Mineral Tour

Location, 2nd floor, main gallery

**A note about the minerals:**One popular thing for kids is showing them their birthstone! If they don’t like the one you show them, tell them that that’s okay, they can pick their own birthstone by picking their favourite mineral in the collection. As they look through the different stones, you can tell them about the different areas they come from.

There are a finite number of elements in the universe, yet they exist in a wide range of forms, colors, consistencies, etc., depending on the circumstances in which they were formed. Take salt. Its scientific name is sodium chloride, meaning that it is made of sodium and chlorine. Sodium on its own is a silver colored metal, and chlorine is a blue poisonous gas (!). It’s hard to imagine two things you’d want less on your food, and yet, the equal combination of the two results in a completely different, new substance which is quite safe.

There is more to the elements around us than their appearance indicates. When the mineral corundum is colorless, it is used as the sand on sandpaper because of its rigidity. However, if it is imbued with blue impurities, we call it sapphire, and when it has red in it, we call it ruby. A mineral is a kind of element that is naturally occurring, inorganic and solid, with regular crystal structure.

If you’ve ever heard of birthstones, then you already know a little bit about minerals. The idea of birthstones, as far as we can tell, dates to the 1st century when the High Priest of Israel wore a breastplate decorated with twelve stones, representing the twelve tribes of Israel. Later, they were tied to the actual zodiac signs, and social meanings were attached to them. Eventually, birthstones shifted away from the Zodiac slightly and were tied to the actual months.  
This concept now exists in many places in the world, with slight variations. Here is one list: Garnet (Jan); Amethyst (Feb); Aquamarine (March); Diamond (April); Emerald (May); Pearl (June); Ruby (July); Peridot (August); Sapphire (Sept); Opal (Oct); Topaz (Nov.); Turquoise (Dec.)

**The Ferrier Mineral Collection**  
The Ferrier Collection includes some of the finest and rarest mineral specimens held by the Redpath Museum. This systematic collection of over 7,000 specimens was purchased in 1913. It was assembled by Walter F. Ferrier (1865-1950), a mining engineer who graduated from McGill University in 1887.

Ferrier began collecting minerals when he was a young boy. He was accepted as a member of the Natural History Society of Montreal at the age of nine. While still a student, he was corresponding and exchanging specimens with some of the famous mineralogists of his time. Ferrier’s subsequent career with the Geological Survey of Canada and in the North American mining industry provided him with many opportunities to acquire mineral specimens and to build one of the largest and most complete private collections in North America. The Ferrier Collection at the Redpath is only a part of his collection. Another suite of some 3,600 specimens was acquired by the University of Toronto in 1894 and became the core of the mineral collection at the Royal Ontario Museum, in Toronto.

The Ferrier Collection in the Redpath was organized in 1913-1914 by R.P.D. Graham (1880-1965), who was professor of mineralogy at McGill for forty-five years.  
Ferrierite-Mg was discovered in 1917 in a railroad cut on the north shore of Kamloops Lake, British Columbia, by Walter Ferrier. He recognized it as a potentially new zeolite group mineral. This was confirmed, and the mineral was named in his honour in 1918.

**Quebec Mineral Display**  
Quebec is an important producer of metals and industrial minerals. In fact, more mineral species have been found in Quebec (and more specifically, Montreal) than in any other region of Canada. Why? Because of Quebec’s geological diversity and unique geological environments.  
Within a 100-kilometer radius of Montreal there are **four** major geological provinces. The Laurentians just north of Montreal are in what geologists call the **Grenville Province**, which is part of the Precambrian Canadian Shield. The metamorphic and igneous rocks of the Grenville Province are about 1 billion years old. (Refer to display from the Grenville Province.) Further north there is the**Superior Province**with rocks around 2 billion years old.(Refer to display from the Abitibi region.)

East of Montreal, stretching through the Eastern Townships and up into the Gaspe Peninsula are the**Appalachians**. When you drive along the Eastern Townships Autoroute you cross what was once the junction between the ancient North American continent called Laurentia and the supercontinent of Gondwanaland. (Refer to display of minerals from the Jeffrey mine, asbestos mines in Thetford Mines-Black Lake, etc.)

Here in Montreal we are standing on the **Saint-Lawrence Platform**, largely composed of sedimentary rocks some 450 million years old. (Refer to display of minerals from quarries in the Montreal area.) Behind the Redpath Museum is Mount Royal, one of 10 igneous intrusions comprising the Monteregion Hills. These were created during the Cretaceous Period, 100 to 120 million years ago -when dinosaurs still roamed the planet!

Quebec’s reputation as a source of new and rare minerals rests largely in our area, including Mount Royal and even the Mount Royal Tunnel directly below the Redpath Museum. (Refer to Monteregian Hills display.) At present, over 4,200 mineral species are known to science. Every year the list grows by about 30 new species. To date, about 215 mineral species have been discovered in Canada. Quebec accounts for about 95 of the new species (40%). Around 75 of those species were discovered within 40 km of Montreal. The over 400 different minerals found within a 40-kilometer radius of Montreal represent nearly 10% of all known mineral species. Think of finding that percentage of the world’s different plant or animal species in such a small area! In addition, around 20 of the minerals from the Montreal area have not been found anywhere else in the world.

The very first new mineral described from Quebec was found right here on the McGill campus in 1874. It’s called Dawsonite, and was named after McGill’s 5th principal, and the founder and first director of this museum, Sir William Dawson.  
**The Meteorite**

Shooting stars are actually not stars at all, but meteors, chunks of iron and rock hurdling into the earth’s atmosphere, and being burned up by the friction of the atmosphere that protects us. Most meteors never make it to the earth, but the approximately 19,000 a year which do are called meteorites. Of these, very few are ever retrieved. However, when scientists can get their hands on one, they study it closely, because meteors are thought to be made up of the same material as the core of our own planet (which we have never been able to reach, but know to be a ball of dense iron). Meteors could be the crushed remains of planets or comets, which collided leaving debris floating around in space. Some meteorites are stony (aerolites), some are metallic (siderites) and some are a combination of both (siderolites).

This chunk is from a siderite, which landed in Arizona 20,000 years ago. It contains small diamonds (along the right edge), and has a hole made by atmospheric friction during entry. It is estimated that the whole meteorite weighed 15,000 tons when it hit the earth, making a huge crater in the ground. Only 30 tons were ever found though. The rest either vaporized or is so deeply embedded in the earth’s crust that it cannot be detected.

A meteorite is also thought to be the cause of the extinction of the dinosaurs. Some 65 million years ago, a meteorite collided with the earth, throwing clouds of dust and debris into the atmosphere. This blocked most of the sunlight, shortened the days, dropped the earth’s temperature and started off a chain that lead to the extinction of many plants and animals, among them the dinosaurs.