Clockwise from top left: Condor Agate, Argentina ; Amazonite with quartz, Colorado; Amethyst on Calcite, Uruguay; Tourmaline, Afghanistan.

ISBN: 978-0-9817995-2-0
9 780981 799520 57495

# Treasured Minerals

by Russ Behnke

# Treasured Minerals

by Russ Behnke

# Introduction

I recently attended a local club meeting of mineral collectors where the discussion centered on "Why collect?" and it seemed that there were as many reasons for collecting as there were collectors. One individual enjoyed the historic importance of minerals; another concentrated on learning a mineral's elemental components; and yet another was fascinated by their structures. My own introduction to minerals was through my father, who one day brought home a book with colored drawings of minerals, one of which was a multicolored tourmaline crystal. I was amazed that such things could exist in nature, and I wondered whether we might be able to find some for ourselves. Forty years ago when I began my search, the world was a very different place, and we had access to many quarries in the state of Connecticut. Gem-quality tourmaline crystals had been found in several of the old mines. My father and I paid a few visits to these quarries, and it was not long before he uncovered the 1-inch-tall green-and-yellow specimen shown here. Seeing that crystal come out of the earth is one of my most vivid memories, and it inspired me to find out all I could about Connecticut's minerals. My mother came with us from time to time, and she found the 0.75-inch purple fluorite crystal on matrix from near the Durham and Wallingford town lines. I especially like this piece, as most of the fluorites from the quarry are green, and this one is truly atypical. After learning what I could in those early years of going to local mines, I went on to study geology at the Colorado School of Mines and then became a collector and dealer.


Today, in 2008, the only place in Connecticut where such finds can be easily collected is Green's Farm, otherwise known as the Roxbury Garnet Mine, which is on the border between Roxbury and Southbury. A garnet in matrix 2.75 inches tall is shown here. This specimen is from the collection of Frederick Augustus Genth (1820-1893) and is typical of what could still be found in the mine. To me, its label "makes" this specimen.

I am very taken with the beauty of minerals because their colors and forms are incredible. I hope this book will serve as your introduction to the beauty of minerals. To me, not everything has to be perfect or absolutely the best. It is nice when that happens, and I do look for it, but I try to see things in context. There is value in memories and history as well as in the mineral itself. I hope my photos will inspire a few new collectors and please the old-timers, and that is my ultimate goal. I begin with photos of my favorite specimens from the Northeast and head west and then on to Mexico, South America, and on to the rest of the world. These are the specimens I decided to make my own. I use no rules to guide me other than that I buy what I suspect will stand the test of time.

**ON THE COVER:** gold on quartz, 4.5 inches tall, Placer County, California

## Dedication

This book is dedicated to my parents, Walter A. Behnke and Doris L. Behnke.


## Acknowledgements

I thank the following people for helping to bring this book about: Doris L. Behnke, Walter A. Behnke, Lawrence H. Conklin, C. Melanie Duque, Joseph A. Freilich, Michael MacDonald, Stephen M. Neely, Alan Palermo, Steve Pober, Ken Thurston, Sharon Warner and Wendell Wilson

## Photo Credits

All photos except those credited to Maplegate Media's corporate photographer, Walter Sidas, were taken by the author.

Design: Alan Palermo
Copy Chief: Lynne Sewell





Published by:
Maplegate Media Group, Inc.,
650 Danbury Road, Ridgefield, CT 06877 USA,
www.maplegatemedia.com

Library of Congress Control Number: 2008941032

ISBN 978-0-9817995-2-0

Printed in China



## The Garnet from Russell, Massachusetts

I was named after a great uncle who, in turn, was named for Russell Mountain—a place his father loved. The mountain is in the small town of Russell, Massachusetts, and I feel that I have a link to the area. I was surprised when I first read about the important find of garnets in that town in 1885. George Kunz reported in his "Gems and Precious Stones" that the garnets had brought the lofty sum of $1,000 at that time. It seems that two men, Daniel Clark and F.S. Johnson, worked the small deposit and sold specimens to all the area museums, including the American Museum of Natural History and the colleges of Yale and Amherst. Like many collectors, Johnson kept the best for himself. Many years later, Joel Sweet happened upon the collection in the family estate, and I was able to buy all the remaining specimens, including this one, which I regard as the best single specimen from Russell. The crystal is utterly sharp and smooth faced—truly like a textbook drawing in its perfection. This rarely happens in nature, and I cannot think of any crystal of equal size that is as sharp as this one. The crystal alone is 2 inches across, and it sits on a matrix of feldspar. The specimen was shown in the September 1994 issue of *Earth* magazine and in the garnet issue of *Extra Lapis*. Although it is a little illogical to think that the discoverers of this deposit would have left behind anything of value, many people have hunted for the locality. No one, to my knowledge, has ever found anything truly significant in the general area. One of Daniel Clark's nicest Russell garnet specimens is on display in the museum in Pittsfield, and Russell garnets are in many private collections. I had the crystals analyzed years ago, and they are almandine, an iron-bearing garnet, rather than spessartine, which they are sometimes labeled as.

# Two New England Amethysts

One winter day, this 6-inch-tall, pagoda-shaped amethyst was collected by Cliff Trebilcock while he was wearing snowshoes! He was collecting at the famous Deer Hill near Stowe, Maine. This specimen is regarded as the best amethyst ever found there. He made his big discovery of this jewel of a specimen and many large flat plates of amethyst and struggled through the snow to take them all home. I acquired this choicest piece from Cliff quite a few years later in 1982, and the specimen has since been shown in the *Mineralogical Record*, Volume 14, page 175, and in "The Mineralogy of Maine" (plate 17). It is among the most photogenic specimens from Maine, and its unusual form and great color combine to make it a singular specimen to me.

I have spent considerable time in the field looking for my own specimens. The choice one shown below is the best I have uncovered. Robert Pagini and I were looking for crystal-lined pockets in the unfinished Route 11 road cut in Salem, Connecticut. We found one crystalline vein, and while digging along it, we each found one of the amethyst crystals of this specimen. It was immediately evident that the two amethyst crystals and the small clear quartz crystal of an earlier generation had been one specimen that had separated! Bob had a stellar collecting day and went home with several other amethysts in his cache. So I had the good fortune to keep the crystals together. The reconstructed piece measures just under 3 inches tall; it may not be a very significant amethyst to the rest of the world, but it surely has significance to me and to other collectors of Connecticut minerals who share the dream. There is nothing quite like prospecting for your specimens to get a reality check on just how rare it is to find a first-rate mineral! They are uncommon and elusive, and that is a part of our fascination with searching for our own specimens!

# Amethysts from Rhode Island

Rhode Island is not generally known for its minerals but, like many East Coast states, it has produced some good amethysts; a few of these are astoundingly good and very different from those found in other states. Perhaps, most obviously, the amethysts are associated with a pure white milky quartz that almost looks like porcelain. When the amethyst is deeply colored, the contrast is amazing and very pleasing. The two specimens shown here and opposite were found in 1982 and were dug by Sal Avella and Fred Corcoran. I was luckily able to buy most of the best pieces from this early find. These two pieces are shown in the *Mineralogical Record* in Volume 14. I also sold the specimen that went to the Smithsonian Institution and appeared on the front cover of *Mineralogical Record*. The scepter shown here is 2.75 inches tall and is one of the most beautiful I have ever seen.

The specimen of white quartz with the single crystal of deep amethyst measures 3.75 inches across, and in my opinion, it is the most striking piece from the find. Certainly, there were larger pieces, but I was taken by the strength of the color contrast, which seemed strongest in this piece.

It's interesting that the site where the specimens were dug is in someone's front yard in a residential area of Hopkinton. There are probably more specimens to be found, but Sal and his friends have dug the locality for one weekend a year for many years now, and they have not found anything to equal their earliest finds. Sometimes, a few large crystals are encountered, but they pale in comparison.

# Remarkable Calcite from New York

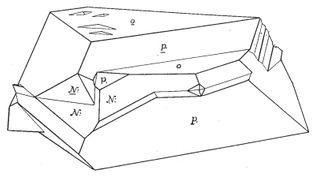
Regular mining at the White Rock Limestone Quarry near the now forsaken village of Lewisburg, New York, ceased when a huge vug of rose and amethystine calcite crystals opened high above the quarry floor; it was a rose-hued grotto! On that fall day in 1906, perhaps the most important find of calcite ever made on the East Coast of the United States was revealed.

The astonished miners had never seen anything like this plethora of vibrant crystals. Miss Sterling, a mine owner, called in a state geologist, and it was soon decided that this historic find should be relocated in its entirety to the State Museum in Albany.

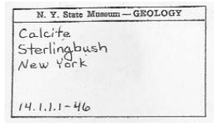
A part of this tremendous find was reassembled in the museum; it was of great public interest and drew visitors to the museum for many years. Museums regularly "refresh" their displays, and at some point, the exhibit of the calcite grotto was disassembled and stored. Then, in 1989, museum curator James E. Campbell was offered a collection of more than 1,500 New York State specimens in exchange for the one magnificent calcite pictured here; to Mr. Campbell, the offer was too good to resist. To this day, very few specimens from this find, generally referred to as the "Sterlingbush discovery," have left the museum.



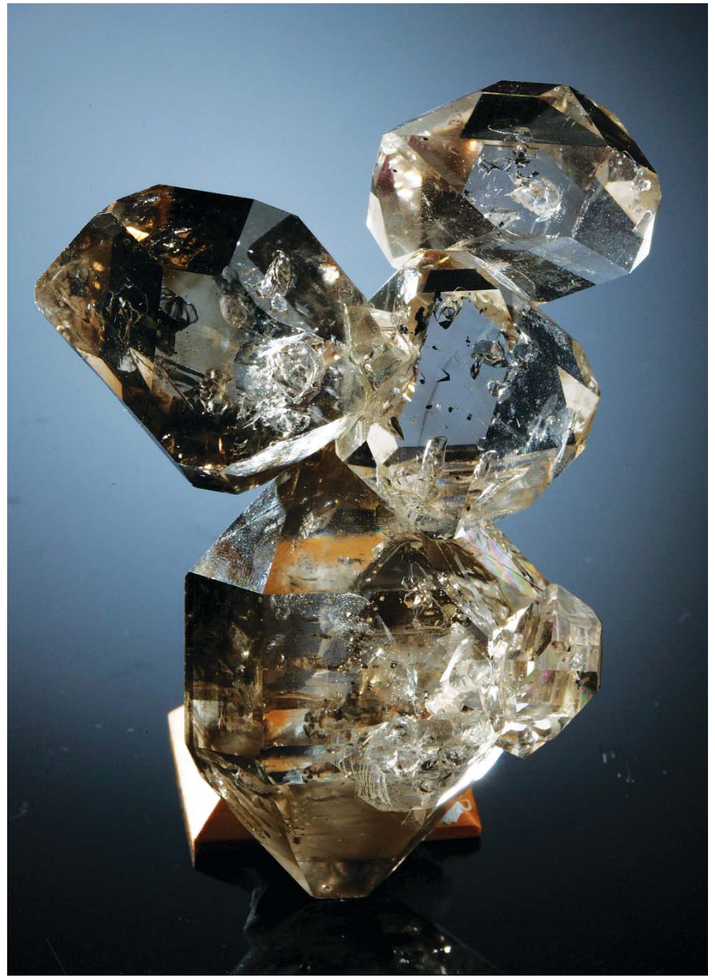
S



A chemical analysis done at the time of the find suggested that the extraordinary color of these crystals was caused by the presence of neodymium. In 1910, Whitlock published his "Calcites of New York" in which there are drawings of these amazing calcites. One of the twinned crystals illustrated here as number 5 closely resembles this marvelous specimen.




While the museum still has single crystals weighing up to 1,000 pounds, this specimen, which measures 13 inches across, is the best collector-size crystal in the entire find. It is in exceptionally fine condition, as it was collected with unusual care; the crystal faces are as sharp and as flat as they should be. The lilac color the crystal exhibits is rarely encountered anywhere in the world. To add further glory to the specimen, the crystal is a doubly terminated and twinned floater with almost no point of attachment. It is unlikely that more specimens will be recovered here, as the mine is now a part of Fort Drum. The Sterlingbush find, while limited to this one pocket, was otherwise as important in its day as the Elmwood Tennnessee calcite discovery of modern times. I regard this specimen as the best collector-size calcite from the USA's East Coast.



# Herkimer “Diamonds”

Herkimer County in New York State has long been noted for producing countless beautifully crystallized transparent quartz crystals. These are known as “Herkimer diamonds” for their brilliant crystalline nature, but they are really quartz that often has great luster.

The 4.5-inch-tall specimen on the facing page is from the appropriately named “Ace of Diamonds Mine” in Middleville, Herkimer County. Most of the quartz crystals from this mine are colorless, but this specimen has an unusual smoky aspect. Although this piece has been repaired as most similar groups have been, one of the local miners considers it to be the nicest he has seen during his many years of collecting.

Other types of quartz are found in the area. The Treasure Mountain Mine was operated for only a short time, but it produced a few exceptional scepter quartz specimens, some with calcite or dolomite. The 2.5-inch specimen shown below is an exceptional black scepter on a simple calcite. It is the nicest combination of the two minerals that I have been able to acquire from this area.

Also from the area but rarely seen are inclusions of pyrite or marcasite in clear quartz. These occur in several of the mines. A 1-inch crystal collected by Ken Silvy is shown above.

I have other specimens from the Herkimer mines; I treasure them, but these are my favorites. I have chosen to show pieces that are more unusual than standard finds.

# Fluorites from Illinois

Say “Hardin County” to any mineral collector, and he will think of the great blue, yellow and purple fluorites from the now closed mines there. Many collectors’ first mineral purchase was of a fluorite octahedron that had been cleaved by the local miners. This 2-inch polished yellow and purple octahedron with inclusions of a sparkling sulfide mineral may be exceptional, but it shows how the fascination with minerals was often ignited.

The 4-inch example of deep blue fluorite with calcite is a neat example of how fine the blues are; they are the world’s best. When this piece came out in 1993, I told everyone that they would be great investments, and I think that has been proven to be sound advice.

I recently acquired this piece from Donald Fisher, a now retired geologist for the state of New York.

All of these fluorites were found in the Minerva Mine, which produced the most colorful and wonderful specimens of the district—at least, in my opinion. Slices were made of some of the damaged fluorites. I looked for years to find one with all three colors, and this is the nicest example I found. The section shown is 4.5 inches long. I found it at a small gem and mineral show in Massachusetts, suggesting that, like gold, treasure is where you find it.

# Michigan Coppers

Michigan's Upper Peninsula has produced many fine copper specimens. Some of the forms observed are really beautiful, and I have chosen these two pieces as representative.

The 4-inch "Swan" (facing page) consists of a number of large copper crystals that come together in a perfectly zoomorphic form. The specimen was in the collection of Benjamin Shaub, a professor of mineralogy at Smith College in Massachusetts. He lived from 1893 to 1993 and wrote many papers on mineralogy, including articles on agates—a passion that we shared. He had an impressive collection of minerals and agate and agate-like minerals. To me, the "Swan" is a pleasant reminder of a man who wrote his last book at the age of 96.

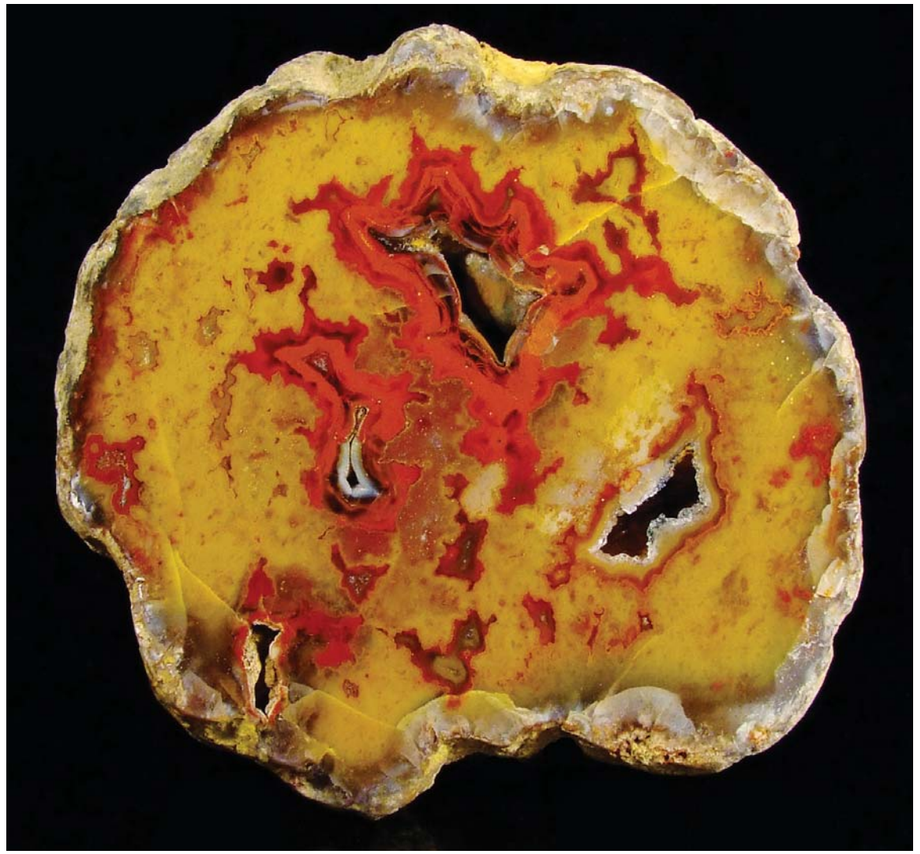
The 1.25-inch-tall copper tree shown here is from the Hancock Mine, Houghton County, Michigan. Tree-like forms in copper are actually fairly common, but this one exhibits sharper crystals than most and is in absolutely perfect shape.

# Some American Chalcocites

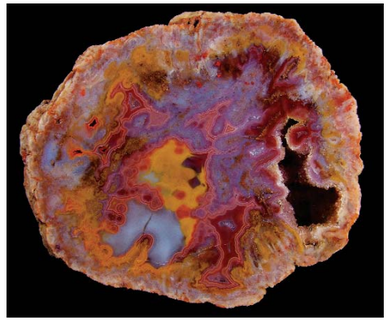
I grew up 20 miles away from the Old Copper Mine in Bristol, Connecticut, so it was only natural for me to visit it on one of my first outings. Nothing much remained to be found even 40 years ago, but the mine was world famous for its great chalcocite crystals; they can be seen in mineral museums around the world. Chalcocite is a black copper sulfide, and copper-bearing minerals, with their wide range of colors and crystallized habits, appeal to many collectors. The Bristol Mine was once the largest copper mine in the United States, and it produced most of its fine specimens between the 1830s and 1850s. The group of crystals shown on the left measures 2 inches across and is fairly typical of some of the finer groups that were found.

The large specimen of iridescent chalcocite on the next page is 6.25 inches across. It was found by Casey Jones in August 1996 at the Flambeau Mine in Ladysmith, Wisconsin. This piece came from the last significant crystal-lined cavity that was found in the mine. This cavity was named the "Rocket Pocket."

At the Tucson Mineral Show following the discovery of the Rocket Pocket, Dr. Steven Neely and Dr. Edward David ganged up as a team to buy Casey Jones's best two available pieces, and this is the one that Dr. David acquired on February 11, 1997. The Flambeau Mine and the Bristol Mine are now a part of history, and neither is likely ever to produce another significant specimen. The Flambeau Mine specimens often have a peculiar multicolored iridescence that seems to be unique to them. Some are more bluish and others more golden, but in any case, they are very distinctive and are now very highly prized.



# Agates of Kentucky and Tennessee



I have searched for fine agates for a long time, but I never realized just how fine some American agates could be until 2007. I was shocked when I saw the 6.5 inch "Solar Storm" agate from Greasy Cove in Tennessee. Ken Thurston, its previous owner, told me "The yellow with red banding is top-of-the-line. Most Paint Rock agate comes in small pieces, is completely fractured and has poor color and pattern. You have one of the rare, large, highly colored pieces that is minimally fractured. Very few gem-quality agates of its size were ever found." The specimen was found about 10 years ago, and it seems unlikely more will be found anytime soon. The red spider-web design seems to be characteristic of the limestone agates of Tennessee and Kentucky, but it is found all too rarely to satisfy demand.

I was lucky to purchase several fine Kentucky agates this year. The 3.9 inch red and black half-nodule is from Middlefork Creek, and the 6.5 inch mauve and yellow example is from Jones Branch. Because I have been searching for special Kentucky agates for some time, I was able to purchase these the day they were cut. Brightly colored specimens such as these are among America's rarest agates.

# The Amazonite Twin

This 7.25-inch-long specimen of amazonite, which is a green variety of microcline, was mined in the 1970s by the late Ray Ziegler, who found it in Teller County, Colorado. The specimen was sold by Ray's agent, Dick Willis, to Bob Matuzas, who was known as a great field collector, especially of the Patterson, New Jersey, trap-rock minerals. Bob probably found the best red stilbite ever at Patterson, and he did many trades with the American Museum of Natural History back in the days when they were actively trading.

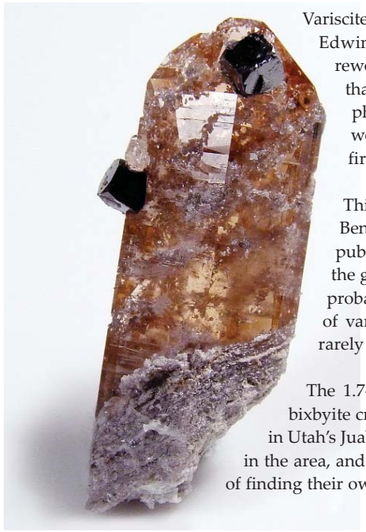
I was very happy when Bob called and told me I could buy his collection. To my mind, this is the best piece of the many fine pieces he had. Amazonite crystals with smoky quartz crystals are one of the ultimate mineral combinations and one that every collector hears about and wants. This example is even more wondrous, as it has a great Manebach twin. Twins of crystals are typically considerably larger than single crystals, and that makes them stand out from a background of smaller crystals. If you look at the largest crystal on the specimen, you will see that it exhibits a "V" shape that marks the twin plane where the crystal faces are repeated as if viewed in a mirror.

Twinned crystals are typically much more highly valued than single crystals, and that is partly because of their rarity and partly because of their size. Roy Smith, who collects amazonite, told me that this is, in his opinion, one of the two best Manebach twins with quartz that he has ever seen. The color on this amazonite specimen is exceptional—about as good as it ever gets. The smoky quartzes are in fine condition and do not overwhelm the amazonite, as is often the case. Collectors really want an amazonite with quartz and not quartz with amazonite. The preference is for more of the more vibrantly colored mineral.

During my time at the Colorado School of Mines, I attempted to dig my own specimens in Teller County but had little success, although I did have some fun at one of the pay-to-dig localities that existed back then. I had hoped to find something like the fine specimen in the school museum, and though that certainly was a great specimen at the time, now, there are much better examples, and I am lucky to at last have one of them.



# Variscite and Topaz from Utah



Variscite was discovered in Fairfield, Utah, in 1893, but not until Edwin Over and Arthur Montgomery intermittently reworked the mine from 1937 to 1939 were the large nodules that are now so highly prized found. Variscite is a phosphate mineral and is one of 14 phosphate minerals that were found in the deposit. Eleven of these minerals were first found during this operation.

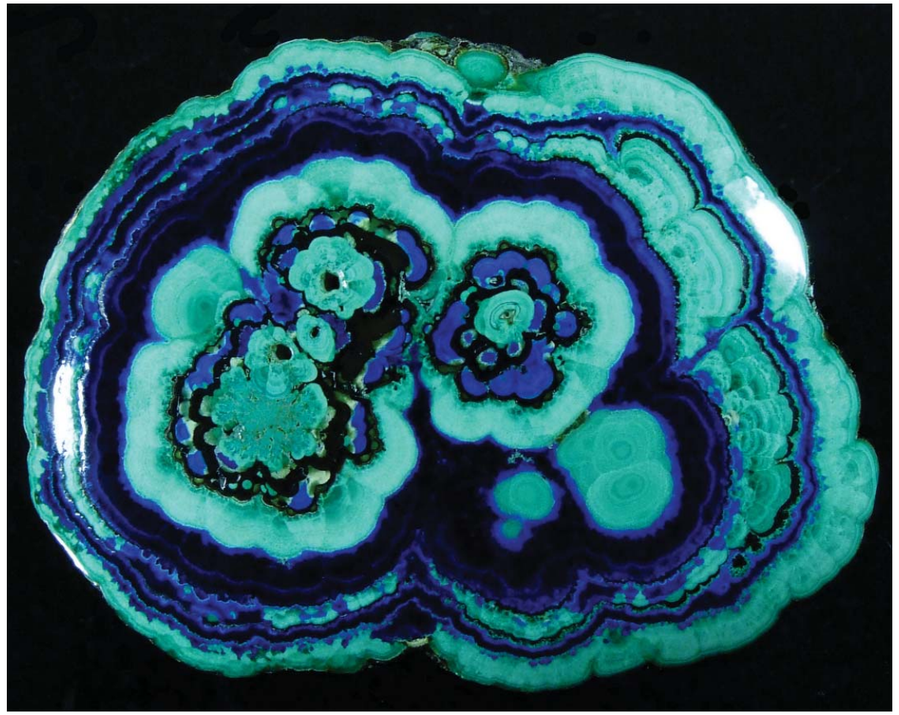
This specimen is 7 inches across and was shown in Benjamin Shaub's "Treasures from the Earth" which he published in 1975 when he was 82 years old. The variscite is the green mineral, and the yellow is crandallite; the white is probably wardite. There have not been any more recent finds of variscite to match these multicolored nodules, and they rarely appear for sale.

The 1.7-inch-long topaz shown on the left is associated with bixbyite crystals. It is from Topaz Mountain in the Thomas Range in Utah's Juab County. Specimens such as this one are still being dug in the area, and collectors can still visit Topaz Mountain with the hope of finding their own specimens.

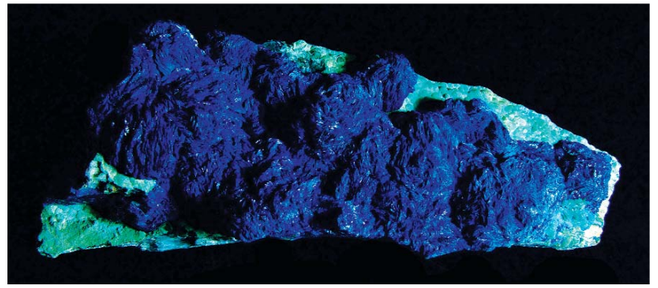
# Native Copper from Arizona

Arizona has long been one of the best sources of native copper. The 7.5-inch-long specimen shown on the opposite page is a treasured example of nature's calligraphy. The "Dragon" is one of the most wonderfully zoomorphic specimens I have seen. I acquired it years ago from the late Steffie Pardo who, with her husband, ran a rock shop near Tucson until 1972. This copper is from the Ray Mine in Ray, Arizona.

The crystallized copper shown on the left is 1.62 inches long and is from the New Cornelia Mine in Ajo, Arizona. The crystals are amazingly sharp and complex, and Ralph Clark says that this is the finest "small copper" he has seen from Ajo. Ralph probably has the finest collection of specimens that will fit into a 1-inch cube in the country. Sharp copper crystals are very highly valued, and this is among the best for its size from anywhere.

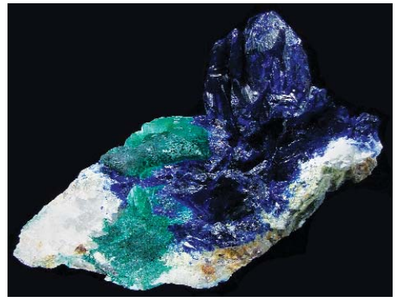






## Azurite and Malachite from the United States

Some of the most beautiful specimens and gems of azurite with malachite have come from the huge mines at Morenci and Bisbee, Arizona. The polished end of a stalagmite or stalactite of these minerals is shown opposite. It measures 2.66 inches across and is remarkable in that it is not merely a slice. I acquired it from the granddaughter of the original owner. It is from the 1884 find at Morenci, which was described by George Kunz. Few of these specimens were ever found, and most were sliced. Another photo of the specimen will be printed in the soon-to-be-published "Gems."



Bisbee produced many fine crystallized azurites on malachite. Most of these copper carbonates were smelted into copper. The specimen shown above, is 9 inches across and consists of rosettes of azurite on malachite. I acquired it from Donald Fisher, author of "The Rise and Fall of the Taconic Mountains." Quite a few specimens from Bisbee were saved over the years, but this one is of good size, and the contrast between the blue and green pleases me. Connnecticut also has recently produced a few good azurite with malachite specimens. The 2.25-inch specimen shown here is from Somers and was collected by Bill Clark. I believe this to be the finest azurite from Connecticut.

# Gold

Gold was likely one of the first metals to attract man's attention. It remains in a class by itself in the mineral collecting world. Nothing quite matches the beauty of finely crystallized gold, especially when it appears to burst out of a vein of contrasting white quartz. It is one of the few minerals that are instantly and universally recognized.

In the United States, gold specimens from California, Nevada and Colorado are especially desirable, and we are fortunate to live in a period of active production from the first two of those states. Beautiful sprays of various crystal habits can still be procured in the contemporary marketplace. The best of these specimens bring huge multiples over the value of the gold they contain.

My California specimens are from Placer County. Typically, I offer more information on the locality of my specimens; but in the case of gold, I feel limited in what I can accurately and confidently report. There are countless stories about gold, gold miners and gold mines. As you can imagine, miners are protective of the exact location of their prospects and are often unwilling to provide accurate locality information. There is tremendous misdirection as well as a creative and even a compound naming of mines. A few years ago, a lawyer called to enquire whether I would be an expert witness regarding the source of some California gold specimens. I did not ask who he represented, but I had a feeling it would involve someone I knew, and there was no way in which my involvement could make everyone happy, and I might succeed in making myself miserable. So I told the attorney that in my entire life I had never been in a gold mine and that I considered all localities suspect. After all, what did I really know, other than what I had been told by other sources, and was that not hearsay? I was not an expert in California gold specimens! Although I could make observations of a probable nature, the people who worked in the mines involved were the true experts. If he could not get the facts out of them, he would never have the truth. Money was involved, so it was not difficult to find an "expert" willing to testify. The case dragged on, and it was an unpleasant experience for the expert witness. Sometimes, through luck or providence, I say the right thing!

The large gold on quartz is 4.5 inches tall, and I lovingly call it "The Christmas Tree." It is quite flat and, hence, two-dimensional, which is quite typical of gold from certain veins in Placer County, California. I particularly like the form of this piece, and the luster of the crystallized gold is enchanting.

The specimen shown above is 3 inches tall and exhibits especially nice crystals. There are certainly bigger and more valuable gold specimens, but these two have a certain pizzazz that I simply enjoy. They mesmerize me, and I could gaze at them for hours.



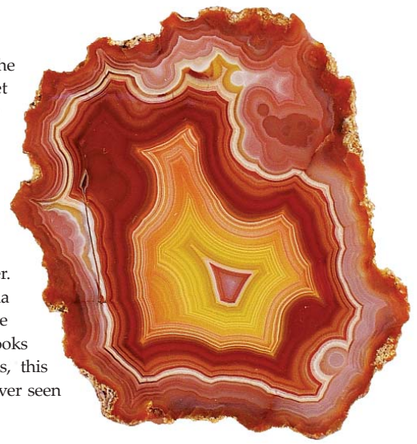
# Tourmalines from Coast to Coast

In the U.S., tourmalines have been found in many areas. Many of the best and most productive mines are in California, but New England also has a few significant sources. The Himalaya Mine in Mesa Grande, California, was a most prolific source that once produced 90 tons of crystals. It is hard to imagine how so many crystals could be distributed for so long, but now that the mine is closed, they are more difficult to find and are at last as much valued as their counterparts from the rest of the world. The crystal shown on the opposite page is doubly terminated with a flat bottom termination and a more pointed top termination. This is quite typical of tourmaline, and the coloring and form of the Himalaya Mine tourmalines makes them easily recognizable. It is 3.7 inches tall, and it has lilac lepidolite mica crystals near the termination and associated white albite crystals as well. It is from the Matt Tannenbaum collection, and I acquired it in a trade.

Many years ago, I was able to collect tourmalines in Connecticut at the Strickland Quarry in Portland and the Gillette Quarry in Haddam Neck. These places are now off-limits, but 40 years ago, it was possible to go to both. Shown on the left are tourmalines from the Gillette Quarry. I collected the broken crystal that yielded the 3-carat green faceted stone, and my father cut it. I also found the unusually colored green and blue tourmaline with a purple cap. It is 0.75 inch tall.

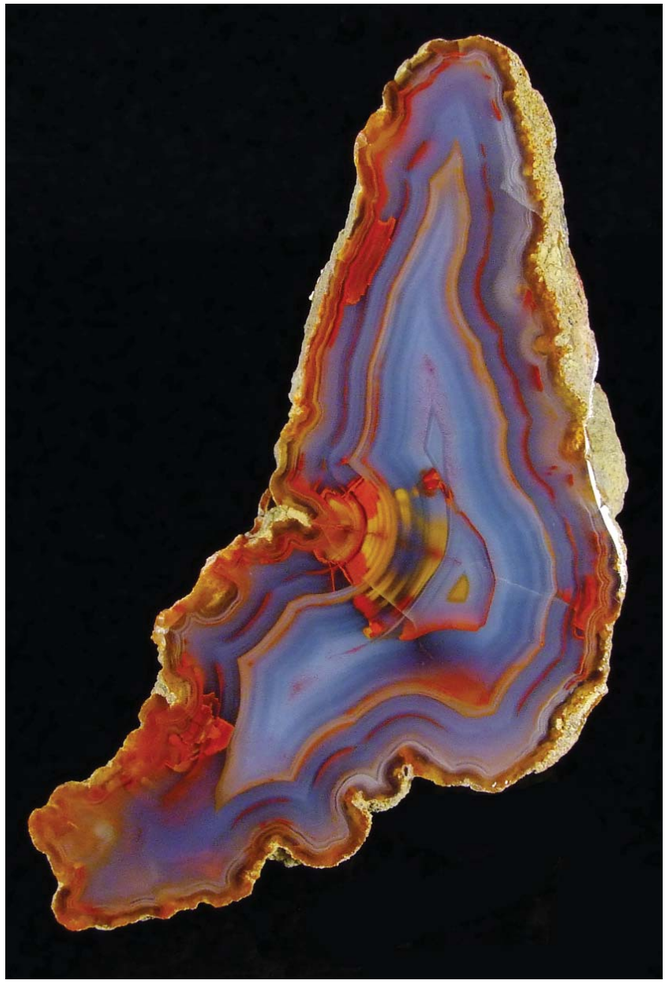
In 1972, a great source of tourmaline was discovered in Newry, Maine. Gem crystals up to 1 foot long and 4 inches in diameter were found. Green crystals were the most common, but there were also watermelon-color crystals and a few reds. The 33.54-carat cut stone shown on the right, is among the 10 best found at that site, and it is flawless. It was cut by Carl Barney, who believed it was the best of the many that he had cut, and I purchased it with Michael MacDonald some years ago.

# Laguna Agates



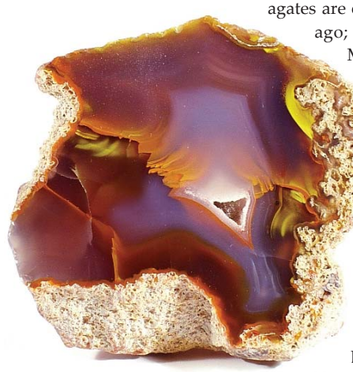
Laguna agates are the most plentiful of the beautiful nodular Mexican agates, yet prized specimens are surprisingly rare and have become very valuable. Laguna agates are typical fortification-type agates, but their colors can be extraordinary in both range and intensity. The 6-inch specimen shown opposite was a gift from Lawrence H. Conklin, a fellow Laguna agate collector and mineral dealer. This slice is far larger than most Laguna agates and I am totally amazed by the intensity of its colors. Although entire books have been written about Laguna agates, this piece never fails to awe me, as I have never seen another quite like it.

The 3.5-inch-tall "Rooster" Laguna agate shown above, is from a relatively recent find. I particularly like agates that make me think of other things, and that will become more apparent in the following pages.



## Apache Flame Agates

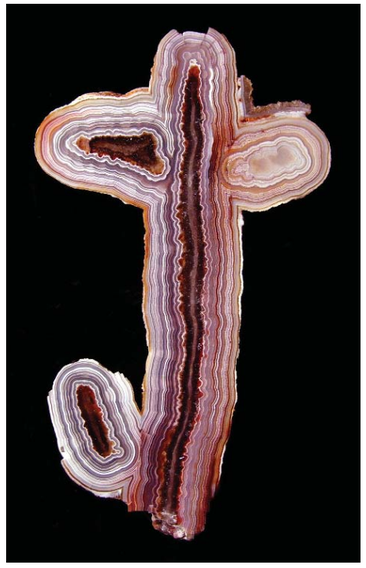
From Chihuahua, Mexico, we have the Apache Flame agate, which was discovered in 1957 near Ejido El Apache. These agates have great vibrant splashes of color and remind us of the bold brushwork of Vincent Van Gogh. There is something unsettling about them when they're compared with the orderly fortifications seen in the typical Laguna agate. Very few Apache agates are ever seen. Few have been found; they were mined long ago; and the deposit seems to have been mined out. Multicolored examples are especially desirable. In contrast, Laguna agates have been mined for many years and will likely be exploited for decades to come.



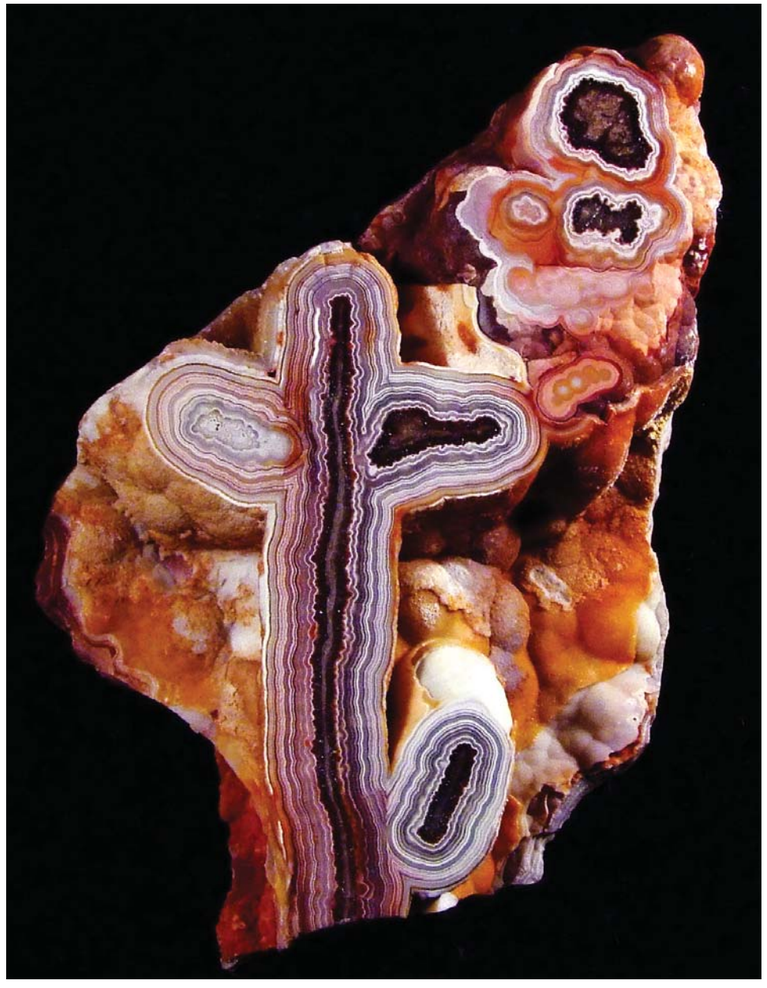
The Apache Flame agate on the opposite page was bought from miner Benny Fenn in 1960 by June Culp Zeitner, who is known for having written nine books about minerals. This is an amazingly large agate nodule for Mexico, as it is 10 inches tall and weighs 7 pounds. Very few of the Laguna agates reach 5 inches. I acquired it from Brad Cross, author of "The Agates of Northern Mexico."

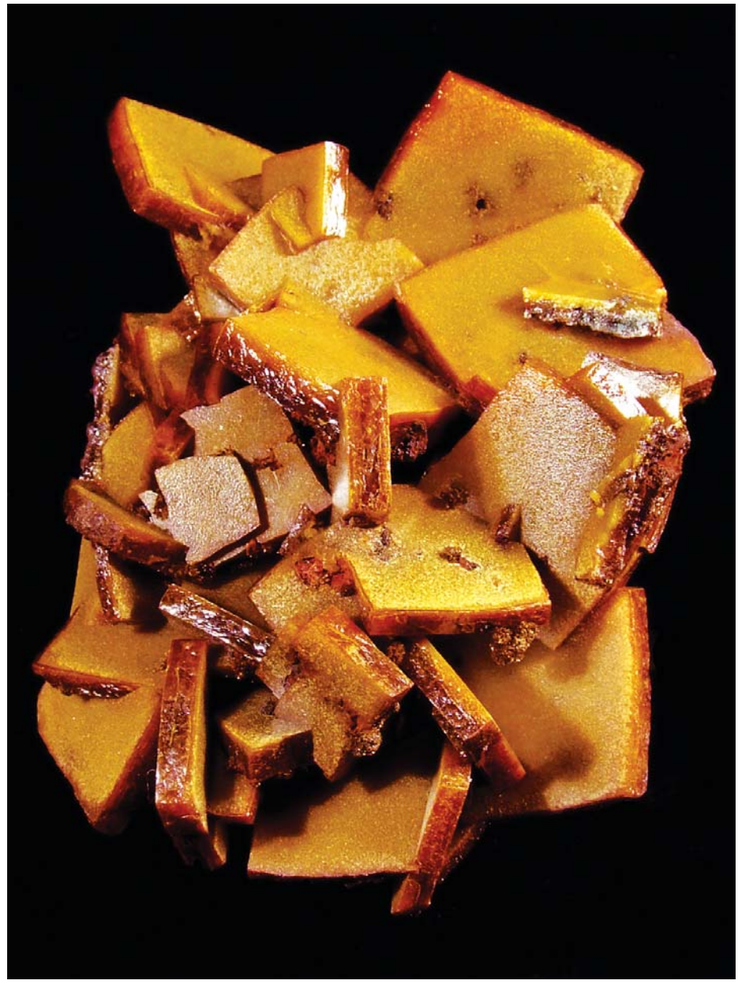
Brad owns the most famous Apache agate of all—"The Hooded Owl"—and I have what I call "The Dove," which I acquired from the collection of Steffie Prado. She cut countless agates in her shop, and this was the finest Apache in her collection.

## Crazy Lace Agate

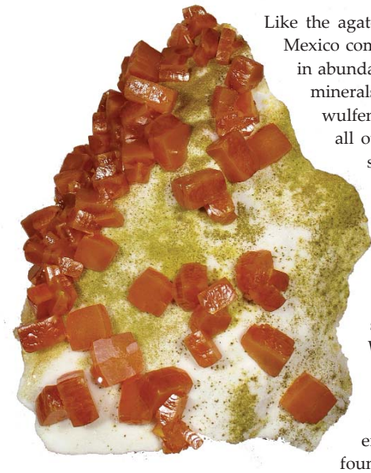


When Johann Zenz's book "Agates" came out, I grabbed one of the first copies. As an agate lover, I studied every page to see just how large each piece was so that I could best imagine what the specimen actually looked like. I was especially struck by the specimen on page 435—the one referred to as the "Cross of great symbolic value." It was the one piece in the book that really captured my imagination, and I felt I had to have it. Its owner wasn't listed in the book, so I called on Brad Cross to help me find it, and he kindly did. I was able to buy this piece from its European owner. I consider this the best of all crazy lace agates, and it makes me think of a painting of a saguaro cactus and clouds by Pablo Picasso. It is 8 inches tall, and the other portion of the agate is shown above.





## Wulfenite from Los Lamentos



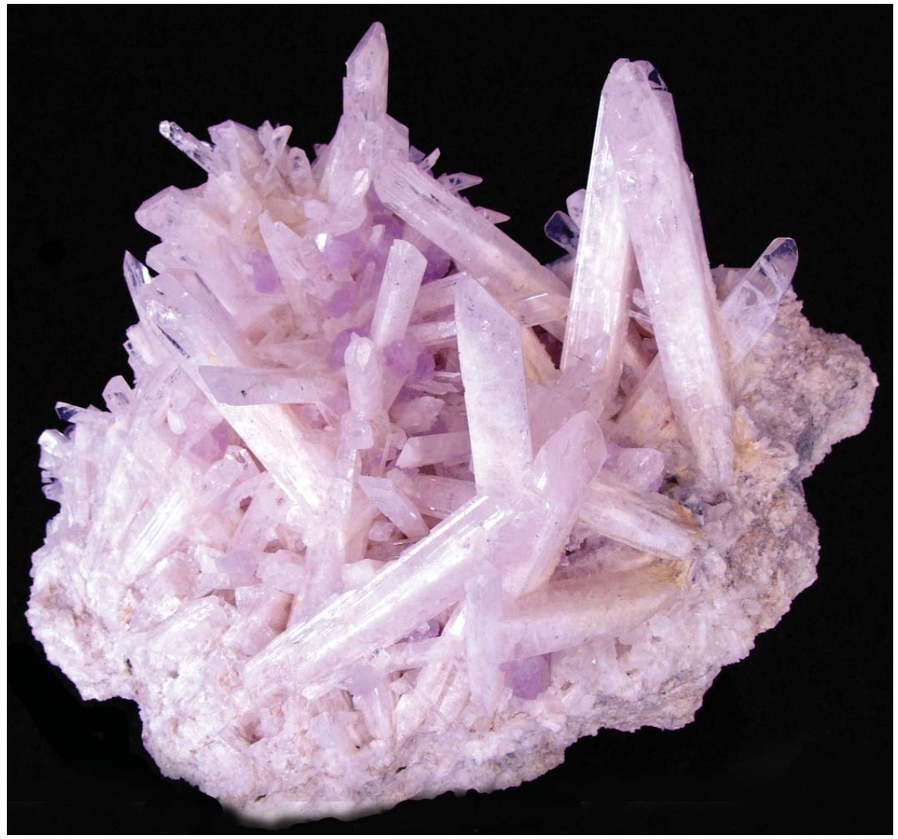
Like the agates, many of the great wulfenite specimens from Mexico come from Chihuahua. These specimens were found in abundance in the 1960s and 1970s, but like so many fine minerals, they seem almost to have disappeared. The wulfenite specimens found in Los Lamentos are known all over the world and are treasured for their butterscotch yellow and orange crystals. The 3.5-inch-tall specimen on the opposite page is from the collection of Dr. Edward E. David. The crystals all interlock without any trace of a matrix.

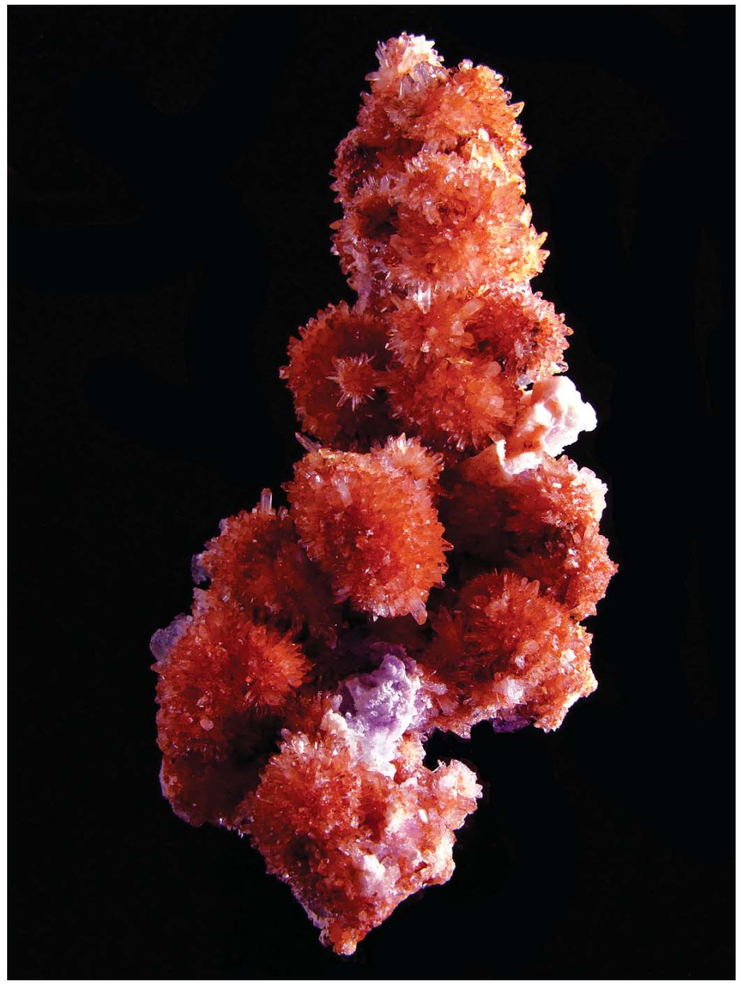
The other specimen exhibits more orange crystals and is on a matrix of white barite with a sprinkling of minute crystals of descloizite. Wulfenite is a lead molybdate, so it was a valuable ore. It was commonly mined as such in Mexico and Arizona, but today, very little can be found, and mines no longer use wulfenite as an ore mineral. Even if a good source of wulfenite could be found, if it were well crystallized, it would be far too valuable to mine as ore, and it would surely be preserved as specimens.

# Danburite and Amethyst from Mexico

Danburite was discovered in Danbury, Connecticut, but the Connecticut specimens are ugly and none have been found there in recent years. The Mexican specimens are much more attractive, and this one is especially nice, as small lilac amethysts contrast with the finger-size danburite crystals. The specimen measures 12 inches across and is the nicest large combination of the two minerals that I have seen. It was found in Charcas, San Luis Potosi, Mexico, in 2007. I really like combinations of minerals, as they are generally much harder to find, and they tell us something about the order of crystallization of the minerals in the deposit that gave birth to these rarities.

The amethyst shown here is from Piedra Parcada, Las Vigas, Vera Cruz, Mexico. It measures 3.5 inches across, and it forms a perfect V. There are certainly much bigger and better amethysts from Mexico, but the V form has always been highly sought after by collectors, and that makes this piece worth including here.







# Creedite and Silver from Mexico

I once owned John Barlow's largest and finest purple creedite from Mexico. I bought it from Stephen Neely, and I was lucky to acquire the 9.4-inch-tall orange creedite from the new find in 2007 at Mina Navidad, Durango. Unlike the purple creedite, which was a flat plate of crystals, this specimen has great spherical sprays of creedite crystals with associated fluorite and quartz. It was slightly larger when I bought it, and I bought it thinking it could be trimmed into a truly beautiful form. I am very happy with the results of the trimming. Mexico probably has the best creedite specimens ever found anywhere, and I think that this ranks near the top for its size and associations.

Mexico has long been known as a major producer of silver. The miniature specimen shown here is from Guanajuato, and I acquired it shortly after it was mined in 2004. The form of the wires is very pleasing, and I like that it's on a matrix of calcite because that helps to confirm its natural origin. There are many other localities for obtaining silver and silver minerals in Mexico, but good specimens such as this one are difficult to come by.

# Blue Topazes from Brazil

In the 1960s when I was just starting out, topaz appealed to me greatly, and Harvard University (Boston) had the most impressive specimen I had ever seen. Although they had larger specimens from Brazil, including one weighing perhaps as much as 200 pounds, the crystal shown on the opposite page had a tremendous appeal to me; it is just less than 6 inches across. The crystal has great luster and transparency and is a pale, icy blue. It is crystallized all over and in perfect condition. It was found in Teofilo Otoni and was likely imported by Alan Caplan in the 1940s. The Colorado School of Mines has a somewhat similar crystal, which is definitely a Caplan specimen and probably from the same find.

When I saw the specimen, it was probably the finest collector-size Brazilian blue topaz in existence. But then came the 1970s and the discovery of minerals at Virgem da Lapa. The Limoero and Xanda Mines produced specimens of topaz of a deeper blue. Two of my favorite specimens from Virgem da Lapa are shown here.

The deeper blue crystal—a small cabinet specimen—has lepidolite inclusions and is a complete floater. The second crystal has great form and has lepidolite only on parts of it. It is a miniature specimen and also a perfect floater.

Eventually, with all of its new finds, Harvard let go of the topaz I had coveted in my youth, and I was happy to at last acquire it. Even after all these years, there are still relatively few topazes that I would prefer to have.



## Gems from Ouro Preto

The case at Harvard that contained the large topaz just described and illustrated also contained what I considered to be the best small specimen in the museum: a euclase that virtually glowed with a vibrant almost neon emerald green. This was the most intensely colored euclase I had ever seen, and my eyes were drawn to it from across the room. Deeply colored euclases are the greatest treasures of Ouro Preto and are very rarely found. The specimen shown on the opposite page is 1.12 inches tall, and in incandescent light, it looks a vibrant blue and still attracts as much attention as it does by sunlight. The color change is not often noted, but it is very pronounced. Recent finds of euclase are very significant, but this remains one of the best for its superb color and luster.

Euclase does not pay the bills at Ouro Preto. The vast majority of the gems mined are topaz. A typical 3-inch-tall orange crystal is shown on the left. Once in a great while, bicolor orange and red crystals are found. Purple topaz is also found, but rarely, at Dom Bosco in Ouro Preto. A 1.25-inch-tall crystal I acquired from the William Shelton collection is shown on the right.

# Bicolor Tourmaline from Minas Gerais, Brazil

If the chemistry of the environment changes as a tourmaline crystal develops, the result is a single crystal of tourmaline exhibiting two or more colors. This happens all over the world, and it is very common in Brazilian tourmalines.

This 12-inch-tall tourmaline on feldspar matrix (shown opposite) is from the Pederneira Mine, which is famous for producing many large tourmaline specimens. Almost all of these have been repaired, but that is accepted, much as restoration is accepted in the world of fossils and art. These are among the largest, well-crystallized tourmalines you are likely to see.

The red and green loose crystal is from the small Ferrugina Mine, which produced only a handful of specimens, but their color intensity and contrast are very striking.

The Coronel Murta Mine produced these odd crystals—pink with yellowish green terminations. This specimen is 3.1 inches tall.



## Brazilian Tourmaline

The Pederneira Mine is also known for some very large blue tourmaline crystals. The example shown is 14 inches tall overall and has associated quartz and lilac lepidolite mica.

In the early 1970s, Virgem da Lapa produced tourmaline with many color combinations. The one shown here is 4.25 inches tall and was imported by Milton Sklar.

The Cruzeiro mine was also a large producer of pink and green tourmalines. The pink example shown here is 2.6 inches tall.

# Aquamarine

Aquamarine is always popular as a gemstone or as a mineral. It is found in many countries, but Brazil seems to be known for the best rough material and for some truly large crystals. The blue-green aquamarine on the opposite page is 5 inches long and weighs 354.5 grams. It is extremely clean and would make a great carving. It is from Jacqueto, Medinos Neto, Bahia. A similar crystal that I once had was cut by Moonsteiner for a customer of mine.

Connecticut has produced small quantities of aquamarine from a number of quarries and prospects. It was during the late fall of 1991 that my father and I were walking along Long Hill in Haddam when we came upon a tree that had fallen. We had heard the stories of the Hamlin brothers who, in 1812, discovered tourmaline crystals in the roots of a fallen tree and then opened the first gem mine in the United States, but what would we find? As it turned out, in the first few minutes of digging in the tree roots, the 1.1-inch green beryl shown here tumbled out of the dirt, and we knew we were on to something. We found quite a few more crystals in the coming months, and I know there are more crystals on that hill somewhere. I found one small loose boulder that contained yellow beryl, morganite, spessartine, topaz, lepidolite, torbernite, elbaite and other minerals that I could not track back to their source. Someone will find it someday!

The 5-inch-tall thin blue crystal is very clean and is from Jacquereta, Minas Gerais. It was in the collection of Marion Stuart before I acquired it.



# Rose Quartz on Quartz

The Smithsonian Institution is home to the best known rose quartz specimen. Called the "Van Allen Belt," it exhibits a lei of rose quartz crystals encircling a large quartz crystal. That has set the standard for all collectors to pursue, and rose quartz crystals associated with quartz crystals are regarded as the most desirable and expensive of all quartzes.

This specimen is 6 inches tall and is from the classic Lavra da Ilha, Minas Gerais, Brazil. I acquired it after receiving a phone call from a collector who thought he had something special for me. Indeed he did, and I will be forever grateful for that call.

Collectors are generally blessed to find even a little rose quartz with a clear or smoky quartz crystal; these are lovely and sought after. The cream that everyone really hopes to find is something like this specimen. The central perfect clear quartz crystal sets off the more abundant rose quartz crystals perfectly. This greater margin of rose quartz is atypical but desirable and, indeed, preferred.

Many rose quartz specimens are barely pink, but they are still revered; these crystals are deeply blushing and of the color that collectors yearn for in their vision of a superior rose quartz specimen.

By way of contrast, this fine 0.87-inch "rose" of rose quartz on feldspar is from the original discovery of rose quartz crystals made at Newry, Maine. Prior to the discovery of the Brazilian specimens, this was about as attractive a rose quartz as one could hope to acquire. It is from the Bruce Jarnot collection and was collected by Jim Mann in 1984.

# Rutilated Quartz

Rutile, which is a titanium-dioxide compound, is often found as inclusions in quartz, especially in certain Brazilian mines. As extremely fine, nearly invisible, perfectly aligned needles, it is also responsible for the asterism sometimes seen in rubies and sapphires. When the rutile needles get a bit thicker, they can look silvery, red, or golden. All three of these colorations are shown here.

The 2-inch, 693-carat golden rutile star (opposite) is from Brumado, Bahia. I acquired it in 2001 when they were more readily available. The star is formed when rays of rutile grow out in alignment with the central ilmenite crystal. This is a form of epitaxy or a crystallographically oriented growth.

The 5-inch-tall crystal with the red inclusions (right) is from Ibitiara, Bahia. Good rutilated quartzes that have not been polished are surprisingly rare.

Left: this 4-inch-wide polished crystal with silvery inclusions is from Alan Palermo.

## Some Small Jewels

Rhodonite has been found at Morro da Mina Mine, Conselheiro Lafaiete, Minas Gerais, during the last couple of years. This is a rare, truly free-standing crystal that grew to perfection in an open vug. It was still covered with white pocket clay when I purchased it from Jeff Collins. It is 1 inch across, but it has the most vibrant red possible. The only other place that produces such beautiful deep red rhodonite is in Broken Hill, Australia, and they can be insanely highly valued. Red minerals are always desirable, and rhodonite, when truly red and not simply pink as it sometimes is, is among the most desirable of all minerals.

A little gold is still mined at Alta Floresta, Mato Grosso, and some great specimens of crystallized gold have come from there over the last few years. The 2-ounce crystal shown (above right) is 1.5 inches long and has interesting growth features. It also came from Jeff Collins.

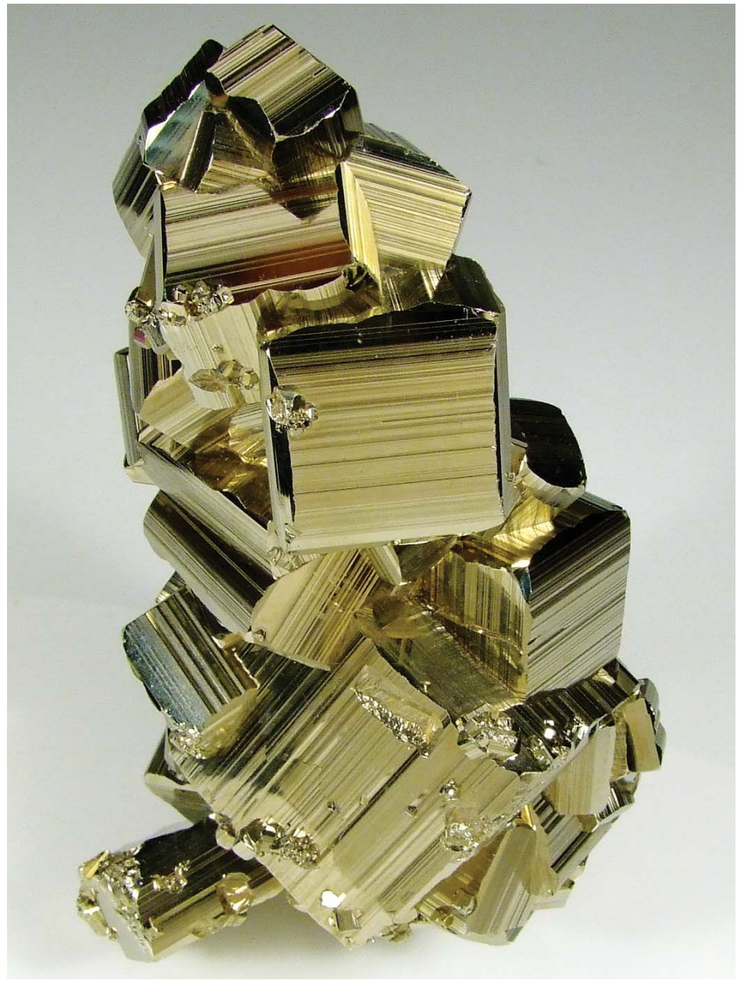
Gold (above left) was also found just over the border from Brazil at Icabaru, in Venezuela. This 0.88-inch well-crystallized gold was in the collection of the late Jack Carlson, and is being illustrated in "Rocks and Minerals."

# Pyrite

I have greatly loved the incredibly lustrous mineral pyrite for a very long time. In 1972, while attending the Colorado School of Mines, I sold one of the first octahedral pyrites to come out of Peru to the Colorado School of Mines Museum for the then lofty sum of $800. That year, I also sold a fine pyrite from Colorado to the Denver Museum of Natural History. I think that both museums still have these pieces in their collections.

At the Joseph Freilich mineral auction at Sotheby's in 2001, a 5.25-inch octahedral pyrite from Huanzala, Peru, was sold for $74,500. This pyrite had exceptional luster and was considered the best one in existence because it was so bright and had such a very desirable octahedral form. This sale seems to have given birth to what is now called the "Pyrite Rule." Some dealers said that a great specimen of a common mineral was worth more than a great specimen of a rare mineral. Perhaps the logic was that being the best among so many was better than being the best of a few. Still, no matter how much I like any pyrite, including my own 7.5-inch-tall specimen from Huanzala shown here, I find that logic a little hard to take too seriously. Perhaps I grew up thinking that pyrite was "fool's gold," but still, would not most of the population, even of collectors, prefer a great gold over even the best pyrite?

This pyrite specimen is a complete floater and is shown in two views, as it has no true front or back. It has great luster and shows several different crystal forms. I consider it the nicest pyrite I have ever owned.

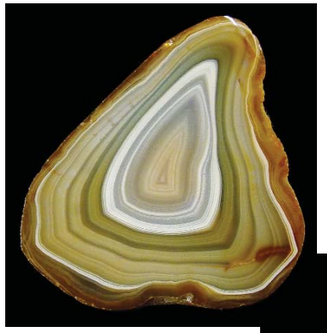


# Rhodochrosite

Rhodochrosite is found as a gangue mineral in many sulfide-rich ore deposits, and the highest tonnage of this mineral has probably come from the 18 miles of tunnels at the Capillitas Mine in Catamarca, Argentina. At this mine, crystals of rhodochrosite are unusual; instead, stalagmites and stalactites are the norm. The best rough material from this mine is cut into thin slices that show one or more eyes of rhodochrosite. The 2.9-inch specimen showing two eyes is choice, as the circular outlines are complete. In the 5.75-inch specimen with multiple eyes (above) the color is absolutely the finest and the material is almost transparent.

Rhodochrosite, which is a manganese carbonate, is found in crystals in many other localities, including Colorado, Peru and South Africa. The 1.25-inch specimen shown on the right is of a rare "wheatsheaf" habit from one find made in 1978 at N'Chwaning I Mine in the Kalahari Manganese Fields, South Africa.

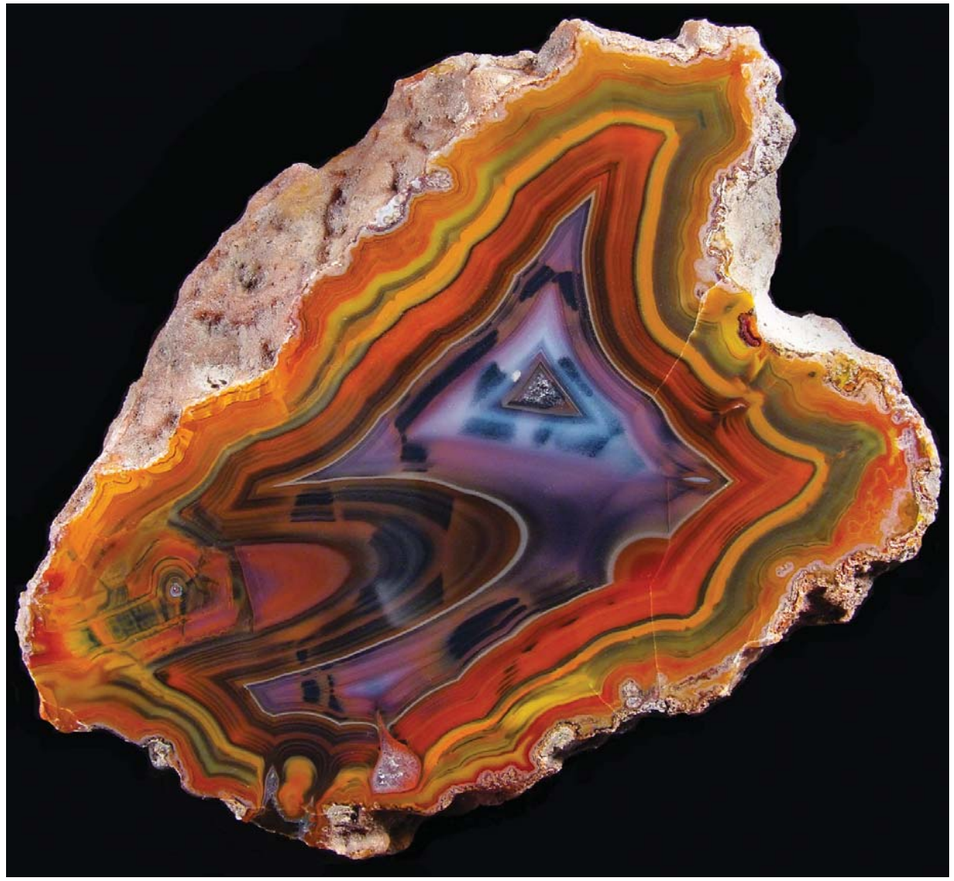
# Agates from Argentina



The 4.5-inch agate shown on the opposite page is the most rainbow-like agate I have ever seen. I acquired it in September, 2008 from some new workings in the area known for Condor Agates. If I were forced to live with only one agate, this would be it! The colors are not only bright but also very pure and intense, and the number of colors it exhibits is rarely equaled.

In the last few years, many fine agates have come from Argentina. Many were put into a collection by David P. Wilber—perhaps the most noted dealer of the 1970s. I happened to be in just the right place to get Dave's largest single Condor agate which he had named "Big Bertha." This is the 7.25-inch agate shown here. It is special not only for its size, but also for its floating center. The contrast between the lilac island and the orange border is truly wonderful and makes this one of the most memorable of all the Condor agates.

Another place in Argentina has river-rolled agates such as the 3.25 inch specimen shown above. It is called a "Black River agate," and these are very different from the Condor agates.



## Calcite and Amethyst from Uruguay

This closeup shows a group of water-clear calcite crystals that measures up to 7.5 inches long. When I was first offered this piece, I could not believe my luck. My only thoughts were about how many more there might be like this—or better!—and would I be able to afford them? It turned out that this piece is one of a kind, and I did not have to worry about the market suddenly being flooded with gem calcite crystals. The quality of this specimen is truly remarkable. I have never seen another group of gem calcites of such size, and to have them sitting on amethyst makes it all the better. This specimen and the next one were found in Artigas.

Stalagmites of deeply colored amethysts such as this 9-inch-long example are remarkably rare. This specimen was mined by Arlindo in 1992 in the La Mojarro Mine in Artigas. It is actually a coating of amethyst crystals over a long calcite crystal that has long since dissolved. The hexagonal outline of the calcite is all that remains as evidence of how this encrustation pseudomorph formed.

# “Dreamland”

In 40 years of collecting, many extraordinary specimens have passed through my hands, but there are still a few that rise above the rest for me. They include the unique yellow topaz on quartz that’s now in the Carnegie Museum. My favorite specimen of all time is this calcite striped with amethyst from the Santino Mine in Uruguay. At around 40 pounds, it is also my largest specimen, and it measures 14 inches across.

For me, the aesthetics of this singular specimen could not be improved. The color of the amethyst is the best there is, and to the left of the calcite, it forms a perfect dome that balances the amethyst striped calcite beautifully. Striped calcites such as this are called “skunks,” and they are the most highly regarded specimens from Uruguay. A skunk sitting next to a stalactitic amethyst of the finest color is unheard of, and it is impossible for me to think of a better specimen from Uruguay. In fact, I have not seen a better specimen from any volcanic formation anywhere in the world.

The formation of skunks of striped calcite requires a second mineral of similar crystal lattice size and structure to form at about the same time. Fortunately, this applies to calcite and quartz, but it is rarely observed in nature, at least, not in stunning specimens. In 1970, my father collected a few quartz-striped calcites from the Cinque Quarry in East Haven, Connecticut. Deeply colored amethyst was rarely encountered in this quarry. It seems very bizarre that two areas known for this type of formation are virtually a world apart. I know of no other local quarries that have produced such a phenomenon. My father’s best specimen (above) is 1.5 inches long and set me on a quest to find something like it. It took me nearly 40 years to find it, but it was well worth the wait. Having it is a dream come true, and I named the specimen “Dreamland.”



# Amethyst and Prehnite from Namibia

Gas pockets in the basalt flows in the neighborhood of Brandberg, Namibia, have produced wonderful amethysts and prehnites over the last dozen or so years. The 5-inch-tall, doubly terminated crystal shown opposite has great luster and color and was once in the Harvard collection along with the 5.75-inch-long prehnite with calcite shown here. The prehnites from Brandberg are among the best in the world.

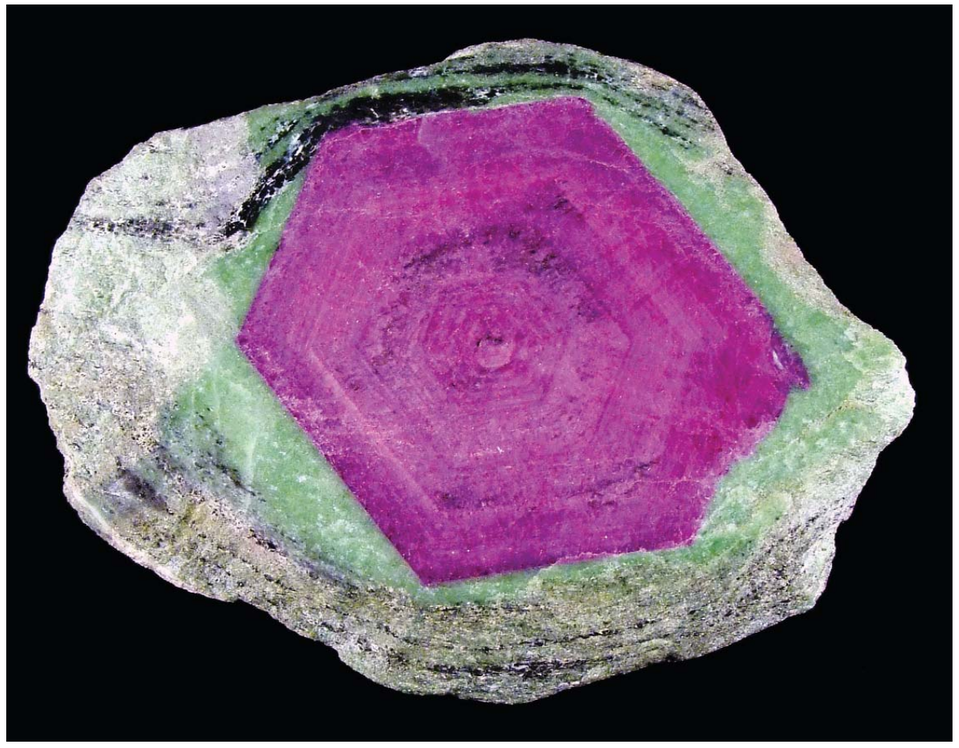
The 3-inch-tall scepter amethyst is from the Marshall Sussman collection. Marshall may have had the best collection of Brandberg specimens ever assembled, and he said that even his collection, which he sold, contained nothing as deeply colored and transparent as this scepter.

# Carrollite Crystals from the Congo

Carrollite is a sulfide of copper, cobalt and nickel that was only recently discovered as occurring in large wonderfully formed crystals. The crystal shown opposite measures 2.75 inches across and has a little attached calcite; it weighs 1 pound and is exceptionally large and fine, especially as an octahedral carrollite. All of the crystals shown here are from the Kamoya South II Mine, Kambove, Congo.

The 1-inch crystal pictured above is a perfect floater and it exhibits an incredible number of crystal faces.

The other crystal (left) measures 2.12 inches across and also has a great, mirror-like luster. It is clear that I have a fondness for this mineral, and I think that it will be a great and perhaps almost unobtainable classic in the future.



## Ruby and Sapphire

This 5-inch polished specimen of ruby in green zoisite is from Longido, Tanzania. It is predominantly used for carvings, but small rubies can sometimes be faceted from this rough.

Specimens of sapphire in matrix were found in Madagascar at Amboarohy. A fairly typical 1-inch crystal in a 3-inch matrix is shown on the right. I acquired this in Tucson from someone who was walking around a minerals show carrying a backpack of goodies.

For at least 2,000 years, Sri Lanka has been a major producer of sapphire and ruby. The sapphire crystal shown on the left is 1.75 inches tall and weighs 74 carats. The bipyramidal form is typical of sapphires from this area. The crystal is slightly water-worn, which is often the case. Most of the mines in Sri Lanka are working the gem-bearing gravels and not the hard rock.

# Some English Prizes

England has produced many extremely fine mineral specimens, and the British Museum was often considered to be *the* mineral museum of all mineral museums. The great treasure of the British Isles is the mineral bournonite, which is a copper lead antimony sulfide. Bournonite specimens were mined from about 1850 to 1875 at the Herodsfoot Mine, Liskeard, Cornwall. Although it is gray, its cogwheel form is pleasing, and these gained a reputation as the most desirable of almost all minerals. Acquiring one of the British Museum's bournonite specimens is a collector's dream, and although this piece is certainly not as fine as the best in that collection, acquiring any British bournonite is noteworthy; this 3-inch group with crystals of considerable size would be very hard to duplicate.

England is also noted for many fine fluorites and calcites. This calcite is from the Stank Mine, and I have been told that it surpasses anything in the British Museum. I sold it to Dr. Stephen M. Neely, who in turn sold it to Collector's Edge, and they sold it to Keith Proctor. It is amazing how many times some of my specimens have changed hands and, seemingly, always at a profit.

# German Manganite and a Mining Woodcut

Manganite's name reflects its chemical composition: manganese oxide. It is a fairly common manganese ore, but it is rarely found in fine crystals. One locality for manganite crystals far exceeds the rest—Ilfeld, Harz, Germany. Most of the very best specimens were mined there over a century ago, and these have stood the test of time as very important collector specimens. It very well may be the one black mineral that every collector truly wants in his or her collection.

This lustrous specimen displays somewhat atypical divergent crystals of good size. It is a 3-inch group, and it has a great history. It was a significant specimen in Robert Hesse's fine collection, and it was sold by Paul Desautels, who was best known as the curator of mineralogy at the Smithsonian Institution, to Robert Matuzas, who kept it for many years before he sold it to me.

The hand-colored woodcut reproduction is from the first major work on mining, "De re Metallica" ("On the Nature of Metals" [minerals]). It was published in 1556 after the death of its author, Georgius Agricola. I imagine that this is what Agricola observed at the mine in the Erzgebirge, the Ore Mountains, where he lived. The Harz Mountains, where the manganite was found, are not that far away. The woodcut shows miners cutting branches, dowsing with these and digging for minerals. It is one of my favorite woodcuts, and I acquired it years ago from Herb Obodda. To me, it illustrates an age-old quest for the finest minerals, and still no effort is too much!

# A True Tale of Two Sulfurs

I have had the good fortune to end up with two of the best sulfurs I have ever seen. Many of the great Sicilian ones were dug in the 19th century, and nothing in the world quite equals the best specimens from there.

The example shown here is 6 inches across and is transparent. It was owned by Clarence S. Bement, who had the finest mineral collection of the 19th century. The entire Bement collection was bought by J. P. Morgan in 1900 and given to the American Museum of Natural History. This piece was given to their collection (number 32161), and it was sold in 1982 to Lawrence H. Conklin. Conklin, in turn, sold it to a private collector more known for his oriental art, and in 2002, Conklin reacquired it. We both considered it the prize of the collection, and I was luckily able to trade for it. The specimen is from Cianciana, Sicily, and it ranks among the best in the world.

The single crystal is remarkable in that it is likely as large as any ever found in the New World. At 4 inches, I think it is the largest fine American sulfur crystal, and it is from Steamboat Springs, Nevada. It is from the Anthony Gricius collection and had been acquired from Gisler, who acquired it from the dealer Scott Williams. The crystal is hoppered: its outer edges grew more rapidly than the central faces. This is typical of the rapid growth seen in volcanic fumaroles. Synthetic crystals of sulfur can be grown using certain dangerous chemicals, but synthetics are never the size of the crystals shown here.



# European Fluorites

England, France, Germany, Italy, Spain and Switzerland have produced a treasure trove of fine fluorites.

The Swiss fluorites with quartz were long considered the best, and the example shown here is a great combination of the rare pink fluorite octahedrons with absolutely stunning and nearly flawless quartz points. The specimen measures 6.6 inches tall and was collected years ago by Kaspar Fahner. He found it in the Grimsel Region near Bern, Switzerland, and a photo of him holding a similar specimen from the find is on page 384 of Peter Bancroft's "Gem and Crystal Treasures," which was published in 1984. This specimen was also owned by Eric Asselborn before I acquired it.

The Spanish fluorite on the left is particularly interesting in that it shows two different crystal forms that correspond, more or less, to the two different colors. The blue faces of the cubes are quite smooth and lustrous, and the purple dodecahedral faces are etched. The specimen stands 5 inches tall and is from La Collada, Oviedo, Asturias, Spain. It was in the collection of Donald Fisher for 15 years before I acquired it in 2008.

# Bornite and Copper

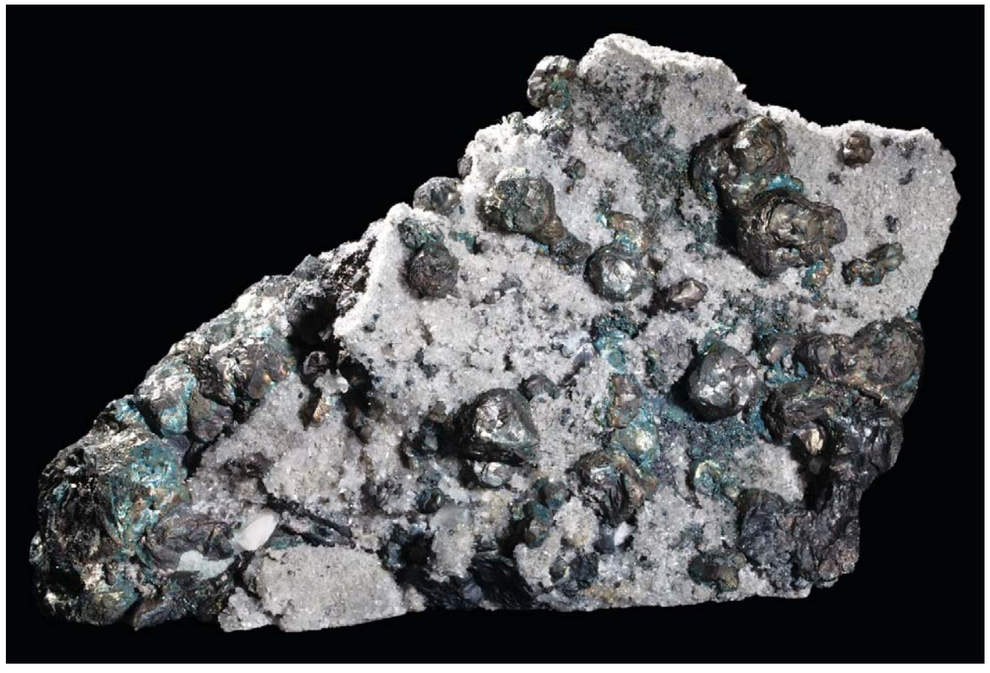
Bornite is a copper iron sulfide and is a common ore of copper. It is found around the world, and massive, freshly broken pieces are brightly colored and called "peacock ores." Their heft and color make them fascinating to beginners.

Crystals of bornite are very rare, especially for such a commonly found species. The crystals are almost always crude, but notwithstanding their roughness, they are very desirable.

The miniature specimen of bornite crystals on quartz crystals shown on the left is from the Old Copper Mine in Bristol, Connecticut. I acquired it from Dr. Mark Feinglos, who seems to be the only collector I know who could spare a specimen. This one probably dates to the 1830s to 1850s, and that partly accounts for its rarity.

Several large specimens and many smaller specimens of crystallized bornite on quartz were found more recently at the Dzhezkazgan Copper Mine in Kazakhstan. The specimen on the opposite page is a remarkable 10.5 inches across, and the crystalline mass on its left side is as large as any I have seen. I acquired it several years ago from Dr. Edward E. David.

Native copper is also found in Kazakhstan. The 5.5-inch-long specimen shown here is an unusually long and sharp spinel law twinned crystal. Twins of this size and sharpness are rarely seen, and this example is from the Itauz Mine.



# Apatite

The dramatically zoned green apatite on the opposite page is from the tin- and tungsten-rich ore veins at Panasqueira, Portugal. The specimen, which was in Ed David's collection, measures 5.25 inches across, and the apatite crystal is quite large for the locality at 2.8 inches across. Specimens from this mine are considered to be among the best in the world, but some of the New England pegmatites are perhaps even better. Apatite comes in a variety of colors: yellow, green, blue, white, pink, and purple, which is the most esteemed.

I started my business in 1974 by selling a 2-inch purple apatite crystal on a white matrix for what seemed like a good price. Unfortunately, had I kept that piece, I could probably now sell it for 100 times as much as I received then. It amazes me how much some of the best specimens have grown in value in my lifetime. I suspect that these will continue to do well, especially given the uncertain future of the U.S. dollar. Minerals really are treasures because they are real, scarce and in truly limited supply.

Apatite was my father's favorite mineral. He went to Strickland Quarry in Portland, Connecticut, three or four days a week for years to look for his own apatite specimens. He found what might be the best blue apatite from New England. He found this very lustrous 1.5-inch crystal of good color on May 19, 1985, in the northernmost part of the first mine dump. That was a very good day.

# Tourmalines from East Asia

Many areas in East Asia have produced tourmaline, but for the moment, I'll consider only two and look at others later.

Red tourmalines from Russia are well known; in fact, instead of "rubellite," "siberite" is the word often used to connote such crystals. This crystal is 2.9 inches high and is from the Malkhan Mines in Transbaikal, Russia. It was shown as part of the "Millennium Collection" that Joseph A. Freilich exhibited in Tucson in 2000. His collection was considered the best ever shown at the famous Tucson show, which is the largest mineral show in the country.

The 4-inch-tall green crystal is from Amarnath, Himachal Pradesh, India. India is well known for zeolite minerals from its huge basalt flows, but colored tourmaline crystals are very rarely seen there. This specimen was found in 2004 and is one of only a few dozen crystals found there.

# Chinese Cinnabars

It was 1978, the week before the United States established diplomatic relations with China, when I acquired my first small shipment from there. The little wooden box contained one cinnabar and one wolframite. No one else had thought of doing business with the Chinese at that early date, so I was the first American to import minerals from China. Cinnabars were almost never seen here at that time.

I was lucky to have read a book on China put out by the Bureau of Mines. They listed every important mine in China that was known to them, and I wrote to them all. I established ties with the Beijing Geological Museum and the Tongren County Mercury Mine. In the early days, I was able to exchange with the Museum, and I was eventually able to buy from them. The miners were interested in televisions and calculators, and I was able to send these in through Hong Kong. I acquired many nice specimens from the mine, but eventually, new people in Beijing cut me off from doing business directly with the mine. They wanted to be in control of everything. My contact at the mine was "re-educated," and I was not able to reestablish ties with the mine for some years. At that early stage, travel directly to the mines was prohibited. Everything seemed to be a state secret.

Chinese cinnabars have no equals, and they have been mined and revered in China for hundreds of years. The crystals have been saved for a long time and were built into traditional "Mountains" in which the best cinnabars were glued to imaginatively created mounds of quartz crystals. This was in keeping with the Chinese tradition of respecting traditional natural forms. My first specimen from the mine was one of these mountains, and I felt bound to say I was impressed, but that was not quite what Americans were looking to buy.

The cinnabars shown here are among the best I could save. There are both twinned and untwinned crystals on or with quartz and/or dolomite. The cinnabar included in quartz is a great rarity and it is the best I ever acquired. It is a pleasant reminder of my early days in China.

# Azurite and Malachite from China

In 1980, I imported 800 azurite roses and some malachite specimens from Shilu, Guangdong, China. The first specimen (shown opposite) was sent to me so that I could place a value on the lot. I still regard it as the best multiple rose. This piece is 3.7 inches tall and has great luster, as does the single, 3.5-inch rose shown below. I was amazed by how these two pieces stood so far above the other specimens in terms of luster and perfection. A few specimens were larger, but none matched these two in terms of quality.

The 7.75-inch malachite is the most aesthetically pleasing, and I hand-carried that one back to the U.S. from China. I know of only one, in the Beijing Geological Museum, that I would say is better.



# Stibnite from the Far East

When I began collecting, a Japanese stibnite was regarded as the ultimate specimen by many collectors. Their great metallic luster and incredibly long, complexly terminated crystals could not be matched by any other mineral. An illustration of fine a Japanese stibnite from "The Mineral Kingdom" is show below.

I was very fortunate to bring the first similarly beautiful stibnite specimens out of China to the American market. I learned that the Chinese had being mining the area around Iyang in Hunan since 1895. In fact, in the late 1970s, the U.S. Bureau of Mines estimated the Chinese had at least a 100-year supply of antimony from its stibnite mines. Dr. Hu Chengzhi of The Beijing Geological Museum presented this fine piece to me in 1983. This 5.5-inch spray was illustrated soon after its acquisition in "The Mineralogical Record," Volume 14, on page 387. Certainly, bigger stibnite crystal groups are now known, but I still feel the honor that was bestowed on me through the receipt of this gift; I will always treasure this specimen and feel a certain privilege that I was responsible for bringing the first fine Chinese stibnites to American collectors; and it is significant to me that it is illustrated in the finest of mineralogical magazines.

I acquired a second great stibnite group in 1995. It was the pick of a 600 specimen lot that Daniel Trinchillo imported. The crystals are thick and heavy, much like the best from Japan. It measures 6.5 inches tall and is from Luo Yang, Hunan. It seemed everybody "had" to have it then, but I kept it anyway. There is something about the heft and feel of a great stibnite that is beyond explanation or reason.

# Chinese Fluorite

Fluorite is used in making steel, and Chinese fluorite has been imported into the United States for that purpose since shortly after diplomatic relations were initiated. Today, it is easy to go to a large mineral show and see Chinese fluorite specimens seemingly everywhere. They come in many colors and crystal habits. At this time, it is easy to find light green, flawless cubes with many dealers. These would have been tremendously valuable years ago, had they been found in a limited quantity, but now there are literally tons of fine specimens.

I had hoped to have more to do with the importation of fine fluorites. The first good green fluorite which I imported in 1980 was incredibly fine for the time. The luster was equal to any fluorite from anywhere, and it is shown here. It measures 2.62 inches across and is from Xiang Hua Ling, Hunan Province. These green cubes with purple centers are something that I wanted to bring to the mineral market. I tried for years to convince my sources that these would be worth collecting as specimens, yet nothing I said could convince them to set these aside. It was about a dozen years before anyone started saving these fluorites for collectors.

Another fine fluorite from the same locality is shown here. It measures 6 inches across and shows large green octahedral crystals coating an earlier generation of smaller grayish lilac crystals.

# Butterfly Twins of Calcite

When I was younger, the most revered of all calcite twins were the great English specimens. These were generally seen as loose crystals and matrix specimens with symmetrically formed twins were and remain extremely rare.

In recent years, China has produced some amazing calcites, and the twins shown here are among the most important matrix specimens exhibiting butterfly twins. Both specimens have associated hematite which gives them great color in addition to their wonderful form.

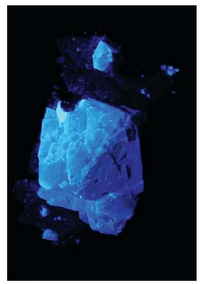
The specimen to the far left is perfectly symmetrical and measures 5 inches across. It was in Stuart Wilensky's personal collection.

The specimen on the left is from Peter Via's collection and measures 6.5 inches across. Both specimens were found in the Shan Hua Pu Mine, Xiang Hua Ling, Hunan, China. To my mind, butterfly twins such as these are the most beautifully formed of all calcites.

# Scheelite from the Panda Reserve

In recent years, China has produced the world's finest specimens of scheelite. This should come as no real surprise, as the country has the world's largest supply of tungsten ore, and scheelite is calcium tungstate.

The specimen shown on the opposite page is 6 inches tall and was found in the Zinyang Mine, Sichuan, China. The scheelite is larger than most, of a good orange color and sits on a bed of mica crystals.



Scheelite is a very important ore mineral, but it is generally massive and looks like ordinary quartz. It can be very difficult for a prospector to quickly distinguish it in the field unless he looks at it under short-wave ultraviolet light. As shown in the photo on the left, the scheelite will then glow a bright blue or blue white, making it easy to distinguish from most minerals.

Other important mineral specimens were found in the area, which was made into a reserve for the endangered panda. Among these are specimens of beryl and cassiterite. A 5-inch specimen of these two minerals is also shown above. This piece is from the Edward E. David collection.

## Wolframite with fluorite and quartz

China has the world's greatest deposits of wolframite and produces some of the best mineral specimens of wolframite, the iron tungstate. The wolframite is often found in hydrothermal veins which also contain quartz and fluorite.

The 8-inch-long specimen shown on the far left is from Qiang Gi Dong, Hunan Province. It is among the very best ever found. Wolframite can be broken very easily, but these crystals are in perfect condition and are associated with purple fluorite and quartz.

Ore veins occur in Connecticut, too. When Thomaston Dam was being built from 1957 to 1960, veins of quartz containing galena and wurtzite were found.

The late Ed Piela collected many of the nicest specimens that came from this operation. The 1.75-inch specimen of quartz with brilliant fluorite cubes was one of those he found in this hydrothermal vein.

# Chinese Pyromorphite

The alluring colors of pyromorphite make it one of the most coveted minerals that contain lead and many collectors specialize in it. It is found near the surface of many lead mines throughout the world. Fine specimens are known from Idaho, France, and Germany, and the newly discovered bright, and sometimes almost electric, green ones from China are among the best and may be the most beautifully colored.

The specimen on the facing page is 3 inches across and has a most unusual form. Many of the crystals are twisted and curved to resemble seaweed being swept about by the tide. I know of no other specimen of pyromorphite which shows this habit so beautifully. It is from The Daoping Mine, Gongcheng, Guilin area, Guangxi, China. I acquired it in a trade with Stuart Wilensky in 2008.

The specimen illustrated above is a small cabinet specimen from the same mine. It has the best color from the initial find a few years ago. The crystal structure is more typical and it has a pleasing crystal size range. It was imported by Daniel Trinchillo, who sold it to Dr. Ed David. Ed and I then exchanged pyromorphites. I got this fine specimen and he got another Chinese one which once was in the collection of Steve Smale. To me these two specimens represent the very best pyromophite has to offer.

## A Great Combination from China

It must be clear that I simply love minerals; this passion started early in my life, as my dad introduced me to the hobby. Specimens of associated minerals are of special interest to me; it is the range of forms, colors, luster and, indeed the science of their evolution, that intrigue me.

This stupendous specimen from the Shangbao Pyrite Mine, Leiyang County, Hunan, China, is a beloved favorite of mine;  it measures 5 inches across and showcases three common mineral varieties in an uncommon way.

The first mineral to crystallize was the artichoke quartz. I have not seen this crystal habit from any other locality at the same time;  these crystals are strange and lovely. The pyrite cubes were the second mineral type to crystallize, and they offer a grand contrast in luster and structure. No less essential to the stunning beauty of this piece are the sharp purple fluorite crystals that were the last to crystallize. Unusually, the fluorite partially coats the pyrite. The fluorite adds not only texture but also great color to this extraordinary favorite of mine.

Mineral associations always come together with some intrigue and beauty. This is a lesson that I was taught early, and combinations of minerals continue not only to interest me but also to amaze and captivate me.

## Pegmatite Gem Minerals from China

China has a number of pegmatite quarries that produce gem minerals. The garnet on quartz is from Tongbei, Fujian Province. These are currently being mined, but this example, at 7 inches, has larger doubly terminated quartz crystals than most. The rich distribution of orange spessartine garnets enhances the quartz and feldspar matrix. The piece is in perfect condition and is crystallized all around.

The elbaite tourmaline is from a manganotantalite mine in the Altai Mountains, Xinjiang Autonomous Region and measures 1.25 inches tall. It is one of two of my Chinese elbaites that were illustrated in "The Mineralogical Record," Volume 14, page 388. I had hoped to get more of these, but production at the mine was very limited.



## Kunzite from Afghanistan

The gem-bearing pegmatites near Mawi, Laghman Province, Afghanistan, are among the world's most prolific sources of gem spodumene crystals such as the purple to lilac to pink variety known as "kunzite."

The 5-inch-tall crystal shown opposite is a perfect, doubly terminated, very clean gem crystal that I acquired from the collection of Edward David.

Crystals of kunzite on matrix are much harder to come by, and I especially like this 5-inch specimen of a doubly terminated kunzite crystal on a pure white quartz crystal.

# Tourmaline with Quartz from Around the World

The pink tourmaline on quartz, which measures 5 inches across, is from Paprok, Nuristan, Afghanistan. Both the quartz and tourmaline are perfectly formed, and the specimen has a touch of lilac lepidolite that sets it off perfectly. I truly covet great combinations of minerals, as they are truly rare, and I acquired this one as part of a trade with Dr. Edward E. David. In this trade, Dr. David, who was science advisor to President Nixon and a vice president of Exxon, acquired the wondrous Russian gwindel quartz that is now in the Houston Museum, and I received this specimen and a very large pink Pakistani fluorite that is also shown in this book.

Tourmalines with quartz occur in pegmatites all over the world. I particularly treasure this 1-inch-long doubly terminated gem crystal of smoky quartz with green tourmaline inclusions. My father found it in the water-filled pit at the Sawmill Quarry in Haddam while it was being actively mined by Herb Hewitt. Herb was an interesting character who was always going on about the glories of his quarry. It truly was a wonderful place to explore and had produced very fine smoky quartzes, beryls and tourmalines. I knew how good these specimens could be because Dr. Wimsatt, an English professor at Yale University, had shown me an especially nice collection of these minerals from the mine. Shortly before the old miner died, Herb showed me a 4-inch-long brown tourmaline he had just found and told me that there was a great pocket of smoky quartz under the water-filled pit. He was not able to get back to it, and he died not long after telling me this story. So my father and I, along with Bruce Jarnot, decided to drain the quarry and see what was there. The muscular Bruce carried the pump up the hill, the quarry was drained in a few hours, and we were able to explore the pit. There was not a single decent specimen to be found. That gave us all the more reason to be pleased with what we already had.



# Beryl with Schorl

Schorl, the black variety of tourmaline often found in pegmatites, and beryl are both commonly found in the same locality, yet good combinations of the two minerals are rare and highly valued. The specimen shown here was imported by Wayne Thompson and measures 3.75 inches tall. It is from Pech, Nuristan, Afghanistan. Wayne mentions the find in his *Ikons* and states Sandor Fuss has the best of these combinations which has since been resold to Peter Via. This specimen, according to Wayne, was the third best piece from the find. I particularly like it as I spent a great many days with my dad looking for both minerals in the pegmatites of Haddam, Connecticut, and I know how difficult it would be to duplicate this specimen.

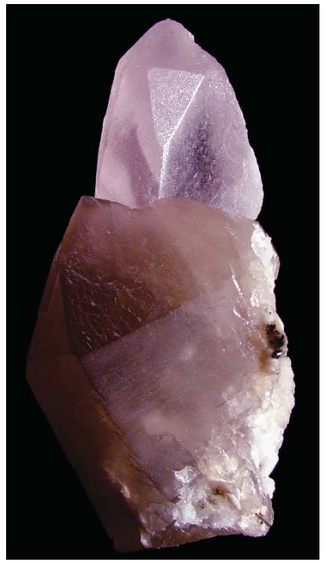
The specimen shown above is from Erongo, Namibia. Some people consider it the single finest specimen from that area. With the two schorl crystals flaring off the aquamarine and microcline crystals, it is the perfect association specimen.

# Morganite from Afghanistan

Morganite is the pink variety of beryl, much as aquamarine is the blue variety of beryl. Morganite is found in many pegmatites all over the world and it has been found in some abundance in Pech, Nuristan, Afghanistan during the last few years.

The sharp, textbook- perfect, hexagonal crystal of morganite with a quartz crystal and on a 4-inch-long matrix of white albite and lilac lepidolite is especially nice. There is even a little green tourmaline associated with the morganite.

The other specimen (shown on the right) from the find is 5.5 inches tall and shows a gem quality complete, but somewhat oddly formed, and partially etched morganite crystal on a smoky quartz crystal. The two specimens of morganite are about as different as can be, especially considering they are from the same find, and they make quite an extraordinary pair.





# Two Rare Minerals from Afghanistan

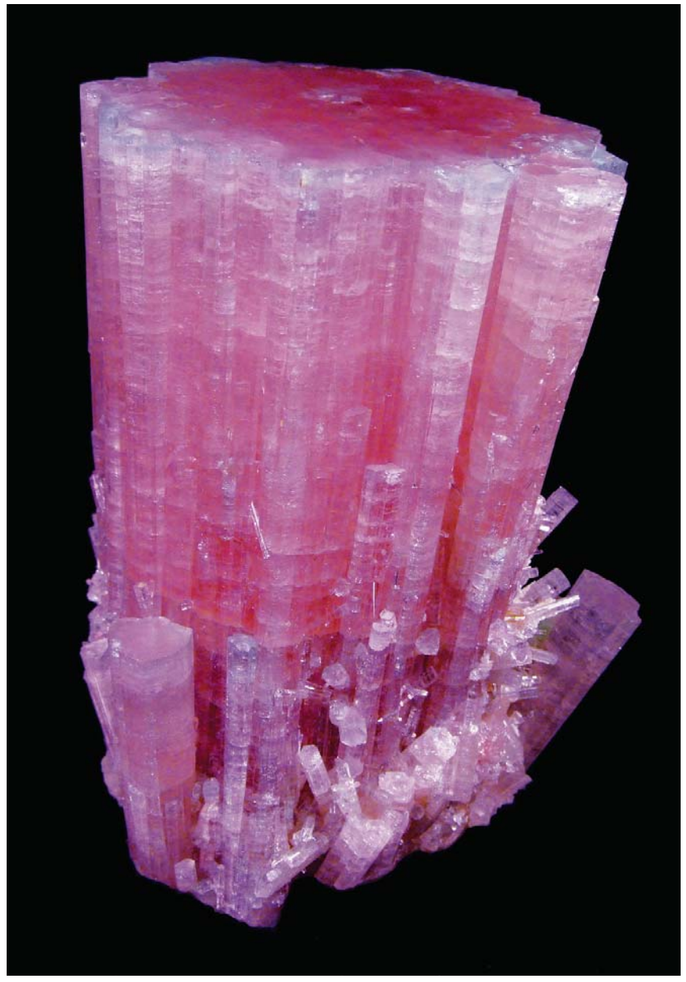
Pollucite is a rare cesium-bearing mineral that was found in gem-quality fragments at the Walden Gem Mine in Portland, Connecticut, and has since been found in remarkably large crystals in some of the pegmatites of Afghanistan. While I generally do not collect white minerals, this 5-inch crystal of pollucite is speckled with bright green elbaite crystals that make it much more interesting and attractive. The specimen is from Kandesh, Poprok, Kunar, Afghanistan. I have seen a few other pollucite association specimens, but this may well be the prettiest.

The 2-inch-long red manganotantalite crystal shown here is rarely matched in quality or size; in fact, the last better one I saw was exhibited in Joseph A. Freilich's case in the 2000 Tucson show. I recall some people telling Joe that his manganotantalite was the best thing in his case, and his case was, in all probability, the best case any individual had ever displayed at a mineral show. This piece is from Pech, Kunar, Afghanistan. Manganotantalite contains tantalum, but the tantalum ore that is typically mined in the Congo is all stream-rolled pebbles, and it is never found crystallized like this rare jewel of the mineral kingdom.

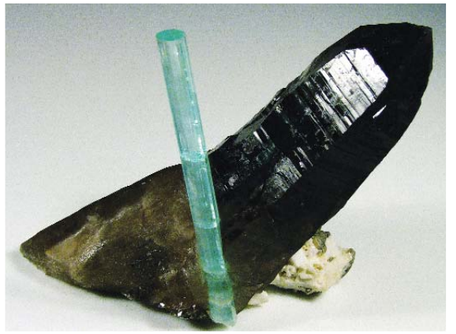
# Mushroom Tourmalines

Tourmaline crystals are generally thought to be simple elongated prisms, and while that is generally true, there are some wonderful exceptions. Sometimes, a crystal will just expand outward towards one termination. An especially beautiful example of mine from the Peter Via collection is shown here. This 5.5-inch-long specimen is from Mawi, Afghanistan. It has a nice light pink color and a slightly bluish cap, but the cap is much wider than the base. This and the delicate side crystals make the specimen truly interesting. I suggest that the more easily a specimen can be broken, the rarer it will be, and the more desirable and valuable it becomes.

The second specimen is another "mushroom" habit of tourmaline. This was my favorite one from Burma. The multiple mushrooms look almost like fireworks going off, and the associated feldspar crystal makes this, to my mind, the nicest of all the Burmese "mushroom" tourmalines that I have seen. This specimen is now in the Chris Douglas collection.



# Aquamarine with Quartz



Pakistan is the current source of most of the world's fine aquamarine matrix specimens, and two of my favorites are shown here.

"The Cannon" exhibits two doubly terminated gemmy aquamarine crystals on a matrix of quartz crystals and small black tourmalines. The uppermost aquamarine measures 5.1 inches long, and the entire specimen is in perfect condition. This piece is from Shigar.

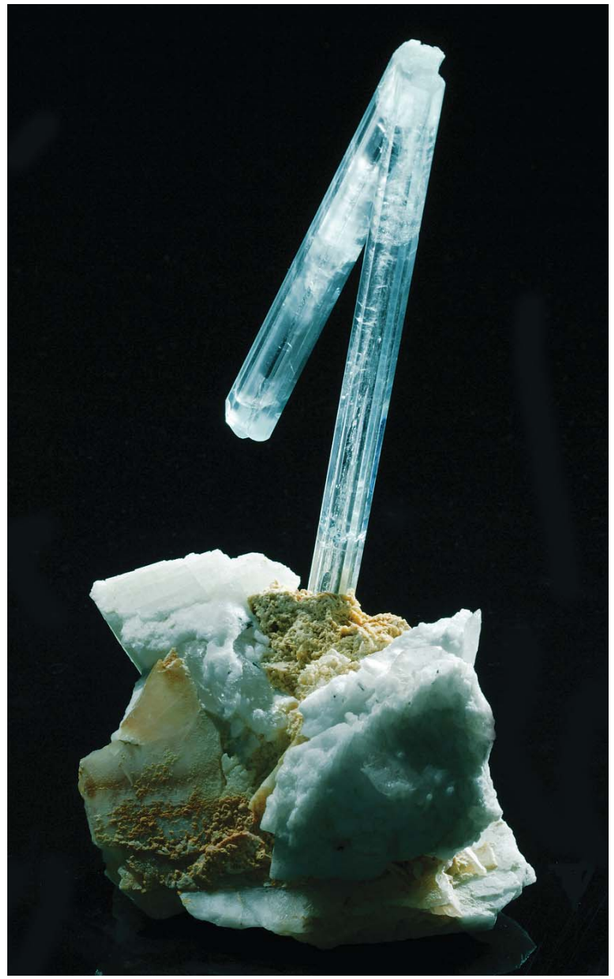
The other specimen is from Gilgit and exhibits a 5-inch-long aquamarine on a 7-inch-long smoky quartz crystal. The aquamarine has been repaired, but I think that is to be expected, much as it is with amazonite and quartz from Colorado. Combinations of aquamarine and smoky quartz are much rarer than amazonite and smoky quartz, and a specimen of this quality is truly a wonder. I do not know where I could get another specimen of this size and quality.

# Aquamarine with Feldspar

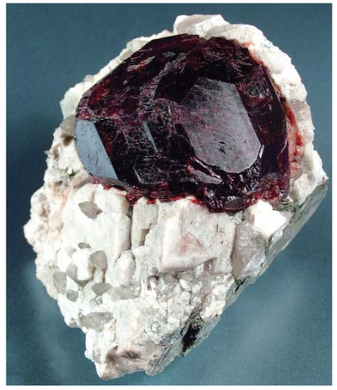
Both of these aquamarine-on-feldspar specimens are from Gilgit.

"The Sailboat" is 8 inches tall, and it reminds me of Marc Weill's tourmaline sailboat. The matrix is feldspar and calcite—an unusual mineral for a pegmatite. There is one repair to the aquamarine near the matrix, but it is otherwise perfect. It is very unusual to find aquamarine crystals growing together in the way that these two do above the matrix. Both aquamarine crystals are rather surprisingly doubly terminated.

The other specimen (right) measures 2.5 inches across and shows bright orange spessartine garnet crystals sprinkled on the white feldspar matrix, and this matrix contrasts dramatically with the icy blue doubly terminated aquamarine.



## Sphene and Garnet



Sphene, or titanite, crystals can be very desirable; in fact, some people consider the American Museum of Natural History's sphene to be the best specimen in the entire collection. But this mineral is not always well appreciated in this country, perhaps because the historically important localities were in the Alps, and few of those specimens made it to the United States. The green twinned sphene shown here on a white matrix measures 3.5 inches tall overall, and it is not coated with chlorite as so many of the lesser quality sphenes are. It is from Gilgit, Pakistan, and I acquired it some years ago, shortly after the Freilich auction when I saw the price his smaller specimen brought. I have not been offered another as fine since I acquired this one.

The Skardu Road area of Gilgit has produced many fine garnets. This especially nice 4-inch-tall specimen shows a sharp crystal on feldspar and quartz. I acquired it from Ed David some years ago in a trade.

# Quartz from Pakistan

Quartz should be mentioned when writing about the minerals from the Pakistani pegmatites. There are occasional specimens of rose quartz and rutilated quartz found in the mines. There are also faden quartzes from Alpine-like deposits.

My favorite is this 5.5-inch-tall quartz from near Gilgit. It came out some years ago, and I was told it was from a pegmatite. Unfortunately, it appears to have been a one-of-a-kind discovery, as I have never seen another to match it or even come close. It is as lustrous and as flawless as the finest Alpine quartz. In addition, it appears to be a Dauphine twin, and the milky quartz matrix adds interest, contrast and value.

More typical of the quartzes from Pakistan is the crystal shown above. It is 3 inches across and is from Shigar. It is a fairly typical milky white crystal and would not be worth noting were it not for its association with the light green beryl that makes it a small prize.

## Fluorite from Nagar, Pakistan

Pink fluorite rarely reaches the size of this 6-inch monster. It has a light green center and has predominantly octahedral faces, and it is from Nagar in Pakistan. Nagar has produced more aquamarines than any other area in Pakistan, and it seems to be the only source of pink fluorite crystals in Pakistan. Pink fluorites are rarely seen worldwide. They are found in smaller sizes in Peru and Japan and in large crystals in the Alps and Nagar. I acquired this piece and the Mawi tourmaline on quartz in exchange for the Russian quartz that Ed sold to the Houston Museum of Science in the sale of his first collection.

The other specimen shown here is a 1.25-inch piece with a touch of attached muscovite mica. The muscovite seems to be diagnostic of specimens from Nagar. They almost all exhibit it somewhere. This fluorite is a very pretty piece, but the larger specimen is much more important and valued for its size and rarity.

# Aquamarine from Nagar, Pakistan

Nagar in Pakistan has proved to be the most prolific area for aquamarine finds. Tons of the material must have been found. Nagar aquamarine is always a bit milky. Perhaps, as in milky quartz, this hazy aspect is due to inclusions of very tiny gas bubbles.

The 6.9-inch-tall specimen shown here was once in the Peter Via collection. I have named this "The Cactus" because it looks so much like a saguaro cactus. Bill Larson and Dave Wilber owned a Himalaya Mine tourmaline crystal group that they had given the same name. I rather like this piece for its size and form, which reminds me of my Crazy Lace Agate, which also resembles a cactus.

The 3.12-inch specimen shown is typical of how most of the aquamarines from Nagar look. It is in perfect shape and, hence, a nice mineral specimen, but it is not in the same league as "The Cactus." I imported this Nagar beryl, along with many other Pakistani specimens, directly from Pakistan.

# Topaz from Pakistan

Pakistani topaz develops in myriad colors; one calcite vein near Katlang is famous for having produced orange to pink and even red crystals, yet few have come from there for years. Blues are rarely encountered in the pegmatites of Pakistan. It is the glorious sherry-colored topaz that is most offered from the pegmatites, and no one should consider the finest sherry topaz to be anything but spectacular.

Combination specimens that include two fine gem crystals are most remarkable, and I consider them my equivalent of the Holy Grail. I think that the piece shown opposite is one of the most significant pegmatite specimens I have acquired. It is perhaps the most photogenic and dramatic specimen in this book. This 4.5-inch matrix of feldspar hosts smoky quartz crystals, a gem topaz and a fine blue aquamarine crystal. This aesthetic combination was found near Gilgit, Pakistan; it was sold to me shortly after it arrived in this country in 2007. I know of only one Pakistani combination of topaz and aqua that I evaluate as superior.

The miniature specimen of sherry topaz shown above, has brilliant clarity, great luster and form and, of course, the color can only be described as incredible. It sits on a diminutive base of white albite crystals that add interest, contrast and, perhaps surprisingly, great value. Matrix topaz is much rarer than single crystals, and to many collectors, gem crystals perched on just the right amount of matrix are true wonders of nature.

# Giant Crystals of Brookite and Beryllonite from Pakistan

Brookite is, like rutile, titanium dioxide, but its atomic structure is different. It typically has been found in crystals measuring less than 1 inch, but a recent find in Pakistan has redefined what a good size crystal of brookite might be. This group of crystals is from the Kharan Region, Quetta, Baluchistan, and is a whopping 2.88 inches long. This is among the largest known specimens of the type, and it is still quite transparent and lustrous.

Beryllonite is formed when beryl is attacked in the late stages of some pegmatite's formation. Prior to some discoveries in Pakistan, it was typically found in crystals up to about 1 inch long . This crystal, though not among the largest from Pakistan, is 4 inches long and is associated with lilac lepidolite mica. It was found in Nyet Bruk, Baltistan.

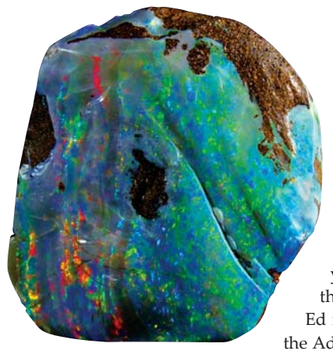


# Stilbite's Most Wanted Associates

Stilbite is a common mineral found in basalts and metamorphic rocks around the world. It is especially common in India, where it can be associated with all the other zeolites and the typical trap rock assemblage.

The white crystallized hemispheres of the rare mineral goosecreekite are on a matrix 7.25 inches tall. The vertical stilbite spray adds a strong contrast in form and color to the goosecreekite and makes this specimen as fine as any I have seen. It is from Jalgaon, Maharashtra, India.

Stilbite is also found in Connecticut. The late Ed Piela collected this specimen during the construction of the Thomaston Dam in Thomaston. The piece measures 1.25 inches and is backlit to show the yellow stilbite sitting on purple fluorite. It is an amazingly beautiful association and very distinctive. While botryoidal fluorite has now been found in India, no stilbite occurs on fluorite like this anywhere else that I am aware of. Once again, associations make the specimen much more interesting.



## Australian Finds

Australia produces the world's finest specimens of crocoite. The 5-inch specimen shown here exhibits wonderfully reticulated crystals. It was imported years ago by Julius Zweibel and went into the Ed David collection. I acquired it from Ed in one of our trades. The crocoite is from the Adelaide Mine, Dundas, Tasmania. Crocoite is still being mined in Tasmania for the collector market. It is lead chromate and one of the few bright orange minerals.

Opal is also still being mined. This 1.8-inch boulder opal is from Queensland, Australia. I acquired it at one of the mineral auctions that were once held at Harvard University.



## About the Author

Russ Behnke has collected minerals for most of his life. He and his father were avid field collectors, and Russ spent much of his youth exploring the complex pegmatites and other mineral deposits in Connecticut. He particularly enjoys collecting gem crystals and agates, and many of those in his spectacular collection are displayed in this book. He has a degree in Geological Engineering from the Colorado School of Mines, and he was the first American to export minerals from post-Mao China. He has also imported minerals from Brazil, Uruguay, Pakistan, Peru, South Africa, Libya, Namibia, and the Congo. Specimens which were once his now grace the Smithsonian, The American Museum of Natural History, The Houston Museum of Science, The Los Angeles County Museum, and the Carnegie Museum as well as many private collections world wide. He now lives 90 miles northeast of Manhattan in Meriden, Connecticut, where he enjoys hiking, fishing, and reading. He hopes his photography and writing will inspire the desire to collect and instill a greater appreciation for the natural world. He may be reached through his website at www.russbehnke.com.