

HUI PŌHAKU 'Ō HAWAI'I

Rock & Mineral Society of Hawai'i, Inc.



Meeting Times

MEETING

Wednesday

March 28

6:15-8:00 pm

Makiki District Park

Admin Building

NEXT MEETING

Wednesday

April 25

China Minerals

LAPIDARY

Every Thursday

6:30-8:30pm

Makiki District Park

2nd floor Arts and
Crafts bldg

MEMBERSHIP

DUE COSTS 2011

Single: \$10.00

Family: \$15.00

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Tourmalines

By Dean Sakabe

The mineral for March is Tourmalines. This is the general name for a group of related gemstones that come in just about every color.

There is an old Egyptian legend, in which the tourmaline, on its long journey up from the center of the Earth, passed over a rainbow. In doing so, it assumed all the colors of the rainbow. Hence it is sometimes referred to as the "gemstone of the rainbow."

Tourmaline - "Jolly Green
Giant"

Newry Quarry, Maine
Watermelon tourmaline
(4" x 8")

The name tourmaline comes from the Singhalese words "tura mali". Loosely translated, it means something like "stone with mixed colors". This refers to the color spectrum of this gemstone. There are tourmalines colored red, green, blue, yellow, brown and black. Furthermore, it is common that they have two or more colors. There are also tourmalines which change their color when the light changes from daylight to artificial light, and some



indicolite)
) Si₃O₆(OH)₃
(gem)
Elbaite
Na(Li,Al)₃Al₃(BO₃)₃Si₃O₁₂(OH)₃
Newry gem pit, Newry, Maine
Na(Li,Al)₃
Newry ge

Tourmalines

show a cat's eye effect. Essentially no two tourmalines are exactly alike.

Tourmalines are mixed crystals of aluminum boron silicate with a complex and changing composition. The tourmaline group in itself is a fairly complex. Slight changes in the composition cause completely different colors. Crystals of only a single color are fairly rare. The same crystal will often display various colors and various nuances of those colors and it also is marked by dichroism. Depending on the angle from which you look at it, the color may be different or more or less intense. All tourmalines have a good hardness of 7 to 7.5 on the Mohs scale.

There are many unique properties of tourmalines. First, they are piezoelectric meaning that when a crystal is heated, compressed, or vibrated, a different electrical charge will form at opposite ends of the crystal. Conversely, if an electrical potential is applied to the crystal, it will vibrate. Tourmalines are also pleochroic, which means that the crystal will look darker when viewed down the long axis of the crystal (C-axis) than when viewed from the side. This property goes beyond the idea that the crystal is just thicker in that direction. Even equally dimensioned crystals will demonstrate this trait. This property can be used as an advantage by gem cutters who may wish to enhance a crystal's pale color or weaken a strongly colored crystal.

Elbaite, Alice Springs, N Territory, Australia

The four most common tourmalines are distinguished by their color and transparencies. Elbaite is the gemstone tourmaline and comes in many varied and beautiful colors. It



Elbaite, Haapaluoma Pegmatite, Finland

is transparent to translucent and is highly prized as minerals specimens and as gemstones. Elbaite is easily the most colorful of all the gemstones.

The iron-rich Schorl is the most abundant tourmaline. It is black and opaque. Schorl is a common "accessory" mineral in igneous and metamorphic rocks. Although too opaque to

Tourmalines

be used as a gemstone, schorl is used as an ornamental stone when found as inclusions in quartz, this stone is called "*tourmalinated quartz*". Usually when someone refers to tourmaline they are referring to either elbaite or schorl.

Uvite, Bahia, Brazil

The two other more common tourmalines: dravite and uvite, although they are much less common than elbaite or schorl. They are getting noticed for their beautiful specimens. Some of dravite's crystals are nicely formed, translucent brown and they can reach a rather large size. Uvite is a green translucent to opaque tourmaline that is growing in popularity and is being cut as a gemstone.



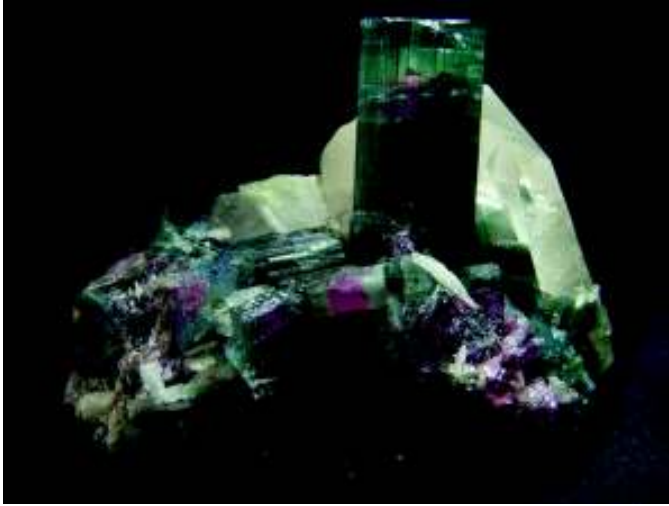
The individual color varieties have their own names. For example, a tourmaline which is red is known as a "rubellite", but only if it continues to display the same fine red in artificial light as it did in daylight. If the color changes when the light source does, the stone is called a pink tourmaline. Blue tourmalines are known as "Indicolites", yellowish-brown to dark brown ones as "Dravites", green tourmalines are "Elbites", and black tourmalines are known as "Schorl". The last mentioned, mostly used for engravings and in esotericism, is said to have special powers with which people can be protected from harmful radiation.

One particularly variety is the Green Tourmaline, also known as a "elbaite or verdelite". However, if its fine emerald-like green is caused by tiny traces of chrome, it is referred to as a "chrome tourmaline". The absolute highlight among the tourmalines is the "Paraiba Tourmaline", a gemstone of an intense blue to blue-green which was not discovered until 1987 in the Brazilian state of Paraiba. These gemstones are much sought-after treasures today.

In 2000, tourmalines were found in Malawi having a vivid yellow color, known as "Canary Tourmalines". The magnesium in that particular area created this last color of the rainbow.

Tourmalines have even more names: ones with two colors are known as bicolored tourmalines, and those with more than two as multicolored tourmalines. Slices showing a cross-section of the tourmaline crystal are also very popular because they display, in a very small area, the whole of the incomparable color variety of this gemstone. If the center of the slice is red and the area around it green, the stone is given the nickname "watermelon". On the other hand, if the crystal is almost colorless and black at the ends only, it is called a "Mohrenkopf", (resembling a certain kind of cake popular in Germany).

Tourmalines



Watermelon Tourmaline, Minas Gerais, Brazil

Tourmalines are found almost all over the world. There are major deposits in Brazil, Sri Lanka, and South and South-west Africa. Other finds have been made in Nigeria, Zimbabwe, Kenya, Tanzania, Mozambique, Madagascar, Pakistan and Afghanistan.

Tourmalines are also found in the USA, mainly in California and Maine. Although there are plenty of gemstone deposits which contain tourmalines,

good qualities and fine colors are not often discovered among them. For this reason, the price spectrum of the tourmaline is almost as broad as that of its color.

In 1971, Maine adopted the Tourmaline as their state Gemstone. The best specimens of tourmalines in Maine are found in a pegmatite dikes (a very coarse-grained type of granite). The slow cooling and solidification of the pegmatite veins allowed the mineral grains to grow to much larger sizes than in ordinary granite. The conditions in some places favored the development of open cavities in which elbaite crystals grew with greater perfection and clarity. Such as was the case in the Dunton Mine in Newry, Maine. In 1972, many fabulous red and green crystals were found, including the ten-inch "Jolly Green Giant," which is now in the National Museum of Natural History in Washington, D.C.

Pala International has been active in mining development since 1969, and is known for its work in the Pala mining district, in north San Diego County, California. The company is internationally famous for its many mining projects, specifically those involving tourmaline, an important precious stone.

The first mine operated by Pala was the Stewart Lithia. Previously operated for its lithium content, a deposit of tourmaline was also discovered. In 1969, Pala Properties International (later renamed Pala International) opened the Stewart Lithia mine in search of the tourmaline-enriched zone. Underground workings continued with reasonable success, finding top-quality pink tourmaline. Other associated minerals such as quartz and spodumene were also discovered.

Along with the Stewart mine, Pala International acquired the Tourmaline Queen and Pala Chief mines. After connecting roadways were established between the two mines, work providing information for the mine plan and new theories regarding the location of mineral rich

Tourmalines

zones for the mine plan and new theories regarding the location of mineral rich zones for study. A successful period followed, with approximately 1500 feet of underground workings developed in a little over three years.

Among the many discoveries at the Tourmaline Queen, in particular the “Blue Cap Pocket,” which was later referred to as the find of the century by Dr. Vincent Manson, then-curator of the American Museum of Natural History. Although underground tunnel footage production is commonly looked at in tonnage or footage per day, mining top quality mineral specimens and gem material is a completely different form of tunneling. The smallest fracture or imperfection can reduce the value of the product. Therefore the techniques used requires a pace set to eliminate any disturbance to the crystals, and footage becomes secondary to careful tunneling. Since the use of explosives is the primary cause of damage, a great deal of experience is needed in this type of mining, with smaller crews preferred over larger production methods.

In 1977, the lease of the Himalaya mine was acquired and work commenced in a new environment. Approximately 9,000 feet of tunnel were driven into hard rock. The rock of this mine was more dense than that of previous projects. Pala International had to develop new techniques allowing safe removal of the tourmaline and other associated minerals. Pala actively mined the Himalaya until August 1998.



Tourmaline, Gaoligong Mts, Yunnan Province, China

WE HAVE A FACEBOOK PAGE! LET'S GO LIKE IT!

HTTP://WWW.FACEBOOK.COM/PAGES/ROCK-AND-MINERAL-SOCIETY-OF-HAWAII/103902329673700?V=WALL&REF=SGM

MAHALO TO MARKUS FOR ESTABLISHING OUR *ROCK FACE!*

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The Rock & Mineral Society meets on the 4th Wednesday of each month (except for adjusted dates in November and December) at the Makiki District Park, 7:00 - 9:00 pm. Enter from Keeaumoku Street. Parking is free but limited.

The Newsletter is published monthly, some days prior to the meetings and is distributed in electronic format by email (Adobe Acrobat PDF file attachment). Printed copies are "snail" mailed to those who do not have email. The electronic format usually contains full-color images; the print version may be limited to B&W due to reproduction costs.

DOOR PRIZES

Please note that we have instituted door prize drawings at our monthly meetings. Because of Hawaii's gambling laws, these drawings cannot be conducted in the common "raffle" format where tickets are sold. Rather, each *paid* member attending the meeting will receive a drawing ticket upon request. A voluntary donation of \$1.00 is requested and encouraged. Drawings will be conducted at the end of the meeting with available prizes awarded in random order. You must be present to win. Please remember: if you win a prize, please bring one to the next meeting. This helps to keep our drawings going. Thank you.

Parking at Makiki Park

Parking along Keeaumoku St. starts at 5:30

After that, good luck because it drops off really fast!

Don't forget about next month!

China

Gemstones

Grossular Garnets with Vesuvianite, Jeffery Mine, Quebec, Canada

—NOT from China





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