

AN ELEMENTARY INTRODUCTION TO
CRYSTALLOGRAPHY

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*Brooklyn, N. Y.**(Continued from page 94)*

There are two more forms with twenty-four faces. These are best called the trigonal (three-edged) tris-(three-faced) octahedron and the tetragonal (four-edged), tris- (three-faced) octahedron. They both have a three-faced pyramid on each face of the octahedron. To develop them draw a triangle with equal sides and one corner at the top. This will represent one face of the octahedron. The top corner will be the end of the c axis, that to the left a , and that to the right b .

It is only necessary to remember that the larger symbol means further away from the ends of the axes. Take 221; this indicates that the a and b axes are cut half way in, towards the center, where the axes cross each other, while the c axis is cut at its end. The lower edge of our triangle is a line between the ends of the a and b axes.

If the points indicated by 2, 2 on these axes should be joined by a line, such a line would be parallel to the edge of the triangle or of the octahedron. The face indicated by 221 would thus be tipped down equally on the a and b axes and up on the c axis. The other two faces, 212 and 122 would be similarly placed. The three faces would build a little pyramid on a face 222. This face 222 is exactly parallel to 111, and can in fact not be distinguished from 111.

If in the center of our triangle we put a dot and join it to the three angles or tips it represents one face of the octahedron with its three sided pyramid, each side having three edges. With the other faces of the octahedron treated in the same way we would have our trigonal trisoctahedron of twenty-four faces.

(111) in brackets means all the eight faces of an octahedron, while 111 means the upper, right hand, forward face. The portion of a crystal in this direction is often called a quadrant, or, more properly, an octant. Note that this octant has all three symbols without a dash. This is generally true of any face in this octant. To reverse the sign by putting in dashes where there are none, and leaving them out where there are, indicates a face directly opposite a given face.

(221) and (211) are the symbols of two crystal forms that have twenty-four faces each. As each of them can only be varied by changing the position of the odd number, 1 in 221 and 2 in 211, it is evident there can be only three of these faces in each octant. The idea we can get of them from the symbol is the direction and the amount of the slant.

The four-faced cube (210) has edges at the base of the pyramid identical with the edges of the cube. The three-faced octahedron (221) has edges at the base of the pyramid identical with the edges of the octahedron.

The planes that make these faces cut two axes equally near the center and the third axis further out, or at the end.

(*To be continued*)

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, June 14, 1917.

The President, Mr. Trudell, in the chair. Eleven members and four visitors present. Mr. Frederick Oldach, proposed by Mr. Gordon, was elected to active membership.

Mr. Samuel G. Gordon gave a brief talk, illustrated with lantern slides, on "Some Philadelphia Mineral Collections."

Mr. Oldach reported the results of the Society's trip to Mineral Hill on May 6th. Chromite and anthophyllite were found at Moro Phillips' chrome mine, on Battles' farm. At Mineral Hill a little sunstone, moonstone, amazonstone, and deweylite were obtained.

The Secretary reported the trip to the Frankford localities on May 19th. The stilbite locality, now being filled with rubbish, looked uninviting and was not entered. This quarry is situated at Church and Leiper Sts., opposite the site of the molybdenite locality, which has been built over. Clark's quarry has again been abandoned, and is filled with water. It is doubtful if it will ever be reopened. At O'Neill's quarry the following were noted: orthoclase, hornblende, epidote, wernerite (?), biotite, vermiculite, stilbite, titanite and apatite.

The trip to Unionville on Decoration Day was reported by Mr. Knabe. At the corundum mines the following are obtainable: corundum, albite, tourmaline, margarite, and green quartz; at Beryl Hill: indifferent pieces of beryl, muscovite and microcline; at the Poorhouse Quarry, not at present being worked: quartz, calcite, dolomite and chesterlite (microcline).

The secretary reported the trip to the West Philadelphia localities on June 9th. At 64th and Lansdowne Ave. a hill is being leveled and the gneiss contains large cleavages of orthoclase showing Carlsbad twinning. Poor specimens of hyalite were obtained. A small quartz crystal was found at the Overbrook locality, back of the Blind Asylum.

In view of the fact that collectors may be thinking of visiting Franklin during the summer, the secretary told of some of the conditions there. The mines are carefully guarded by a dozen detectives, and permission to visit the mines and even the dumps is very difficult, if not impossible to obtain. In fact all visitors are followed by these men, and if a collector does pick up a specimen from one of the dumps, he is forced to put it back.

An amendment to the constitution was made extending the limit of the president's term to three successive years.

FIELD EXCURSION

SATURDAY, SUNDAY AND MONDAY (LABOR DAY) Sept. 1-3. Falls of French Creek. Meet at 69th St. Terminal at 1.15 P. M., Saturday.

STATED MEETING

Thursday, September 13, 1917 8 P. M.

Reports of trips to Frankford, Lafayette, Leiperville, Friedensville, Perkiomen and the Falls of French Creek, by Messrs. Oldach, Gordon, Warford and Trudell.

Illustrated with specimens and lantern slides.

SAMUEL G. GORDON, *Secretary.*