



THE MINERAL VEIN

Official Newsletter of

THE MINERAL SOCIETY OF MANITOBA

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The most common minerals on Earth

Excerpts from David Bressan—Forbes Magazine

What are the most common minerals on earth? The answer is not as easy as it seems and depends if we consider the entire earth or just the part that is directly accessible to us.

The most common mineral in absolute is bridgmanite, known also as Silicate-Perovskite. It's composed of magnesium, iron and silicon dioxide and it's estimated to make up 38% of earth's volume. However this mineral is stable only under high temperature and pressure as found in earth's mantle and it's virtually absent from earth's surface. Samples were first found in a meteorite that fell from space in 1879 but were only described as a mineral in 2014.



In 2014, the Commission on New Minerals, Nomenclature and Classification (CNMNC) of the International Mineralogical Association (IMA) approved the name bridgmanite in honor of physicist Percy Bridgman, who won the Nobel Prize in Physics in 1946 for his high-pressure research.

The composition of earth's crust is different to the inner earth. When earth first formed the entire planet was molten. In this magma ocean light elements like oxygen, silicon, aluminum, sodium, potassium and calcium tended to float upwards, heavy elements like magnesium and iron tended to sink to the bottom.

The light elements formed the rocks of earth's crust. The heavy elements formed earth's core, believed to be almost a pure iron-nickel alloy, maybe even with a crystalline structure.

The crust occupies almost 2.5% of Earth's volume and just ten minerals make up more than 95% of it. The feldspar group, a very complex mixture of oxygen, silicon, aluminum and trace elements like sodium, potassium, calcium and more exotic elements like barium, are by far the most common minerals here, making up almost 58% of all accessible rocks to a geologist. Dark silicate minerals with traces of iron, like pyroxene, amphiboles and olivine, are important minerals with 16.5%. The common quartz, silicon dioxide with some trace elements, follows with 12.5%. The mica group and various metal oxides are making up 7% and the carbonate minerals, despite often forming entire mountains, account for just 1.5%. The remaining 5% comprise more than 7,000 known minerals, however many extremely rare, described only from few or just one locality.

Rocks and minerals are not even evenly distributed on the surface. Rocks with light minerals, like granite and its metamorphic variety gneiss, make up most of the continents. Rocks with dark minerals, like gabbro and its volcanic variety basalt, make up the oceanic crust, covering two thirds of earth.

Just something to think about next time you are smashing some plain old rocks on a field trip.



THE MINERAL SOCIETY OF MANITOBA

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The Mineral Vein is published monthly from September to June.

Meetings are held on the first Wednesday of each month from September to May inclusive at the Manitoba Museum in room P47 on the Planetarium level. They begin at 7:30 PM and feature announcements, an invited speaker and a raffle. Members are encouraged to bring along any new, interesting specimens, or specimens appropriate to the speaker's topic.

Field Trips take place from May to September to interesting sites in Manitoba or neighbouring provinces and states.

Membership: A single membership is \$15 while a family membership is \$20. Memberships run from October to October.

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UPCOMING EVENTS

January 4, 2017: MSM regular monthly meeting begins at 7:30 p.m. at the Manitoba Museum. This meeting will feature guest speaker **Marc Rinne**, Geologist, Precambrian Geoscience Section from the Manitoba Geological Survey. He will talk about plate tectonics, especially with reference to Manitoba, as well as Big Stone Lake area, where he spent some time last summer.

February 1, 2017: MSM regular monthly meeting begins at 7:30 p.m. at the Manitoba Museum.

Speaker to be announced.

March 1, 2017: MSM regular monthly meeting begins at 7:30 p.m. at the Manitoba Museum.

Speaker to be announced.

April 5, 2017: MSM regular monthly meeting begins at 7:30 p.m. at the Manitoba Museum.

Speaker to be announced.



Founded in 1971, the Mineral Society of Manitoba is dedicated to promoting the study of minerals, rocks and fossils for their scientific and recreational value.

The Mineral Society of Manitoba hosts monthly meetings covering a variety of mineral related topics. In addition, the Mineral Society organizes summer field trips to collecting localities, and hosts educational exhibits about minerals and fossils.

CHRISTMAS PARTY SUMMARY

The Annual Christmas Party was held on Wednesday December 7th at the Manitoba Museum in our regular meeting room this year.



The weather was less than perfect this year with snow and blowing snow as well as cold weather and only 19 people attended the event.

The meal was catered by Luigi's Cadillac Catering Services and consisted of a great assortment of chicken, ribs, scalloped potatoes, cabbage rolls, meat balls, potato salad, coleslaw, cheese, pickles and vegetables. The food was good, quite plentiful and reasonably priced. Nobody went home hungry and doggy bags were even encouraged!



The highlight of the evening was by far the variety of desserts brought by the attendees. The agate and geode cookies brought by TJ and Leanne were by far the most original ones!



PRESIDENT'S MESSAGE

I would like to take this opportunity to send you my best wishes for a happy new year 2017 filled with health, happiness and success.

It has been a great year for the Mineral Society of Manitoba with several great guest speakers and many field trips across the province

May 2017 be filled with mineral collecting trips and opportunities to learn about earth science among friends.

MINERAL OF THE YEAR

The International Mineralogical Association has announced that the Mineral of the Year award goes to **chanabayaite**.

This mineral was discovered and studied by Nikita V. Chukanov of the Russian Academy of Sciences (Chernogolovka, Moscow Region) in collaboration with Natalia V. Zubkova (Moscow State University, MSU), Gerhard Möhn (Niedernhausen, Germany), Igor V. Pekov (MSU), Dmitry Yu. Pushcharovsky (MSU), and Aleksandr E. Zadov (NPP Teplokhim, Moscow).



Chanabayaite cristals (photo Leonardus)

Chanabayaite, $\text{Cu}_2(\text{N}_3\text{C}_2\text{H}_2)\text{Cl}(\text{NH}_3, \text{Cl}, \text{H}_2\text{O}, \text{[]})_4$, is a new mineral species from Mt. Pabellón de Pica near the village of Chanabaya in the Tarapacá region of Chile. This unusual organometallic mineral does not only have a unique crystal structure that features the 1,2,4-triazolate anion ($\text{N}_3\text{C}_2\text{H}_2^-$), but also acts as a “bridge” between the geosphere and the biosphere because its deep-blue crystals formed where guano deposits (the source of the C and N) came into contact with a chalcopyrite-bearing gabbro (which supplied the Cu).

Chanabayaite formed by Na and Cl leaching from, and by the dehydration of, another triazolate-bearing natural compound.



Chanabayaite cristals (photo: Matteo Chinellato)

Professor Chukanov is known internationally both for his fascinating mineral discoveries (chanabayaite is but one of the 190 new species under Chukanov’s belt) and his prominent contributions to mineral spectroscopy.

A close runner-up to the winner was decagonite ($\text{Al}_{71}\text{Ni}_{24}\text{Fe}_5$), the second naturally occurring quasicrystal from the Khatyrka CV3 carbonaceous chondrite meteorite.



Khatyrka chondrite meteorite

Tiny pieces of a chondrite were found during an expedition to Chukotka in far eastern Russia by scientists from the US, Russia and Italy, from July 20 to August 7, 2011. The search team removed 1.5 tons of clay and other material from dense gray-blue clay layers that are exposed along Listventovyi stream, and panned it to obtain the heavy fraction within which the meteorite fragments were found.