

# HUI PŌHAKU 'Ō HAWAII

## Rock & Mineral Society of Hawai'i, Inc.



VOLUME 44, NO. 11

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### TOURMALINES

BY DEAN SAKABE

The last highlighted mineral of the month for 2008 is Tourmaline. According to an old Egyptian legend, it is said that 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, and that is why it is still referred to as the "gemstone of the rainbow".

The name tourmaline comes from the Singhalese words *tura mali*. In translation, this means something like "stone with mixed colors", referring to the color spectrum of this gemstone, which outdoes that of all other precious stones. There are tourmalines with colors ranging from red to green, from blue to yellow, and black. They often have two or more colors. There are tourmalines that change their color when the light changes from daylight to artificial light, and some even show a cat's eye effect. Essentially, no two tourmalines are exactly alike.

Tourmalines are mixed crystals of aluminum boron silicate with very complex and changing composition. The tourmaline mineral group is a fairly complex one. Slight changes in the composition cause completely different colors, and so crystals displaying a single color are fairly rare. Crystals will often display various colors or hues of colors; additionally 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. It is always at its most intense when viewed looking toward the main axis (C-axis), which the cutter must pay attention to when lining up the stone.

The individual color varieties have their own names. For example, a tourmaline of an intense red is known as a *rubellite*, but only if

it continues to display the same fine ruby red in artificial light as it does in daylight. If the color changes when the light source does, the stone is called a pink or shocking 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*. Schors are mostly used for engravings. It is also a tool in esotericism, and is said to have special powers with which people can be protected from harmful radiation. One particular 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 then referred to as a *chrome tourmaline*.



The "Candelabra" Tourmaline  
(Mined in 1972 from the Tourmaline Queen Mine, Pala, CA)

### CHRISTMAS POTLUCK!

PLEASE JOIN COME FOR OUR  
CHRISTMAS POTLUCK!

DECEMBER 5, 2008

BRING SOME FOOD AND A PRIZE!

### MEETING

Wednesday

November 19

7:00—9:00 pm

Makiki District

Park

Administration

Building

### CHRISTMAS POTLUCK

December 5, 2008

### LAPIDARY

Starts September

11

Every Thursday

7pm-9pm

Second-floor Arts

and Crafts Bldg

Makiki District

Park

### MEMBERSHIP

COSTS

2008

Single: \$10.00

Family: \$15.00

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## Tourmalines, page 2

The absolute highlight among the tourmalines is the *Paraiba Tourmaline*, (1) a gemstone of an intense blue to blue-green, which was discovered in 1987 in a mine 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, (2) and those with more than two are known 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 range color variety of this gemstone. If the centre 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 *Mobrenkopf*, resembling a a marshmallow-chocolate cake popular in Germany.

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.

Scientists were also interested in tourmalines, because one of its astonishing physical qualities is to gain electrical charge when heated and then allowed to cool. This causes the tourmaline to be positively charged at one end and a negatively charged on the other. This is known as *pyro-electricity*, derived from the Greek word *pyr*, meaning fire.

The gemstone also becomes charged under pressure, the polarity subsequently changing when the pressure is taken off. When the charge changes, the tourmaline begins to oscillate similar to a rock crystal. The Dutch, who were the first to bring the tourmaline to Europe, were familiar with this effect a long time before there was a scientific explanation. They used a heated tourmaline to draw up the ash from their meerschau pipes, and called the gemstone with the amazing powers an *aschentrekker*, meaning 'ash-lifter'.

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 allow the mineral grains to grow into much larger sizes than in ordinary granite. The black tourmaline crystals and many of the brightly-colored ones are usually encased in the surrounding rock. However, conditions in some places favored the development of open cavities in which elbaite crystals grew with greater perfection and clarity. Several spectacular tourmaline pockets were discovered in the Dunton Mine in Newry, Maine. In 1972, many fabulous red and green crystals were found, including the ten-inch 'Jolly Green Giant,' (3) which is now in the National Museum of Natural History in Washington, D.C.



(1) Paraiba Tourmalines  
Mina da Batalha, Paraiba,  
Brazil



(2) Bi-colored Tourmalines  
(Himalayan mine, Pala,  
CA)



(3) Tourmaline - "Jolly  
Green Giant"  
Newry Quarry, Maine  
(Watermelon tourmaline 4"  
x 8")

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## Tourmalines, page 3

Paraiba Tourmalines are cupriferous tourmalines, a nice word meaning that it contains copper. They come from the Mina da Batalha in the Federal Brazilian State of Paraiba, and are small, rare and precious.

Their brilliant, glowing, turquoise and green colors are unique and are not found in any other gemstone in the world. They would not have been found at all had it not been for the determination of Heitor Dimas Barbosa. He was absolutely convinced that somewhere beneath the now famous Paraiba hill, he was going to find something 'completely different'. And he was right.

In 1981, he began his first excavations at an old, dilapidated open cast mine. Then, he had one deep hole after another drilled in the hard ground, without success. After, five and a half years, the first signs of a tourmaline find manifested themselves, and in the autumn of 1989, a handful of the finest tourmaline crystals were brought up into the daylight from one of the many galleries.

These possessed colors of which people had so far only been able to dream. Unfortunately, just at that time, the 'father of the Paraiba tourmalines' was busy getting over an illness and was not able to be present at the mine. The raw crystals were sold without his even seeing them. When word of the find had got around, there was a period of frantic activity at the mine. For another five years, the now-famous hill, only 400 meters long, 200 meters wide and 65 meters high, was combed, and even razed to the ground in places. No significant find has been made since.

Normally, iron, manganese, chrome and vanadium are the elements responsible for the beautiful coloring in tourmalines. The Paraiba tourmaline is different: it owes its splendid color to copper, an element which had never before been observed in a tourmaline. In the Paraiba tourmaline, a fair proportion of its weight consists of copper, with a pairing of manganese. Certain proportions in the mixture of copper and manganese can also result in pale grey to violet-blue tones. Copper in high concentrations is responsible for the radiant blue, turquoise and green hues, while violet and red tones

are caused by manganese. On a side note, experienced cutters can heat the stone to the proper temperature to eliminate the red color resulting in a purer copper coloration.

Now for the bit of controversy. According to tectonic plate shift theory, during the time of Gondwanaland, present day Nigeria fit onto the north-east end of Brazil. Therefore it can be a possibility that the same copper-manganese conditions which occurred in Paraiba, could have also occurred in Nigeria, which is currently producing a lesser radiant cupriferous tourmaline.



Schorl Tourmaline  
Maryland Materials Quarry, Elkton, Maryland



Pink Tourmaline with  
Lepidolite  
(Stuart Lithia mine,  
Pala, California)



Alta Lighona Tourma-  
lines, Mizanbique



Dravite Tourmaline  
Yinnietharra Station,  
Gascoyne, Western  
Australia

# Rock and Mineral Society of Hawai'i INC.

## News and Notes, page 4

### 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.

### WE HAVE A WEBSITE!

[http://pohakugalore.net/Hui\\_pohaku/Hiu\\_pohaku\\_1.html](http://pohakugalore.net/Hui_pohaku/Hiu_pohaku_1.html)

### MAHALO TO MARKUS FOR HELPING US GET OUT OF THE ELECTRONIC STONE AGE!

### THE METAPHYSICAL PROPERTIES OF TOURMALINE (AND THE MOST INCREDIBLE TOURMALINE THAT I EVER SAW) BY JADE EMORY

Tourmaline is an amazingly beautiful gemstone and it comes in so many gorgeous colors. It is reputed to heal balance disorders, from vertigo to inner ear disorders to epilepsy

But I must share a story with you all about the most incredible tourmaline I ever saw. In 1980 I traveled through Banff, Alberta in the Rocky Mountains of western Canada. This quaint artsy town is reputed to be where Archangel Michael lives. In Banff there was, and may still be, an incredible rock store called Silverhorn, owned by Michael and Carol Ridding, who eventually also opened a similar store in Santa Barbara, California. Michael easily recognized my ecstatic enthusiasm for high quality raw crystalline stones. He invited me to his home to see his 'private stash'. I never before had seen so many locks as in his home's security system, but I sure saw why when I got inside. There in the center of the room was a HUGE cluster of perfectly terminated quartz crystals which were matrix for a fabulous gemmy multicolored tourmaline, the size of a MOPED! This was the ultimate rock experience for moi! Tourmaline rocks!

### ALAN ZEIGLER SINKHOLE DEDICATION!

What wonderful news concerning about the preservation of areas of scientific interest here in Hawai'i! Since the Hawaiian islands are so isolated, the presence of eagles, owls, ducks, and geese in these sinkholes by Kapolei boat harbor is especially noteworthy. Keith Krueger was pleased to share this news, and to tell that Bill and other members of our rock club presented testimony to the city council. Funds have been set aside of zoning and education.

### Rock & Mineral Society of Hawai'i, Inc.

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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.

Any newsletter comments are appreciated, and can be sent to [elise.thomasson@gmail.com](mailto:elise.thomasson@gmail.com)

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