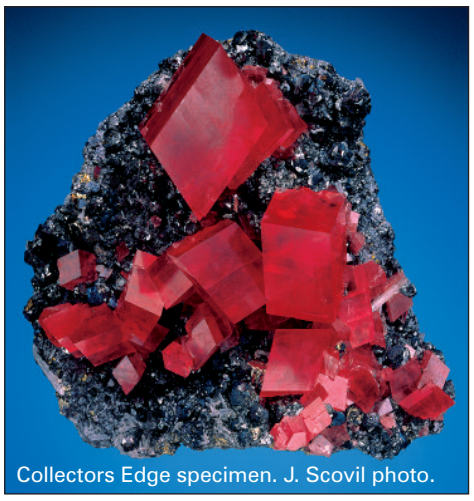

Collectors Edge specimen. J. Scovil photo.

MINERALS

ISSUE #4 THE COLLECTOR'S NEWSPAPER 2012

In this issue also:

Collector interview: Wendell Wilson (USA)

Dr. Wendell Wilson (born in 1946) is well known as being the chief editor of the *Mineralogical Record* for the last 36 years, as well as being a mineral artist and mineral collecting historian. In addition to his many responsibilities at the *MR*, Wendell does the layout for every issue and works intimately with the printers ...

Read on page 13

Journal presentations: MINERALIEN-Welt

MINERALIEN-Welt attracts a wide spectrum of professionals, mineral collectors and people just starting to develop an interest in minerals. Our aim is to offer the newest information as well as report on classics and rarities in the world of fine minerals. Because we are a German-based magazine we of course run articles on German, Austrian and Swiss minerals and localities, however, for the most part MINERALIEN-Welt covers international topics, for example on selected mines, important museums or private collections. The always varying content makes MINERALIEN-Welt ...

Read on page 11

S. Rudolph specimen. J. Scovil photo.

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Huge pocket from Sakangyi, Myanmar

Tomasz PRASZKIER & Marco SACCHI

Saw Naung U photo.

Huge quartz crystals in the big pocket in Sakangyi mine, Myanmar.

J. Scovil photo.

Gem topaz from the Sakangyi mine, Myanmar; 5.1 cm high. M. Zinn collection.

INTRODUCTION

The Mogok region in Myanmar has been one of the world's most famous and important gem and mineral-producing areas for centuries. The mines producing rubies and spinels from marbles are especially well known to collectors. The Sakangyi mines, operating in pegmatites, are much less familiar: apart from a very few articles published in gemological magazines they have gone almost entirely undescribed. Probably the most important reason for that fact

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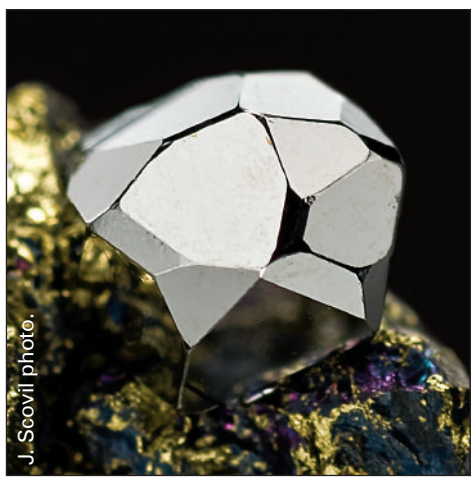
New sperrylites from Canada

Bradley S. WILSON



J. Scovil photo.

Sperrylite crystal 4 mm high in chalcopyrite matrix, from the new find in the Broken Hammer zone, Sudbury, Canada. D. Bunk specimen.

INTRODUCTION

A spectacular find of sperrylite crystals was made in 2011 at the Broken Hammer zone near Sudbury, Ontario, Canada. Fine crystals as large as 15 mm were recovered from surface exposures.

The Broken Hammer zone is a platinum group element-copper-nickel deposit, located in the Sudbury region, that is currently being considered for mine development by Wallbridge Mining Company Limited. It's interesting to note that in a mining camp as old and as heavily explored and mined as Sudbury, an important new mineral discovery can still be made on the surface today – and this discovery of fine sperrylite crystals certainly is important from a collector's standpoint.

Sperrylite, a platinum arsenide ($PtAs_2$), was first described in 1889 by H. L. Wells from crystals collected at the Vermilion Mine (the type locality), approximately 46 km southwest of the Broken Hammer zone.

GEOLOGY OF THE SUDBURY STRUCTURE

Sudbury is home to a world-class nickel-copper mining camp where ore exploitation has gone on since 1886. The district's by-products include platinum group elements (PGE), cobalt, gold, silver, selenium, tellurium, and sulphuric acid. The Creighton Mine, the deepest mine in Sudbury and in the Western Hemisphere, has been active continuously since 1901 and has produced more than 155 million tonnes of ore. By 1999, 116 metal deposits had been found in the Sudbury camp; in 2009 the total of ore already produced and remaining resouces was estimated at 1.65 billion tonnes, with an average nickel content of about 1.2% and an average copper content of about 1.1%.

The majority of the ore bodies in the area are related to the 1.85 billion-year-old Sudbury Igneous Complex (SIC) and

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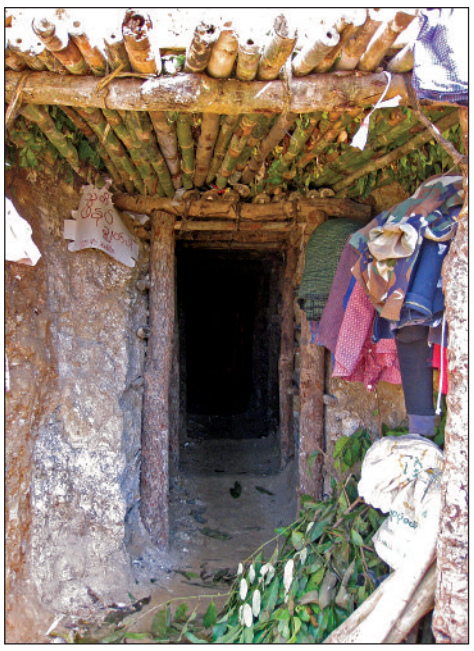
Famous Buddhist temple: the Shwedagon Pagoda, Yangon, Myanmar. Photo M. Mauthner, courtesy Pala International.

Continiued from page 1

is that the Mogok area has been closed to foreigners for years, but now that political changes are starting in Myanmar, there is a chance that the Sakangyi area will be re-opened in the near future. An additional problem with Sakangyi specimens is that the vast majority of them are sold to Chinese dealers and later resold as Chinese specimens.

The Sakangyi mines are the source of some of the world's best topaz crystals, and they produce incredible combinations of topaz with huge, clear quartz crystals, feldspars and mica. Spectacular specimens of aquamarine crystals are also known from the locality.

At the end of 2006 a huge pocket filled with incredible crystals was found in one of the Sakangyi mines. Thanks to the mine owner, Saw Naung U, the mud was washed out and the pocket was photographed before specimens were extracted! This is probably the only pocket ever photographed in this area. Because of the exceptional size and quality of the specimens, and because the find was so well documented, the pocket is worth special attention.



Entrance to the mine in Sakangyi. F. Bärlocher and Win Htin photo.

SAKANGYI PEGMATITES

Sakangyi is located in the Mogok Metamorphic Belt (MMB) in front of the Himalaya collision zone. This belt was formed in the Alpine orogeny, which was a result of the collision between the Indian and Asian plates. The main geological consequence of this massive collision was the formation of the Himalaya chain of mountains.

The MMB is a huge elongated structure stretching North-South along the whole of Myanmar, it is over 1500 km long and 22-40 km wide. The MMB was heavily injected by post-orogenic magmatic intrusions, mainly of granitic type. In the later stages of its geological evolution the MMB was uplifted and exposed in its present form.

Sakangyi is located in the area where one of the intrusive bodies – the Kabaing Granite, composed of gray biotite microgranite – crops out. The age of this intrusion is estimated at 15-20 my, i.e. Miocene. The age of the pegmaties is very similar to the age of the granites, so most probably the pegmatites' formation was a direct result of late magmatic processes. Pegmatitic bodies are located close to the edge of intrusion, and their chemistry strongly implies that contamination processes where they contacted metamorphic rocks, such as marbles, played an important role in their formation. The pegmatites are lenticular in shape, up to a few meters wide and significantly elongated - to a few dozen meters long. The temperature of their formation has been determined as 500-650°C. They are classified as REE beryl-type pegmatites.

The Sakangyi pegmatites have been the source of gemstones, and less frequently of specimens, for over 100 years. Gemstones are mined either directly from the weathered pegmaitites or from colluvial/alluvial deposits. Specimens come from excavations made directly in the pegmatite bodies.

LOCALITY AND MINES

The Sakangyi mines are located in the Mogok Valley, approximately half an hour‘s walk from the main asphalt road linking Mogok and Mandalay towns, 16 km west of Mogok.

There are currently seven small mines operating in the Sakangyi mining camp. The majority of them are just simple tunnels or shafts a few dozen meters long. The mines operate in the bigger pegmatite bodies, particularly in their cores, where pockets are usually located. Because the pegmatites are partly weathered and kaolinized, mining is quite easy.

Map of part of Asia showing Myanmar; the insert shows the location of the Mogok and the Sakangyi mines.

The most intensive production in Sakangyi took place in 1990’s and 2000’s. Recent production has been much slower and has focused on gemstones from the alluvial/colluvial deposits.

The most intensive mining in the area is done in the dry season – from September to March.

The majority of specimens and gems are transported to the border town of Ruili, where they are sold to Chinese dealers.

Mogok town – capital of gemstones and minerals of Myanmar. F. Bärlocher photo.

Workings at Sakangyi, entrance to the main mine at the left. F. Bärlocher, Win Htin photo.

MINERALS

The mineral species from Sakangyi which are of most interest to collectors are described below. Because knowledge of these pegmatites is limited, and no serious mineralogical analyses have yet been done, the complete list of minerals from the pegmatites is certainly longer than the one given here.

Beryl

Besides topaz, beryl is the most important gem mineral mined in the Sakangyi area. It occurs in a wide variety of aquamarine colors – from deep blue through light blue and greenish blue, and much more rarely as pinkish morganite zones. The crystals are mostly translucent, but many are entirely gemmy. Their form is typical for aquamarine: hexagonal, prismatic and elongated, with simple pinacoidal terminations and minor pyramid faces. Sometimes the crystal faces are deeply etched, and crystals of this type usually have complex terminations.

The beryl crystals commonly reach 10 cm in length, but specimens over 20 cm are known. The vast majority of the crystals are found loose, and sometimes they are doubly terminated. Specimens on matrix or clusters are much more difficult to find.

The gemstone industry is the most important consumer of beryls; however, well formed crystals are usually preserved and sold as mineral specimens. The biggest cut stones made from Sakangyi beryls weigh a few hundred carats!

25 m deep shaft in Sakangyi. F. Bärlocher and Win Htin photo.

Miners working in the mine. Saw Naung U photo.

Deep blue beryl (var. aquamarine) crystal from Sakangyi, 10 cm high. N. Luppescu collelction and photo.

Cassiterite

Cassiterite rarely forms well developed crystals, but some of these reach 5 cm. They are typically black with medium metallic luster.

Feldspar group

Minerals of the feldspar group are the most common and constitute most of the volume of the pegmatite bodies. All pockets contain these crystals, and they cover most of the pocket walls.

The lack of detailed mineralogical analyses makes it impossible to definitely name feldspar species. Clearly, both K-feldspars and albites are common.

K-feldspars (microcline and orthoclase) are very frequent and sometimes form crystals measuring to a few dozen centimeters. They are usually well developed, blocky, with medium luster, and white, gray or beige in color. Microcline occurs sometimes as amazonite in colors varying through light green, blue-green and deep green. Usually the amazonite color is not homogenous in the whole crystal but intergrown with other colors. Also, the pinkish opalescent variety of K-feldspar (moonstone) is known from Sakangyi.

Albite is usually white and occurs as the cleavelandite habit overgrowing older K-feldspars. Rosettes of cleavelandite reach up to 30 cm.

Fluorite

Fluorite is an uncommon species in the Sakangyi pegmatites. When it does occur it is purple-blue. Its interesting botryoidal forms reach up to a few cm.

Herderite

A few specimens of herderite crystals on feldspar are known from Sakangyi. The biggest crystals reach up to a few cm and are green or greenish.

Mica group

Mica (most probably muscovite) is very common in pockets in pegmatites in Sakangakyi. It occurs as typical hexagonal booklets, usually grayish or colorless with good translucency, and sometimes with good luster. The size of the booklets reaches over 20 cm, and the crystals are often well formed and sharp-edged.

Because of the low value of mica, miners do not care too much about its specimens unless they are part of the matrix of specimens of the more valuable species.

Topaz

Topaz is the most important gemstone and the main target of mining in Sakangyi. It is also the most significant mineral for collectors. The large size of some of the crystals and their sharp forms, gemminess, and interesting paragenesis make those topazes world-class specimens.

Gem beryl (var. aquamarine) with quartz from Sakangyi, 7.5 cm high. W. Larson collection. J. Scovil photo.

The size of the crystals varies from a few mm up to monsters weighing 80 kg! Even the biggest ones are usually well formed and often of cutting quality.

The majority of the topaz crystals are colorless, white, pale orange or pale champagne-colored, but smoky, brown, light blue, deep orange and deep champagne-colored crystals are also known.

The luster of the crystals is usually good or very good.

The habit of the topaz crystals is classic for this species – long to short prismatic, and frequently stubby when cleaved. The dominant forms are prisms, rhombic pyramids and pinacoids. Crystals frequently exhibit a large number of different forms, making beautifully complex specimens.

Some of the crystals have small etching figures and growth features, especially on the terminations.

All of the crystals that are not well formed are cut. The sizes of the gemstones made of Sakangyi topazes are exceptional, reaching thousands of carats!

Tourmaline group

Tourmaline crystals are quite common in Sakangyi pegmatites. Probably these are elbaites. They are formed as prismatic crystals, usually with simple pinacoid and/or pyramid terminations. The size of the crystals seldom exceeds 2-3 cm. The majority of the crystals are either completely black or black in their lower parts with color-zoned, gemmy terminations. Usually non-black tourmalines are greenish, pink, colorless or brown.

Because the gemmy parts of tourmalines are small they do not have high value as gems, but their occurrence makes the paragenesis much more interesting and valuable for collectors.

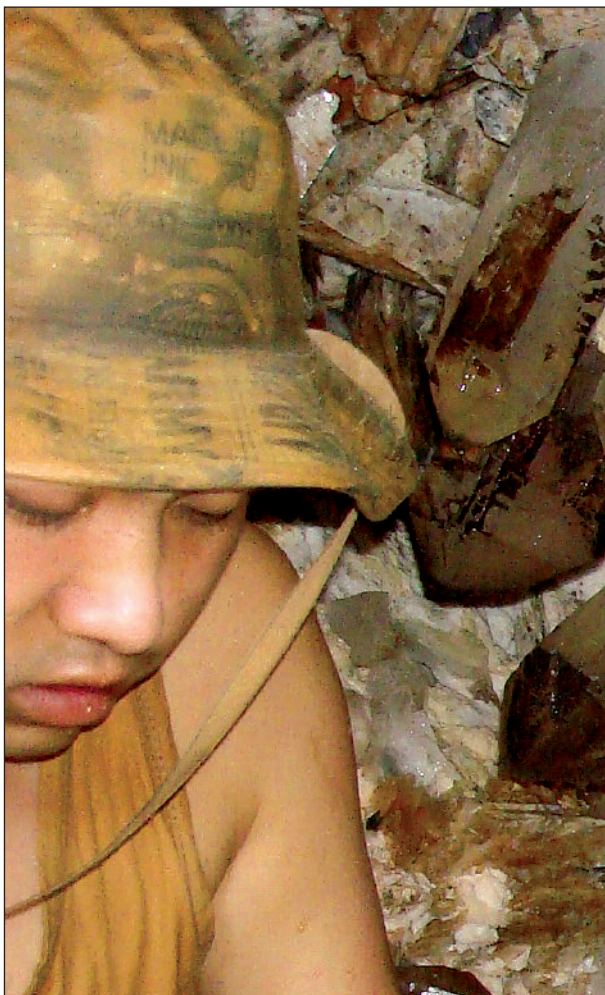
Topaz crystal from Sakangyi, 9 cm high. M. Weill collection. FMI-J. Elliott photo.

Gem topaz crystal from Sakangyi. W. Larson collection. M. Dixon photo.

Huge pocket just after its discovery, still full of mud. Saw Naung U photo.

Huge quartz crystals in the pocket. Saw Naung U photo.

Miner with huge quartz crystals inside the pocket. Saw Naung U photo.



Huge quartz, feldspar, mica and topaz crystals (at the center) in the pocket. Saw Naung U photo.

Quartz

Quartz is one of the most important mineral species, occurring in all bigger pockets in Sakangyi. Its habit is classically prismatic, usually with medium-lustrous or very lustrous crystal faces, sometimes preferentially frosted. The vast majority of the crystals are white or colorless and transparent. Yellowish, pink or smoky varieties are much more rare. Quartz crystals often show a well developed parquet pattern on prism faces.

Usually crystals grow in the pockets as a continuation of the pegmatite's graphitic texture. Thus all of their free-growing parts protrude in the same direction in relation to big K-feldspar crystals.

Some of the pockets contain quartz crystals which were broken and re-healed in the crystallization process.

The most common size of quartz crystals from the Sakangyi mines varies from a few to 20 centimeters, but there are also giant crystals known. The biggest one weighs 78 kg, while some of the clusters reach almost 200 kg!

What is more, small (3-4 cm), Japan-law-twinned quartz crystals showing the typical flattened habit are known from the locality.

Hair-like inclusions of rutile are reported in some quartz crystals.

Clean quartz is usually used as a gemstone or carving material, but well formed crystals, especially when associated with other minerals, are frequently sold as mineral specimens.

Scheelite

Scheelite crystals in Sakangakyi are rare but sometimes of good quality. They reach 2-3 cm and are usually yellow, orange or white; some green crystals have been reported. Sometimes parts of the crystals are gemmy. Their habit is pseudo-octahedral, typical for the species.

A part of the huge pocket filled with crystals. Saw Naung U photo.

Miner sitting in the huge pocket filled with monstrous quartz, feldspar, mica and topaz crystals. Saw Naung U photo.

Miners carrying out a huge specimen using bamboo. Saw Naung U photo.

Federico Bärlocher with huge topaz crystals. F. Bärlocher photo.

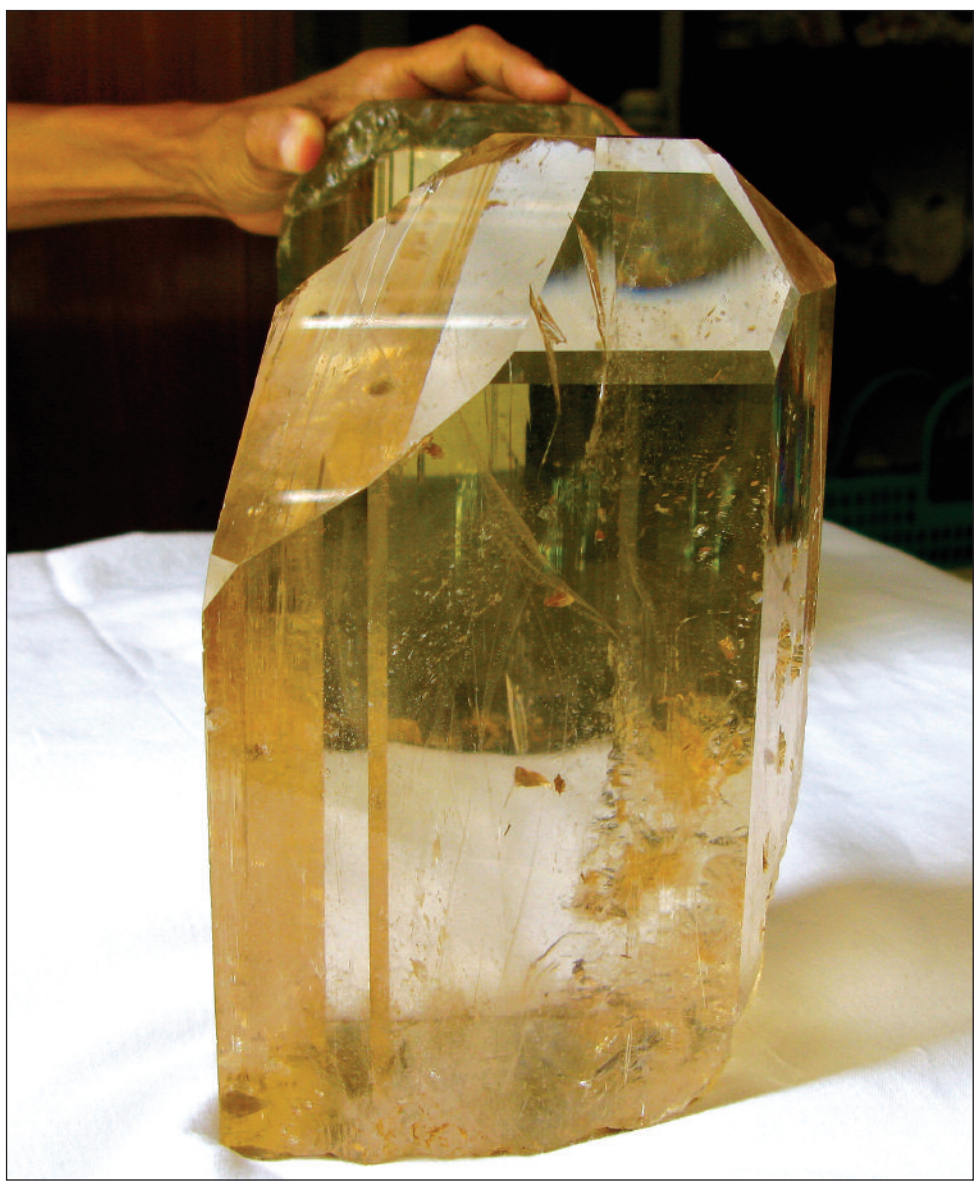
8-kg topaz crystal from the pocket. F. Bärlocher photo.

Specimen of topaz, quartz and feldspar over 35 kg. F. Bärlocher photo.

Clean 1.5 kg topaz crystal from the big pocket. Saw Naung U photo.

Examining freshly extracted specimens. Saw Naung U photo.

180-kg cluster of quartz, feldspar and mica from the pocet. Saw Naung U photo.



Superb gem topaz crystal weighing 4.5 kg! F. Bärlocher photo.

Topaz crystal, 6.7 cm tall. Arkenstone specimen. J. Budd photo.

Other minerals known from Sakangyi are columbite-tantalite, danburite, hessonite, rutile, sillimanite, thorite and uraninite.

POCKETS

Even more exciting than the minerals themselves are the pockets discovered through the years in the Sakangyi mines. We know very little about the majority of them because they were treated as "secrets" of the mine owners and also because, as mentioned above, the Mogok area is closed to foreigners.

The majority of the pockets are located in the core zone of the pegmatite bodies, which are composed of quartz, feldspar, mica and accessory minerals. Usually the pockets are not bigger than 1 meter, but there have been some important exceptions, including a pocket that reached over 8 m!

The paragenesis found in the pockets is usually very simple, containing only 4-5 different mineral species. All pockets contain feldspars and mica, and the majority of them also contain quartz. Topaz, beryl and tourmaline are more rare. Occasionally other mineral species are found.

The best available information on what the cavities look like comes from one of the most important mines owned by the Burmese medical doctor Saw Naung Oo. He started his operation in 2002 and for the first 4 years found almost nothing. Bonanza discoveries of pockets took place in the years 2006-2007, but since then, in spite of continuous mining, not much new has been discovered. It is very likely that pockets found during the 2006-2007 period formed a series of vugs located in the same zone.

The first important pocket, called "the Aquamarine Pocket", was hit in 2006 and produced 198 specimens containing lustrous, gemmy aquamarine crystals to over 10 cm long. Some of the crystals are simple and sharp, while others are etched and show interesting morphology. The majority were extracted as loose, single crystals, but a few specimens with quartz were recovered as well. Some of crystals are doubly terminated. Their colors range from light to deep blue. The biggest cut sone made from that find weighs 80 carats.

At the end of the same year another important pocket was found. It produced one of the biggest known quartz crystals from the area – 78 kg! Quartz crystals extracted from that pocket weigh altogether about 1.5 tons! Most of them are water-clear and very lustrous.

Cluster of topaz crystals, 9.5 cm high. W. Larson collection. J. Scovil photo.

The most extraordinary pocket, discovered at the end of 2006, was filled with mud so that its real size and quality were not apparent at first. After washing the mud out the miners found that the pocket was approximately 1.5 m high, 2 m wide and 8 m long! Clean, water-clear quartz crystals reaching 0.5 m hung from the roof and walls of the pocket, together with giant feldspar and mica crystals. Most importantly, a large number of clean, gemmy topaz crystals, from colorless to champagne-colored, were also found in the pocket. Some of these enormous topaz crystals, reaching 20 cm, are shown in the photos here. After careful extraction using only hand tools, hundreds of specimens were recovered from the pocket. The biggest cluster weighs 178 kg and the biggest individual topaz crystal weighs 80 kg! Miners carried these monsters using bamboo and ropes: it looked as though hunters were bringing deer into the village after a successful chase.

Topaz with quartz from Sakangyi pocket, 17 cm wide. Pala International specimen, now in the E. Long collection. J. Budd photo.

Topaz with quartz, muscovite and feldspar, 15 cm. Fine Minerals Intl. specimen. FMI-J. Elliott photo.

This exceptional pocket may be considered one of the world's most important topaz finds, having produced some of the best known topaz/quartz/feldspar matrix specimens.

PERSPECTIVES

Mogok has a rich gem-mining history and an expanding gem industry. It is almost certain that the Sakangyi mines will operate as long as pegmatites produce gemstones and specimens, but it is very difficult to predict whether any more exceptional pockets will be found. Today, with generally increasing use of digital cameras, there is a chance that the next extraordinary find will be documented photographically, creating a topic for another article about the Sakangyi area.

ACKNOWLEDGEMENTS

The authors would like to thank several people without whose contribution this article couldn't have been written. First of all, thanks to Doctor Saw Naung Oo, who photographed the pocket and contributed to the preservation of significant mineral specimens from the mine, and to his daughter, Mrs. Saw Sanda Soe, who provided us with many important details. Thanks also to Federico Bärlocher, Bill Larson, Jeff Scovil, James Elliot, Joe Budd, Mark Mauthner, Kyaw Thu, Mia Dixon and Neal Luppescou for providing the photos, and to Peter Lyckberg for the help with additional information. And last but not least we would like to thank Tom Moore for editing the article, and Joanna Gajowniczek, Mary and Paul Cragan for their help with corrections.

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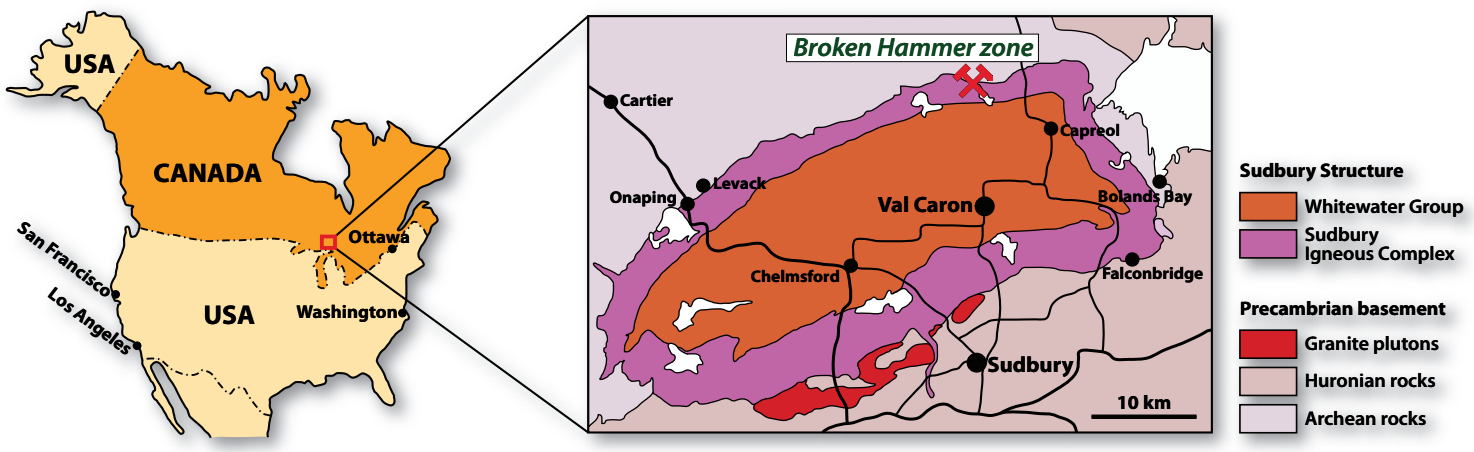
New great find: sperrylites from Canada

Bradley S. WILSON



Map of North America outlining the Sudbury region. Map insert shows simplified geology of the Sudbury Structure, the most important towns and roads in the area and the location of the Broken Hammer zone (simplified after Péntek et. al. *2008).*

Continiued from page 1

are classified as magmatic sulphide deposits, further divided into 4 subtypes. Most of the deposits are located at or near the base of the Sudbury Igneous Complex.

In plan view the SIC consists of an elliptical basin-shaped package of igneous rocks, 58 by 28 km, composed of continuous layers of norite, quartz gabbro, and granophyre, with a discontinuous basal layer of xenolith-rich quartz dioritic rock called the Sublayer. Above the SIC lies the Sudbury Basin which is occupied by the Whitewater Group, a package of sedimentary rocks consisting of heterolithic breccia at its base (Onaping Formation), followed by mudstone, siltstone and wacke. Together the SIC and the Sudbury Basin are called the Sudbury Structure. Underlying the Sudbury Structure and extending beyond it are the footwall rocks: gneissic and granitic rocks of the Archean Superior Province to the north and granitic and metasedimentary-volcanic rocks of the Proterozoic Southern Province to the south. These footwall rocks also include several types of unusual breccia; one of these, the Sudbury Breccia, has been observed as far as 80 km from the SIC.

The origin of the Sudbury Structure and its metal deposits is generally attributed to a meteorite impact 1.85 billion years ago. In the impact theory, the SIC is considered to be an impact melt, the Whitewater Group is the lithified remains of breccias and sediments that infilled the crater, and the unusual breccia found in the footwall rocks (Sudbury Breccia) is the result of the damage caused to the earth's crust by this massive impact.

Sperrylite crystal 1.1 cm high. Wallbridge specimen. B. Wilson photo.

Despite the quantity of ore mined in the past century, well crystallized minerals of any kind from the Sudbury area are scarce. Customarily, until very recently, mineral collectors speaking of desirable specimens from the area would mention only sperrylite from its type locality, the Vermilion Mine. In 1971, the Royal Ontario Museum acquired a specimen with a 12 mm-wide sperrylite crystal from that mine: the largest Canadian sperrylite crystal known at the time. But the discovery of larger, still excellent sperrylite crystals from the Broken Hammer zone will change this state of affairs.

MINERALIZATION OF THE BROKEN HAMMER ZONE

The Broken Hammer zone Cu-Ni-PGE deposit is located approximately 17 km north of Val Caron in Wisner Township and 30 km north of Sudbury. The de-

This trail was the only way to reach the Broken Hammer zone in October, 2006. B. Wilson photo.

Tarp over collecting area in the Broken Hammer zone in 2006. B. Wilson photo.

Massive chalcopyrite vein, Big Boy vein, exposed during the workings in the Broken Hammer zone. B. Wilson photo.

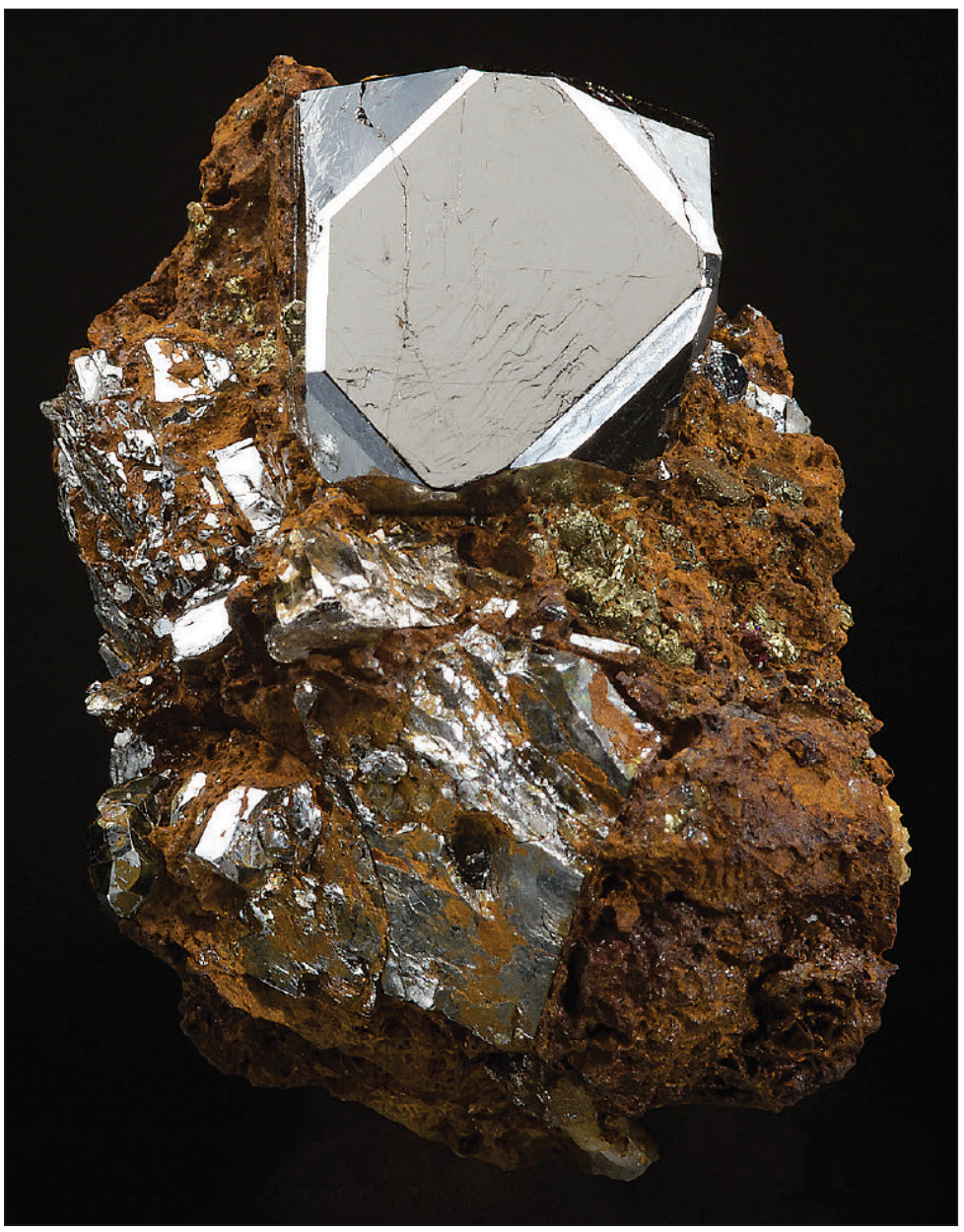
Working in the open pit in the Broken Hammer zone in 2011. B. Wilson photo.

General view at the open pit in the Broken Hammer zone in 2011. Most of the sperrylites come from a small area on the right side of the pit. B. Wilson photo.

Collecting from the Big Boy vein in 2006. B. Wilson photo.

General view of the specimen and close-up of the sperrylite crystal in breccia matrix. Crystal 1.5 cm wide. Wallbridge specimen. M. Bainbridge photos.

Sperrylite-rich specimen, the biggest crystal 1.5 cm high. Wallbridge specimen. M. Bainbridge photo.



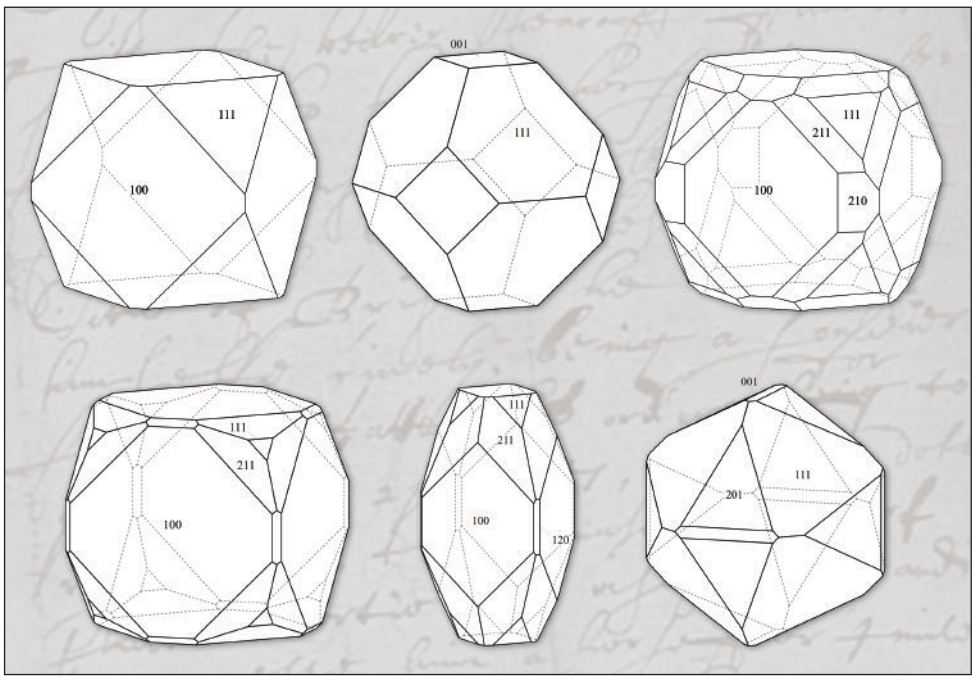
Sperrylite, specimen 2.9 cm high. Wallbridge specimen. M. Bainbridge photo.

posit also lies 1.3 km north of the present exposure of the SIC footwall contact. Mineralization occurs within and adjacent to the Sudbury breccia that developed in quartz monzonite, gabbro and diabase. The Cu-Ni-PGE minerals are distributed in massive sulphide veins, as dissemination/replacement sulphides, and in quartz-dominant veins within the brecciated mineralized zone. Magmatic-hydrothermal fluids played a significant role in the formation of the mineralization in the Broken Hammer zone.

In 2003, the Wallbridge Mining Company discovered platinum and other metals in an area not previously known to contain mineralization. This area was later named the Broken Hammer zone. During the next phase of exploration the zone was delineated by drilling, surface stripping and sampling. In November 2005, Wallbridge Mining Company Limited announced that the Broken Hammer zone had an inferred mineral resource total of 251,000 tonnes averaging 3.80 grams per tonne precious metals (Pd 1.56 g/t, Pt 1.62 g/t, and Au 0.61 g/t), 1.00% Cu, and 0.10% Ni. Stripping of the surface revealed a zone of complex geology and a number of massive chalcopyrite veins up to 1 meter wide, the largest of which was named the "Big Boy vein".

The main ore minerals in the Broken Hammer zone are most likely sperrylite and merenskite for Pt, gold-silver alloy and native gold for Au, merenskite and malyshevite for Pd, millerite for Ni, and chalcopyrite for Cu.

The complete list of sulphides and sulphosalts from the Broken Hammer zone is quite long. The most common sulphides are chalcopyrite, millerite, bornite and covellite, while pentlandite, sphalerite, pyrite, and pyrrhotite are rare. A. Péntek with others in 2008 identified a suite of rare metallic minerals that occur mostly as tiny grains in the mineralized zone; these include bohdanowiczite ($AgBiSe_2$), clausthalite (PbSe), crerarite ($PtBi_3S_{4-x}$), gold-silver alloy ($Au_{65}Ag_{35}$), hessite (Ag_2Te), kotulskite (PdTe), melonite ($NiTe_2$), merenskyite ($PdTe_2$), michenerite (PdBiTe), moncheite ($PtTe_2$), native gold, naumannite (Ag_2Se), sopcheite (Ag_4PdTe_4), tetradymite (Bi_2Te_2S), tellurobismuthite (Bi_2Te_3), malyshevite (which was an unnamed Pd-sulphide in 2008) ($CuPdBiS_3$), violarite ($FeNi_2S_4$) and wittichenite (Cu_3BiS_3).



Idealized crystal drawings of sperrylite crystals from the Broken Hammer Zone. A. Recnik drawings.

DISCOVERY OF SPERRYLITE CRYSTALS

In the Broken Hammer zone, complete sperrylite crystals to several mm and crystal fragments to 7 mm were found and documented for the first time by company personnel during early phases of exploration. In spring 2006, the author visited the site, which at the time consisted of a small cleared and washed area of outcrop in the surrounding forest located about 1.5 kilometers from the nearest gravel access road. In October 2006, the author returned to collect sperrylite crystals. Nearly a dozen small crystals were found, the largest of which was 1.5 mm across.

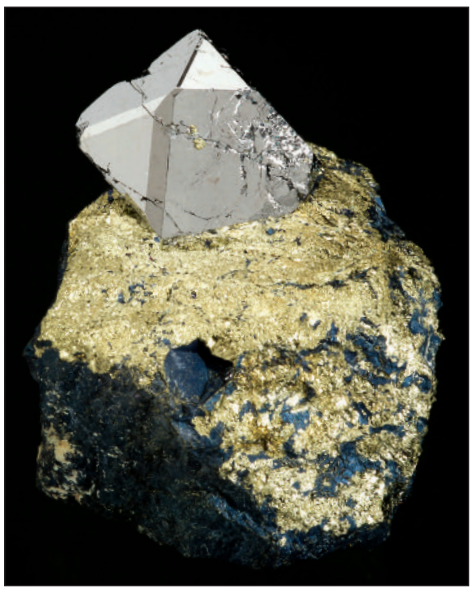
In January 2011, Wallbridge announced that the extraction of a 30,000-tonne bulk sample was underway. This large sample was taken to verify metal grade estimates determined from initial chemical analysis of drill core and for detailed metallurgical testing which will help determine the best extraction method for recovering the greatest percentage of each metal from this deposit. By the end of June 2011, the sample was delivered to Xstrata's Strathcona Mill, located in the Sudbury area, for processing. It was during the extraction of this sample that large sperrylite crystals were discovered.

Tom Johnson, an employee of Wallbridge Mining Company Limited, collected the largest of the new sperrylite crystals in early spring 2011. In May 2011, the author returned to the site and collected a suite of sperrylite specimens. Wallbridge then temporarily covered the crystal-bearing zone around the edge of the pit with earth to prevent potentially valuable sperrylite specimens from being high-graded. In late August 2011, the earth was removed using heavy equipment and then the locality was washed off using high pressure water to remove as much of the remaining earth as possible. This was done to allow detailed geological mapping of the entire pit by company geologists. At this point in time, Tom Johnson and the author returned to collect additional specimens. The zone hosting most of the largest crystals has now been removed in order to collect potential crystal-bearing rock that was later processed for specimens. A second crystal-bearing zone, a few meters lower

Sperrylite crystal 9 mm high. Wallbridge specimen. M. Bainbridge photo.

Sperrylite crystal 9 mm high. Wallbridge specimen. M. Bainbridge photo.

Sperrylite crystal 7 mm high. Wallbridge specimen. M. Bainbridge photo.



Sperrylite crystal in chalcopyrite from the Broken Hammer zone, Sudbury, Canada. Specimen 3.3 cm high. M. Bainbridge photo.

down the pit wall, produced most of the smaller sperrylite crystals (<5 mm). The most accessible parts of this zone have now been removed as well.

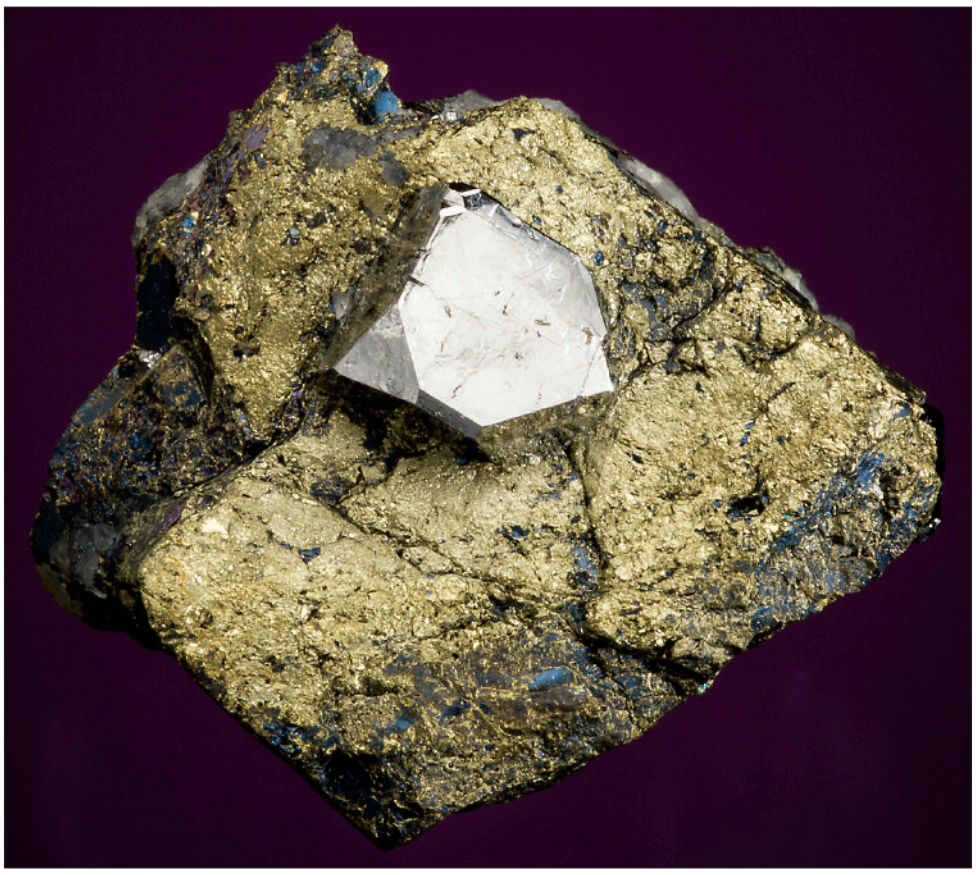
In total, over 400 specimens were collected, with sperrylite crystals ranging in size from under 1 to 15 mm and ranging in quality from poor to excellent.

SPERRYLITE

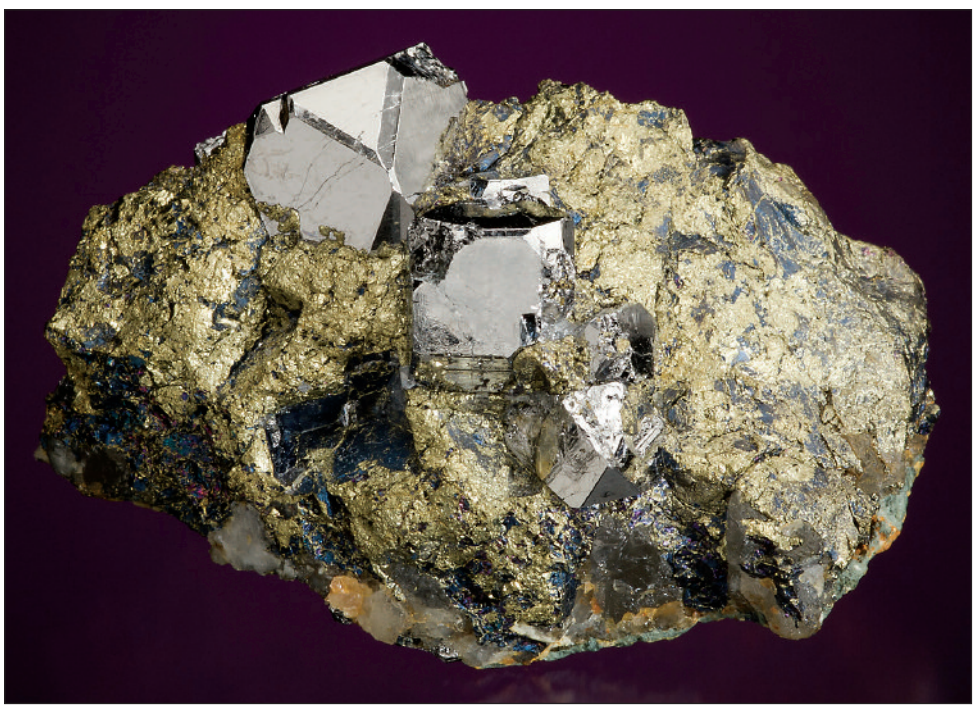
Sperrylite from the Broken Hammer zone occurs as isolated, mostly complete, well-formed, euhedral crystals with bright silver-white, highly reflective crystal faces. All were found encased in matrix and later exposed mechanically. At least five types of matrix were identified: massive chalcopyrite, massive millerite intermixed with lesser amounts of chalcopyrite, an epidote-quartz-rich matrix with variable grain sizes and mineral ratios, a porous rusty gossanous matrix (likely a product of surface weathering of the sulphides) and rusty breccia consisting of rock fragments held together with iron oxides (likely a weathering product as well). The majority of specimens with crystals greater than 5 mm came from one small zone where the matrix was chalcopyrite, rusty gossan or rusty breccia. As might be expected, very few undamaged crystals were found in either the rusty gossan or rusty breccia. The majority of specimens with small sperrylite crystals (less than 5 mm) have an epidote-quartz matrix, although crystals as large as 9 x 8 x 8 mm are known in this matrix type. This is unlike most sperrylite specimens from elsewhere in the world, where matrix consists primarily of sulphides.

Probably the finest specimen from the Broken Hammer zone consists of a sharp, isolated sperrylite crystal, 13 x 11 mm across, that sticks out 8 mm from a massive chalcopyrite matrix 5 cm across. It's a stunning masterpiece of nature.

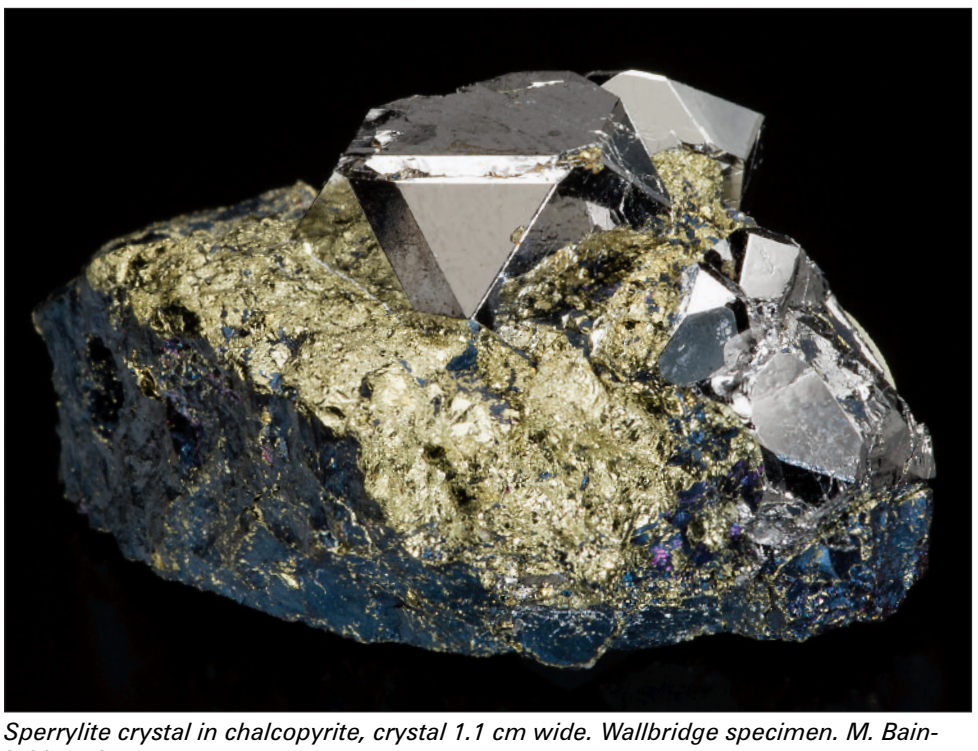
Crystal forms on Broken Hammer sperrylite appear to be similar to those described for sperrylite from other localities. The most common forms are the cube and octahedron. Some crystals seem to possess a simple cubo-octahedral habit, while others are far more complex. In addition to the cube and octahedron, many crystals appear to display pentagonal-dodecahedral and trapezohedral-trisoctahedral forms that truncate the edges of cube faces or cube-octahedron faces, respectively. Most sperrylite crystals are not ideally developed and therefore some of the forms are either exaggerated or absent.



Sperrylite crystal, 1.3 cm across, in chalcopyrite matrix, specimen 5 cm wide. Wallbridge specimen. M. Bainbridge photo.



Sperrylite crystal in chalcopyrite, crystal 1.3 cm wide. Wallbridge specimen. M. Bainbridge photo.



Sperrylite crystal in chalcopyrite, crystal 1.1 cm wide. Wallbridge specimen. M. Bainbridge photo.

PERSPECTIVES

Wallbridge Mining is in process of determining the economics of the Broken Hammer deposit, and thus of deciding whether or not they will commence with developing a Cu-Ni-PGM mine. If a metal mine is not opened the prospects for another bonanza of fine sperrylite specimens seem low because most of the currently known surface exposures have been heavily collected. If a mine is developed on this site, then the future looks bright for the potential recovery of additional fine sperrylite specimens.

ACKNOWLEDGEMENTS

The author would like to thank some of the many people at Wallbridge Mining Company Limited for their help with this article, specifically, Tom Johnson for help in the field with logistics and specimen collection, Attila Péntek for providing useful comments and suggestions and Alar Soever, company CEO, for recognizing the specimen potential of this discovery and having the vision to help preserve our mineral heritage. The author would also like to thank Aleksander Recnik for help with crystallography and crystal drawings, John Rakovan for suggestions and comments, Tom Moore for editing and Paul Cragan for making comments.

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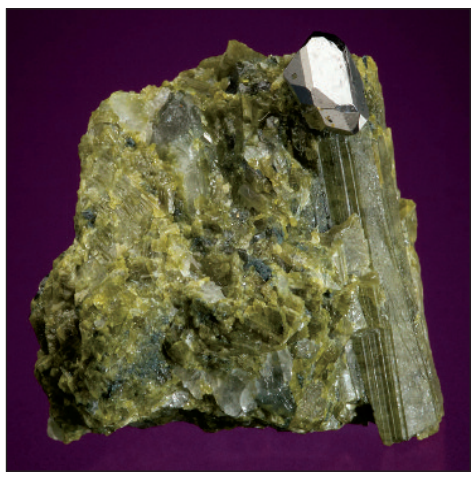
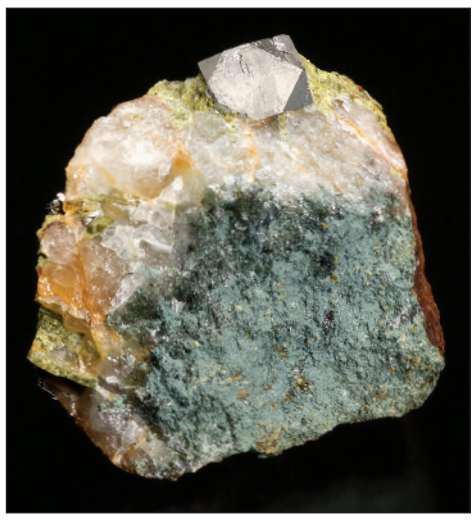
Sperrylite crystal in epidote matrix, crystal 1.2 mm wide. D. Joyce specimen. J. Jaszczak photo.



Sperrylite crystal in epidote matrix, crystal 4.5 mm high. Wallbridge specimen. M. Bainbridge photo.



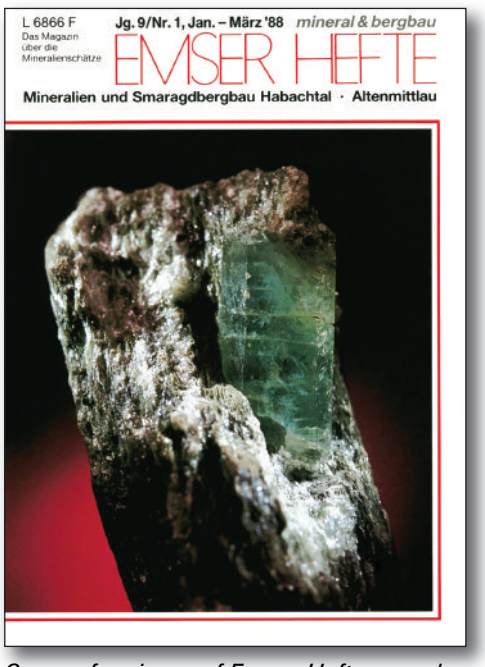
Sperrylite crystal in quartz-epidote matrix, specimen 4 cm wide. Wallbridge specimen. M. Bainbridge photo.

Journal presentations: MINERALIEN-Welt

Cover of the first issue of the MINERALIEN-Welt published in 1990.

MISSION

MINERALIEN-Welt attracts a wide spectrum of professionals, mineral collectors and people just starting to develop an interest in minerals. Our aim is to offer the newest information as well as report on classics and rarities in the world of fine minerals. Because we are a German-based magazine we of course run articles on German, Austrian and Swiss minerals and localities, however, for the most part MINERALIEN-Welt covers international topics, for example on selected mines, important museums or private collections. The always varying content makes MINERALIEN-Welt an indispensable companion for every lover of beautiful crystals and gems and for those who want to stay current with what is happening in the world of mineral collecting.



Cover of an issue of Emser Hefte – predecessor to Magma and MINERALIEN-Welt.

QUALITY

The only 100-page mineral magazine in Europe, MINERALIEN-Welt comes in a special format and is very easy to handle. MINERALIEN-Welt is printed in full-color on high quality glossy paper to guarantee brilliant mineral pictures. The layout is modern and regularly modified to meet our reader's demands. One special clue regarding the content is the unique section ACHAT-Magazin (Agates magazine) in the back of every issue and the convenient show calendar SAMMLER-Info, which is mailed automatically to all our subscribers for free. Although MINERALIEN-Welt is published in German its editorial staff spans six different nationalities, over the past 20+ years we had over 200 authors from all continents, and we have 6200 subscribers from 41 countries.

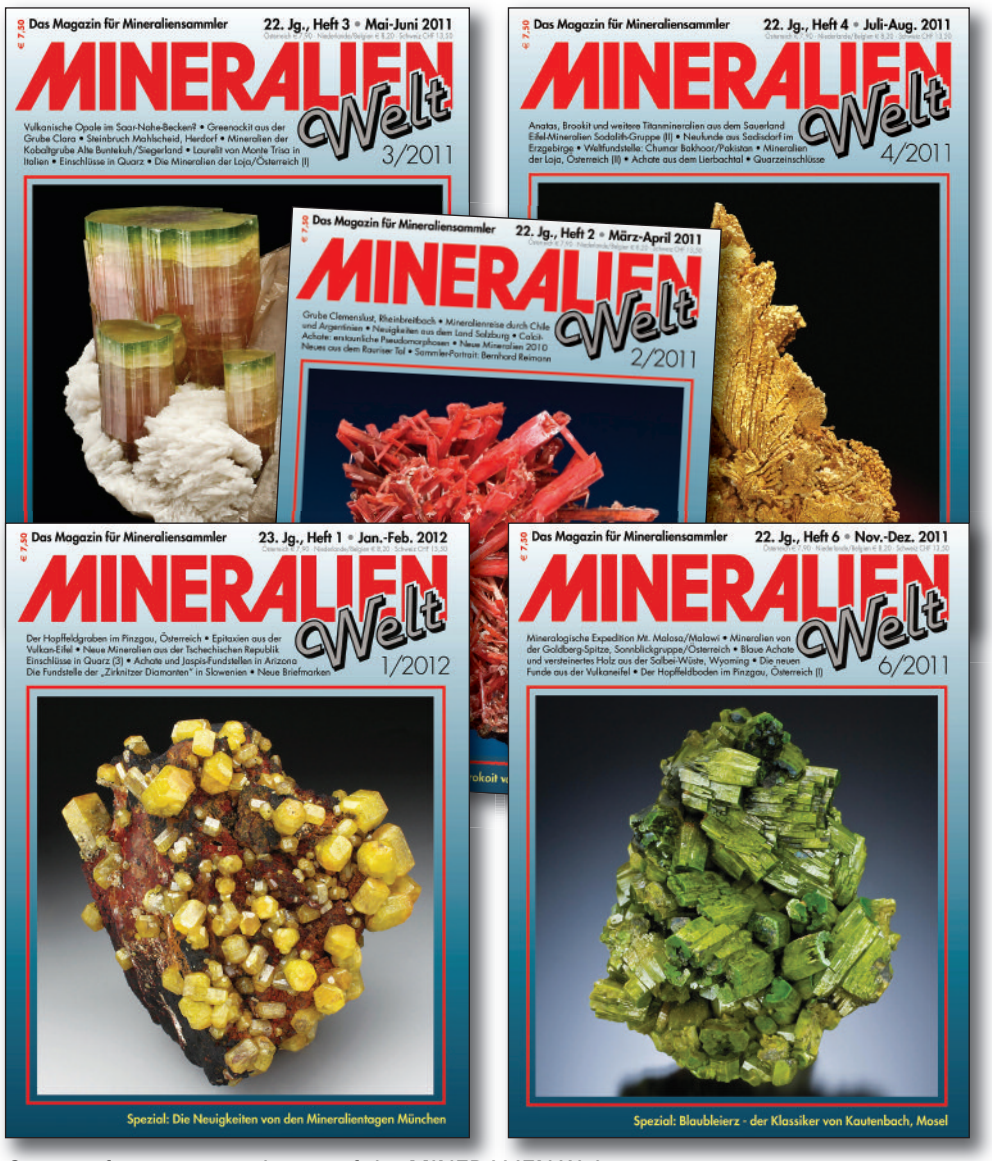
WEB PAGE

The internet is of course very important because the hottest news in the world of minerals is usually spread here first. It is also an important tool for advertising but so far no online-edition is planned. On our homepage, however, you can check all tables of contents of the last 20 years and check if the back issues are still available to purchase, the address is *www.mineralienwelt.de*.

HISTORY

Publisher Rainer Bode started his work as an editor and publisher in 1978,

Rainer Bode – editor and publisher of the MINERALIEN-Welt – at work.



Covers of some recent issues of the MINERALIEN-Welt.

with the publication of the first edition of EMSER HEFTE (the notebook for Ems), which was launched in the first Mineral Days of Bad Ems minerals. Emser Hefte focused on classic mining districts, and was published quarterly, however the series, rich in tradition, came to an end in 1994.

In 1983, with Magma, Rainer put a new, larger format, mineral magazine on the market. Renowned experts from all over Europe contributed to this specialized journal, which was richly illustrated. However, it too was abandoned, after only seven editions.

In 1990 the larger format for MINERALIEN-Welt was created. This was precipitated by the reunification of the Federal Republic of Germany (West Germany) and the German Democratic Republic (East Germany).

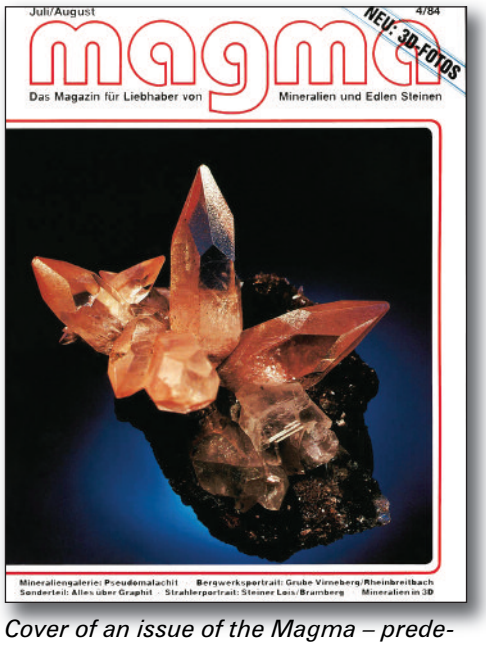
From 1985-2009, Rainer Bode has lived in Haltern-Flaesheim, approximately 30 km north-east of Essen, where he and his wife, Doris, ran a small, specialized publishing house (*www.bodeverlag.de*) for the world of minerals and the mining industry.

World-wide recognition was earned by Bode Verlag with the publishing of the books on Morroco (2004), Russia (2007) and Namibia (2007), as well as the famous AGATES triology (2005, 2009 and 2011). In the 2009 Bode Verlag moved to its new home in Salzhemmendorf-Lauenstein in Lower Saxony.

SUBSCRIPTIONS

A 1-year subscription costs 46€ (Germany), 54€ (worldwide surface mail).

Collectors can order the magazine and sign up for a subscription online through our shop *www.bodeverlag.de/shop* or just send a mail to bode-verlag@t-online.de.



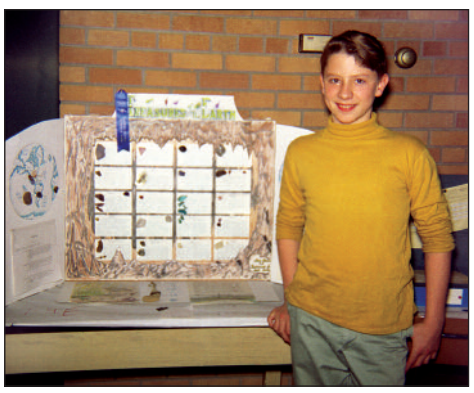
Cover of an issue of the Magma – predecessor to MINERALIEN-Welt.

Logo of the MINERALIEN-Welt.

Collector interview: Wendell Wilson (USA)

Wendell Wilson – mineral collector, Mineralogical Record *editor, author of many articles. Recent photo (2009) by G. Spann.*

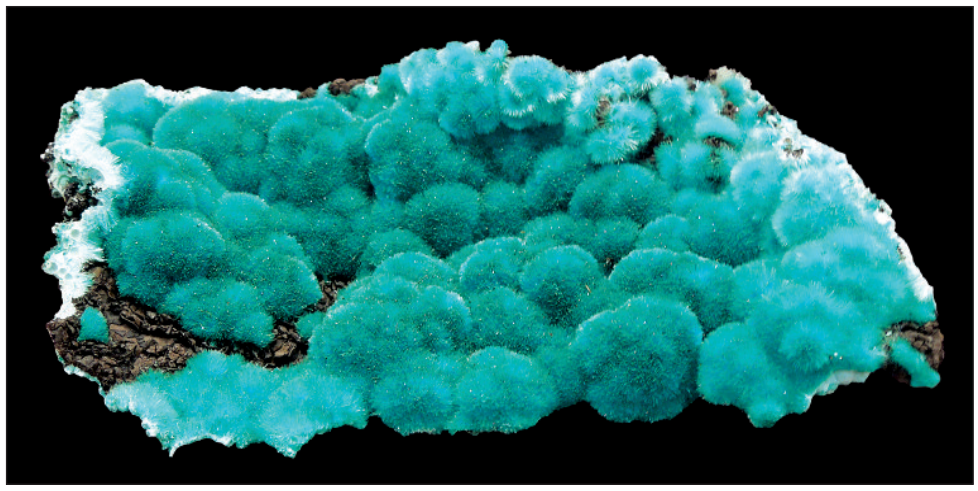
Dr. Wendell Wilson (born in 1946) is well known as being the chief editor of the *Mineralogical Record* for the last 36 years, as well as being a mineral artist and mineral collecting historian. In addition to his many responsibilities at the *MR*, Wendell does the layout for every issue and works intimately with the printers so that every publication meets his very high standards. It is less well known that he is also an avid field collector who spent a lot of time in his early days collecting underground at many famous localities. To my surprise, he is also a black belt in karate. Because he is such an erudite mineralogist/collector, we decided to make this interview a bit longer than normal.



Wendell with winning Science Fair entry about Mineralogy in 1958, at age 12.

Tomasz Praszkier (Minerals): *Tell me something about your family background.*

Wendell Wilson: Well, my father was a professional engineer and, in his later years, a corporate CEO; in the 1950s he helped design and build some of the earliest computers for the military. My mother was an artist and poet. So I came by my dual interests in science and the arts through them. No matter what subjects I studied or what projects I undertook or what business problems I encountered, one of them always understood the problems and could provide help when I needed it.



The world's finest aurichalcite specimen, 14 cm wide, collected by Wendell Wilson in 1972 at the 79 mine in Arizona, USA. Now in the collection of the Arizona-Sonora Desert Museum. W. Wilson photo.

TP: *How and when did your interest in minerals and collecting begin?*

WW: My parents used to take me for summer vacations to Duluth, Minnesota, on the shore of Lake Superior. There I collected agates on the beach and visited rock shops where I bought my first small specimens around 1956, when I was ten years old. I saw amethyst crystals from up the shore at Thunder Bay, Ontario, and collected prehnite and thomsonite from shoreline exposures. I was immediately fascinated with minerals, and the fascination has never left me.

TP: *Your mineralogical studies culminated in a Ph. D. - what was the specialty and theme of your studies?*

At heart I am an artist, and I actually began my college career majoring in Fine Art. But I decided in my second year that it might be difficult to put food on the table as an artist, and that a regular paycheck would be more likely if I pursued my second love – geology/mineralogy. So, in order to cover both bases, I took a double major of Art and Geology, alternating Geology classes with Art classes. My Masters Thesis was on the mineralogy of a very interesting meteorite (Bondoc). For my PhD work I specialized mostly in geochemistry, worked on some of the first lunar samples, and did rubidium/strontium age-dating of some very old rocks (3.5 billion years).

My PhD program required that I have a "minor field" of study; I had already qualified in German, and my first thought was to take Russian. But instead, because I loved specimens, I proposed to my advisors that my minor field be "Museum Science." There were no classes offered in that subject, so I suggested that I do it all by "independent study" during the summer at some big museum. To my advisors' credit, they said "Why not?" to my unorthodox suggestion. Subsequently I was taken on as an intern by Brian Mason, Head of the Mineral Sciences Department in the Smithsonian Institution. I worked for him mornings on Lunar samples, and spent afternoons playing with all the great mineral specimens. I got to know John White and Paul Desautels, and I also spent time there learning mineral photography, with a little help from Lee Boltin.

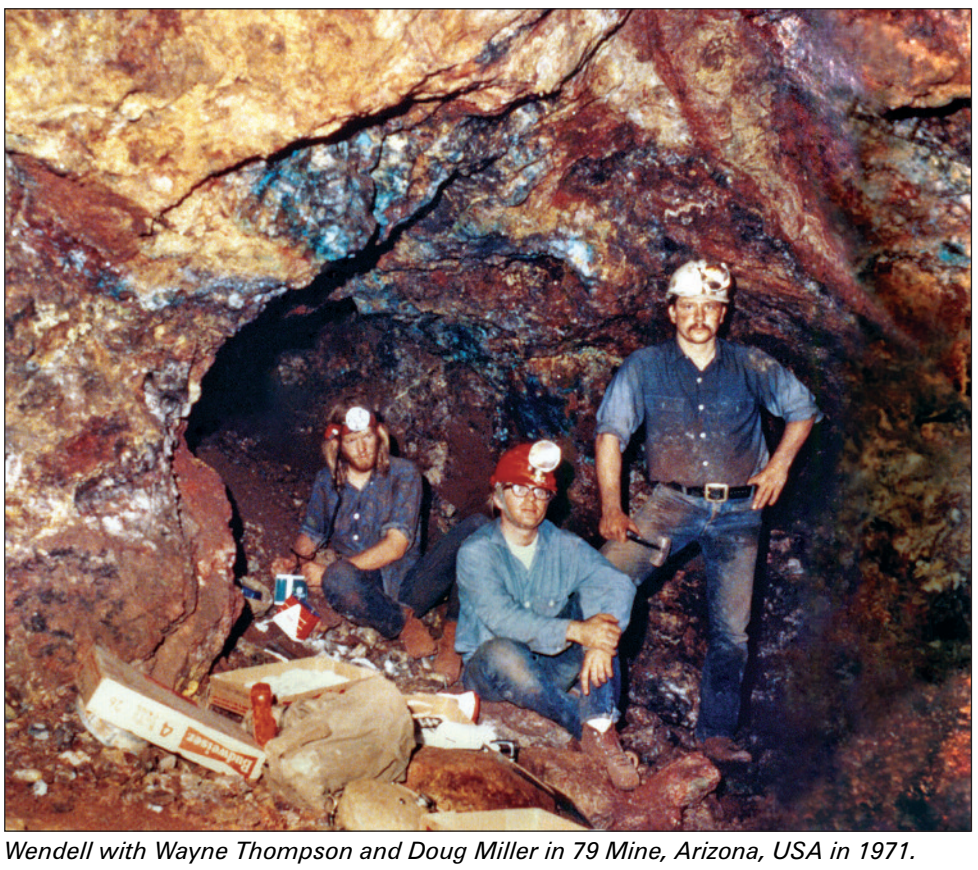
Wendell with collecting partner Doug Miller (right) and a non-collector friend at the 79 Mine in 1972, having just emerged from collecting the aurichalcite pocket.

TP: *When and where did your first mineral collecting take place?*

WW: My first really successful field trip (aside from childhood adventures along the lake shore) was to a working lead mine (the Buick mine) in Missouri with my college roommate, John Winston. We found a marcasite crystal pocket big enough to sit in, and carved out enough big cabinet specimens to fill the back of the mine geologist's pickup truck. They were totally covered with mud, and we didn't realize what fabulous specimens we'd found until we got them back to the motel and washed them off in the bathtub. They had an unusual pyramidal habit, almost like dogtooth-spar calcite, and were very lustrous. I've never seen anything like them since.

TP: *What do you consider your most important field collecting trip? What is your best self-collected specimen?*

WW: One highlight is certainly collecting aurichalcite at the 79 mine in Ari zona in 1972. I found what I believe is still the world's finest specimen of the species – a 14-cm slab of amazingly dark turquoise color, composed of sparkling crystals so big that light actually reflects off the tiny termination faces, something I've never seen on other specimens of aurichalcite. I later sold it to a local collector for $150 (a lot of money to a poor college student in those days). I took out three boxes of great specimens, but that one was the best of the lot. It is currently on exhibit at the Arizona-Sonora Desert Museum.



Wendell with Wayne Thompson and Doug Miller in 79 Mine, Arizona, USA in 1971.

TP: *In what countries have you field collected?*

WW: Other than the U.S., just Brazil. Luizelio Barretto and Alvaro Lucio took me around to various famous localities. It was fun collecting wardite crystals at

Wendell with Paul Moore in Brazil in 1973 at the "Avenida Tourmalina".

Wendell with his wife Carolyn in 1974 at the Grandview Mine, Arizona, USA.

Lavra da Ilha, an island mine in the middle of the Jequitinhonha River which is most famous for rose quartz crystals.

TP: *You collected during times of many great discoveries (Red Cloud, Blue Caps etc.) – did you participate in any of them? Who were your collecting partners in the past?*

WW: I did most of my field collecting in Arizona when I was working on my Master's Degree at Arizona State University, and later when I would make trips back to Arizona specifically to collect. I collected with several people over the years, nearly all fellow students, like Doug Miller and Rick Stinchfield. Wayne Thompson (now a well-known mineral dealer) was one of my favorite collecting partners in the 1970s; he considered me a good luck charm. I also collected in Brazil with John White and Paul Moore (who kept jumping off into the jungle after butterflies). When my girlfriend, Carolyn (now my wife), would come out to Arizona to visit, she would go underground with us. We collected many times at the Apache, Red Cloud, Old Yuma, Rowley, Glove, Ray, Grandview, Grand Reef, Defiance, Silver Hill, Silver Bill, Harquahala and 79 mines, among many others. And my connections as a geologist got me into working mines as well, like the Magma mine.

Wendell Wilson with Wayne Thompson in 1980 at the Ray Mine, Arizona, USA.

I made my best discoveries at the 79 mine, but the Rowley mine was also one of my favorites, because sparkly wulfenite was everywhere. You climbed down a timbered incline to the 100-foot level, which branched left and right at the bottom. To the left was all the wulfenite. To the right was a vein of gem-grade chrysocolla, and that was also where all the bats lived, so the bat guano would accumulate on the floor, sometimes up to 15 cm deep. Local ranchers would come in and shovel it out periodically to sell as very expensive high-grade fertilizer. The smell of the guano was so incredibly powerful that my mind would shut down and I couldn't take a step closer, so I never got to the chrysocolla vein. But the smell still permeated the rest of the mine to a lesser extent, and I collected there so many times that now I just *love* the smell of bat guano; it's so nostalgic!

TP: *Is there a focus or specialty in your collection? What kind of specimens do you collect, what size, locality etc? How many specimens do you have?*

WW: I have about 400 specimens in my collection – mostly thumbnail size but also a fair number of miniatures and a few small cabinet-size specimens. I decided ultimately not to specialize in any particular size or locality, but to consider each specimen independently, and only acquire those that really give me a lot of pleasure to own (and that I could afford). Consequently perfection and aesthetics are the most important factors; most of my specimens have very bright, clean color and many are gemmy and lustrous.

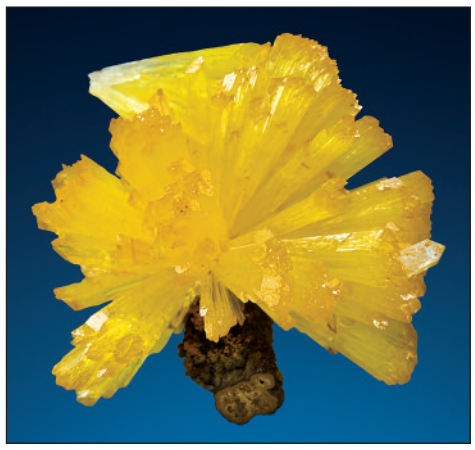
TP: *You have sold your collection three times in the past. Is each new collection different or higher quality than previous one? Were all of them thumbnails collections?*

WW: My first collection was essentially a species collection plus self-collected specimens. That's always a good way to start, because it helps you learn about all kinds of minerals. Having done that, you can move on to other types of collections. I saw the first three issues of the *Mineralogical Record* in 1971 when I visited the home of Scott Lewis in Phoenix, and I also saw his superb collection of competition-quality miniatures. That blew me away, because I had never seen such aesthetic specimens. Then and there I decided to get rid of my first collection and start over.

My second collection was more oriented toward aesthetics and certain localities, and contained quite a few nice things, mostly miniatures. But after many years it got to be worth a fair amount of money, and I began to wonder whether that money might be more reponsibly invested in the stock market. So I sold it all, and for two or three years in the 1990s I didn't collect minerals.

During that interval, however, I became very interested in collecting antique miners' lamps and (forgetting entirely about the stock market!) built an excellent collection, and wrote two books on the subject (on frog lamps and on miner's candlesticks). I had over 50 different kinds of frog lamps, and some very rare candlesticks, some of which were mechanical folders and silver-inlayed presentation pieces. I owned Friedrich Kegel's personal brass carbide lamp; he was the Mine Director at the Tsumeb mine from 1922 to 1938. I should have kept that one for its mineral collecting significance.

Wendell doing mineral photography in 1979.



Mimetite from Ojuela mine, Mexico; 2 cm high. W. Wilson collection. J. Scovil photo.

Uvarovite from Outokumpu, Finland; 1.8 cm high. W. Wilson specimen and photo.

Display case in Wendell's home with his recent collection. W. Wilson photo.

Rhodochrosite from N'Chwaning mine, South Africa; 2.9 cm high. W. Wilson collection and photo.

But I missed the excitement of the hunt for minerals, especially at shows. So I finally sold all of the wonderful mining antiques (after using some for props in still-life paintings) and returned to mineral collecting, with a very focused concentration on aesthetic specimens. Of course my enthusiasm for minerals returned immediately in full force.

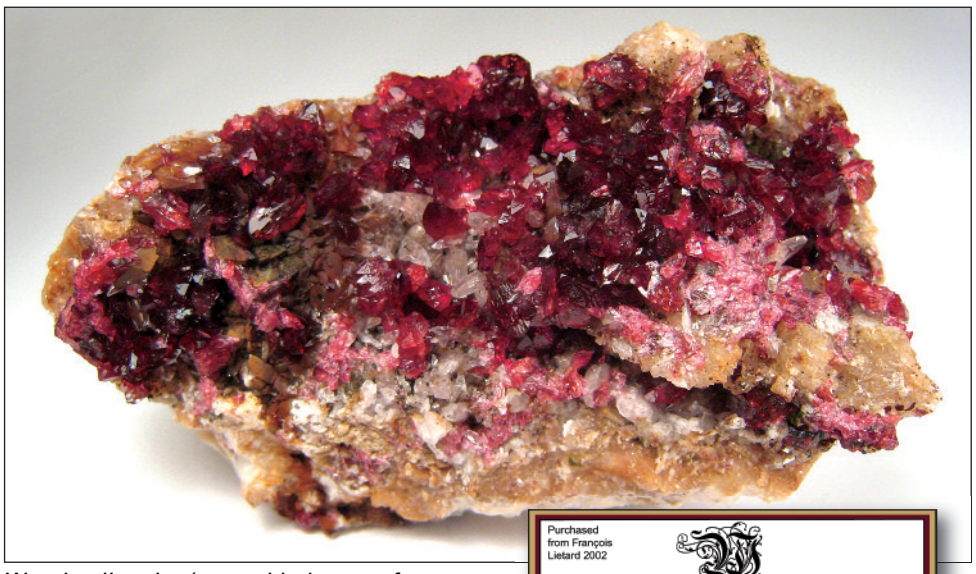
TP: *There is a mineral species named after you – wendwilsonite – do you have any good specimens of "your mineral" in your collection?*

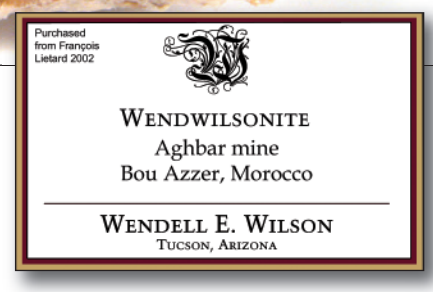
WW: It is honor enough to be the subject of a mineral name, but for the species to be so gorgeous is truly amazing, I'm very fortunate. I do have one very good example, about 8.5 cm wide with nice, big, richly colored crystals. I bought it from Francóis Lietard in 2002. It was the second-best one he had, and I have always kicked myself for not buying the best one. I've learned that, in mineral collecting, there are three main sources of pain: (1) specimens you didn't buy but should have, (2) specimens you sold but shouldn't have, and (3) specimens you broke. Passing up that best wendwilsonite still hurts to think about; it would have been fun to own.

TP: *What is the best specimen in your collection in your opinion? Is it also your favorite piece?*

WW: My best piece is a phosphophyllite thumbnail from Bolivia. It measures exactly an inch, has good color, is a nice evenly balanced V-twin, and is perfectly lustrous and undamaged. It even has a trace of rock at the base, so I can officially call it "on matrix." It had been brought back from Bolivia to Tucson in the 1950s by an American mine geologist, and given to his wife as a birthday present. She was never a very active collector and remained unknown to other local collectors. Finally she decided to sell it in 2006, and I was shocked when I saw it, because I had thought I knew where all the good ones were, and this one was completely new.

TP: *You are the author or co-author of around 150 articles (mainly published in MinRec), over 350 column installments on various subjects, and 13 books, and you have overseen the production of around 30 special issues of MinRec. How did you become involved with the MinRec? When did you start working there as a full-time job?*





Wendewilsonite (named in honor of Wendell Wilson), 7.8 cm wide, from Bou Azzer, Morocco; from Wendell's collection. At right: his label for the specimen. W. Wilson photo.

WW: I had always thought I would be a museum curator after getting my PhD. But major mineral museums are few, and when I graduated in 1976 there were no openings. John White had been keeping track of my job search, and so he offered me the job of editor of the *Mineralogical Record*. His own curatorial job at the Smithsonian was not allowing him sufficient time to also produce the magazine, and he needed help. So I came on board, at the princely salary of $15,000/year. All of the money to pay me came from the profits from the second edition of the Glossary of Mineral Species (1975); John said that if I couldn't get the circulation up enough to pay my salary for the second year, I'd be out of a job. Fortunately I was able to double the circulation in that first year, thanks in part to special projects like the Colorado Issue and the Tsumeb Issue, and to a greater emphasis on specimen photography, which people really appreciated.

TP: *What future do you see for MinRec and what kind of content do you plan for the future? Will it be some day published only as a digital journal?*

WW: I think the *Mineralogical Record* has a great future, because it is a vehicle of passion about minerals, and it connects with the passion of collectors. All of us on the staff are mineral collectors, and love to talk to other collectors. For example, when a subscriber calls Tom Gressman (our Circulation Director and Associate Publisher) about ordering some back issues, they often end up chatting for half an hour about minerals. We'll continue to focus the magazine on locality mineralogy, especially the more famous localities that collectors are likely to have represented in their collections. And we like to include a lot of historical information and market news as well, sometimes augmented by reports describing individual collections not just of elite specimens but sometimes collections with interesting specializations. As long as we continue to have the support of our readers and our wonderful group of Fellows who help us with donations, we'll be here.

As to going digital, I suppose that is the destiny of all publications, but we'll probably continue as a paper publication for quite a few more years. However, I would eventually like to publish the early volumes on CD, and have all published articles available online for downloading. That's something we'll be working on in the future.

TP: *As you probably know there are some collectors who accuse MinRec of being "controlled" by high-end dealers/collectors, claiming that publishing photos of high-value specimens is promoting the wealthy, and publishing special issues devoted to private collections is like printing sales catalogues at subscriber expense? There are obviously many agendas in a hobby as varied as mineral collecting, and accusations, however unjustified, affect other's perceptions. Would you address this issue?*

WW: We've always heard accusations of being "elitist," either because our content is perceived as being "too techni-

Tanzanite from Merelani Hills, Tanzania; 2.3 cm high. W. Wilson collection. M. Keim photo.

Väyrynenite from Shengus, Pakistan; 1.7 cm high. W. Wilson collection. J. Scovil photo.

Euclase from Lost Hope Mine, Zimbabwe; 1.9 cm wide. W. Wilson specimen and photo.

Diopside from Merelani Hills, Tanzania; 2.5 cm high. W. Wilson collection. M. Keim photo.

The best specimen in Wendell's collection (in Wendell's opinion) – phosphophyllite from the Unificada mine, Bolivia; 2.7 cm. W. Wilson collection. J. Scovil photo.

Ludlamite from Santa Eulalia, Mexico; 2.8 cm high. W. Wilson collection and photo.

Volume 7, number 2 of the Mineralogical Record*, published in 1976, the first issue edited by Wendell Wilson.*

cal," or because we try to publish photos of the best specimens we can find, many of which would be too expensive for the average collector. But we have always felt that doing so is educational for every reader. The best specimens show the fullest development of the various features and qualities of a species; you can always extrapolate that downward to lesser specimens, but you can't look at lesser specimens and know what the best will look like. Every collector carries a mental databank of knowledge about how good every species he's seen can get at various localities. When you collect or are offered a specimen for sale, you can then judge its quality accurately. Why would you want to buy an art book about Rembrandt if it only pictured his mediocre works and none of his best paintings? So you buy a book that shows his best paintings, and you don't waste your time gnashing your teeth over who owns them or the fact that you can't afford to buy them! Personally none of us at the *Mineralogical Record* can afford to collect elite specimens, but we still love to look at them; it is part of having a passion for minerals.

In the past we had ONE special issue devoted to a private collection that, in retrospect, did indeed seem too much like a sales catalog (even though we naively didn't realize at the time that it would be regarded that way). Since 2000 we have only issued such publications as free separate supplements to the regular issues; subscribers are free to enjoy them or call them advertising or just discard them, knowing that none of their subscription money went to pay for them.

TP: *You have extensive knowledge and interest in the history of mineral collecting and mineralogy. Why do you find it so interesting?*

WW: I like relating to the mineral collectors of the past, because after studying them and their lives in detail, I see that we are all exactly the same in our passion for minerals. I can't get to meet them anymore but I can still get to know them.

TP: *Can you tell us about the book "*The History of Mineral Collecting 1530-1799*"?*

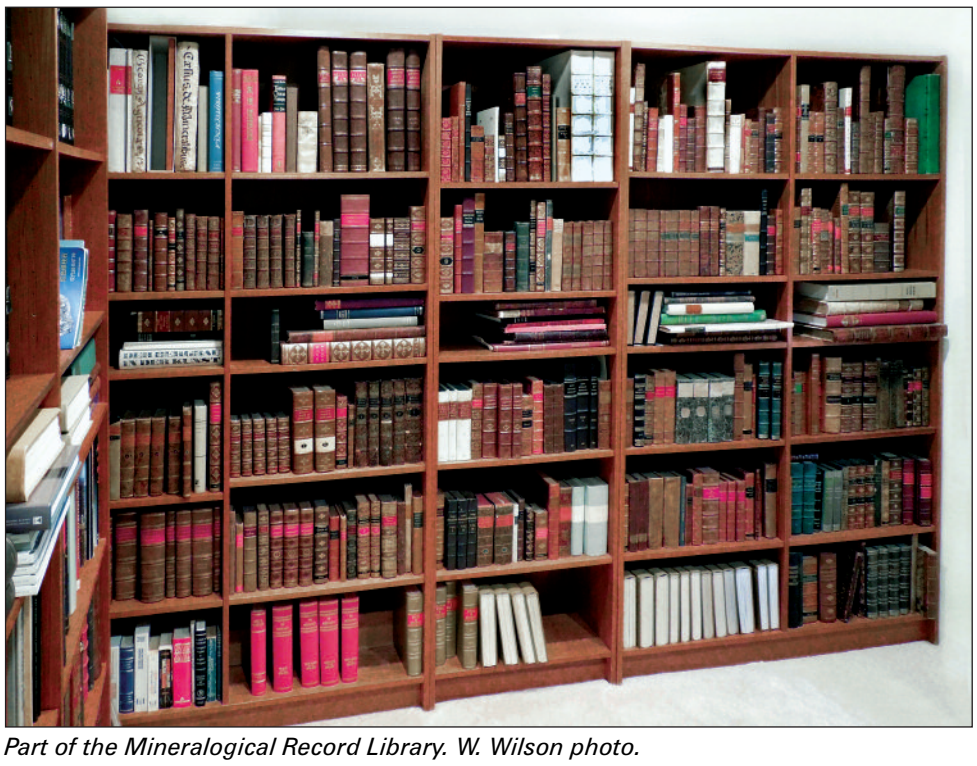
WW: That was one of those projects that started out small and got completely out of hand. Originally I wanted to write a Handbook of Mineral Collecting, and decided there should be a chapter on the history of mineral collecting, just to add a little perspective. But the more I researched it, the more information I found. I had guessed that no more than a couple of dozen mineral collectors were really active in the 18th century and before; but by the time I was done I had documented over 1200 of them. Truly, if I had known what I was getting into when I started, I probably would not have done it. But it was fascinating and I learned a lot doing the research.

TP: *Can you explain to the Readers what "The Mineralogical Record Biographical Archive" and "The Mineralogical Label archive" are?*

WW: The label collection was initiated by the famous mineral collector and micromounter Neal Yedlin (1908-1977) in the 1960s. It was inherited upon his death by fellow label collector Ronald Bentley (1948-1995), who merged it with his own extensive holdings. Bentley bequeathed his and Yedlin's label collections (over 5,000 examples, counting duplicates) to the *Mineralogical Record* Library in 1995. The other major repository of mineral labels in the U.S. was assembled by Richard A. Bideaux (1935-2004), who in the 1990s also acquired the equally large collection of Lawrence H. Conklin and merged it with his own. The labels in Conklin's collection had all been salvaged from the effects of the late Peter Zodac (1894-1967, founder of *Rocks & Minerals* magazine) in 1967. Bideaux graciously bequeathed this combined collection of over 3,500 labels to the *Mineralogical Record* Library, in 2004. He believed that doing so was the only sensible choice for the ultimate disposition of such a collection. Since then we've acquired numerous other collections, and now have about 25,000 examples – by far the largest such collection in the world.

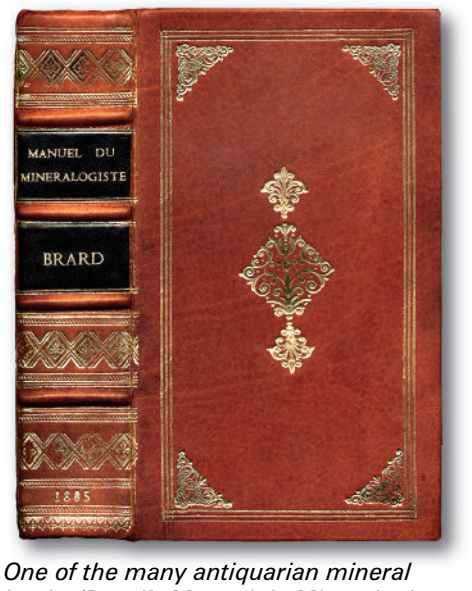
With such a great resource at hand, I felt we had an obligation to do more than just sit on it. So I began writing up biographical notes on many of the early mineral dealers and collectors and posting them online along with images of their labels. Many labels can be dated to a specific span of years, thus allowing collectors to date their specimens while learning more about the background of each piece. Thus far, I've posted about 1,600 biographies illustrated by about 4,000 labels and portrait photos.

To me, connoisseurship in minerals has three essential components: (1) some knowledge of the science of mineralogy and a passion to learn about how minerals form, (2) a finely developed aesthetic sensibility in judging minerals, and (3) an appreciation and knowledge of the history of specimens and of our place in the history of mineral collecting. The Biographical Archive helps with that last component.

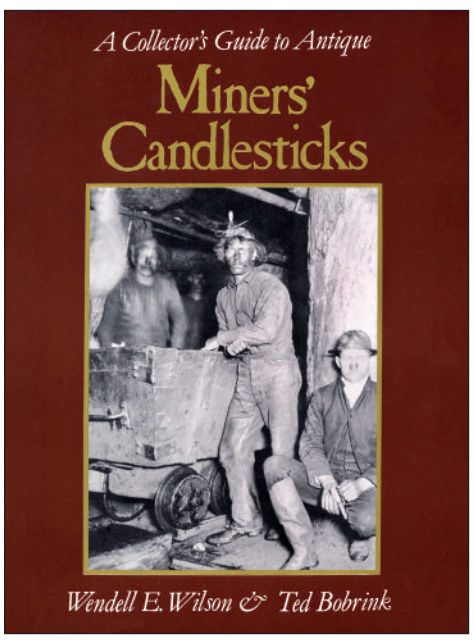


Part of the Mineralogical Record Library. W. Wilson photo.

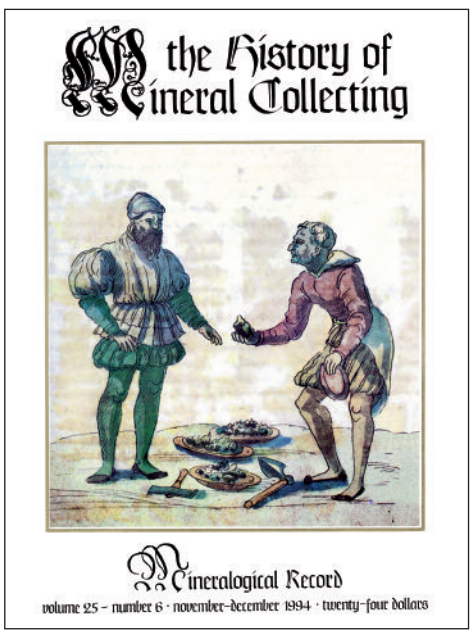
Some of the reprints of antique mineralogical books prepared for publishing by Wendell.



One of the many antiquarian mineral books (Brard's Manuel de Mineralogiste, 1805) in the Mineralogical Record Library with a new binding designed in contemporary style by Wendell.

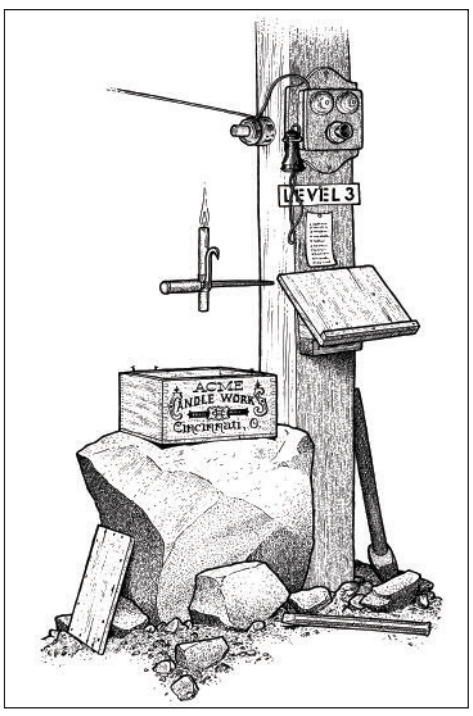


*Cover of "*A Collector's Guide to Antique Miner's Candlestics*" written by Wendell Wilson and Ted Bobrink. Published in 1984 by* Mineralogical Record*.*

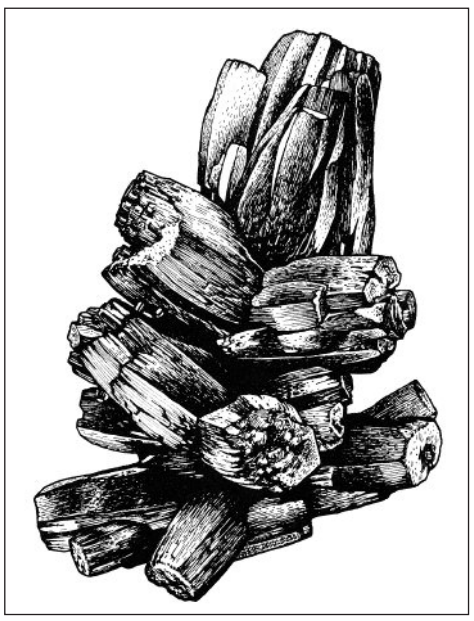


Book size special issue of Mineralogical Record *(1994, vol. 25/6) "*The History of Mineral Collecting*" written by Wendell.*

"Blue-cap tourmaline from the Tourmaline Queen mine, California" (1973), pen and ink drawing by Wendell Wilson, 20 x 25 cm, Gemological Institute of America collection. The specimen measures 15 cm; W. Larson collection.



"The Mine Telephone" (1983), pen and ink drawing by Wendell Wilson, 17 x 25 cm, artist's collection.

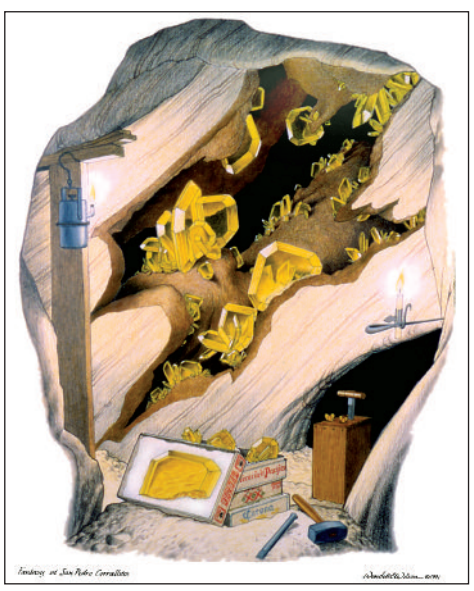


"Pyromorphite from Les Farges, France" (1978), pen and ink drawing by Wendell Wilson, 14 x 20 cm, Gemological Institute of America collection. The specimen measures 3 cm; K. Roberts collection.

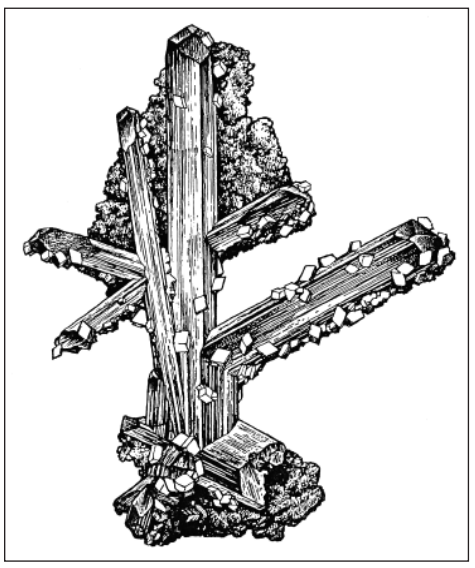
TP: *And what about the Mineralogical Record Library?*

WW: It was started in the early 1980s when I found that even the University of Arizona Library (which is very large) did not stock the kind of collector literature that I and our authors routinely needed when writing and editing articles. They didn't even have a complete set of *Rocks & Minerals* magazine! So I began gathering complete sets of all kinds of collector magazines, including *Rocks & Minerals*, *Rock & Gem*, *Gems & Minerals*, Lapidary Journal, and all of the European journals as well, over 40 journals all together. Then, as the slim magazine budget allowed, I began adding antiquarian mineralogical works. After 30 years of work on it we now have one of the world's best mineral reference libraries, especially for antiquarian works, and that's an invaluable resource in producing interesting articles. I'm sure we have the world's largest collection of antiquarian mineral collection catalogs, mostly from the 18th century – over 50 titles, which is many more than the British Library possesses. No other institution specializes in preserving the history of mineral collecting.

"Manganese Ore at the Sweet Home mine, 1898" (1994), ink, watercolor and Prismacolor pencil on art board by Wendell Wilson, 28 x 35 cm, M. Zinn collection. A fantasy scene depicting enormous crystals of rhodochrosite at the Sweet Home mine in Colorado.



"Fantasy at San Pedro Corralitos" (1991), ink, watercolor and Prismacolor pencil on art board by Wendell Wilson, 28 x 35 cm, M. Zinn collection. A fantasy scene depicting a wulfenite pocket in the San Perdro Corralitos mine, Mexico.



"Cerussite from Tsumeb, Namibia" (1977), pen and ink drawing by Wendell Wilson, 15 x 19 cm, Gemological Institute of America collection. The specimen measures 30 cm; Houston Museum of Natural Science collection.

We regularly use a lot of the old books for historical information and illustrations.

Many of the books needed rebinding when we got them, so I designed bindings that are historically accurate in style for the time period and the country of origin. Pictures of the bindings are shown on our website, a tribute to Skip Carpenter, who executed my designs so beautifully.

Sometimes, as a sort of literature reclamation project, we would reprint 20 to 50 facsimile copies of extremely rare illustrated mineralogical works that were in danger of extinction (we call it our "Antiquarian Reprint Series") and sell them as fund-raisers to pay for the purchase of more library books. We eventually reached 13 reprints in the series. I'm particularly proud of the reprint we published of Fabien Gautier d'Agoty's Histoire Naturelle Règne Minéral (1781), the first book with printed colors (rather than hand-colored), because there are no complete surviving copies of the original, but we assembled a complete reprint from the surviving parts found in several libraries. The income from the Antiquarian Reprint Series, plus important donations, has allowed us to build a really exemplary library of mineralogy books dating back to 1557.

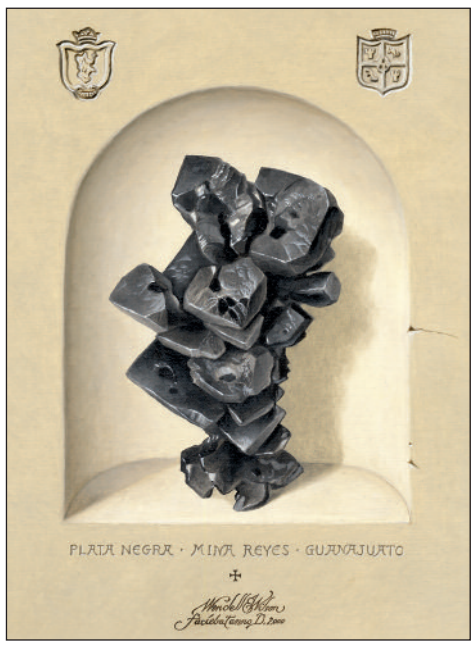
TP: *You are also very involved in the promotion of mineral art, and have had over 1,000 artworks published over the years. Can you tell us about the idea of MinRec's Museum of Art section? It is now available online. When do you plan to break ground on the new building, and will it be bigger than the National Museum of Art?*

WW: Mineral art has never received much coordinated publicity. There are books on botanical art and art depicting birds and other animals, but mineral art (devoted to the Third Kingdom of nature) has been neglected despite having an equally long and interesting history. So I thought it would be educational to pull it all together in a format equivalent to that of the Biographical Archive, except featuring mineral artists though history, with images of many of their artworks. When you see it all in one place you can gain a deeper perspective.

Wouldn't it be great to have a real museum for mineral art!? The picture of the big impressive museum on our web page is my fantasy – actually it's the Minneapolis Institute of Art (where I spent a great deal of time as a child). However, if someone would like to donate ten or twenty million dollars, it can become a reality.

TP: *Having studied art, you were an artist before becoming a mineralogist. In earlier issues of MinRec there were many of your drawings and paintings, but now they appear only rarely. Have you stopped painting them?*

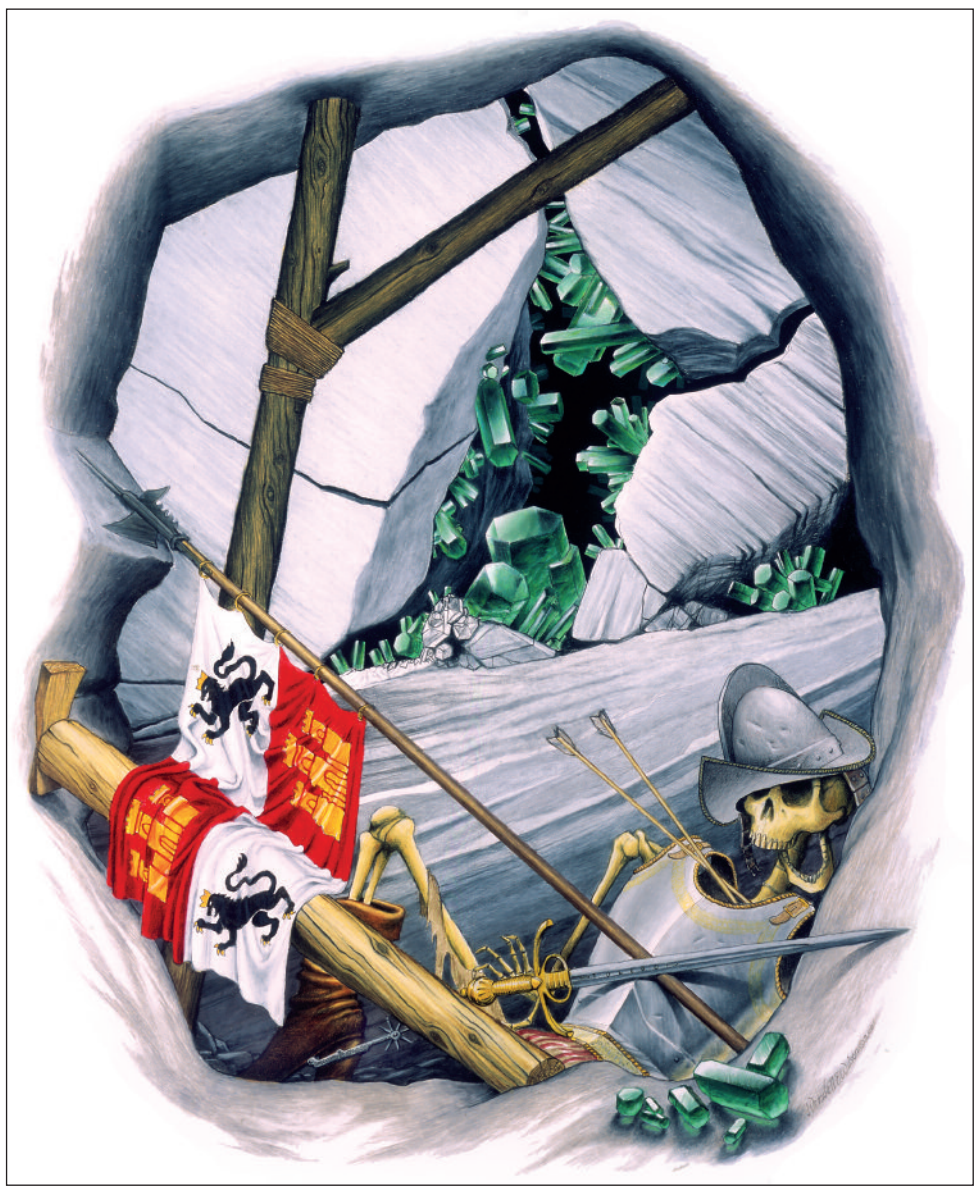
WW: Many of my line drawings of specimens date to the early period of the magazine, when color photos were too expensive to print, and even B&W photos didn't look that great. Many of the advertisers commissioned me to produce some eye-catching illustrations for their ads. Oil paintings, of course, take much longer to create, and they take 6 months to dry properly – it's a more involved process with the layers of glazing and so on, and I don't usually have enough time to do more than one or two a year. But I still do paintings occasionally.



"Plata Negra, Mina Reyes, Guanajuato" (2000), oil on canvas painting by Wendell Wilson, 21 x 29 cm, artist's collection. Painted in the style of 16-century Spanish still life artists. The specimen measures 6.8 cm; S. Edde collection.

TP: *What kind of drawings/paintings do you enjoy working on?*

WW: I think my best work is still life paintings involving mining artifacts. I did a painting in 1980 depicting two safety lamps, a blaster, a dynamite box, a miner's pick and hammer, set up as if underground. I wanted to create a scene where all of the sources of light were within the frame of the painting, so you could get a feeling for how dark it would be underground if your light went out. I started the painting in Maryland in 1979, but I couldn't find broken mine rock anywhere to show as a base (only rounded stream cobbles, which don't look like mine rock). I had to wait to finish it until we moved to Tucson; my

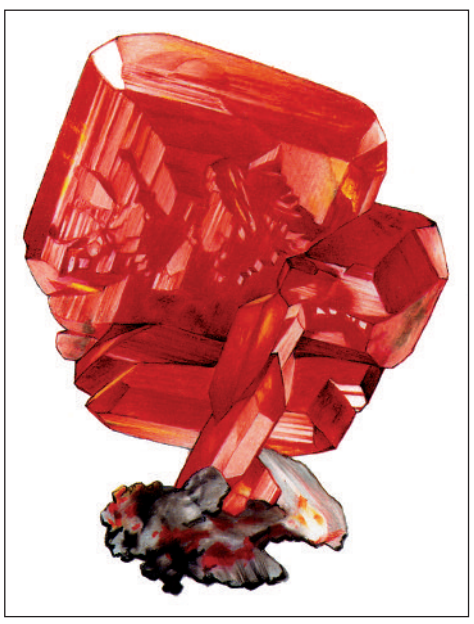


"Montezuma's Emerald Mine" (2001), ink, watercolor and Prismacolor pencil on art board by Wendell Wilson, 28 x 35 cm. M. Zinn collection. A fantasy scene depicting an emerald crystal vein in Colombia.

"The Jonas Mine Pocket" (1985), ink, watercolor and Prismacolor pencil on art paper by Wendell Wilson, 28 x 35 cm, K. Proctor collection. This is not a fantasy scene, but rather a documentary reconstruction of a real tourmaline pocket with crystals over a meter long, based on specimen photos and interviews with miners.

wife and I drove out to a mine dump and filled up my car's trunk with broken rock, then I set up the still life again on that as a base.

I also like to paint mineral specimens, especially wulfenite, and I recently completed an oil painting of a tanzanite crystal that came out very well. I also do watercolor specimen paintings highlighted with Prismacolor pencil. The combination of media produces a nice depth of color and detail. But oil painting is still my favorite. And I've done a number of paintings of crystal pockets, mostly fantasies just for fun, but the pocket painting I did for *Gems & Gemology* magazine was an accurate reconstruction of the Jonas mine tourmaline pocket.



"Red Cloud Wulfenite" (2000), ink, watercolor and Prismacolor pencil on art board by Wendell Wilson, 23 x 30 cm, D. Morris collection. The specimen measures 2.9 cm, and was in the G. Schlepp collection.

TP: *You've had over 6,500 mineral photos published over the years, and for a long time you were one of the main mineral photographers for MinRec. Is photography one of your hobbies, or was this just a necessity of the times? I see that after the "professional" photographers (like Jeff Scovil, Van Pelts) appeared, your photos were published much more infrequently.*

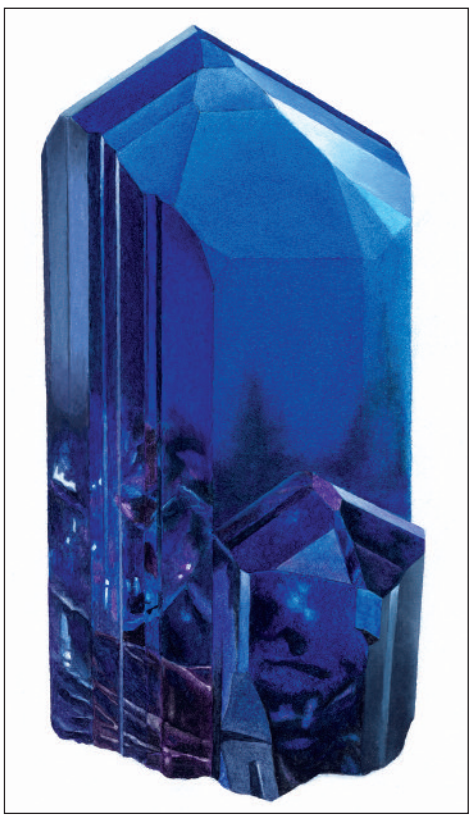
WW: I enjoyed doing mineral photography for many years, and worked out a simple, straightforward style involving a white background grading into black at the top. —Nothing fancy that would distract from the specimens, but enough depth of shading to make them look like they were in a real space, perhaps on a shelf. The real challenge was careful lighting, a surprisingly complex aspect (I wrote a detailed article about the subject and it is posted on our website). After many years, though, it began to seem like drudgery, and I was becoming concerned about the increasingly high dollar value of the specimens I was handling. It occurred to me that if I accidentally broke one it could be very costly for the *Mineralogical Record*. So I was very grateful when Jeff Scovil's photographic career expanded to the point where I could get most of the photos I needed from him.

TP: *At the end we would like to ask about your personal perspectives of our hobby?*

WW: The hobby, at least in the U.S., has changed gradually over the last 50 or 60 years. Right after World War II, rockhounding was very popular, by people who knew next to nothing about mineralogy. Many of the true mineral collectors, a much rarer breed, were closer to being what used to be called "amateur mineralogists." These were people who knew a great deal about mineralogy and even maintained rudimentary home laboratories where they could perform simple chemical and physical tests to identify species. They often worked with professional mineralogists, they wrote articles, formed clubs and were determined to enjoy mineralogy on a fairly scientific level. As the decades passed, those folks slowly died off and their place was taken by collectors, sometimes very active field collectors, who were not so well versed in mineralogy. Today it seems as if systematic and descriptive mineralogy is largely ignored in college curricula and the vast majority of collectors focus on aesthetic specimens. Although collectors still exist at all economic levels, and good specimens are available in all price ranges, there also seem to be far more wealthy collectors than there were 30 or 40 years ago. It's interesting that there likewise seems to be far more world-class specimens on the market today than there ever used to be.

TP: *What would be the specimen of your dreams to add to your collection?*

WW: I've always wanted to own a really fine emerald crystal on matrix. But in all my years of collecting I've never been offered one that I liked. When I finally confront such a specimen, it will almost certainly be out of my price range.



"Tanzanite from Merelani" (2009), oil on canvas by Wendell Wilson, 21 x 29 cm. The crystal measures 6.6 cm. Specimen and painting are in the collection of D. Trinchillo.

TP: *So, we wish you the best of luck in finding that perfect emerald for your collection!*

Oil-on-canvas paintings by Wendell Wilson: Upper: "Chihuahua Calcite" (1977), 53 x 81 cm, D. Trinchillo collection. Painted from a 5-cm specimen in the collection of M. and J. Zweibel. Lower: "Underground Mining Scene" (1980), 50 x 66 cm. M. Sussman collection.

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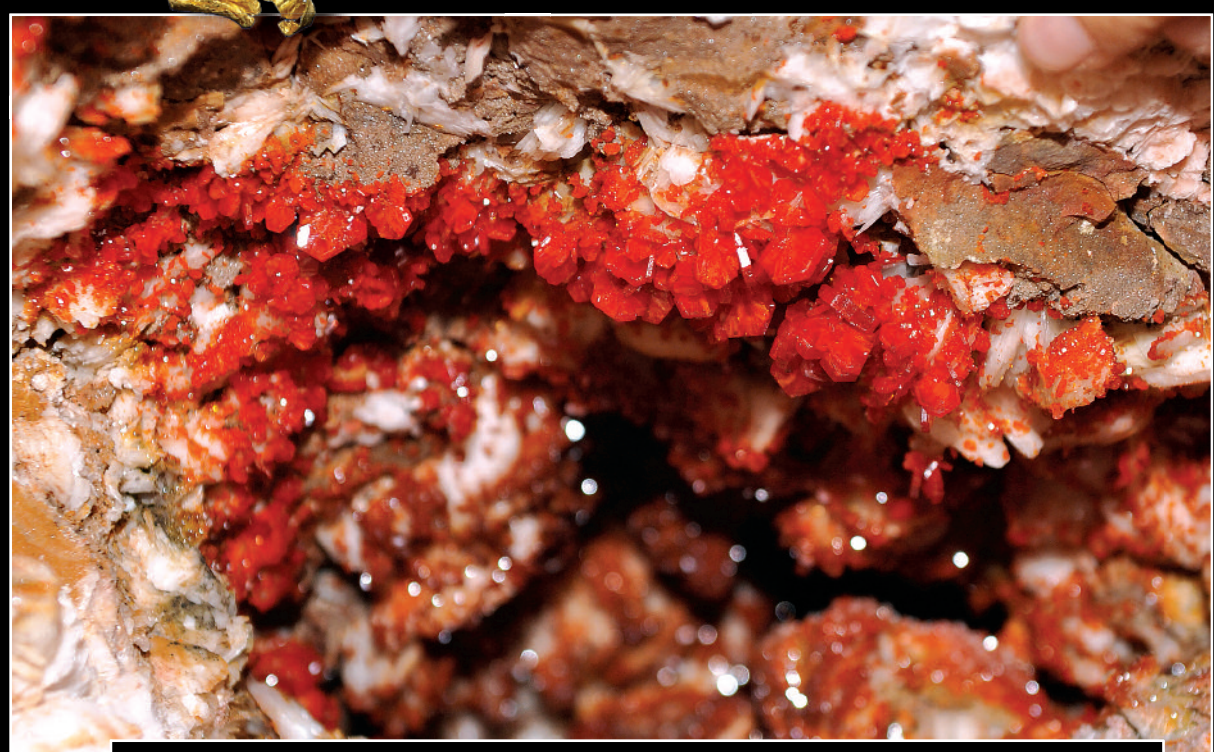
J. Scovil photo.

Tom (Spirfer Minerals) with self collected specimen in Rogerley, UK.

www.SpiriferMinerals.com

Beryls from Volodarsk Volynskii, Ukraine. M. Bieńkowska photo.



Vanadynite pocket, Mibladen, Morocco. J. Gajowniczek photo.

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