

AN ELEMENTARY INTRODUCTION TO
CRYSTALLOGRAPHY.

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(Continued from page 50)

Let us take the symbol 100 and consider the position it indicates for a plane.

We know the 1 in the first place indicates that the plane passes through the near end of the axis a . The 0 in the second place indicates that it is parallel to b ; to help the memory, we may say that it would not cut the b axis no matter how far they were both prolonged, associating 0 with *not*.

In the same way the 0 in the third place means that the plane is parallel to c , the c axis. Let us assume that the axes are 1 inch or unit long from the center to the front and to the back, to the right or E, the left or W., upward or N., and down or S. Now to go back to the map, we have placed or imagined a plane say 1 inch in front of the map hanging in front of us. The symbol $\bar{1}00$, with a dash over the 1, read minus 1, 0, 0, indicates another plane in exactly the same way 1 inch back of the map. These two faces, in a way, cut out a board, and the faces are accordingly called pinacoids from the Greek for board. In the same way 010 and $0\bar{1}0$ would give two faces, or make a board, with its edge towards us standing upright. Of each of these two pairs of faces, pair by pair, it is said "they are not closed forms" because there is no limit given to their extension. If we combine the symbols 100, $\bar{1}00$, 010, $0\bar{1}0$ we would have cut out a pillar, sometimes called a second order prism, altho I think it best not to use the word prism in this way. If a crystal was of some length in this direction it would best be said to be elongated parallel to c , the third axis. Now we have four faces or planes and between them four edges, the latter all parallel. Such a set of faces are said to be in a zone. 100 indicates that the front face is parallel to c , 010 indicates that the side face is parallel to c so the line where they meet is also parallel to c or is c except that by convention we put the c axis thru the middle of the crystal. 001 and $00\bar{1}$ would indicate two more planes, one on either end of our pillar; either of these is called the base or the basal pinacoid.

By the three pairs of faces or pinacoids, our figure would now be closed. If we take the three axes as 1 inch long each way from the center and each axis at right angles to the other two, we have a cube, which every one knows. It has 6 faces, 12 edges and 8 corners. It has 3 zones, of 4 faces each, parallel to a , b or c , the first, parallel to a , taking in the four faces 010, 001, $0\bar{1}0$, and $00\bar{1}$. This would be called the a zone or the zone of the face 100; a would be called the zone axis and the 100 the zone face. The zone axis is parallel to the zone edges and the zone face is across or at right

angles to them all. If we can make out the pinacoids, we may be able to place a crystal in the conventional position by putting one of the first pair toward us, one of the second pair to the right and one of the third above.

If we take a corner where three edges meet, these three edges may be taken as the three axes. If extended beyond the corner and moved to the center without changing their direction they would be our typical axes.

The cube, with two other forms to be described and four more are classed as belonging to the Cubic or Isometric System of crystals. They are characterized by three axes at right angles and of equal length.

(To be continued.)

BOOK REVIEW

DIAMONDS; A STUDY OF THE FACTORS THAT GOVERN THEIR VALUE. FRANK B. WADE, of Shortridge High School, Indianapolis, Ind. G. P. Putnam's Sons, *New York*, 1916.

This little book of 150 pages is intended to furnish information to both dealer and purchaser of diamonds, as to the features of diamonds which are of influence on their market value. Chapter I is on color (spelt thruout colour), II on flaws, III on cutting or "make," IV on repairing and recutting, V on mounting, and VI on "Buying the engagement ring." The advice it contains is in every way excellent, and the presentation of the subject is so clear and so enlivened by specific cases illustrating the several points made that the book will make interesting reading to anyone even tho they do not plan to take up diamond-collecting as a hobby.

E. T. W.

NOTES AND NEWS

The collection of minerals at the Boston Society of Natural History has recently been rearranged and is now exhibited under modern conditions. The collection has been divided into two parts, one of which is entirely made up of New England minerals, the other a general collection from all over the world.

Eventually it is planned to keep only New England material with a small general synoptic collection, thus conforming to the policy adopted in other departments of the Museum.

The specimens are all exhibited on plate glass shelves without individual mounts. This method has been found to give the maximum light, and to prevent shadows; it has the additional advantage of being colorless and hence does not detract in any way from the color of the specimens.

Although the collection is very strong in New England minerals, especially those from the older localities, its curator desires to obtain specimens which will improve the present ones, and any from new or recent localities that are not as yet in the collection. For this purpose the Society is willing to exchange some of the specimens from outside of New England for particularly fine New England minerals.

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