and remains so, the continued development being one of complexity, and confined to the inner portion of the pit. (See Fig. 10 *c*.) This development as observed under greater magnification includes the formation of a long rhombic pit within the primitive figures and elongated parallel to *a*; each side of this rhombic form is subdivided into two faces, as the mature stage approaches, producing as the ultimate form, Fig. 11, an etching bearing the primitive outline inset with an elongated octagonal pit, extending parallel to the brachy-axis and divisible by two symmetry planes. This manner of growth, while involving a great many changes, never alters the figure to a form other than one which accurately indicates the symmetry of the basal pinacoid.

Topaz is, therefore, according to the etchings of six fundamental crystal forms, divisible by three symmetry planes at right angles, which accords with the holohedral symmetry of the orthorhombic system of crystals.

SOME CRYSTAL LOCALITIES IN ST. LAWRENCE COUNTY, NEW YORK[1]

WILLIAM J. MILLER

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St. Lawrence county, New York, has long been famous for numerous localities from which fine mineral specimens representing many species have been obtained. Specimens from this region have found their way into many of the mineral cabinets of the world. During the prosecution of the detailed geological survey of the Russell quadrangle, in the middle of the county, a number of mineral localities (mostly new ones) of considerable interest were found by the writer. At most of these places good crystals and groups of crystals of tremolite, diopside, and hornblende may be obtained with the aid of a geologist's hammer, but much better material would doubtless be found by blasting open the ledges.

[1] Published by permission of the State Geologist of New York. [The famous mineral localities of St. Lawrence County have not been treated in this series of articles heretofore; but we are glad to report that in addition to the present description of several new localities, we have on hand a manuscript in which all of the older ones are described in great detail; this will be published when space permits, in the course of the next 3 or 4 months. ED.]

Tremolite

Close to the road 0.7 kilometer (2/5 mile) east of West Pierrepont, and also at and near the corners 2½ km. (1½ miles) east of the same place, limestone contains bunches of long prismatic crystals of light gray tremolite commonly ranging in length from ½ to 5 centimeters. Many of the crystals are well formed, with good terminations. Parallel growths are common.

About 0.7 kilometer (2/5 mile) a little south of west of Endersbees Corners a big outcrop of limestone contains fissures, 5 meters or more long and up to 3 decimeters wide, filled with interlocking relatively slender crystals of nearly pure white to colorless tremolite. The crystals range up to 7 cm. long, but good terminations are not common. Very fine large masses of the interlocking crystals may be obtained.

In limestone 0.9 km. (½ mile) southeast of East Road school, small groups of short stout crystals of light gray tremolite occur. They range in length up to 3 cm. and most of them are almost perfectly formed, many having excellent terminations. Groups of similar crystals occur in schist associated with some limestone 0.9 km. (½ mile) southwest of Van House Corners.

Very large crystals of light gray tremolite occur a few meters west of the road near a maple sugar house on top of Hamilton Hill, about 1 km. south of Russell. The tremolite seems to lie at or near the contact between a big pegmatite dike and Grenville pyritous gneiss. Some of the crystals are over a half meter long and 15 to 25 cm. thick, but crystal faces are not well developed on them, and they break to pieces easily along cleavage planes. Good specimens 15 cm. long, showing parallel growths, with some fairly well developed crystal faces may be obtained.

Diopside

About 0.3 kilometer (⅕ mile) northeast of East Road school a ledge of limestone contains many crystals of diopside. This may be the place mentioned by Smyth[1] who says: "Here the minerals are pyroxene (a diopside variety in very large crystals), gray amphibole, feldspar, scapolite, phlogopite, and tourmaline. The minerals fill irregular pockets or short veins, scattered through the limestone." There are many good diopsides 3 to 5 cm. long. Within a cavity in the limestone, but well out of

[1] C. H. Smyth. *Trans. N. Y. Acad. Sci.*, **15**, 267–268, 1896.

reach, the writer saw a well formed crystal of the diopside probably at least 2½ decimeters long. It would be difficult, if not impossible, to get out this large specimen in its entirety.

Veins in limestone near the road 2½ km. (1½ miles) east of West Pierrepont (just west of Moore's Corners) contain coarse calcite thickly set with crystals of diopside and some masses of phlogopite. The well formed, relatively slender, prismatic diopside crystals range in length up to 2 centimeters. Weathered specimens best show the crystals.

Limestone 0.7 km (2/5 mile) south of Clark's Corners contains many more or less well formed crystals of light green monoclinic pyroxene (probably diopside) up to 5 cm. in length.

Hornblende

Groups of excellent black hornblende crystals occur in veins in syenite along its contact with a small mass of included limestone 0.4 km. (¼ mile) south of Jones pond near the southwestern corner of the quadrangle. Solid masses of crystals 15 cm. across are readily obtainable, and a little blasting would yield better specimens. The crystals are stout prisms, usually very well formed with double terminations, and from 1 to 2 cm. in length.

Origin of the Crystals

The origin of all the crystals above described is believed to have been about as follows. During the intrusion of the igneous rocks (granite-syenite series), magmatic vapors or juices were given off and penetrated or came into contact with, and dissolved, some of the (Grenville) limestone. Under varying local conditions crystals of tremolite, diopside, and hornblende developed from the lime-rich magmatic solutions. In all cases limestone is either actually the rock containing the crystals, or is close by, and the igneous rock is either directly associated with the crystals, or is likewise relatively near.

Corrections to List of Fellows of M. S. A.

Page 46 (February number), change address of Dr. Elliot Q. Adams to: Nela Park, Cleveland, Ohio.

Add after Prof. Crawford: Dr. A. R. Crook, State Museum, Springfield, Ill.

Page 47, after Prof. Richardson add: Prof. Heinrich Ries, Cornell University, Ithaca, N. Y.

After Prof. Winchell add: Prof. John E. Wolff, Harvard University, Cambridge, Mass.