The Cobalt Area Silver-Arsenide Deposits

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The annual New Mexico Mineral Symposium provides a forum for both professionals and amateurs interested in mineralogy. The meeting allows all to share their cumulative knowledge of mineral occurrences and provides stimulus for mineralogical studies and new mineral discoveries. In addition, the informal atmosphere encourages intimate discussions among all interested in mineralogy and associated fields.

The symposium is organized each year by the Mineral Museum at the New Mexico Bureau of Geology & Mineral Resources.

Abstracts from all prior symposiums are also available: https://geoinfo.nmt.edu/museum/nmms/abstracts

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The Cobalt silver mining area, in northern Ontario, Canada, was discovered in 1903 by workers of the Timiskaming and Northern Ontario Railway and is renowned as the source of 600 million troy ounces of silver, mostly mined as native silver in association with Co-Ni-Fe-Sb sulpharsenide and sulphosalt minerals in carbonate veins. The near-vertical veins were emplaced in fault-controlled fractures in various rock types, all within a few hundred meters of the Nipissing Diabase Sill. The sill intruded local rocks 2.162 billion years ago and deposition of the silver veins occurred after that. According to fluid inclusion studies, the minerals in the veins were precipitated from hypersaline aqueous solutions into fault-controlled fractures at pressures of 600 -1360 bars (60-136Mpa) over the temperature range of 300-350 degrees Celsius.

Silver, acanthite, calcite, Keeley Mine, South Lorraine Township, Ontario, Canada. 5 cm tall.

Royal Ontario Museum Collection Ray McDougall Photo.

The source of the vein minerals has never been definitively determined but theories share the commonality that the heat from the 333m thick diabase and, perhaps, its parent magma body caused metals to be concentrated from a local source(s) and moved by the saline solutions to eventual emplacement in fractures, in all surrounding rock types, including the Nipissing diabase sill. The elemental makeup of the veins has resulted in a unique and interesting suite of minerals and mineralogical textures, including nine type-locality minerals, which will be covered in detail in this presentation.

Silver, Calcite, Keeley Mine, South Lorraine Township, Ontario, Canada. 4 cm. Royal

Ontario Museum Collection Ray McDougall Photo.

Lollingite-coated silver crystals, Langis Mine, Casey Township, Ontario, Canada. 6.0cm across. David Joyce photo.

Safflorite, Beaver Mine, Cobalt, Ontario, Canada. 8.5cm across. David Joyce photo.

Nickeline, Rusty Lake Mine, Leith Township, Ontario, Canada. 2.5cm tall. David Joyce photo.