecting on Forest Service managed land should be considered "surface collecting only" and absolutely no disturbance in creeks. Contact the local ranger station for current rules and regulations before visiting any Forest Service location.

North Carolina has produced some of the finest amethyst specimens in the world. The continuing efforts of serious rockhounds and prospectors is sure to turn up new locations and revive old sites for years to come. 🏹



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Rick Jacquot (828) 779-4501

rick@wncrocks.com



FAVORITE FINDS



Left: Nice phantom crystal collected by a MAGMA member during the June, 2010 MAGMA club dig at the Reel Mine.

Below: Amethyst crystal specimens from the Troy Lancaster Pocket, Reel Mine. May, 2011. Troy Lancaster photos.

Opposite page: Amethyst crystal specimens from the Troy Lancaster Pocket, Reel Mine. May, 2011. Troy Lancaster photos.



FAVORITE FINDS



A Rockhound's Guide to Tucson 2015

Jim Landon
Photos by Jim Landon



For anyone with an interest collecting, buying, selling, or just looking at rocks, gems, minerals, or fossils, Tucson is a must see destination in February. The city hosts the largest gathering of dealers in the world and is international in scope. At the many different shows that are held concurrently, you can find examples of almost any kind of material the earth has to offer. For first timers, the experience is truly mind boggling and one can quickly reach sensory overload with all of the specimens that are being offered for sale. This year, most of the festivities started January 31st and ended on February 15th with the four day Tucson Gem and Mineral show that is organized by the Tucson Gem and Mineral Society. Nearly every hotel along Interstate 10 on the west side of Tucson is transformed into a rock mecca along with several other locations scattered around the city and outlying suburbs. Dealers at many of the locations offer similar materials, but there are differences in both the quantity and quality of items being offered.

This year was the third consecutive year I have been able to attend the Tucson show and this time around, I gave myself a week, so I would have

more of a chance of getting around to as many of the venues as possible. Even at that, I was only able to attend 9 of the 41 shows that were being held. I have found that there is no way that one can get to them all, even if you had a full two weeks to do so. The Tucson events are held on the heels of the Quartzite gathering and some dealers participate in both events. Anyone visiting Tucson during the shows can fine tune their experience by seeking out shows that specialize in their interests, or are not open to the general public. Events like the Gem and Jewelry Exchange (GJX) and the American Gem Trade



Every year this publication is put out prior to the shows. It has listings for all of the events taking place along with detailed maps that show locations, lists of dealers at each show, and layouts of each location that show where dealers can be found. I believe these can be purchased before the shows start, but I always pick one up when I get down there. There are stacks of these at each venue and they are free.



The larger air conditioned tents at the Kino Sports Complex show are crammed with a variety of dealers.



Check out these killer plates of quartz and pyrite crystals being offered for sale at the Kino Sports Complex Show.



Is anyone interested in Brazilian amethyst? This is part of the offering from one dealer at the Kino Sports Complex show.

Association (AGTA) are closed to the general public and open only to those in the gemstone buying and selling business. Others specialize in things like beads or are open to wholesale dealers only. Many of the other shows offer both wholesale and retail venues and some of the dealers will set up shop in more than one venue so that they can hit both the wholesale and retail markets. While many of the shows set up in hotels, some like the Kino Gem & Mineral Show and 22nd Street Mineral, Gem & Fossil Show are housed in huge air conditioned vinyl tents which are nearly the size of a football field and set up on parking lots.

The Kino Gem & Mineral Show which is held at



At the JGM show, there was an area out back that was stacked with boxed mineral specimens on pallets that had been shipped in from points unknown and being offered for sale. Why buy one specimen when you can buy a ton.

the Kino Sports Complex takes up several acres of parking lot. Space wise this is the largest show of any offered in Tucson. It caters to a wide variety of interests, but offers the largest selection of rough rock with material from all over the world. If you are interested in Mexican rough like Laguna Lace, Laguna, and Coyamito agate or almost any kind of agate that can be found then this venue is for you. Many of the major manufactures of lapidary



The Highland Park venue offered several different models of rock saws and other lapidary equipment. This company was offering discounted show deals on all of their equipment, in part because they didn't want to have to ship it back to their business. Many vendors offer these deals.

equipment also have booths at this show. I was especially impressed with the equipment being offered by Highland Park. They had a variety of saws from 8 inch to 36 inch monsters and really neat sphere machines. There are several large tent complexes that house jewelry and bead dealers. In total there were over 200 dealers at this show. There is ample free parking, a food court, and free shuttle service. The only drawback to this show is that much of it is outside and if you are not used to the heat and sun, there is a tendency to cook on warm days.

The Jewelry, Gem & Mineral Expo (JGM) was a smaller show than Kino and featured 47 dealers. Two dealers stood out to me at this show. Ravenstein which specializes in faceted Oregon sunstones, had an impressive array of stones for sale and there were several dealers who were selling mineral specimens and Ethiopian opals. This show also has free parking and easy access off I-10.

The 22nd St show is one I always spend time at. Several of the miners from the Weather Channel Show "Prospectors" have their booths set up at this venue. This year I had a chance to spend some time talking to Travis and Amanda Anderson who mine aquamarine on Mount Antero and other kinds of crystals from the Pikes Peak area in Colorado. Dwayne Hall from the series was also



Travis and Amanda Anderson from the Weather Channel Show "Prospectors" were selling aquamarine crystals from their Mount Antero claims.



Dealers at the Globe-X Show set up many their displays in the central courtyard of the hotel complex.



This display of Cretaceous age fish fossils from the chalk formations in Kansas was one of the coolest fossil displays I saw in Tucson this year. It was featured at the 22nd St. Show.



This is one of the most beautiful amethyst geodes from Brazil I saw on this trip. The deep purple color and perfection of the crystal points was breathtaking.



A close-up of the skull of one of these predatory fish gives you some kind of an idea of what they were capable of doing to their prey.



Top left: With interior lighting, the Rogerley fluorite specimens are a deep emerald green.

Middle left: In sunlight, Rogerley fluorite fluoresces blue.

Bottom left: Under UV light, the same specimen fluoresces a deep lavender.

Top right: Large tourmaline and quartz crystal specimen being offered by the Vasconcelos brothers from Minas Gerais Brazil. Their tourmaline specimens were spectacular.

Bottom right: Pan full of gold nuggets found in Australia with Minelab metal detectors.



there selling stones he had collected on Antero. Dwayne is about the nicest guy you would ever want to meet. The Dust Devil mine owners who have been mining Oregon sunstones for many years also had a place at this show. They were offering both faceted and rough sunstones from their mine. This show also offers some of the highest quality fossils of any of the shows in Tucson. Triebold Paleontology had an incredible display of replica fossil fish from the Niobrara chalk formation in western Kansas. Check them out online (triebouldpaleontology.com) to see the huge variety of fossils they offer for sale. Their work at preparation was exceptional. The 22nd Street Show has a food vendor and also ample free parking with ready access of I-10.

The next two shows are within easy walking distance of each other once you find a place to park. They are the Pueblo Gem & Mineral Show and the GIGM-Globe-X Gem Show. This is the only venue I had to pay to park at. There are two lots available with spaces costing \$5.00/day. Globe-X is held at the Days Inn/Convention Center and the Pueblo Gem & Mineral Show is at the Riverpark Inn. Both are easily accessible from the access road that parallels I-10. Globe-X is always the hotspot for Mexican fire agate rough and numerous dealers offering rough rock and crystals of every type and description. The Days Inn has a central courtyard surrounded on all sides by rooms where the vendors stay and then display their wares in the courtyard. This is a big show with lots to see if you are interested in small items.

The Pueblo Gem and Mineral Show has some of the best offerings in quartz crystals and amethyst cathedrals of any show in Tucson. Some of them have had one side removed so they can be made into tables with a sheet of heavy glass covering the open side so that all of the interior crystal beauty can be displayed. There is so much to see at this show. There are dealers selling Montana agate cabochons, amber, facet rough, tourmaline, rutilated quartz, the list goes on and on. If you have any interest in Afghan lapis this show is the one to visit. There was tons of the stuff for sale from lower grades to the very expensive high end

rough that was being sold by the gram. I also had a chance to spend some time with two young and very talented facetors from Colorado named Brett and Allyce Kosnar. I dropped off some pieces of quartz crystal rough that I had mined at Crystal Park in Montana for them to facet. I was really pleased that they were willing to spend some quality time with me going over the details of how to cut my rough to get the best quality and largest stones. If you have rough you might be interested in having faceted I would highly recommend these two. Their website is www.kosnargemco.com.

I purposely left the best show in my estimation for last. It is called the Arizona Mineral & Fossil Show and it is held at the Hotel Tucson City Center. Hotel Tucson City Center is a beautiful venue with palm and orange trees in a large grassy central courtyard and it also has a pool. This show is where many of the serious mineral, fossil, and gemstone dealers stay and hang out. People show out of their rooms, the courtyard and large meeting areas as well as in large tents that are set up on the hotel property. The very best amethyst cathedrals from Uruguay are offered for sale here as well as large specimens of petrified wood that have been slabbed and polished for use as tables. Incredible mineral specimens from localities around the world are also offered for sale. The Brazilian tourmaline and Afghan kunzite and aquamarine are especially beautiful. There is always a dealer from Australia who is selling gold specimens that were found with metal detectors. For those of you with the means, you can go down under with their company and go out on metal detecting trips with them.

I also spent time drooling over the Alberta Canada ammonites and ammolite that were being sold by a company called Canada Fossils Ltd. The color range of the shell material spans the rainbow. Canada Fossils is the specimen arm of another company called Korite that transforms ammolite into breathtaking jewelry. You can check them out on the web to see what they are offering. There is only one source for this material in the Bear Paw shale in southern Alberta and it is pretty spendy to buy.



Canada Fossils Ltd. had a number of outstanding complete Alberta ammonites like this one for sale, along with smaller pieces of various sizes that had been stabilized and covered with a protective coating of epoxy. They were asking as much as \$46,000 for their best whole specimens. The smaller stuff is used in jewelry and goes by the name ammolite.



Sabir Rasool holds a large, perfect, deep blue aquamarine crystal he and his brother brought to the show. Like many of the dealers at the Tucson City Center show, they rent the same hotel room every year where they set up their displays.



Afghan lapis rough was for sale by the ton. This material was most suitable for carving and cutting up for less expensive finished items.



Kunzite crystals from Afghanistan come in a range of colors. These pink ones were being offered by Sabir and Mohammad Rasool.

Over the years I have made friends with some of the dealers at the Arizona Mineral & Fossil Show. Two of them are brothers from Peshawar Pakistan. Every year they bring high end kunzite, ruby, aquamarine and other mineral specimens to show. We have had many great conversations about the gem and mineral business and how the specimens they deal with are found in both Pakistan and Afghanistan. Their business is called Peak Valley Gems and you can check them out on their website www.peakvalley.com.

Something new that I had heard about and read a lot about on the web in the beautiful green fluorite that is being mined in Weardale Northern England by Jesse Fisher. His mine, called the Rogerley has been producing killer specimens for several years. Jesse has a website and blog where you can follow his mining operation through the season. The cool thing about the fluorite specimens from the Rogerley is that they fluoresce blue in sunlight and violet in UV light.

There are so many other things I could talk about that I saw at the Arizona Mineral & Fossil Show but this article would end up looking like the novel *War and Peace*. There were the ametrine specimens from the Anahi Mine in Bolivia, meteorites from all over the world, fossil fish from Wyoming, lustrous pyrite from Spain. There were the famous amazonite and smoky quartz specimens that are being mined in Colorado and featured on the Weather Channel Prospectors show and whole tents full of amazing Brazilian and Uruguayan amethyst cathedrals. One could literally spend their whole trip just at this one venue.

There are many places to stay in Tucson and it is easy to get around. Most of the major shows are along the I-10 corridor and there are frontage roads on both sides that allow easy access to the different venues. If you plan on making a trip down there for the February shows, I would suggest that you book a room early as hotel and motel space fills up pretty fast. I find Tucson to be one of the cleanest cities I have ever visited. Every resident I talked to down there was friendly and helpful. Partaking of the Tucson events should be on everyone's bucket list. It is a memorable experience. ✍

Mineral & Lapidary Museum of Henderson County

400 North Main Street
Hendersonville, North Carolina, 28792
(828) 698-1977 www.mineralmuseum.org



The Mineral & Lapidary Museum of Henderson County, the project and dream of Mr. Larry Hauser, opened on November 6th, 1997.

The museum contains one of the finest mineral collections in North Carolina. Many of the minerals on display are donated or are on loan from local rockhounds and members of the Henderson County Gem and Mineral Society.



American Rockhound

Kenneth Hart Kyte

Richard Jacquot

1916 - 1984

I want to tell you about a rockhound I got to know pretty well. I never met him, he died three years before I moved to North Carolina. I learned about him from his gem and mineral collection!

One day in 2000, I was hanging out at "Jeanette's Jewelry and Pawn" in Asheville, NC. While visiting Jeanette, she told me about a friend who had a lot of rocks they needed to sell, and asked if I could help her out. Of course I said I would. I assumed that it was another person that had a few boxes of rocks to sell, and I would either buy them, or get someone I know to buy them. I was wrong!

Marjorie Branstetter (Margie), was the lady I met at the Ken Kyte residence about ten miles from my home near Asheville, NC. Margie was in her mid 80s at the time. She was the sister of Vivian Kyte, Ken Kyte's widow. Vivian was in bad health, living in a nursing home, and Margie was in charge of liquidating her estate. She led me to the back of the house where I observed a long

warehouse type building that had been built onto the main house. When we went inside, I was in awe of all the crates, boxes, flats, barrels and buckets of rocks. There were wooden "Canada Dry" crates and boxes filled with agates and petrified wood, shelves and tables lined with mineral and crystal specimens, and Cloth sacks filled with cutting rough. I estimate that there was a minimum of 100,000+ lbs of gems, minerals and lapidary equipment stored in the warehouse that Kyte had built to hold his collection. Over the next two years, I worked for Margie and the Ken Kyte estate, arranging the sale of minerals to gem clubs and individual collectors, cataloging, labeling and organizing and cleaning the thousands of specimens that were there.

Through the weeks and months that I sorted through his rocks and minerals, I began to learn about the man. Ken had lived in Mississippi at one time and eventually ended up here in North Carolina, where he met and later married Vivian.



Wooden "Canada Dry" crates loaded with tons of agate from Needle Peak, Texas and some agate from other locations, mainly in the mid-west. The antique wooden crates had a lot of value as well as the rare agates they contained.



Shelves, flats, crates and boxes loaded with numerous excellent specimens from all over the United States. There was at least 100,000 lbs of material stored in the warehouse that Kyte built to house his collection.

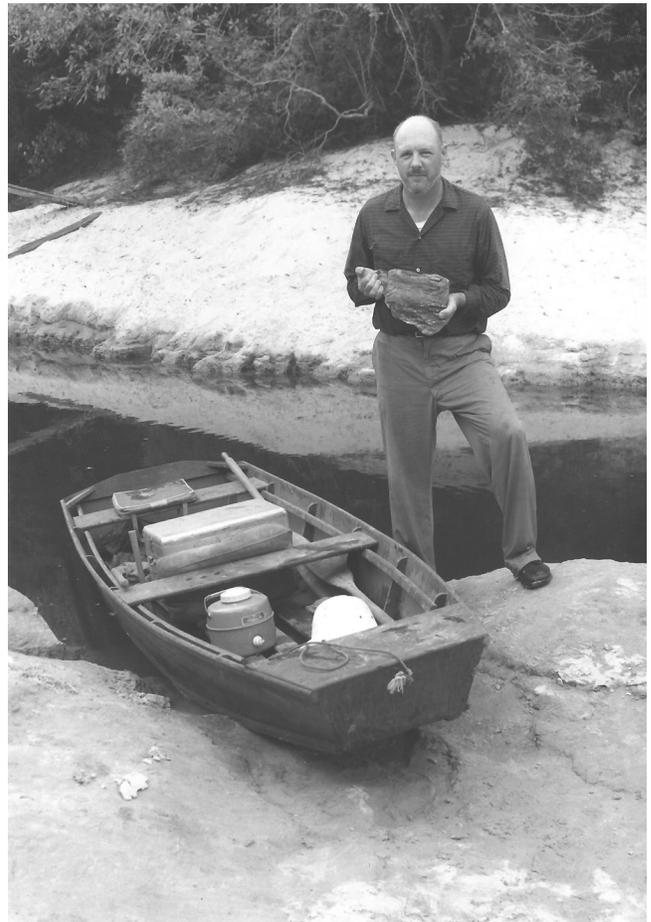


A photo taken in 1964 of a group of rockhounds showing off a large specimen of cinnamon grossular garnets in matrix from Madison County, NC. From left to right: Bill Quinn, Vira Tow, Margie Quinn, Vivian Blitch (Ken Kyte's future wife), and Jim Tow. This photo ran in a local newspaper. Back then, rockhounding was well respected and appreciated and good finds made the news.



From left to right: Cush Mudge, Mike Lane and Ken Kyte. Talking rocks at a gem and mineral show in Huntsville, Alabama in 1970.

He had visited much of the country collecting. The majority of the material consisted of agates and petrified wood from Texas and the mid-west, sites that are known for top quality specimens. Kyte had literally tons of specimens from these locations: Needle Peak agate, Big Bend, Woodward Ranch, Rio Grande River agate, giant petrified logs from Mississippi and much more. His North Carolina collection was



Ken Kyte collecting petrified wood in the Biloxi River, Mississippi in 1962. He had a slide show of collecting in this river that showed some of his larger pieces and the alligators he encountered while collecting.

impressive as well: a 77 lb emerald matrix piece from the Crabtree Emerald Mine in Spruce Pine, along with numerous sacks filled with smaller emerald matrix pieces; huge sapphires from the Old Pressley Sapphire Mine in Haywood County; giant plates of cinnamon grossular garnets from Madison County. The 7.27 carat diamond I reported on in Volume 1, Issue 2 of American Rockhound is from the Kyte collection. Whatever Ken collected, it was collected properly, with no damage and the specimens were top quality. Was this because his years of rockhounding took place when there was an abundance of material to choose from? Or maybe he just knew what he was doing.

Ken was well respected among his peers. I learned this reading his personal correspondence, letters from friends thanking him for his help, or a special rock he may have sent them. I also had

the good fortune to meet a couple of rockhounds that had known Ken. They had nothing but good things to say about him.

By looking at his mineral collection, I saw that Ken was a well traveled rockhound, but what kind of person was he? I began reading through the piles of old magazines, newsletters and personal correspondence he had accumulated. Ken was very articulate and did a lot of writing for various magazines and club newsletters promoting the hobby, new discoveries and lapidary techniques that he wanted to share. He was involved in many gem and mineral shows across the country selling his finds. He was handy at mechanics and had several well built, homemade pieces of lapidary equipment. In June Culp Zeitner's *Southwest Mineral & Gem Trails Guide (Lapidary Journal, Pg. 137, 1972)* an article described a heat treating process that Ken had developed for enhancing the color of Mississippi agates. From the Rock Tumbling Hobby board: "Ken Kyte is said to have developed a heat treating method for enhancing the color to brighter oranges, yellows, reds, and pinks. He would pack the agates in large containers of sand, then put them in a gas oven (his was one he had rigged outside). He turned up the heat carefully, 50 degrees at a time, until it was as high as it could go. Then he left it on 'for a while' and then started to turn down the heat. Once the heat was off, he left the agates in the cooling oven overnight without peeking. The color is said to have gone completely through the stone - and doesn't look artificial - just an augmentation of what color the stone had previously." (andy321.proboards.com/thread/50239)

His collection told me that Needle Peak, Texas was his favorite rock hunting area. This was evident, in that about half of his rocks were Needle Peak material. Many rockhounds that came to his home to buy some of his specimens commented that, "Needle Peak was no longer in Texas, but in Ken's warehouse!". I decided to do some Internet research on agates from Needle Peak and came across some interesting stuff. One site (www.woodwardranch.tripod.com) talked about chalcedony/agate after aragonite crystal pseudomorphs. From the website - "Another rare find from Needle Peak has been the orthorhombic



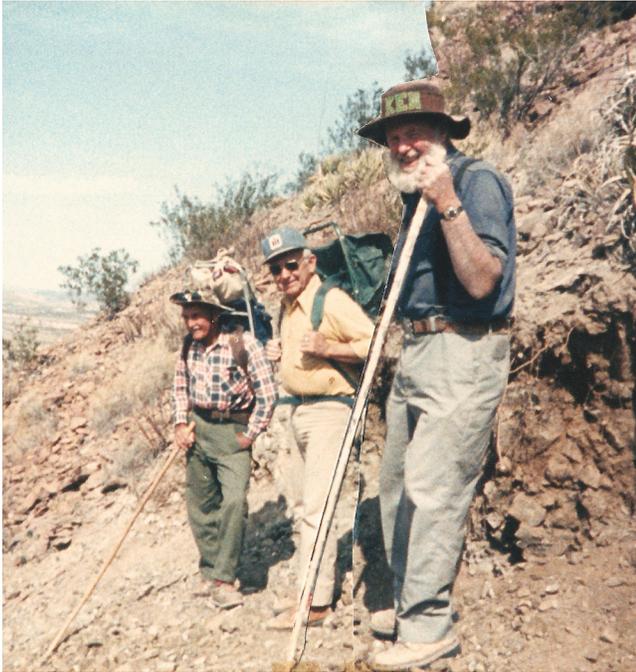
Ken and Vivian Kyte, collecting agate and petrified wood at Needle Peak, Texas in 1980.

aragonite as pseudo-hexagonal twinned crystals, coated with chalcedony (agate). The aragonite was later dissolved out leaving only the shape of the aragonite crystal." The site had a photo of a large specimen of this material and stated that only a few smaller similar pieces have been found to date. This was posted in 2009. I remembered seeing several of these in Kyte's collection, some big and some small. June Culp Zeitner also did an article that mentioned Needle Peak agate in *Rock & Gem* magazine (*Lapidary Lore and More*, July, 2002 through March, 2006, can't locate the exact issue). In that article she stated that a form of sagenite agate from Needle Peak was a rare find. I found a cigar box loaded with slabs of this agate. I also salvaged numerous slide presentations that Ken had assembled to various sites he had visited. I have shown some of these to local clubs here in NC. The members get a kick out of seeing what collecting conditions were like back in the 50s and 60s.

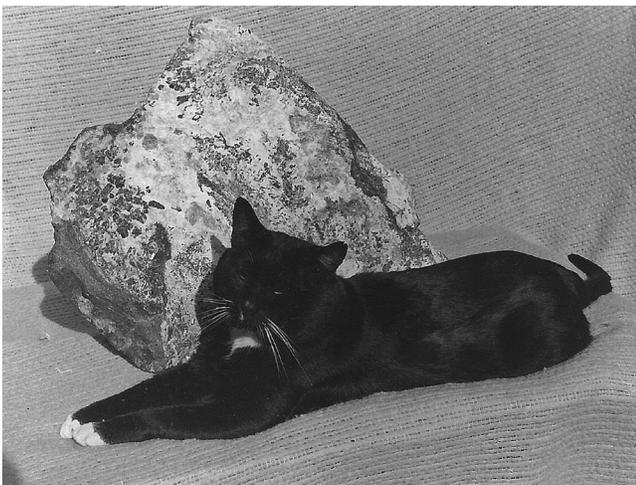
Rocks can tell a story, in this case, they told the story of a man that was an experienced rockhound, a respected man and a good friend to many others in the hobby. The next time you get a lead on a good mineral collection for sale, and go to buy some, or all of that person's rocks and gems, take a minute and look for other things that may go with the rocks: letters, magazines, articles, or pictures. Get to know the collector, the information they pass on may help you in future rockhounding endeavors. Every person that has helped promote this hobby in a positive way should be remembered, just as I am remembering

Ken Kyte here.

Ken and his wife Vivian were avid rockhounds. Ken lived to the age of 68, dying in 1984 in Asheville, NC. Vivian, born in 1917, died at the age of 87 on August 3rd, 2005 in Fairview, NC. If they were here today, I know I would be proud to have them join my club and accompany me on



Some early Photoshop work from 1984. This picture shows, from left to right: Col. Gordon Frich, Jim Trimmer and Ken Kyte, rock hunting on Needle Peak. Kytes picture was added to the photo, either by him, or by his friends after he died in 1984.

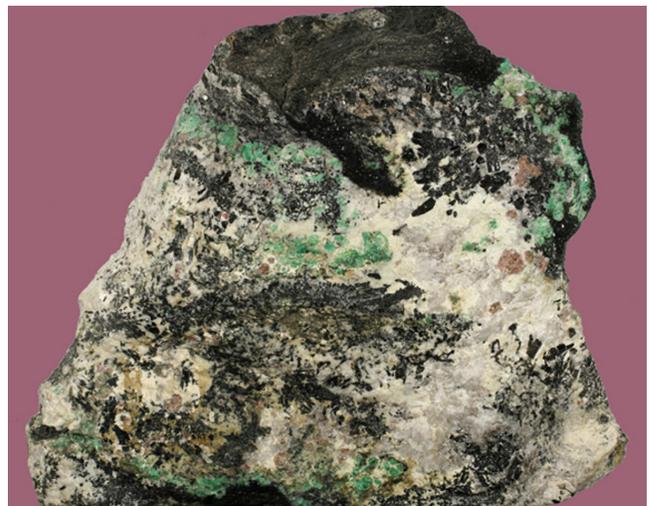


Ken Kyte's cat, posing with his recently dug, 77 lb (34.9 kg) specimen of emerald in matrix from the Crabtree Emerald Mine near Spruce Pine, NC. This photo was taken in 1974, so I assume that was when the specimen was dug.

collecting trips. Ken liked Needle Peak so much, that they buried his ashes there. If you are ever in Texas, hiking and hunting rocks, and get a chance to visit Needle Peak, look for a small bronze memorial that says "Ken Kyte, 1916-1984", take a moment to say hello, and remember one of the good guys that kept this hobby alive. 🚶



Yellow, red and green moss/plume agate, Needle Peak, Texas. Collected by Ken Kyte. 4^{3/4}" x 4^{1/4}" x 2^{1/4}" (12.07 cm x 10.8 cm x 5.72 cm).



A recent photo of the 77 lb (34.9 kg) Crabtree matrix specimen collected by Ken Kyte in 1974. Since I acquired this specimen in 2000, it has been on display at several shows and museums for others to enjoy. Ed Speer photo.

Famous American Meteorites

Weston Meteorite

Fairfield County, Connecticut

Fell December 14, 1807, 6:30 AM EST

Stone Chondrite H4

John Sinclair

In the early hours on a cold December morning in 1807, the residents of Weston, Connecticut were awakened by three loud explosions. Some were up and working in their fields and witnessed the unfolding event. A large bright fireball was seen traveling southward through the sky. It exploded over Weston and stones were seen to fall in at least six locations. The rumbling from the sky was described as sounding like “a cannonball being rolled along a wooden floor.” The explosions were described as being like large artillery fire. The event startled both man and animal alike.

Multiple stones were recovered by terrified residents and many were broken with the thoughts they contained gold or something else of high value. This was a time when beliefs in the supernatural were common and these stones were surely seen by some as a sign from heaven. Out of approximately 350 pounds of stones and fragments recovered, only about 50 pounds were preserved. One account says one large stone was broken into pieces and given away as souvenirs.

As luck would have it, a Yale Professor of Chemistry, Benjamin Silliman, soon heard news that stones had fallen from the sky. Yale was only about 35 miles from the event and Silliman and his colleague, Professor James Kingsley, arrived there a few days later. They recovered fragments from many of the stones that were found.

Without the efforts of Silliman and Kingsley, Weston would not have been distributed to worldwide museums and institutions but would have been lost to history and science. The Weston meteorite was the first recorded meteorite fall in the United States and it led to advancements in the way we studied science in the US. In colleges, Science and Philosophy were grouped together and Silliman led efforts to separate the two.

Silliman’s writings and research on the Weston meteorite caught the attention of another



Wood cut print of a recreation of the Weston Meteorite impact, from the 1800s. Photo courtesy of John Sinclair.

man interested in science. Thomas Jefferson. There was friction between President Jefferson and Connecticut at this time. Jefferson had implemented the Embargo of 1807 which stopped all export of American goods and it shut down the port town of New Haven causing dire economic conditions there.

There are reports that Jefferson made the comment “That it was easier to believe that two Yankee Professors could lie than to admit that stones could fall from heaven.” Reports of Jefferson saying this are incomplete.

Jefferson received a letter written on February 8, 1808 from Mr. Daniel Salmon, a resident of

Connecticut about a recovered stone.

SR.,

Being Solissted by a Number of Gentlemen in Fairfield County State of Connecticut & in perticular by many of the town of Trumbull in sd. County in which town is the place of my Residence also by many in this City to Communicate to your Excellency the Intelligence of a large mass of the late Meteor Stone which fell Near my house on the morning of the 14th. Day of December last & being perswaded your Excellency would wish to Obtain the fullest Evidence of this Extraordinary phenominon in the United States of America I take the liberty thus to address you—and hereby to inform your Excellency that I Now hold and am possesd. of the largest fragment of the meteor Stone which has yet or proverbally Ever will be found wighing 37 pounds this peice as yet is preserved intire & proved by Inconterable Evidence to have fallen on the Same Day the Meteor passed Over weston and I was an Eye & Ear witness with many of my Neighbours that a Stone fell on the Same field where this fragment was found to wit on a field Sewed with Rye after a Crop of Oats this peice was found 3 feet below the Surface and many Spires of Green Rye & Oat Stibbel at the bottom of the Cavity & on sd. fragment was found many Spires of sd. Rye & Stubble this must be an Evidence that it fell from the atmosphere it has also ben Carfully Examined by the professional Gentlemen in Connecticut and at this place and they all without hesitation Declare this peice to be of A Meteoric production & no Doubt Can arise but that it Derives its Origen from the Same Sours with all those peices which have been Annalised both in Connecticut and at this place

I have ben Solicited to present this fragment at the Seat of Government and in perticular to your Exelency & the present Executive together with the National legislator that they might have the Pleasure of Viewing it this peice is highly Impregnated with Iron many peices apearig on its Surface of pure Iron as thoug it had pased under the hammer I Should take Great pleasure in being the bearer of this New Visitor in the united Stats and to Give the Curious an oppertunity of Seing this Mass was not the Distance So Great and my Resorces Small—Pleas to Excuse the length of

this Communication and Accept Asurances of my Esteem and may your Excellency be under the protection of him by whom kings Reign & princes Decre Justice

I am Respectfully your Obedient and Very Humle Servt.

Daniel Salmon

In Jefferson's response to the letter he states skepticism to the fact that stones could fall from the sky.

Washington Feb. 15. 1808

Sir

I have duly recieved your letter of the 8th. inst. on the subject of the stone in your possession supposed meteoric. it's descent from the Atmosphere presents so much difficulty as to require careful examination. but I do not know that the most effectual examination could be made by the members of the National legislature, to whom you have thought of exhibiting it. some fragments of these stones have been already handed about among them. but those most highly qualified for acting in their stations, are not necessarily supposed most familiar with subjects of natural history: and such of them as have that familiarity, are not in situations here to make the investigation. I should think that an enquiry by some one of our scientific societies, as the Philosophical society of Philadelphia for example, would be most likely to be directed with such caution & knolege of the subject, as would inspire a general confidence. we certainly are not to deny whatever we cannot account for. a thousand phaenomena present themselves daily which we cannot explain. but where facts are suggested, bearing no analogy with the laws of nature as yet known to us, their verity needs proofs proportioned to their difficulty. a cautious mind will weigh well the opposition of the phaenomenon to every thing hitherto observed, the strength of the testimony by which it is supported, and the errors & misconceptions to which even our senses are liable. it may be very difficult to explain how the stone you possess came into the position in which it was found. but is it easier to explain how it got into the clouds from whence it is supposed to have fallen? the actual fact however is the thing to be

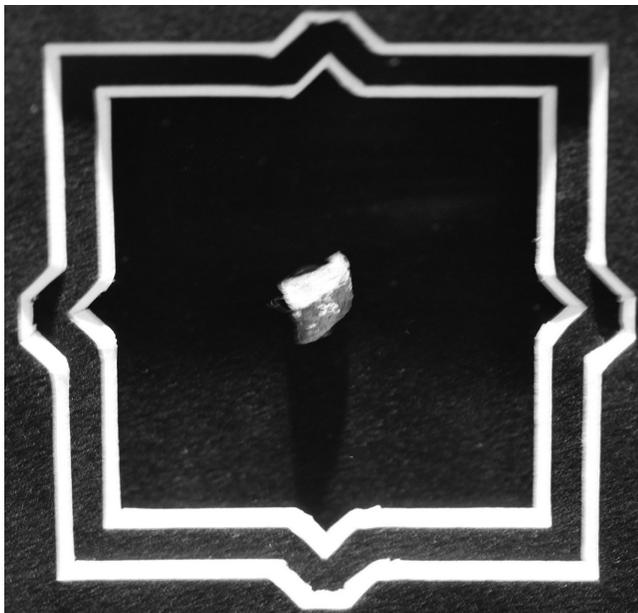
established, and this I hope will be done by those whose situation & qualifications enable them to do it. I salute you with respect.

Th: Jefferson

Of all the stones that fell and were recovered in Weston, only one was kept intact. It was a 36.5 pound stone that was found days after Silliman and Kingsley left Weston. Locals urged the finder to donate the stone to Yale but it was sold to George Gibbs III to be added to his extensive and famous mineral collection. Yale acquired Gibb's collection and the intact meteorite in 1825 and the stone became the foundation for Yale's now extensive meteorite collection. It's most likely the same meteorite that Daniel Salmon wrote to Thomas Jefferson about in 1908.

Benjamin Silliman's response to the meteorite fall in Weston and his later scientific work and distribution of the Weston meteorites makes him the first American Scientist to research and document meteorites. He could be called the father of American meteorite science. He also founded Yale Medical School and was the first person to distill petroleum in the United States. Silliman also founded *The American Journal of Science*.

Thomas Jefferson and Benjamin Silliman were both interested in rocks, minerals and fossils.



Close-up of a fragment of the Weston Meteorite at the Pisgah Astronomical Research Institute (PARI). John Sinclair photo.

There was surely friction between them because of the Embargo of 1807 and the hardships it caused the people of Connecticut. One can only imagine the foundation for the advancement in sciences that could have been made at this time if these two men were not at odds with each other because of the political environment of the day. Great strides would have been made in the science of geology if they were able to work together in researching meteorites and the Weston meteorite fall of 1807. 🚀

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***Yale Peabody Museum of Natural History
The Weston Meteorite***

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From Thomas Jefferson to Daniel Salmon, 15 February 1808," Founders Online, National Archives (<http://founders.archives.gov/documents/Jefferson/99-01-02-7423>)

1807 Weston meteorite critical moment for American science

1807 fireball researched by Yale professor Benjamin Silliman

John Burgeson, Staff writer

***Published 9:55 pm, Sunday, January 2, 2011
StamfordAdvocate .com***

Who is the Liar Now? By Anna Berkes

Posted in: Thomas Jefferson, A Summary View, Research

www.monticello.org/site/blog-and-community/posts/who-liar-now



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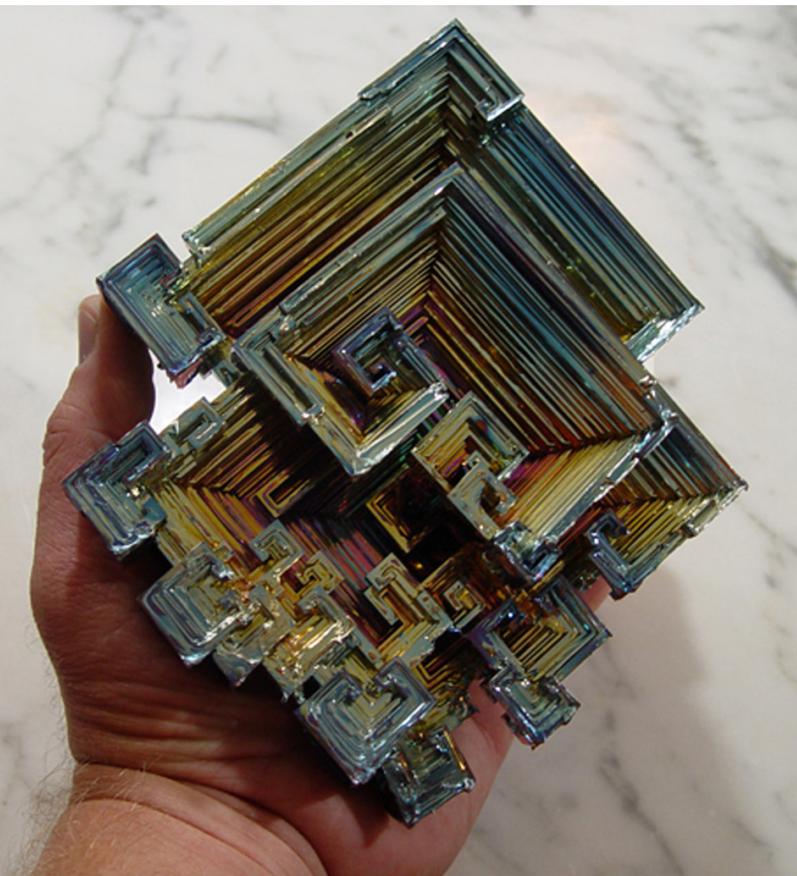
I was born on December 27, 1973 in Portsmouth, Virginia. I started collecting rocks when I was about five years old. I had noticed some fresh granite was brought into my granddad's driveway. It had different colors than usual so it attracted me. I had keen eyes then so I noticed little, gem red faceted spots in some of the granite. I learned those were little garnets. I was sure hooked on rocks from that point forward. They were a beautiful pigeon blood red.

My Grandma and Granddad wasted no time getting me to the mall to the kiosk jewelry store. They had over priced Mexican polished geodes but I did not care. We about bought them out. I had a great collection and then my mom got into the action. She had heard of a rock shop in Richmond named Packard's Rock shop. We went there and learned of a few sites in VA that were open. I found my first beryl piece at the Ligon Mine in Amelia County, got garnets in Beaver Dam, VA and got a good taste of the Morefield Mine with my dad. My parents were dedicated to getting me outside on the rip-rap and away from the riff-raff hanging around the neighborhood.

Later on in life, I met a man named Bill Kline at a show in Tower Mall in my hometown of Portsmouth. He was keen to my enthusiasm in the hobby. He bought and traded with me in the show and I had a friend for life. What makes him special to me is that he introduced me to crystal growing. He did not tell me how to do it, rather he gave me a piece of bismuth and said "go home and give it a try". I brought him some Bismuth crystals the next day. I had used a propane torch to melt it in a spoon and figured it out from simple curiosity. There was no instruction or "YouTube" to reference. He had been doing it before it was in style.

After that, we became friends and kept the secret to ourselves. I respected his effort and did not want to hurt a friend's hard work. It paid off one day when he offered me an all expense paid trip to Quartzsite, Arizona to help him sell minerals and his Bismuth. It included lots of time to explore the surrounding mountains and even find some bits of native Gold in the quartz. I had one of my best life experiences with him and his wife, Lisa. They did a great job putting up with me and my youth.

One of his wishes was to grow the biggest bismuth in the world. He had some thoughts on how to do it, but was not able to get around to it. He passed on after having a very full life. A few years passed and I still had a want to try some of my theories on how to get the really big bismuth crystals to grow. I set up shop, and after a LOT of frustrating attempts I had a crystal that even I could not believe. It measured about seven inches on a side and was not intergrown anywhere. The crystal had all the colors of the rainbow. I know he would be proud of the accomplishment...or madder than a bull in July. I developed the process with only my own research and determination. The technique stuck and several more show pieces were grown. These all ended up in club members hands as they are very popular with the Mountain Area Gem and Mineral Association (MAGMA) club. They are very difficult to grow over 4" tall as they are very "soggy" and malleable on finishing the grow. Many have been lost at the moment of birth due to that stuff we call gravity. It is very frustrating. I have had entire days of growing go by with no good specimens coming forth. Did I mention the sloshing of hot metal? My right arm bears burns in testimony to the dangers involved in this process. Anyone attempting the growing of bismuth should practice good safety. Handle molten metal



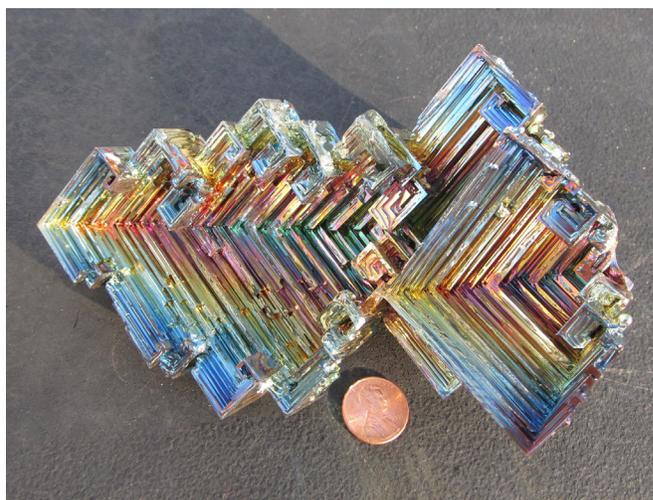
In April, 2010, this bismuth crystal was, and may still be, the largest specimen of this type in the world. This is a free standing open face crystal group. It weighs 7 lbs 1.2 oz (3.21 kg) and measures 8" x 6½" x 3½" (20.32 cm x 16.51 cm x 8.89 cm). Lab grown under controlled conditions by Tom Leary, Tom is the absolute master of bismuth crystal growing! This piece now resides in a private collection in Los Angeles, California.



When not working, hanging out at home with his wife and daughter, or growing bismuth crystals, Tom stays busy digging the numerous mines he frequents in Virginia and North Carolina. Here he is hunting amethyst at Scufflin Acres Farm in Prospect, Virginia.



Large bismuth specimens grown by Tom Leary. Tom Leary photo.



Large bismuth specimen grown by Tom Leary. Tom Leary photo.

carefully. Wear safety glasses and a long sleeve, fire resistant shirt. Wear gloves as well. I wear a face shield when handling it. I encourage folks to enjoy the art of growing these for themselves, it is educational and rewarding. 🦋

Tom grows bismuth crystals for sale at his home lab in Virginia. If you would like to purchase bismuth specimens from Tom, email him at: piffsniff@aol.com



A small bismuth specimen I bought from Tom for my collection. 3½" x 3½" x 3⅛" (8.89 cm x 8.89 cm x 7.94 cm). Weight: 1 lb 6.8 oz (0.65 kg).



Large (6"+) bismuth specimen grown by Tom Leary, see dollar for scale. Tom Leary photo.

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All that Glitters...

John A. Lichtenberger

Societies throughout time have lusted after those metals that are durable, have an appealing color, and have received special significance in society as being highly valuable. The precious or noble metals are usually taken to include gold, silver, platinum, rhodium, ruthenium, palladium, iridium and osmium. The first two, along with copper, are often referred to as coinage metals, since besides having major industrial uses, they have historically been used to represent wealth as a hard asset both in commerce and by sovereign states.

One of the biggest gold coins in the world is the \$10,000 dollar Australian Gold Nugget which has a full kilogram of 99.9% pure gold. In 2007, the Canadian Mint made a 100 kg 99.999% gold coin, with a face value of \$1 million, and now manufactures them to order, but at a substantial premium over the market value of the gold.

Most of the coinage in use today in the US is not made from any of these metals, as their values by weight of metal in the coins increased beyond the face value of the coin during the 1970s and 1980s.

Of the eight metals listed above, gold is arguably the most popular, followed closely by silver and perhaps platinum. The other five are rarely encountered (although I've used them all) and usually only found in specialized electronic, medical, and aerospace applications due to their unique properties. All have high specific gravity, ranging from 10.49 gm/cc for silver to 22.50 gm/cc for osmium and iridium. All but silver have high resistance to corrosion, do not form oxides readily, and have relatively high melting points (osmium has the 4th highest melting point of any element).

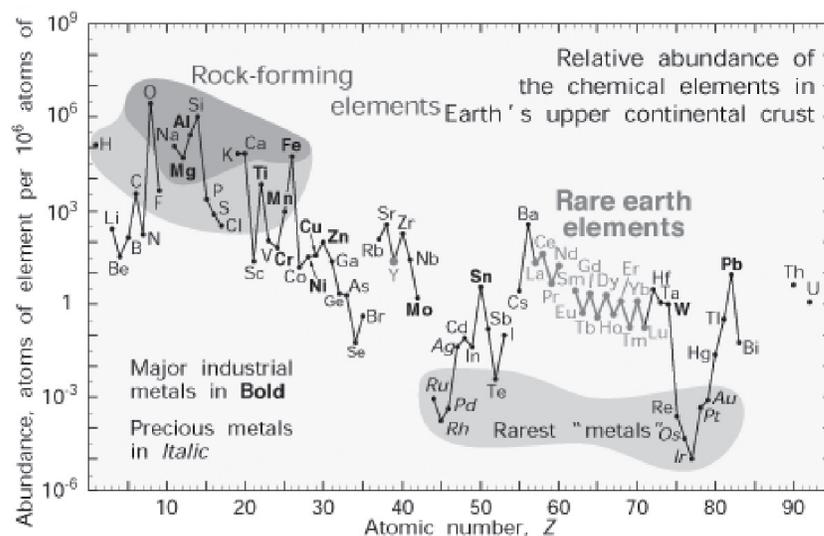
The top ten producing countries

for the platinum group metals are:

- | | | |
|----|--------------------|-----------|
| 1 | Russian Federation | 83,200 kg |
| 2 | South Africa | 75,118 kg |
| 3 | United States | 12,700 kg |
| 4 | Canada | 6,500 kg |
| 5 | Zimbabwe | 5,680 kg |
| 6 | Japan | 5,600 kg |
| 7 | Botswana | 3,000 kg |
| 8 | Australia | 600 kg |
| 9 | Poland | 15 kg |
| 10 | Serbia | 15 kg |

Osmium, the heaviest element, was discovered in 1803 by Smithson Tennant and William Hyde Wollaston in London, England, who analyzed the insoluble residue left when platinum ores were dissolved in aqua regia (a mixture of hydrochloric and nitric acids) to create soluble salts, and concluded that it must contain a new metal.

By treating this residue alternately with alkali and acids, a volatile new oxide, which was believed to be of this new metal, was obtained. Later research on larger quantities of this material yielded two new metals, iridium and osmium. Osmium tetroxide was distilled off and



Relative abundance of the platinum group metals.



Osmium crystals

decomposed to the native metal. Since osmium oxide is volatile and toxic, osmium is rarely used in its pure state, and is instead often alloyed with other metals.

Most of the osmium in existence comes from the processing of platinum and nickel ores. Osmium alloys such as osmiridium are very hard and, along with other platinum group metals, are used in the tips of fountain pens, instrument pivots, and electrical contacts, as they can resist wear from frequent operation. They were also used for the tips of phonograph styli during the late 78 rpm and early “LP” and “45” record era.

The discovery of **iridium** is associated with the native platinum used in African and South American cultures long ago. Pieces in use always contained a small amount of the other platinum group metals, including iridium and other impurities.

Due to the difficulties in melting these metals, producing and handling iridium was very difficult in the 1800s after their discovery. John Isaac Hawkins, an inventor who also invented the iron framed upright piano, was looking to obtain a fine and hard point for fountain pen nibs, and in 1834 managed to create an iridium-pointed gold pen.

Alloys of iridium with another noble metal, ruthenium were used to make thermocouples in the 1930s. These allowed for the measurement of high temperatures in air up to 2000 °C.



Iridium mineral

Rhodium was discovered in 1803 by William Hyde Wollaston, soon after his discovery of palladium from crude platinum ore. His procedure involved dissolving ore in aqua regia and neutralizing the acid with sodium hydroxide (NaOH). Platinum was recovered as ammonium chloroplatinate by adding ammonium chloride, NH₄Cl. Most other metals like copper, lead, palladium and rhodium were precipitated with zinc. Diluted nitric acid dissolved all but palladium and rhodium, which were then dissolved in aqua regia, and the rhodium was precipitated as Na₃[RhCl₆]•nH₂O by adding sodium chloride (salting out). After rinsing with alcohol, the rose-red precipitate was reacted with zinc, which displaced the rhodium in the ionic compound and thereby released the rhodium as free metal.

After the discovery, rhodium found only minor applications, including rhodium-containing thermocouples used to measure temperatures up to 1800°C. The first major application was for decorative uses and as corrosion resistant coating. Subsequent to this, introduction of the three way catalytic converter by Volvo in 1976 increased the demand for rhodium. The previous catalytic converters used platinum or palladium while the three way catalytic converter used rhodium to reduce the amount of NO_x in the exhaust. Very thin (0.000010”) coatings of pure rhodium are used on silver microwave hardware, and expensive jewelry to protect the silver from tarnishing. These are plated from rhodium sulfate

baths.

Historically **Gold** coins were widely used as currency. When paper money was introduced, it typically was a receipt redeemable for gold coin or bullion. This metal has been a valuable and highly sought-after precious metal for coinage, jewelry, and other arts since long before the beginning of recorded history. The gold standard, in which a certain weight of gold was given the name of a unit of currency, was the standard for a long period in the United States; the government set the value of the US dollar so that one troy ounce was equal to \$20.67 (\$664.56/kg), but in 1934 the dollar was devalued to \$35.00 per troy ounce (\$1125.27/kg). By 1961, it was becoming hard to maintain this price, and a pool of US and European banks agreed to manipulate the market to prevent further currency devaluation against increased gold demand. Major producing localities and reserves include:

Obuasi - Ghana, western Africa	29,830,000 Oz
Cadia East - New South Wales, Australia	37,600,000 Oz
Pueblo Viejo - Dominican Republic	40,085,000 Oz
Oyu Tolgoi - South Gobi Desert, Mongolia	46,340,000 Oz
Olympiada - Central Siberia, Russia	47,500,000 Oz
Grasberg - Papua, Indonesia	106,231,000 Oz

... and many more. Looking at the millions of ounces of reserves at these mines, one wonders just how rare gold is.

Gold was known for centuries, if not millennia, and, because of its ductility and malleability - workability - as well as its resistance to acids and atmospheres, has had major use. Gold is attacked by and dissolves in alkaline solutions of potassium or sodium cyanide, to form various salts including gold cyanide—a technique that has been used in extracting metallic gold from ores in the cyanide process. Gold cyanide is one of the components of electrolytes used in commercial electroplating of gold onto base metals and electroforming. A

typical gold plating bath consists of potassium gold cyanide, phosphoric acid, cobalt or nickel in small quantities (improves hardness), and potassium salts to improve conductivity.

Of all of these metals, I'm most familiar with gold, as I have plated many ounces onto electronic devices over a 40+ year span. Gold has unique properties; it does not tarnish, conducts electricity well, reflects and conducts microwaves exceedingly well, and lasts forever. I've also restored many antique service medals and pins. Gold is the most malleable of all metals; a single gram can be beaten into a sheet of 1 square meter, or an ounce into 300 square feet. Gold can be manufactured so thin that it appears transparent, and various thicknesses will pass light and appear purple to red.

Gold chloride (chloroauric acid) solutions are used to make colloidal gold by reduction with citrate or ascorbate ions. Gold chloride and gold oxide are used to make cranberry or red-colored glass, which, like colloidal gold suspensions, contains evenly sized spherical gold nanoparticles.

Platinum metal was used by pre-Columbian Americans in Ecuador to make ceremonial tools from a white gold-platinum alloy. The first written reference to platinum appears in 1557 by Julius Caesar Scaliger as a description of an unknown noble metal found between Darién and Mexico, "which no fire nor any Spanish artifice has yet been able to liquefy".

Antonio de Ulloa is credited with the discovery of platinum. In 1750, after studying the platinum sent to him by Wood, Brownrigg presented a detailed account of the metal to the Royal Society, stating that he had seen no mention of it in any previous accounts of known minerals. In 1752, Henrik Scheffer wrote a description of the metal, which he referred to as "white gold", including an

Metals	Osmium	Iridium	Rhodium	Gold	Platinum	Ruthenium	Palladium	Silver
Specific Gravity	22.59 g/cm ³	22.56 g/cm ³	12.41 g/cm ³	19.3 g/cm ³	21.45 g/cm ³	12.45 g/cm ³	12.023 g/cm ³	10.49 g/cm ³
Melting point	5491 °F (3033 °C)	4435 °F (2446 °C)	3567 °F (1964 °C)	1947.52 °F (1064.18 °C)	3214.9 °F (1768.3 °C)	4233 °F (2334 °C)	2830.82 °F (1554.9 °C)	1763.2 °F (961.78 °C)
Boiling point	9054 °F (5012 °C)	7466 °F (4130 °C)	6683 °F (3695 °C)	5378 °F (2970 °C)	6917 °F (3825 °C)	7502 °F (4150 °C)	5365 °F (2963 °C)	3924 °F (2162 °C)
Mohs hardness	7.0	6.5	6.0	2.5	6.0	6.5	4.75	2.5

Some properties of the platinum group metals.

account of how he succeeded in fusing platinum ore using arsenic. Scheffer described platinum as being less pliable than gold, but with similar resistance to corrosion.

Franz Karl Achard made the first platinum crucible in 1784. He worked with the platinum by fusing it with arsenic, then later volatilizing the arsenic and hammering the residue to solidify it.

False assumptions were made at the time that due to its hardness-which is slightly more than for pure iron-platinum would be a relatively non-ductile material, even brittle at times, when in fact its ductility and malleability are close to that of gold. These assumptions could not be avoided because the platinum being used was contaminated with minute amounts of platinum-family elements such as osmium and iridium, amongst others, which are now known to significantly harden it. Alloying this impure platinum called "plyoxen" with gold was the only solution at the time to obtain a ductile alloy, but nowadays, very pure platinum is available and extremely long wires can be drawn from pure platinum, very easily, due to its crystalline structure, which is similar to that of many soft metals.

The discovery in natural platinum of additional elements Ruthenium, palladium, rhodium, osmium and iridium occurred in the early 19th century when platinum in alluvial sands of Russian rivers led to use as raw material to make plates and medals and for the minting of ruble coins. Residues of platinum production for minting were available in the Russian Empire, and therefore most of the research on them was done in Eastern Europe.

In the mid 19th century, the Baltic German scientist Karl Ernst Claus showed that the compounds prepared by Gottfried Osann contained small amounts of ruthenium, which Claus had discovered the same year. Claus isolated ruthenium from the platinum residues of the ruble production while he was working in Kazan University, Kazan. Ruthenium is used in platinum and palladium alloys to make wear-resistant electrical contacts. In this application, only thin-plated films are used to achieve the necessary wear-resistance.

Palladium was discovered by William Hyde Wollaston in 1802. Wollaston purified enough of the material and offered it, without naming the discoverer, in a small shop in Soho in April 1803. It was named by Wollaston in 1802 after the asteroid Pallas, which had been discovered two months earlier. He disclosed that he was the discoverer of palladium in a publication in 1805, as he found palladium in crude platinum ore from South America by dissolving the ore in aqua regia, neutralizing the solution with sodium hydroxide, and precipitating platinum as ammonium chloroplatinate with ammonium chloride. He added mercuric cyanide to form the compound palladium(II) cyanide, which was heated to extract palladium metal.

In the run up to 2000, the Russian supply of palladium to the global market was repeatedly delayed and disrupted because the export quota was not granted on time, for political reasons. The ensuing market panic drove the price to an all-time high of \$1100 per troy ounce in January 2001. Around this time, the Ford Motor Company, fearing auto vehicle production disruption due to a possible palladium shortage, stockpiled large amounts of the metal purchased near the price high. When prices fell in early 2001, Ford lost nearly US \$1 billion. The largest use of palladium today is in catalytic converters.

Palladium can absorb something like 960 times its own volume in hydrogen, swelling somewhat to form several palladium hydrogen alloys, alpha and beta phases. The hydrogen in the alloy, interesting enough, is considered to be in a metallic state, hence the constant scientific interest. Extensive studies have shown that hydrogen atoms randomly occupy the octahedral interstices in the metal lattice (in an fcc lattice there is one octahedral hole per metal atom). The cold fusion experiments back in 1989 all used palladium electrodes immersed in deuterium oxide (heavy water) D₂O, wherein electrolysis allowed absorption of the deuterium into the metal cathode. This supposedly produced excess energy over what was being used, so the claims of "cold fusion" went out worldwide. Unfortunately, Stanley Pons' grasp of electrochemistry was somewhat naïve, as no one was able to duplicate

their results. Plus, the ever present problem of no verifiable neutrons detected during the supposed fusion event.

Palladium is used, due to the extraordinarily high rate of diffusion of hydrogen through thin foils, to purify hydrogen and its isotopes. I worked extensively with palladium in the mid 1970s as my masters' thesis involved absorption of hydrogen into palladium and involved using this high diffusion rate to make essentially a permanent hydrogen electrode for electrowinning metals and other arcane industrial stuff. These are called dimensionally stable anodes (DSA), and are used in production of metals, chlorine, lye (caustic soda) and many other chemicals and processes where insoluble anodes are needed. Traditionally, carbon rods or platinum coated titanium are used, but they are expensive and the carbon slowly disintegrates under use. A true hydrogen electrode would last forever in aqueous solutions, as hydrogen could be generated on one side of a foil and dissolved out of the opposite side in the reaction cell. As it turns out, palladium acts as a reversible super sponge, capable of absorbing and releasing large quantities of hydrogen and then acting like a hydrogen electrode. This is the Holy Grail of electrochemistry, since the hydrogen $\rightarrow (H)^+ + e^-$ is assigned the value of 0.00 volts in the electrochemical series, which is then used to predict corrosion rates and engineering uses of metals. I built a cell with a palladium foil separating two chambers, generating hydrogen on one side of the foil and dissolving hydrogen out of the other side, thereby making a dimensionally stable anode for electrochemical use. I probably should have received a patent out of this, but I was just a lab rat and failed to grasp the politics of graduate school. At least in theory, that's how it would work. In practice, it depends on the electrolyte in the reacting cell, sulfuric worked fine, chloride containing not so good, and fluoroborate worked fine, along with many other processes we screened.

Palladium is alloyed with gold to produce white gold, electroplated with nickel for medical devices and high corrosion resistance applications, and also as a protective coating for silver.

Silver has been used for thousands of years for ornaments and utensils, trade, and as the basis for many monetary systems. Its value as a precious metal was long considered second only to gold. The word "silver" appears in Anglo-Saxon in various spellings, such as *seolfor* and *siolfor*. The chemical symbol Ag is from the Latin word for "silver", *argentum*s. Slag heaps found on several continents and on the islands of the Aegean Sea show silver was being smelted from lead ores as early as the 4000 BC using surface mining.

Roman miners produced on a scale unparalleled before the discovery of the North America. Reaching a peak production of 200 tons per year, an estimated silver stock of 10,000 tons circulated in the Roman economy in the middle of the second century AD, five to ten times larger than the combined amount of silver available to medieval Europe and the Caliphate around 800 AD. Most of us are aware of the multiple uses of silver, both as coinage, for decorative and jewelry uses, and industrial (silver is the best conductor of electricity). Much of the world's silver produced is byproduct of lead mining (argentiferous galena).

During World War II, the shortage of copper led to the substitution of silver in many industrial applications. The United States government loaned out silver from its massive reserve at West Point to a wide range of industrial users. One very important use was for bus bars for new aluminum plants needed to make aircraft. During the war,

Rank	Country	(M) oz. 2012	(M) oz. 2013	Y/Y%change
1	Mexico	172.3	169.7	-1.5%
2	Peru	111.9	118.1	+5.5%
3	China	113.1	118.0	+4.3%
4	Australia	55.5	59.2	+6.7%
5	Russia	45.0	45.4	+0.9%
6	Bolivia	39.7	41.2	+3.8%
7	Chile	37.0	39.2	+5.9%
8	Poland	41.3	37.6	-9.0%
9	United States	34.1	35.0	+2.6%
10	Argentina	24.3	24.7	+1.6%

Top 10 Silver producing countries (millions of ounces) in 2013.

many electrical connectors and switches were silver plated. Another use was aircraft master rod bearings and other types of bearings. Since silver can replace tin in solder at a lower volume, a large amount of tin was freed up for other uses by substituting government silver. Silver was also used as the reflector in searchlights and other types of lights. Silver was used in nickels during the war to save that metal for use in steel alloy.

I made an electroformed silver trophy back in the mid 1980s for Wright Patterson Air Force Command. It was presented to the team responsible for developing the night vision targeting system for missiles and guided armament during the first Iraq war, called the Order of Daedalians 1987 Low Altitude Navigation & Targeting Infrared for Night Systems Program (L.A.N.T.I.R.N) Office, Air Force Systems Command.

These metals except silver and gold share the common traits of high hardness, high melting points, catalytic activity, and conversely, low chemical reactivity. They can be separated into two groups, high density (iridium, osmium, platinum, & gold) and intermediate density (palladium, ruthenium, rhodium & silver) and they occupy columns 8 thru 11 and rows 6 and 5 in the periodic table respectively. 🦄

Some useful online references:

www.mineweb.com

www.indexmundi.com/minerals

www.daedalians.org/index.htm

minerals.usgs.gov/minerals/pubs/commodity/platinum

www.pgmdatabase.com/jmpgm/index.jsp



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An electroformed silver trophy I made back in the mid 1980s for Wright Patterson Air Force Command. John Lichtenberger photo.



My home lab where I grew the trophy (in tank, lower left). John Lichtenberger photo.



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Annual Rockhound Roundup - July





American Rockhound

KIDS' PAGES

By Steve Barr

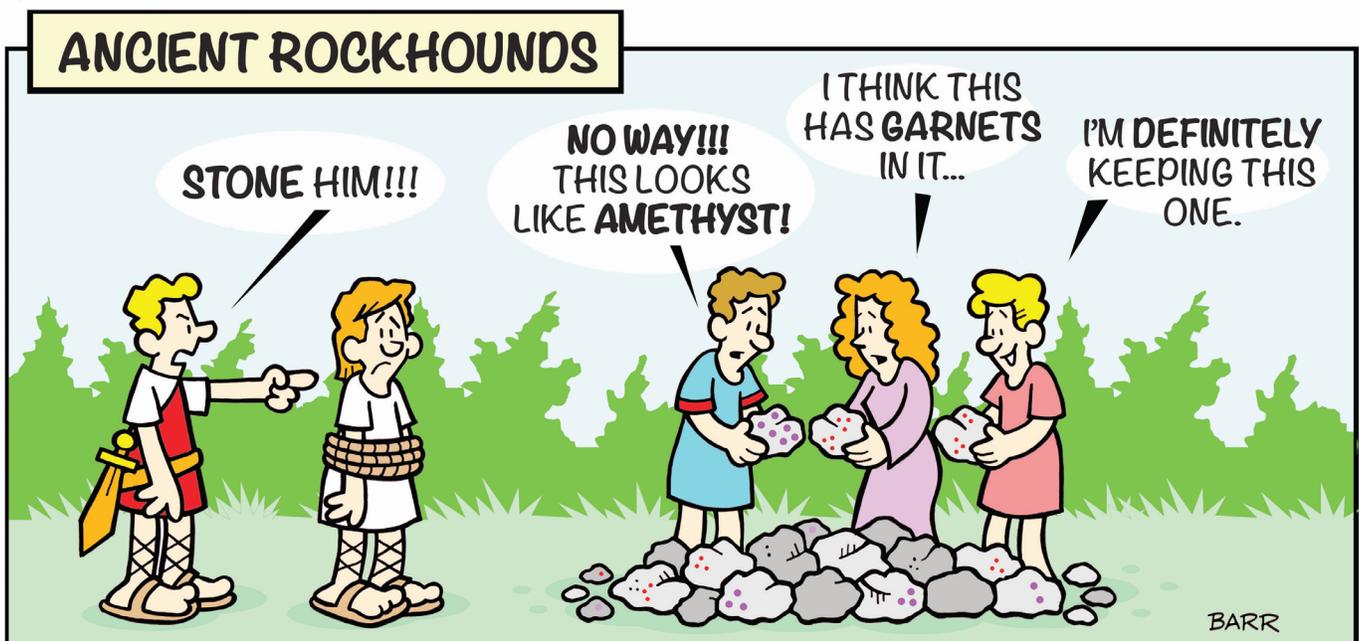
Interesting Amethyst Stories

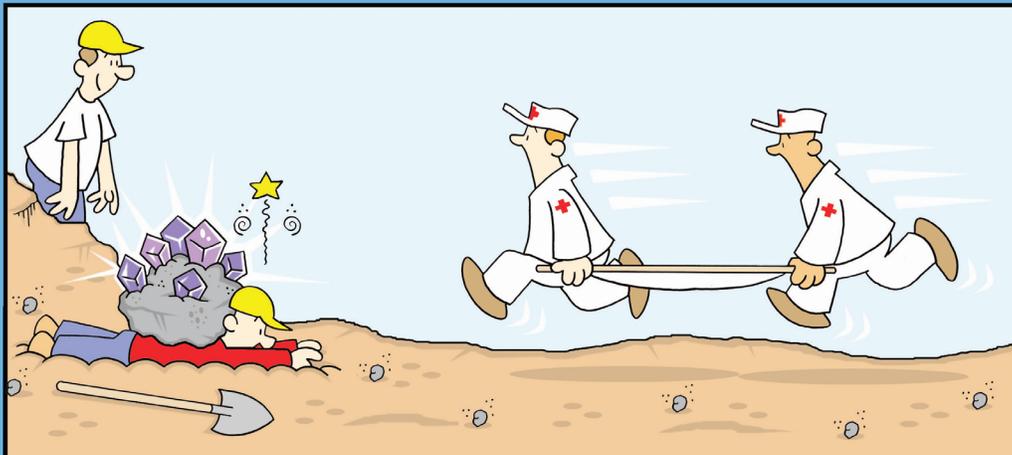
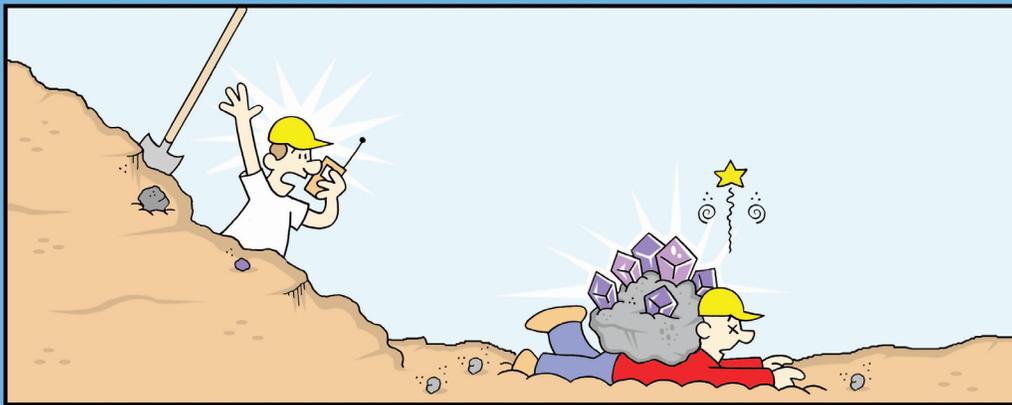
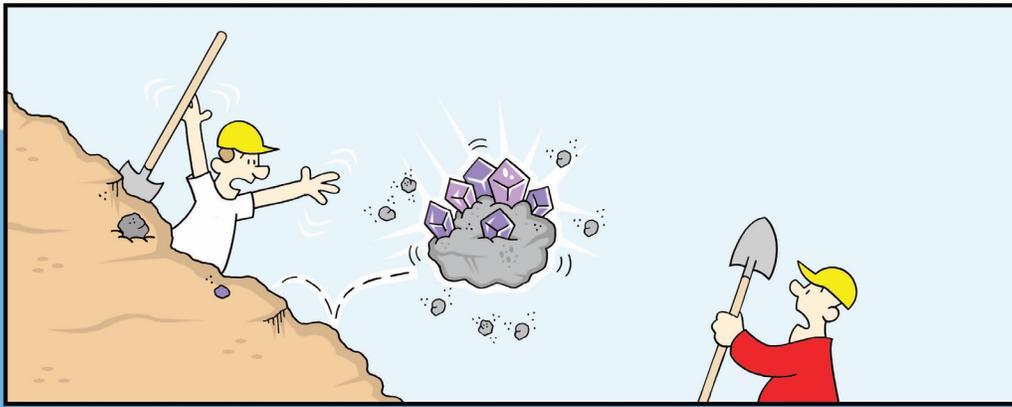
Did you know that in ancient times, amethyst was thought to help keep people from getting drunk? If that's true, then I'm a bit confused. I've seen a whole lot of drunk people wearing amethyst jewelry in my lifetime!

There are all sorts of legends about amethyst from the past. Ancient Greeks believed that the goddess Diana saved a young girl named Amethyst from the angry God Dionysus. According to their myths, Diana turned her into a clear quartz statue to protect her. Dionysus felt so bad about it, he cried into his large cup of wine. The goblet overflowed, and wine poured all over Amethyst and turned her purple!

One of the craziest stories about amethyst involves a stone known as "The Delhi Sapphire". It is actually a large piece of amethyst and was misidentified as a sapphire. The cut stone is set in a very unusual piece of jewelry with strange symbols on it. It was stolen from the Temple of Indra in India by a British soldier in 1857. It is said to have put a curse on everyone who has owned it since. Each person who possessed it had so many bad things happen to them that eventually a man named Edward Heron-Allen threw it into a canal to get rid of it! But a dredger found it and it was returned to him. He was so afraid of the curse, he sealed the gem inside a box with a note warning that he recommended that whoever opened it should throw it into the ocean to get rid of it! He gave it to the Natural History Museum. Years later, a museum employee opened the box and so many bad things happened to them, it was put back in the box and hidden away.

I'm not sure what to make of that story, because every time I've dug up amethyst, I've felt really lucky! But it's still kind of spooky to think about!





BARR

Rockhound News

Richard Jacquot

CHEROKEE RUBY AND SAPPHIRE MINE, MACON COUNTY, NC

As reported in the last issue of American Rockhound, the Cherokee Ruby & Sapphire Mine has been sold and is under new management, the site will remain one of the only “all native stones” locations to collect NC rubies and sapphires. Update since last issue: The new owners of the Cherokee Mine, Matthew Michalik, Lisa Michalik and Stanislava Michalik, have joined the Mountain Area Gem and Mineral Association (M.A.G.M.A.) as lifetime members. Welcome to the club! They have also advised me that they will still honor the MAGMA club discount for current paid club members (must show current membership card to get discount). More information can be found at www.facebook.com/pages/Cherokee-Ruby-and-Sapphire-Mine/210128582335872.

DIAMOND HILL MINE, ABBEVILLE COUNTY, SC

New/old find from the Diamond Hill Mine! About a year ago, Rockhound Jason Brown, brought a specimen into our Asheville, NC gem show that he had collected at Diamond Hill, Antreville, SC about 28 years ago. I obtained it and observed numerous perfect, pale blue colored cubed crystals up to $\frac{3}{16}$ " (0.48 cm) covering one side of the rock and sitting in various places on the quartz crystals inside the

folds of the rock. It is a typical folded vug type formation lined with drusy quartz crystals common from Diamond Hill. The specimen measures 5" x 4" x $3\frac{3}{4}$ " (12.7 cm x 10.16 cm x 9.53 cm). I have collected every type of epimorph/perimorph crystal formation to be found at Diamond Hill, I had never seen any like this. These are not epimorphs, but solid, translucent crystals. My first thought was fluorite. I have numerous epimorph/perimorph specimens of what I have been calling “quartz after limonite”. After talking with two geologists familiar with Diamond Hill, I am now thinking they may be “quartz after fluorite”. I decided to get the specimen tested for a positive identification. On April 3rd, 2015, it tested positive for fluorite, 100% ID. The test was conducted with a Philips PW 3040 Powder X-Ray Diffractometer. The complete details of this find will be published in a future issue of American Rockhound magazine.



Close-up of pale blue fluorite cubes sitting on a bed of drusy quartz crystals. The cubes cover a 4" x 3" (10.16 cm) area on one side of the specimen. Photo field of view is approximately $\frac{3}{4}$ " (1.9 cm).

I will include numerous photos, specifics on the testing and location found at the mine.

Update on the Diamond Hill Mine website. The old information website was "dhmine.com" The new website address is www.diamondhillmine.com.

JACKSON CROSSROADS AMETHYST MINE, WILKES COUNTY, GEORGIA

I talked recently with Christopher Ryan Ledford, owner of the Jackson Crossroads Amethyst Mine (JXR). Christopher advised me that he has reopened the mine to individual collecting. For more information or to arrange a trip for your club or group, visit his website at: www.jxramethyst.com or call John Carter at: (706) 401-7558.

GRAVES MOUNTAIN, LINCOLN COUNTY, GEORGIA

The following is from Mark Woods documenting an interesting find he made at Graves Mountain. In researching these pseudomorph (epimorph/perimorph) specimens, I have found no other references to this and believe this may be a new find from the mine.

Graves Mountain Hematite after Rutile Pseudomorph Mark E. P. Woods

The first specimen of this type I collected while on a trip to the Graves Mountain Mine with William (Bill) Witherspoon, co-author of the Roadside Guide to Georgia Geology. He had never been to this storied location, so I asked him to accompany me on a collecting trip in early November 2014.

We spent more time marveling and theorizing about the various layers that are evident in the walls of the pits than we did looking for specimens, but at lunch I decided to climb up onto a sandy ridge in the upper pit and put my nose to the ground looking for interesting forms. I was hoping for a nice rutile crystal, and I found what I thought might very well be a cluster of rutile under a layer of iron oxide rich sand. Nearby was a smaller but well-defined crystal of a similar appearance and showing several sharp faces. I climbed down to show Bill and he was amused by my excitement at the find. Bill is a long time professional geologist, and so has spent a lifetime studying this subject. I am fairly new to rock hounding and so was like a kid with a new toy. I carefully wrapped the crystals in paper and we continued our lunch and then headed to the lower pit for the afternoon. I learned so much from this trip with Bill that my head was aching. If you ever get a chance to go to one of his many on-location walking lectures, you should most definitely go. I met him at just such an event at Unicoi State Park and really enjoyed the day, so much so that I bought his book!

At home I took some photos of the specimen before I started to clean off the sand, for reference purposes. The sand had interesting near iridescent color in it, like so many specimens from Graves Mountain. See FIG 1.

The sand came off easily with a toothbrush, revealing a large central crystal with a couple of smaller ones on the same matrix plate. Figure 2 shows the cluster and the smaller crystal after brush cleaning.

At this point I was a little confused, because the crystals did not have the characteristic color and metallic luster of rutile, but they did seem to have the geometric form. The crystals were dense, but not as heavy as the large rutiles I had held. I performed all the non-destructive identification tests that I knew how to, but still did not come up with a definitive ID. The best I could come up with was a species in the solid solution series between hematite and rutile, a mix of titanium and iron oxides. I could not locate anything like this in the literature I had downloaded from the Georgia Environmental Protection Division website, or with other Internet searches. The closest thing I could find to a match was a fellow rockhound named John Medici, who had posted pictures on the mineral-forum.com website of a couple

of unidentified specimens he had collected a few years before, between 2004 and 2011. His description indicated that a geologist named George Robinson had identified his samples as possibly hematite pseudomorphs of pyrite.

In early December 2014, I returned to the exact site at Graves Mountain, with the purpose of collecting further samples as my primary goal. I sifted through the loose sand on top of the formation with care and also investigated the hard, obviously metamorphosed sedimentary layers below the weathered material for more samples. I found several attached to the top inch or two of the hard rock, so I was now reasonably certain that this was the origin formation for the crystals. There were more floaters, as well, including another fantastic cluster. One crystal was eroded and had interesting forms within. See FIG 3 and 4.

The next week I returned, this time with tools for working the hard rock of the top of the formation,



FIG 1: I took some photos of the specimen before I started to clean off the sand. The sand had interesting iridescent color in it, like so many specimens from Graves Mountain. Mark Woods photo.



FIG 2: The crystals did not have the characteristic color and metallic luster of rutile, but they did seem to have the geometric form. Left: 1.14" x 0.83" x 0.94" (2.9 cm x 2.1 cm x 2.4 cm). Right: 3.15" x 2.2" x 1.2" (8 cm x 5.6 cm x 3.1 cm). Mark Woods photo.



Fig 3: One crystal was eroded and had interesting forms within. 3.5" x 2.05" x 1.5" (8.8 cm x 5.2 cm x 3.8 cm). Mark Woods photo.



Fig 4: In early December, 2014, I returned to the exact site with the purpose of collecting further samples. I found several attached to the top inch or two of the hard rock, including this fantastic cluster. 3.5" x 2.05" x 1.5" (8.8 cm x 5.2 cm x 3.8 cm). Mark Woods photo.



Fig 5: The next week I returned, this time with tools for working the hard rock. The rock proved too hard to extract the specimens. Mark Woods photo.

with the idea that there might be more examples. There indeed were, but the rock proved too hard to extract the specimens. There were also hematite covered kyanite blades within small voids in the rock, shaped rather like the crystals I was seeking. These I interpreted as fully eroded and replaced former crystal locations. See FIG 5.

I now had more than a dozen examples of this mystery mineral. I had reached the end of my limited mineral identification skills, so I turned to a friend in the Geology Department of the University of Georgia, here in my hometown of Athens, Ga. Sally is a professor of paleontology, specialized in trilobite identification, and so was not really an expert in this area. She recommended I communicate with Samuel E. Swanson, the University's Mineralogist. I emailed him photographs and the test results that I had to date. He returned with the following email:

Hello Mark,

These appear to have been rutile crystals, now coated (and altered?) to/by hematite.

Cheers, Sam

*Sam Swanson, Professor, Department of Geology
University of Georgia
Athens, GA 30602*

I consider this an educated opinion, not a completely solid identification. I would like to have X-ray crystallography performed for confirmation. Until that time, I have the ultimate rockhound's thrill of coming across a previously unknown specimen from a famous location, and some interesting and beautiful crystals to wonder about.

Graves Mountain is a complex and fascinating place, with a bafflingly complicated origin and metamorphic history, as well as the source of so many fantastic specimens of rutile, hematite, and so many others.

Thanks to Junior, (Clarence Norman, Jr.), caretaker of the mine, for letting me and so many others collect there, and for educating me about the minerals found there.

Keep those eyes on the ground and move that dirt!

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Rockhound Recipes

Marinated Red Onions

Gary Nielson

Ingredients:

- ↗ 1 tbls kosher salt
- ↗ 1 large red onion, thinly sliced lengthwise
- ↗ 1 tsp whole black peppercorns
- ↗ 1 tsp dried oregano
- ↗ 3 cloves garlic, peeled and halved lengthwise
- ↗ 1½ cups red wine vinegar

Cook:

- ↗ In a bowl combine salt and onion together. Let sit approx. 15 mins. The onion will release some of its liquid.
- ↗ Add peppercorns, oregano, garlic and vinegar. Seal with lid or plastic wrap and refrigerate at least 4 hrs. before using.

These onions are great over grilled chicken breasts or grilled steaks and even on sandwiches. Top grilled chicken breasts/steaks with a heaping portion of the marinated onions and enjoy.

Vickie's Party Dip

Gary Nielson

Ingredients:

- ↗ 1 lb roll sausage. Can be hot, mild, spicy etc. Whatever you like.
- ↗ 1½ cups diced celery
- ↗ 1¼ cups diced onions
- ↗ 1 16 oz can baked beans, we use Bush's.
- ↗ 1 16 oz can Bush's home-style chili
- ↗ 1 cup BBQ Sauce
- ↗ 1¾ cups fresh diced tomatoes. You can also use a can of Rotel diced tomatoes.
- ↗ ¼ tsp garlic powder
- ↗ Hot sauce to taste
- ↗ Salt and pepper to taste

Cook:

- ↗ In a large skillet or pot, cook sausage over medium heat till it starts to brown and crumbles. Drain off excess drippings. Add celery and onions to the crumbled sausage and continue to cook over medium heat till the vegetables start to get tender and the sausage is fully cooked.
- ↗ Add baked beans, chili, and BBQ sauce. Mix well. Let the mix simmer over low heat for approx. 30 mins. Stir to prevent dip from sticking to bottom of pan.
- ↗ Add the tomatoes and seasonings. Simmer another 15 mins.
- ↗ Transfer to serving bowl and garnish with sour cream, shredded cheddar cheese, and sliced green onions if desired.
- ↗ Serve with tortilla chips. Makes approx. 8 servings.

We have won a few awards with this recipe. Once you start dipping chips into it you cannot stop!

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Shows

2nd Annual Hiddenite Gem, Mineral and Fossil Show and Dig!

Hosted by the Mountain Area Gem and Mineral Association (M.A.G.M.A.) September 25th-27th, 2015, Hours: 9am to 6pm Friday and Saturday, 9am to 5pm Sunday. Free admission. The show is held at the Hiddenite Education Center in Hiddenite, NC. Numerous vendors with gems, minerals and fossils from North Carolina and around the world. Directions: From US 64 Bypass East (Taylorsville), turn left onto Old Mountain Road in Hiddenite. Go straight across intersection with flashing light, cross railroad tracks. The Hiddenite Education Center is on the right. From I-40, take the Hwy. 64 West exit to Hiddenite, turn right onto Old Mountain Road. We will also be conducting a two day dig (Friday and Saturday) at our Sharpes Emerald Prospect, the mine is located approx. 1 mile from the show. The mine will be open to collecting from 8am to 5pm each day. Cost is \$25 per person, per day, children 12 and under are free. For more information on the show and dig, call Rick Jacquot, (828) 779-4501 or email rick@wncrocks.com

Graves Mountain Open House, Rock Swap & Dig!

October 2nd - 4th, 2015, Hours: 8am to 6pm each day. Fee: Donation. The show is held at Graves Mountain, Lincolnnton, Georgia. Food and drinks available for purchase. Numerous vendors with gems, minerals and fossils for sale and trade. Golf carts available to shuttle the diggers to and from the mine. All clubs and rockhounds are welcome to attend! For more information, call Clarence Norman Jr. at (706) 401-3173

If you would like to advertise your clubs gem shows, field trips and other activities, let us know, it's free! Send us the information at info@americanrockhound.com or call (828) 779-4501 for more information.

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Ernest Klatt, Owner
Kevin Klatt, President

Contributor's Guidelines

Want to see your story in print?

If you would like to share a story with us, we would like to hear from you! Tell us about your adventures and let us see the treasures you find.

Field trip and other hobby related articles: If you go on digs with friends and family, with your local club, or alone, and would like to share your finds with us, let us know. If you would like to share a story about another interest you have that is hobby related, that's fine too.

Make sure your article is hobby related to include rock, gem, mineral, fossil and artifact collecting or something that relates: field trips, lapidary art, show reports, book reviews, short stories of your adventures, poems. If sharing the location of a dig site, be sure to include as much contact information as possible: directions, GPS coordinates and phone number for the property owner. If you are unsure if your article would be good for the magazine, email us with your idea and we can let you know: info@americanrockhound.com

Guidelines: Try to make your article between 2,000 and 5,000 words in length.

Make sure to include at least 10-15 photographs with your article, scenery pictures, specimen pictures and people pictures. We need at least 10-15 to pick from for the article. Be sure to include captions for each picture, describing what is happening in the picture, a location or specimen name, size, and who took the photo.

We also accept specimen photos to include in our "Favorite Finds" section. Be sure to include specimen name, size, location found and date found.

Size your pictures at 300 dpi, at least 6" in size or larger, or send the picture files as large as possible so we can resize them to fit the layout. JPG files only.

Submit your article via email or regular mail.

Be sure to include:

- Manuscript, 2,000-5,000 words.
- 10–15 photos sized at least 300 dpi. 6" in size minimum, with captions for photos.
- Detailed maps, geology and history if applicable for your article.
- Your complete contact information: name, address, email and phone number.

Email submissions can be made to: info@americanrockhound.com

Mailed submissions should be saved on CD or flash drive and sent to: American Rockhound
PO Box 542
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All articles are subject to information verification and editing by our staff.

If you are unsure if your article would be good for the magazine, email us with your idea and we can let you know: info@americanrockhound.com

Advertising Guidelines

We offer several options to help you get your message out to our readers: Classified, full page, half page, quarter page and inside cover ads are offered at low rates per issue, or yearly.

Our classified ads cover a variety of categories: books, magazines, cutting rough, estates and collections for sale, rocks, gems, minerals, fossils, meteorites, lapidary services, jewelry, commercial mines/collecting sites, hobby related websites and a wanted section, a place for you to find that special piece you need for your collection or project. If you have something that is related to the hobby that is not listed, let us know and we will get it in the magazine for you.

If you would like to place an ad in our magazine, check out our rates and see what best fits your needs.

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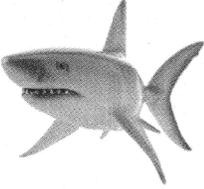
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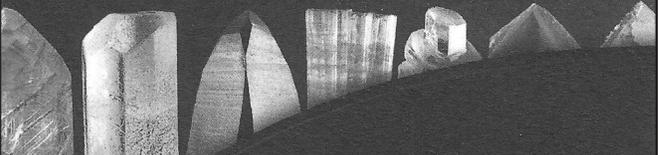
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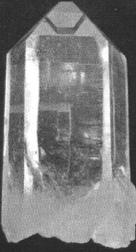
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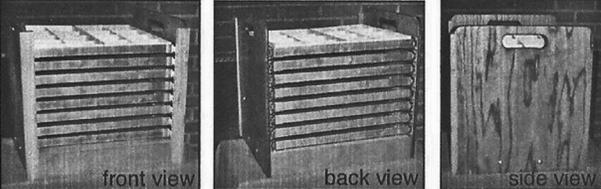


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