CRYSTALLOGRAPHIC NOTATION.*

BY GEO. ACHESON, B.A. SCIENCE MASTER, COLLEGIATE INSTITUTE, TORONTO.

IN crystallographic calculations an abbreviated notation for the forms becomes a necessary convenience. Forms, or crystal-planes, are named usually according to their position and relation to the axes; and a system of signs which indicates these positions and relations constitutes a kind of crystallographic shorthand, the convenience and utility of which is quite obvious.

At present various systems are in use, each having its own special advantages and disadvantages. The object of this paper is to bring before you a system different from any one of these, and, it is hoped, possessed of greater advantages and fewer disadvantages than any of those now in vogue.

I will first briefly describe the three principal systems now in use among modern crystallographers, viz., (I.) Naumann's; (II.) Dana's; and (III.) Chapman's.

I. *Naumann's System.*—The basis of this system is a plane cutting the three semi-axes (triaxial), and is denoted by the symbol *P*.

This is the triaxial pyramid form. The basal form is assumed to consist of this pyramidal form flattened down on the horizontal axes so as to be parallel to them, and cutting the vertical axis at the length *zero*. Its symbol, therefore, becomes $0P$ (*zero-P*).

A prism-form is supposed to be this pyramidal form opened out so as to be parallel to the vertical axis, *i.e.*, to cut it at *infinity*; and so its symbol is ∞P (*infinity-P*).

If the prism is parallel to one of the horizontal axes, it is denoted by $\infty P\infty$; and a diaxial pyramid has the symbol $P\infty$. The sign ∞ before the *P* always refers to the vertical axis; after the *P*, to one of the horizontal axes.

In Naumann's system, then, the base is denoted by $0P$; the triaxial pyramid by *P*; the diaxial pyramid by $P\infty$; the diaxial prism by ∞P; and the monaxial prism by $\infty P\infty$.

In the diaxial pyramid and monaxial prism, a sign denoting to which of the horizontal axes the form is parallel, is affixed to the symbol ∞. Numerical coefficients are also attached to these symbols, denoting the lengths at which the axes are cut, the number prefixed to the symbol always referring to the vertical axis; that following it, to one of the horizontal axes.

In the regular octahedron, instead of denoting the planes by *P*, Naumann made their symbol *O*, the initial of octahedron. All other forms, however, were denoted by the above signs.

II. *Dana's Latest System.*—This system differs from Naumann's in leaving out the sign *P*, and denoting infinity by its initial letter, *I* or *i*, instead of the sign ∞.

In this system, then, the base is denoted by 0 (*zero*); triaxial pyramid by *m*; diaxial pyramid by *m-i*; diaxial prism by *I* or *i*; and the monaxial prism by *i-i*. As before, numerical coefficients refer to the

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