Trip F

MINERAL COLLECTING IN ST. LAWRENCE COUNTY

BY

George Robinson
Fort Jackson, New York

ABSTRACT

The purpose of this trip is to visit some of the classic mineral collecting sites of St. Lawrence County, observe their geology, and collect specimens. Stops will be made at: 1) the Bower Powers farm in Pierrepont, a world-famous locality for doubly-terminated tourmaline; 2) the West Pierrepont actinolite locality; 3) the gem diopside locality near DeKalb; and 4) the Gomer Jones farm in Richville, a well-known occurrence of dravite. Other minerals which may be found at these stops are apatite, biotite, calcite, chlorite, pyrite, quartz, schorl, tremolite and uralite.

The mineral collecting sites of St. Lawrence County may be classified as: 1) those of sedimentary origin; 2) those formed by fracture filling and 3) those of metamorphic and complex origin. These will be briefly discussed, as will their typical mineralogy and their collecting history.

INTRODUCTION

General

The following discussion is an attempt to cover the major information concerning the more important mineral collecting sites of St. Lawrence County, and is not intended to delve deeply into their genesis. The sites can be grouped into three general types: 1) those of sedimentary origin, 2) mineralization along fractures, and 3) those of metamorphic and complex origin. A brief discussion of each follows.

Type 1: Localities of Sedimentary Origin

Of the three types of localities described, those of sedimentary origin

number the fewest. Although numerous quarries have been sunk into both the Potsdam sandstone and Ogdensburg dolomite, very few have ever produced noteworthy mineral specimens. Probably the most important of these is Allied Chemical's Barrett Stone Quarry, near the village of Norfolk.

Here, there are many small cavities in the dolomite located in a band five to ten feet below the top of the second bench in the main pit. Their sizes range from less than an inch to more than a foot across, and are always lined with crystals of dolomite and/or quartz. The quartz appears to have been the first to form, followed by dolomite, calcite, and more rarely marcasite, fluorite, and celestite (in very minor amounts). Often the quartz crystals assume the habit of the more famous "Little Falls Diamonds", and contain hydrocarbon inclusions.

Probably the most abundant and well known species to occur here is dolomite. Although white, gray, and tan crystals have been found, the bright pink, saddle-shaped rhombohedra are the best formed, and sometimes measure nearly 3/4 of an inch across. They are quite likely to be among the world's finest representatives of pink dolomite euhedra.

Type 2: Mineralization Along Fractures

Many excellent crystal specimens have formed in fracture zones throughout the county. Open spaces along fault planes and in brecciated host rock provided convenient channels for mineralizing solutions to enter and form free-growing crystals of many varieties. The Rossie Lead mines, Macomb Fluorite mine, and St.Joseph Lead mines at Balmat are the county's three most prolific mineral occurrences of this type.

Since its opening in 1836, the Cole Hill vein at Rossie has produced hundreds of huge and unique calcite crystals, as well as fine specimens of galena, fluorite, celestite, chalcopyrite, and pyrite. The vein consists of a breccia containing granitic rocks and marble, and hosting many seams and open cavities lined with calcite crystals. The most common habit is the simple rhombohedron with scalenohedral modifications, but complex and twinned forms are not uncommon (see Fig. 2). Equally unique crystals of pyrite were also encountered (Fig. 3).

The Macomb fluorite mine is located along a fault plane in the Grenville marble. Numerous seams and pockets of calcite with sea-green cubes of fluorite are present, and occasionally reach large dimensions. G. F. Kunz described one such pocket found in 1827. (Kunz, 1831)

"The cave is 22 feet north and south, and is 18 feet

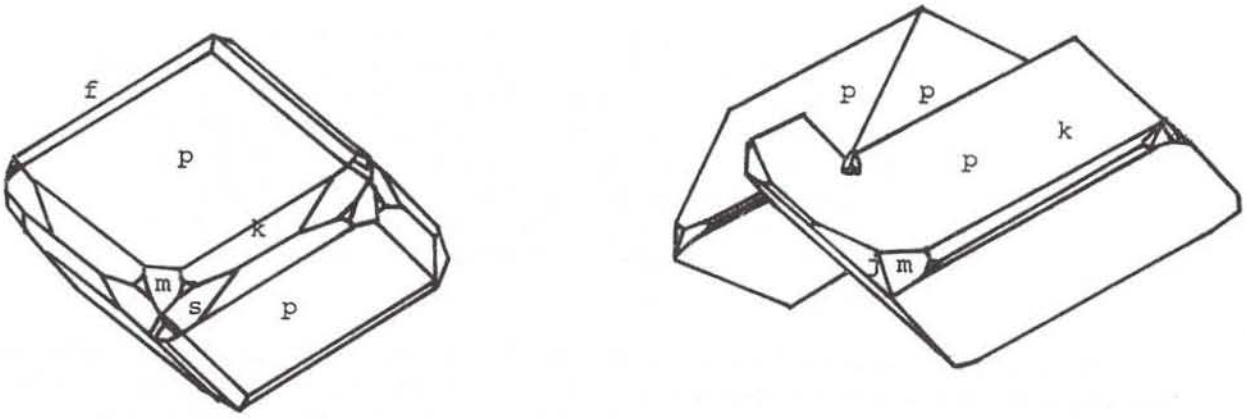

Figure 2.

Calcites, Rossie, N.Y. (after Whitlock, 1909)

major forms

f	(7.2.$\bar{9}$.11)
p	(10$\bar{1}$1)
m	(40$\bar{4}$1)
s	(4.$\underline{6}$.$\bar{1}$0.1)
k	(21$\bar{3}$1)
j	(6281)

Figure 3.
Pyrite, Rossie
(after Beck, 1844)

major forms

p	cube
e	pyritohedron
a	octahedron

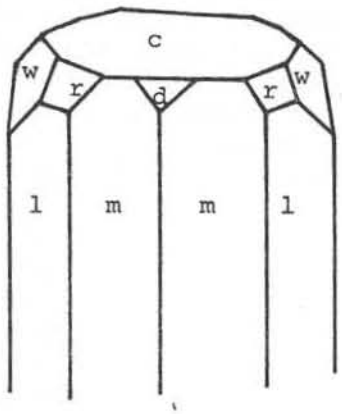

Figure 4.
Danburite, Russell
(after Brush & Dana, 1880)

prisms	m,l
domes	d,w
pyramids	r
pinacoid	c

> east and west, and is 8 feet below the surface.... the top, bottom, and sides were lined with a magnificent sheet of crystals, varying from one to six inches in diameter, each in turn forming part of larger composite crystals....groups of crystals weighing from ten to several hundred pounds each, and one of them measuring 2 x 3 feet were easily detached. The cavity contained at least fifteen tons of fluorite."

The present mining operations by the St. Joseph Lead Co. have unearthed some equally magnificent specimens. Some beautifully twinned clear iceland spar crystals, often coated with tiny glittering pyrite euhedra, have recently been discovered near a fracture zone on the 500 foot level of the number three mine near Balmat. Transparent crystals weighing several hundred pounds have been encountered. Associated with the calcites are large radiating groups of bladed, white celestite crystals, specular hematite, and mountain leather. Very few, but fine quality, lustrous tetrahedrite crystals were also found associated with pyrite, and coating the calcite crystals. Smaller vugs nearby contained gem quality yellow sphalerite crystals perched on a matrix of clear quartz and specular hematite.

Type 3: Localities of Metamorphic and Complex Origin

The marbles and associated calcium silicate rocks furnish a wealth of mineral specimens. In an area of more than 500 square miles from Canton to Oxbow, and Black Lake to Edwards, outcrops of Grenville marble are in contact with many coarse grained rocks of complex origins. In these contact zones are found large, well-formed crystals of various minerals. Quite often the less resistant marble has been eroded away, exposing exceptionally well-formed single crystals and crystal aggregates free from matrix. The following listing associates some of the species with their more important localities.

Actinolite - Pierrepont, Macomb, Russell
Albite - Oligoclase - Fine, Rossie, Benson Mines
Apatite - Rossie, Hammond, Gouverneur
Biotite - Pierrepont, Russell
Chondrodite - Gouverneur, Rossie
Danburite - Russell (see Fig. 4)
Diopside - DeKalb, Russell, Edwards, Fine
Dravite - Gouverneur, Richville, DeKalb, Macomb
Galena - Rossie, Edwards, Macomb
Graphite - Pope Mills, Rossie, Macomb

Groutite - Talcville
Hexagonite - Talcville, Fowler
Lazurite - Edwards
Loxoclase - Hammond, Rossie
Microcline - Edwards, Fine, Rossie, DeKalb
Molybdenite - Benson Mines, Colton
Muscovite - Rossie, Benson Mines
Phlogopite - Edwards, Rossie, Talcville
Peristerite - Macomb, Pierrepont
Pyrite - Rossie, Pyrites, Stellaville
Quartz - Rossie, Macomb, Hermon
Schorl - Pierrepont
Serpentine - Edwards, Fowler, Talcville
Sphalerite - Balmat, Edwards, Rossie, Macomb
Spinel - Rossie
Talc - Talcville, Fowler, Edwards
Tremolite - Gouverneur, Rossie, DeKalb, Macomb, Fowler
Cr-tremolite - Balmat, Macomb
Tirodite - Balmat, Fowler, Talcville
Titanite - Fine, Pitcairn, Rossie, DeKalb
Uralite - Pierrepont, Russell
Wernerite - Pierrepont, Rossie, Gouverneur
Wollastonite - Fowler, Gouverneur
Zircon - Hammond, Rossie

In addition, the following minerals have also been found, or reported as occurring, in or near St. Lawrence county.

Achroite, Agate, Amethyst, Anglesite, Ankerite, Aragonite, Augite, Azurite, Barite, Bornite, Celestite, Chalcodite, Chalcedony, Chlorite, Corundum, Cordierite, Cyrtolite, Datolite, Dysyntribite, Garnet, Guitermanite, Hornblende, Houghite, Hydrozincite, Labradorite, Lederite, Limonite, Magnetite, Malachite, Marcasite, Martite, Malachite, Melanterite, Millerite, Mizzonite, Nutallite, Pargasite, Pyrrhotite, Rensselaerite, Rose Quartz, Sahlite, Selenite, Siderite, Sillimanite, Silver, Stilpnomelane, Sunstone, Willemite, Uraninite, Vesuvianite, Wilsonite, and other minerals.

STOP DESCRIPTION

General

The trip will consist of four stops which are located on the stop map, (Figure 1) . Please note that nearly all the stops are on privately owned land. Please do not litter, and kindly abide by any restrictions or regulations set forth by the land owners regarding the use of their properties.

Stop 1. Bower Powers farm, Pierrepont, N.Y. - This locality is one of the world's most famous for doubly terminated black tourmaline crystals. The tourmaline appears to be of metamorphic origin, and occurs in contacts between Grenville Marble, and a quartz-tourmaline-biotite schist. Nearly perfect crystals are observed both within the quartz-tourmaline rock and separated from it, enclosed by marble. Often crystals are found loose in the soil where they have freed from the marble. It is interesting to note the absence of feldspar at this tourmaline deposit.

Mineralogy

1) Tourmaline occurs as near perfect trigonal crystals with shortened c-axes and lacking the usual prismatic striations typical of the species. Riggs' analyses indicate this is an iron-magnesium tourmaline (Clarke, 1899). Crystals and crystal aggregates are commonly found associated with quartz and uralite. The common habit includes the following forms illustrated by Fig. 5: trigonal prism (m), ditrigonal prism (a), rhombohedra (e) and (r), basal pedion (c), trigonal pyramids (o) , and more rarely ditrigonal pyramids and second order hexagonal prisms (not shown).

2) Quartz is typically milky and shows poor development, but occasionally clear to smoky crystals are found associated with the tourmaline. They are commonly prismatic, with hexagonal prisms and terminating rhombohedra being the only faces developed. The physical development of these crystals does not illustrate enantiomorphism.

3) Uralite is an amphibole replacement of pyroxene. Actinolite commonly replaces diopside, and is a relatively common phenomenon in metamorphic rocks. However, complete, free-standing pseudomorphs are uncommon and the ones from this locality are well known for their perfection and sharp definition. They are usually associated with the tourmaline. Occasionally they grade into unaltered diopside or more rarely into rensselaerite.

4) Apatite is uncommon, but sometimes is found in the calcite as small hexagonal prisms seldom over an inch long. The most common color is light green to brown.

5) Biotite Pseudohexagonal sheets approaching four inches in diameter may be found. It is interesting to note that in areas where the mica abounds, tourmaline is not common.

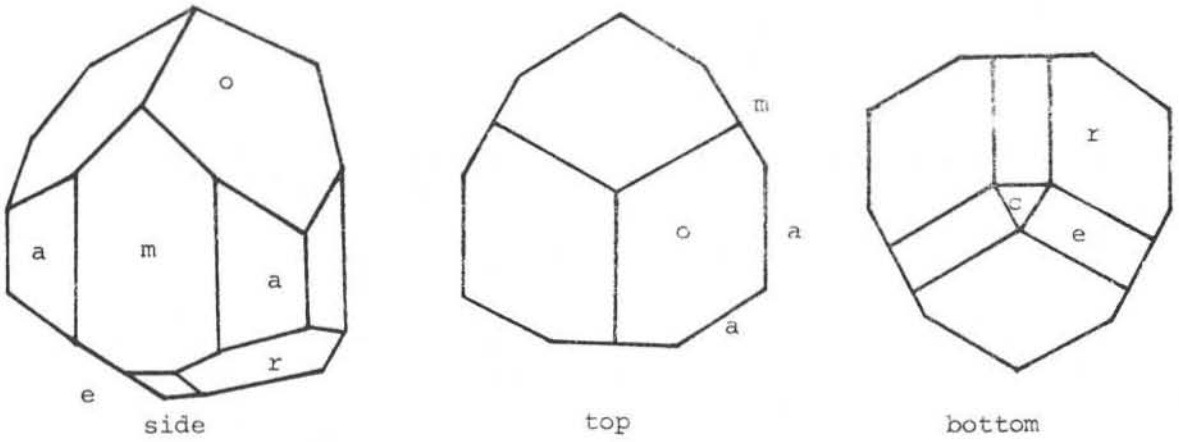

Figure 5. Tourmaline, Pierrepont

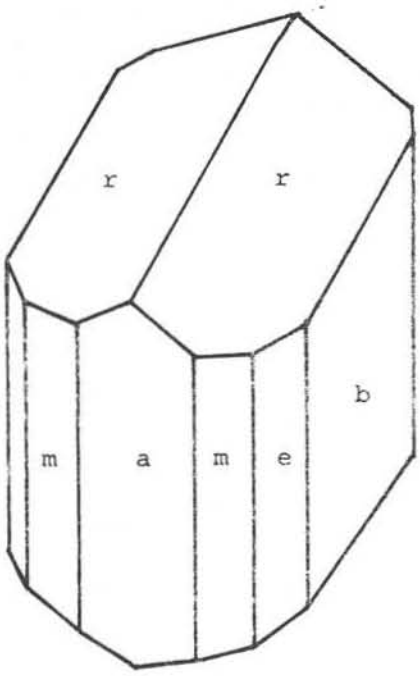

Figure 6.
Actinolite, W. Pierrepont

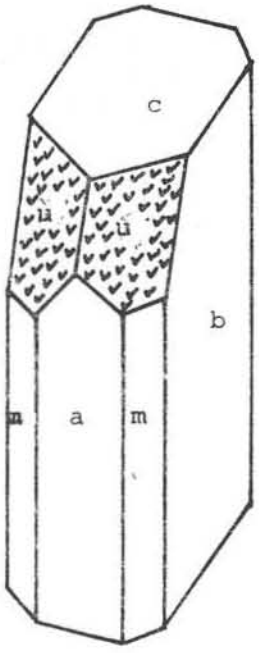

Figure 7.
Diopside, DeKalb

6) Others — Chlorite, pyrrhotite, pyrite, calcite, scapolite, and diopside are also likely to be encountered here, but usually not as desirable specimens.

Stop 2. Actinolite locality, near West Pierrepont, N.Y.- Most commonly observed as radiating fibers, or matted masses of acicular crystals, actinolite is seldom seen as large, perfectly developed euhedra. At this stop, actinolite occurs in the latter mentioned form, and is found in a marble-calc-silicate rock. A few crystals of pyrite, quartz, and dravite have been found here, but are relatively uncommon. The most striking feature here is a fifteen foot outcrop of solid actinolite crystals. Each crystal is remarkably well formed and was probably formerly in contact with marble which has since eroded away.

Figure 5 illustrates the typical habit of the actinolite here. The following forms are usually well developed: orthopinacoid (a), prism (m), prism (e), clinopinacoid (b), and clinodome (r).

Stop 3. Gem Diopside locality, near DeKalb, N.Y.- This is the famous Calvin Mitchell farm to which all mineralogy texts refer when citing DeKalb, N.Y. as a noted locality for diopside. The crystals from here are without any doubt the world's finest gem diopsides. They occur in seams and pockets within the diopsidic host rock which is part of a long ridge composed chiefly of interbedded quartzite and silicated marble. The ridge trends northeast-southwest, and dips 45° to the northwest.

A typical diopside crystal is shown in Figure 7. The common forms include orthopinacoid (a), clinopinacoid (b), prism (m), pyramid (u), and basal pinacoid (c). The pyramids (u) are typically heavily etched, whereas all the other faces are smooth and glassy. Sometimes an asbestiform tremolite is observed growing into and parallel with the diopside, as if it were in the process of replacing it. A few complete tremolite pseudomorphs after diopside have been found here. Unlike other diopside in the Grenville rocks, this diopside seldom shows basal parting, and always exhibits good cleavage (110).

Note: This locality is presently being mined for gem diopside, and mineral collecting is NOT permitted anywhere on the property.

Stop 4. Gomer Jones farm, Richville, N.Y.- Nearly all the famous large brown dravite crystals labelled as coming from Gouverneur, N.Y., probably came from this locality. Here coarse white tremolite crystals, as much as a foot in length, form a major part of the calc-silicate-marble bedrock. Associated with these large tremolites are white pyroxene crystals, apatite, and dravite.

Mineralogy

1) Dravite — occurs as masses, grains, and complete crystals scattered locally throughout the deposit. The largest and best crystals are usually in intimate association with the tremolite and coarsely crystalline calcite. Occasional small, free growing crystals are found in the marble, and loose in the soil. The habit is similar to the Pierrepont tourmalines, with the exception of a few longer, more prismatic crystals.

2) Pyroxene — occurs as small, white to light tan colored crystals in veins in the hard calc-silicate rock. They are presumably diopside, but lack the familiar green color.

3) Apatite — has been found enclosed in the coarse calcite in the floor of the pit at the east end of the hill. The crystals are sharp hexagonal prisms of blue color, and are not commonly encountered.

End of Trip. Return to Potsdam

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