

If the prism is square and not diamond shaped that shows that the lengths of the a and c axes are equal. If the crystal was drawn out that way it would be said to be elongated parallel to b .

These two sets taken together would make a closed form but not a perfect crystal.

There is plainly another set where the 0 is in the first place, 011, 0 $\bar{1}$ 1, 0 $\bar{1}\bar{1}$, and 0 $\bar{1}\bar{1}$.

They would make a prism parallel to a . The three pillars which combine to make a cube have for each pair two faces in common so the cube has only three times two, or six faces. Our last three prisms or pillars made with only one 0 in each symbol if combined would cut out or make a crystal form of three times four, or twelve faces, and for that reason is called the dodecahedron.

The dodecahedron has four faces meeting in a pyramid at each of the six ends of the axes; each face must thus go to the ends of two axes. As I have indicated each of these faces shows that two of the axes in the isometric system of crystals are equal. The octahedron, typified by (111), gives the indication by one of its faces that the three axes are all equal (but not so simply). These, the cube, the octahedron and the dodecahedron are the fundamental forms of the isometric system. There are four more forms in this system; they and all the forms in the other systems are derived from these three fundamental forms. The symbol 100 can only be modified by putting the 1 in each of three places and the 1 with the minus sign in three, making six planes or faces of the cube, the number of the permutations of the symbols being the same as the number of faces for the form it indicates. The same is true for the other crystal forms. The word form is used to indicate such a set of faces or planes. We use the symbol with a bracket to indicate the full set; thus:

(100) stands for all the faces of a cube.

(111) stands for all the faces of an octahedron.

(110) stands for all the faces of a dodecahedron.

The bracket is frequently put in by writers where it should be left out as only one face is intended. These crystal forms are not capable of any variation in the direction of their planes.

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, April 12, 1917.

President Trudell in the chair. Fifteen members and two visitors were present. Mr. M. L. Jandorf and Dr. Herman Burgin were elected active members. Mr. William C. Knabe was appointed Treasurer to take the place of Mr. Oscar Streland who has resigned the office.

Mr. Oldach reported a trip to the Falls of French Creek Mines which are now in active operation. Fine specimens of pyrite, magnetite, calcite, and heulandite (new) were exhibited. Mr. Bengé reported the results of the trip of the Society to Mullica Hill, attended by seven members. Vivianite, beraunite and aragonite (besides eight or nine species of fossils) were obtained, the viv-

ianite and aragonite often occurring as perfect pseudomorphs after belemnites.

An exhibition of microscopic minerals constituted the program of the evening, exhibits being made by Messrs. Bengé, Gordon, Hagey, Knabe and Trudell. Much interest was shown in the Perkiomen and Phoenixville minerals of Mr. Bengé, the Vesuvius minerals and the slide showing the growth of crystals of margaric acid of Mr. Gordon, and in the showy specimens of Mr. Hagey. Mr. Rothermel exhibited a small diamond mounted for the microscope.

FIELD EXCURSIONS

WEDNESDAY, JULY 4. Hellertown and Friedensville, Lehigh Co. Meet at 69th St. Terminal at 7.45 A. M.

SAMUEL G. GORDON, *Secretary*.

NEWARK MINERALOGICAL SOCIETY

The 16th meeting of the Newark Mineralogical Society was held May 6th with eleven members present out of a total membership of twenty-three. During the past season Dr. Colton has been giving at each meeting a talk on crystallography. These talks have proved of great value to all members. At this, the last meeting (indoors) for the season, the talk on the Monoclinic System was postponed and Mr. Reuben Broadbent, of Broken Hill, Australia, gave us a lecture on "Australia: Its Mines and Minerals," illustrated with lantern slides and mineral specimens. At the close of the meeting a vote of thanks was extended to Mr. Broadbent for his kindness in presenting this lecture before us.

Our next meeting in the clubrooms will be held the first Sunday in October at the Newark Technical School, 367 High St., where we will be pleased to welcome anyone interested in mineralogy. Our next meeting, which will be a field meeting, will be held somewhere in the field, date and place as yet unannounced.

WM. H. BROADWELL, *Secretary*.

NEW YORK MINERALOGICAL CLUB

The meeting of Wednesday, April 11th, 1917 was held in the Club room, the President, Mr. J. G. Manchester, in the chair.

The paper of the evening was by Mr. Reuben Broadbent on "Australia and some of its Mines and Minerals."

Mr. Broadbent, a native of the country described, gave a sketch of its interesting history, present aspects, and political or rather natural physiographic divisions and a similar review of some of its mines and mining districts—especially those of Broken Hill, New South Wales. Both these reviews were illustrated with lantern slides of maps and views of the cities, mining districts, and mills described.

His pictures of the machinery employed for the rather new "Flotation method" of concentration gave a realistic impression of the magnitude of its application in the Broken Hill District.

His description of the minerals of the various localities was illustrated with very attractive specimens from his own collection and a supplementary selection from the collection in the Am. Mus. of Nat. History of N. Y. contributed by Dr. L. P. Gratacap.

At the conclusion of his paper Mr. Broadbent supplied much additional information in replies to questions by the members present.

The attention of the meeting was then given to a large garnet crystal found at 168th St. and Broadway, N. Y. B. M. and exhibited by Mr. Charles W. McDonald, the contractor who was grading the plot where it occurred. Several visits were made by members of the Club to the locality from time to time during the progress of the excavation but nothing else of special interest seems to have occurred there.

WALLACE GOULD LEVISON, *Secretary*.