THE ROCKFINDER

Michiana Gem & Mineral Society
Tom Noe, Editor
305 Napoleon
South Bend, IN 46617

MICHIANA GEM & MINERAL SOCIETY, INC.

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THE ROCKFINDER

December, 2003

MICHIANA GEM & MINERAL SOCIETY

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The purpose of the Michiana Gem & Mineral Society is to promote the study and enjoyment of the earth sciences and the lapidary arts, and to share lapidary knowledge and techniques.

General meetings are held the fourth Sunday of each month, 2:00 PM, EST, at Our Redeemer Lutheran Church, 805 S. 29th St., South Bend, IN. Regular exceptions include May (third Sunday), July (no meeting), August (club picnic) and the November/December meeting and Christmas party. Board meetings are held before the general meetings. The annual club show is Labor Day weekend.

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Yearly Membership Dues (Payable by December 15)

_____Individual $15.00 per year
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Please indicate areas of special interest. (To be published in *The Rockfinder*).

General Geology____ Beads ____
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The Michiana Gem & Mineral Society, a not-for-profit organization, is affiliated with the Midwest Federation of Mineralogical Societies and with the American Federation of Mineralogical Societies.

The Rockfinder is published monthly except July and August. Editor, Tom Noe, (ph. 574-289-2028). Co-editor, Herb Luckert, 221 Marquette Ave., South Bend, IN 46617 (ph. 574-282-1354). Reporters, Bob Heinek, Herb Luckert, club members.

PLEASE READ AND SIGN THIS SECTION:

With my signature I hereby release the Michiana Gem and Mineral Society, Inc., and its individual members and the owners of any premises upon which I enter under permit granted to the society, absolutely free of any liability whatsoever, to my person or my property, and further I will respect the equipment and property of the aforesaid owners.

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THE ROCKFINDER

Newsletter of the Michiana Gem & Mineral Society

Volume 43, Number 10 **December, 2003**

Since we celebrated with the Christmas party toward the beginning of December, there is no other December meeting. The next meeting of the Michiana Gem and Mineral Society will be on the third Sunday in January, after the January issue of the *Rockfinder* is published.

Happy Holidays, Everyone!

Dues for 2004 should have been paid by December 15, so if you forgot please pay them as quickly as possible.

Individual, $15 per year
Family, $20 per year
Junior, $1 per year (no *Rockfinder*)
Subscriber, $7.50 per year

Make checks payable to Michiana Gem & Mineral Society.

Please use the green form on the inside cover of the *Rockfinder* so we can update all our information. NOTE: The "Interests" you check will be printed along with your name and address in the next members' directory. Make checks payable to Michiana Gem and Mineral Society.
You can mail dues to

Pam Rubenstein, Treasurer
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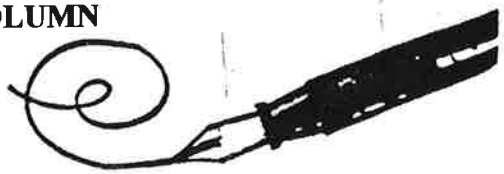
DIANE'S COLUMN



Holiday greetings to one and all! As one year ends and another begins, we have many reflections on the past year. I hope that those memories for you are good and the difficult times fading. The new year always brings hope of good things to come. I feel the world is starting to be a more peaceful place for many people. Let us keep hope in the saying of "World Peace." One person to remember is former member Alec Rubenstein, who is at this time serving our country in Kuwait/ Iraq.

I look back on the club's 2003 functions with smiling memories. I have enjoyed getting to know many of the club members better, despite the fact that presiding over the meeting does takes away a little of my chat time. I look forward to another good year, great participation of members and, I hope, new faces. Share your club interests with others and invite them to meetings.

Our club's snowbirds have flown or are about to, so the rest of us need to stay warm and maybe work with all the rocks that we found over the summer. I know I have many rock-related projects to get to.

I hope to see you all in January.

Diane

Hope, like the gleaming taper's light,
Adorns and cheers our way:
And still, as darker grows the night,
Emits a brighter ray.

Oliver Goldsmith

MINUTES OF THE DECEMBER MEETING

President Diane Gram called the meeting to order on December 7, 2003, at 1:20 p.m. The October minutes were approved with the amendment that Phyllis Luckert will not be available for the Storage Committee. There was no treasurer's report.

Old Business: The location of the society's Labor Day show--Century Center has agreed to a $3.00 parking fee for the 2004 show. David Peltz moved and Pam Rubenstein seconded that the 2004 show be held at Century Center. The motion carried. A committee will be formed for selecting a new location, with the understanding that a decision must be made a year in advance of the show.

New Business: Election of Officers--Bob Miller moved that the slate of nominations be elected. The motion carried without dissent. President: Diane Gram; Vice-President: Margaret Heinek; Secretary: Jeanne Finske; Treasurer: Pam Rubenstein; Liaison: Marty Perry; Past President: Don Church.

Gratitude for the Christmas decorations were expressed: to Emily Johnson and Bill Nelson for the white birch and pine centerpieces, and to our ever-generous Kathy and Bob Miller.

The meeting was adjourned at 2:00, when the Christmas potluck dinner and gift exchange were enjoyed by all 36 members in attendance.

Sr. Jeanne Finske, Secretary

THE WORLD'S DESERTS

By Sam Shapiro

In 1916, during the terrible last year of World War I, Professor Wladimir Koppen of the University of Graz in Austria worked out the system of climate classification that geographers still use today. Using precipitation, temperature, topography and natural vegetation, he created a mathematical formula to define the ecological regions of the world's 56 million square miles of land area: steppe, grasslands, rainy tropics, monsoon tropics, arctic, mountain, humid continental (e.g., Indiana). A Koppen desert is characterized as a region with high daily and annual temperature ranges and less than 10 inches of rain a year (Indiana gets 40 inches--somewhat less in 2002, which was a dry year). Koppen deserts take up 14% (one-seventh) of the earth's land, and there are 13 of them, with at least one on every continent except Europe. Here are some interesting facts about the deserts on the various continents.

NORTH AMERICA (500,000 square miles, in southwestern United States and northwest Mexico):
1. a) The Great Basin Desert, between the Rockies and the Sierra Nevada-Cascade Ranges, which cause the moist Pacific winds to rain on the western slopes, leaving a rain shadow to the east. Largely steppe (10 to 20 inches of rain), becoming true desert in southern Nevada and western Utah. Las Vegas lives on irrigation from Hoover Dam
b) The Mojave Desert ("Death Valley") a transitional region between the Great Basin and the deserts of northwestern Mexico.
c) Sonora and Baja California Deserts, along the Pacific Coast and around the Sea of Cortez.
d) The Chihuahua Desert, Pancho Villa's old stamping grounds, spreading across the international border into Texas, New Mexico, southeastern Arizona. The Colorado and Rio Grande Rivers, originating in snowpack in the Rockies, are essential to the region's farms and cities.
(There are no deserts in Central America or the Caribbean, or in any other places near the Equator.)

SOUTH AMERICA (400,000 square miles, in Patagonia and along the Pacific coast):
2. The Patagonian Desert, in southern Argentina. The Andes, like the Rockies, leave a rain shadow to the east. I visited here as a Fulbright Professor in 1959. The plants are stunningly similar to those in Arizona (Dry Region" in Spanish), where I visit my sister-in-law. You can see desert cacti (such as barrel, saguaro, etc.) in our local greenhouses.
3. The Atacama Desert, caused by the cold Humboldt Current running north, whose winds carry little moisture. In Lima, Peru, I encountered the "garrua," damp clouds that seldom drop moisture. In some places it does not rain for 25 years at a time. Ancient civilizations here (Chimu, Mochica, Inca) depended on half a dozen small rivers running down from snows in the Andes.
(Ten more deserts in future issues).

IMPACT IN THE MID-DEVONIAN

While not one of the "big five" mass extinctions, a significant extinction event took place during the Middle Devonian, about 380 million years ago. It is estimated that this event wiped out 40% of all living marine animal genera. New evidence collected by Brooks Ellwood and colleagues at Louisiana State University suggests that this extinction event could have been caused by an impact event, smaller but similar to the one that occurred at the Cretaceous/Tertiary boundary. Ellwood's evidence, collected from a site in Morocco, shows the presence of shocked quartz and high concentrations of nickel, chromium, cobalt and other elements known to be associated with impact events, along with a sudden change in carbon isotopes. Shocked quartz is known to form at impact sites; the anomalous element concentrations are thought to have originated from the impactor itself. The carbon isotope shift is thought to be the result of a collapse in marine productivity caused by the extinction event. While this evidence is not conclusive, it is strongly suggestive; more research at different sites around the globe is needed to determine if an impact truly was responsible for the mid-Devonian extinction event. The impact evidence was presented in the June 13 edition of *Science.*

SPINEL

By George Judd

Since beauty, rarity and durability measure the value of a mineral as a gemstone, certainly red, light red and orange spinel should rank near the top. This, unfortunately, is not the case; in fact, not only the public but many jewelers are completely unfamiliar with this species. The reasons for this state of affairs are not always easy to discover. However, the best red colors have long been confused with rubies. Since spinel is associated with ruby in most all of the areas of the world where it is mined, this confusion is understandable. In fact, although the habit of spinel (which is a cubic mineral) is the octahedron, these crystals are frequently irregularly developed, so that they resemble the flattened prisms and rhombohedra of ruby to the miners. Also, the names used for red spinel, such as "Balas ruby" and "spinel ruby" fostered confusion.

Among the famous spinels in the British Crown Jewels is the "Black Prince's Ruby." This stone has been polished but retains its shape from the rough; it weighs about 170 carats (estimated, since it has never been removed from a gold bezel setting for weighing). It was first mentioned in 1367, when it formed part of the treasure of the King of Granada in Spain. Upon his death at the hand of Dom Pedro, King of Castile, it came into the latter's possession. He, in turn, gave it to the Prince of Wales, son of Edward III.

A red spinel of more than 400 carats in weight and cut in Oriental style form the apex of the crown made for Empress Catherine II of Russia in 1762. It forms part of the immense Diamond Treasure of the USSR in the Kremlin. The largest red spinel on display in the United States is a faceted stone of 71.15 carats in the American Museum of Natural History.

Almost all gem spinels have been formed by contact metamorphic activity associated with intrusions of molten rock masses into impure limestones or dolomites. However, as with so many gemstones that come from Burma and Ceylon, the primary source is not mined, for it requires the concentration effected by nature in alluvium to make deposits rich enough to mine. Spinels of non-gem quality occur in certain aluminum-rich basic igneous rock, as well as in deposits that arise from the metamorphic alteration of these rocks.

Because spinel is so little known, it is best to describe them by color terms, instead of attempting to popularize variety names.

A. Red spinel, ruby-colored spinel, or ruby spinel. A misleading term, "spinel ruby," has been used for this variety. The best colors are those that approach the appearance of fine ruby, although very dark garnet reds to light purplish reds bordering on pink are included under this heading.

B. Purple or almandine spinel.

C. Pink or rose spinel.

D. Orange spinel.

E. Blue spinel, sapphire-colored spinel, or sapphire spinel. Rarely is this variety of a fine blue; more often it is a grayed-out dark blue to violet-blue or greenish blue. Even the best of these are collectors' items, rather than commercial stones.

F. Alexandrite-like spinel. This is comparatively rare spinel.

G. Black spinel (pleonast or ceylonite).

This opaque spinel is rarely seen now that mourning jewelry is out of fashion.

The sources for gem spinel include Burma, Ceylon (Sri Lanka), Cambodia and Thailand.

PHYSICAL AND OPTICAL CHARACTERISTICS

Chemical Composition: A double oxide of magnesium and aluminum.

Crystallographic Character: Cubic system. Habit: Octahedra and twinned stones

Hardness: 8.

Toughness: Good.

Cleavage: Poorly developed. Cleavages parallel to octahedral faces, (rare).

Fracture: Conchoidal.

Luster: Polished surfaces are subadamantine.

Refractive Index: Gem material is usually 1.718.

Pleochroism: None

References: (1) J. Arem (1987) Color Encyclopedia of Gemstones. (2) Simon & Schuster's (1986) Guide to Gems and Precious Stones. (3)http://www.minerals.net/mineral/oxides/spinel/spinel.htm

The Rockpile (Sept., 2003)

TALC, IT'S MORE THAN JUST A POWDER

'y Sandy Riekeman

The mineral talc is a hydrous magnesium silicate. Its color ranges through various shades of gray and green to the red and brown of impure specimens. It is translucent to opaque, and has a greasy, soapy feel. It usually contains small quantities of nickel, iron and aluminum as impurities.

Talc is used commercially because of its fragrance retention, luster, purity, softness and whiteness. Talc is an important industrial mineral. Its resistance to heat, electricity and acids makes it an ideal surface for lab countertops and electrical switchboards. Talc is also used to coat products that need to slide apart easily, such as nested stacks of plastic pails in a hardware store. Talc is used in making paper (as a filler), paints, plastic, rubber, insecticides, face and talcum powder, soap, fireproof roofing, foundry facings, lubricants, linoleum and oilcloth, electrical insulation, and pottery.

The paper industry is the largest consumer of talc. Talc is used in three stages of paper-making, as a filler, to control pitch and stikies, and in coating formulations. Additionally, talc reduces the friction on paper manufacturing machinery thus reducing wear. The ceramics industry uses talc in clay bodies and in the glazing of wall tiles, sanitary ware, electrical insulating, porcelain and dinnerware. Talc is widely used in the paint industry, particularly in marine paints and protective coatings. The usage of talc is growing fast in the plastics business. The natural qualities of talc give cosmetics stability, texture, skin adhesion, slip and water resistance. Talc is not only used in body talc (talcum powder) and toilet soaps, but also in detergents and washing powder.

Although a small user, the pharmaceutical industry requires highly pure, specialized and bacteria- free talc for tablets, ointments and dusting. Talc prevents loss and absorption of water from animal feed, thus protecting the essential nutrients. Other uses for talc include, dry fire-extinguishing powder, cereal polishing, bleaching agent, floor wax, water filtration, leather treatment, shoe polish, welding rod coating, printing ink, asphalt, jointing compounds, confections, foam rubber and putties.

Talc can be found in many mines up and down the Appalachian Mountains and in California, North Carolina, Georgia, Montana and Texas, Germany, France, Canada, Italy, Austria, South Africa and Shetland, Scotland.

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hftp:/www.statehousegirls.net/vt/symbols/mineral/
http://minerals.er.usgs.gov/minerals/pubs/commodity/talc
http://www.infoplease.com/ce6/sci/AO847693.htrni
http://www.golcha.com/uses.htm

Quarry Quips (Aug., 2003)

TURQUOISE

By George Judd G.G,

Four bracelets made of turquoise and cast gold are the oldest pieces of hand-wrought jewelry known in the world. For 7,500 years they remained on the arm of the mummy of Queen Zer, an Egyptian queen, and were still beautiful when they were excavated in 1900. Turquoise enjoys the same high degree of popularity as it did in the ancient world; in fact, it is often classed as the most important of the opaque gemstones.

The name "turquoise" was first used in the 13th century. It is thought to have come from French words meaning "Turkish stone" ("Pierre turquoise"), probably because the gemstone first reached Europe by way of Turkey.

The history and romance associated with turquoise are exceeded by that attached to few other gemstones. Lengthy accounts of legends and superstitions are contained in almost every book dealing with the subject of gems and jewelry. Most ancient civilizations valued turquoise very highly: the Aztecs, Incas, Persians, Egyptians and the south-western American Indians are those most often mentioned. In Tibet today it is by far the most popular of all materials used for personal adornment, and it plays an important part in the religious ceremonies of the Tibetan people. During the 16th century, turquoise became a medium of exchange among the Indians of the southwestern United States. Even today the American Indian still prizes turquoise highly. Among the Navajos, no Indian is likely to be seen without his piece of turquoise. The higher his

position in tribal society, the finer his stone. Few religious rites of the Indians of New Mexico and Arizona take place without turquoise. Almost all the Indian jewelry in the American Southwest is the turquoise-set type.

Turquoise is a secondary mineral. It is deposited in veins and as nodules (rounded masses) near the surface by circulating ground waters carrying copper, aluminum and phosphorus leached from earlier rocks. The tabular deposits are seldom sufficiently wide to produce thick stones. The fissures are often so narrow and irregular that the mineral recovered can be used only as turquoise matrix. It is found occasionally in alluvial deposits as nodules, but it weathers fairly rapidly when exposed at the surface. The ancient mines near Nishapur in the northeastern corner of Iran (Persia), about 15 miles west of the town of Meshed, are usually considered to be the source of the finest turquoise. Before World War I, turquoise mining was a leading industry in Persia, providing the government substantial annual revenue, but production today is at a virtual standstill. The oldest turquoise mines in the world are situated on the Sinai Peninsula, on the north side of a valley called Maghara Wadi. Here the gem is disseminated in thin seams through a red iron-bearing sandstone, as well in a porphyritic igneous rock. As early as 5,500 B.C. (before the first dynasty), the Egyptians used turquoise for personal adornment, as proved by beads found in prehistoric graves antedating the dynastic period.

Today, the United States is the world leader in the production of turquoise, most of which comes from the Southwestern states. Mining is usually a very simple process that requires little subsurface shaft sinking and tunneling, for turquoise is never found in quantity at depths exceeding 100 feet. Usually, it is exposed on the surface, and good material is often at a depth of but a few feet. An open-cut trench or shallow pit suffices for working the shallower deposits, but for extensive operations at slightly greater depths a shaft is usually sunk and tunnels extended horizontally at intervals along the vein. Most turquoise deposits are found in arid regions, where drainage is no problem. The limited extent of most deposits and their shallow depth usually warrant little in the way of expensive or elaborate equipment.

Most turquoise mining is rather primitive. After the rock has been loosened, it is broken by hammers and raised to the surface in buckets hoisted by ropes. Additional crushing is then done, after which it is hand picked for rejection of unsuitable material.

The copper content of turquoise is responsible for its blue color, and the presence of iron accounts for an all-too-common greenish cast. Since the copper is an essential constituent and iron is also regarded as such by many, turquoise is classed as an idiochromatic stone. The following grading terms have been used in the jewelry trade to indicate the quality of turquoise but they do not necessarily denote geographical origin:

Persian.

This variety is intense medium blue and is the least porous of the turquoises. Therefore, it has a slightly higher specific gravity than most material and takes a much better polish.

American or Mexican.

Pale blue to light blue as well as greenish blue to bluish green. Also, it is often somewhat porous.

Egyptian.

The variety of turquoise called Egyptian is greenish blue to yellowish green. Although it usually has a lower porosity and a higher density than American turquoise, the color is poorer, because of a higher iron content.

PHYSICAL AND OPTICAL CHARACTERISTICS

Chemical Composition: A complex hydrous copper-aluminum phosphate. Iron may replace some aluminum. Copper causes the blue color; iron may cause the green color.

Crystallographic Character: Triclinic system; cryptocrystalline. Minute crystals are known to occur, but they are rare.

Hardness: 5 to 6.

Cleavage: None

Fracture: Conchoidal, granular.

Luster: Polished surfaces are waxy to vitreous.

Refractive Index: 1.61 to 1.65 (doubly refractive).

References. (1) J. Arem (1987) *Color Encyclopedia of Gemstones.* (2) J. Sinkankas (1962) *Gemstones of North America.* (3) G. Kunz (1941) *The Curious Lore of Precious Stones.* (4) E. Dana (1932) *A Textbook of Mineralogy.*

The Rockpile (June, 2003)