Pleochroic, ϵ = colorless, ω = pale blue-green. It thus differs from the average vesuvianite only in slightly higher birefringence.

The writer wishes to acknowledge his indebtedness to Col. Roebling, Mr. Gage, and Ward's Natural Science Establishment for the privilege of examining specimens and to Dr. Larsen for the optical determinations.

POLARIZATION PHENOMENA OF CERTAIN FLUORITES

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While determining the refractive index of fluorite by the method of minimum deviation the writer introduced a nicol prism before the telescope of the goniometer to determine the plane of polarization of the refracted ray. On rotating the nicol no difference in the intensity of light could be observed, but on examining the reflected ray nearly complete polarization was obtained so that it was thought that the prism was not cut at the angle that should give polarization if Brewster's law applies to isometric crystals. A new prism was then cut from a crystal of fluorite from Madoc, Ontario, so that the angle between the reflected ray and the refracted ray should be ninety degrees. With this new prism the same phenomena were observed. A second nicol was now introduced between the collimator and the crystal so that the signal was extinguished. On rotating the two nicols simultaneously extinction was obtained throughout a complete rotation so that it would appear as though we may accept without question the statement that a ray of light passing through fluorite vibrates with equal facility in all directions at right angles to the direction of propagation and is not polarized.

On examining a standard glass prism for comparative purposes the refracted ray was found to be polarized in a plane at right angles to the plane of polarization of the reflected ray, indicating a marked difference in optical character between an amorphous substance and a cubic crystal, both of which give a single signal by the method of minimum deviation and are isotropic under the microscope.

To account for this behaviour of fluorite two hypotheses have occurred to the writer:

(1) Fluorite is singly refracting. The objection to this hypothesis appears in the polarization of the reflected ray with the absence of polarization in the refracted ray, for it is at once evident that if a

large portion of the light is polarized by reflection the residue must be more or less completely polarized by refraction, if we are dealing with a singly refracting substance.

(2) Fluorite is doubly refracting with $\alpha=\beta=\gamma$. A single signal would be observed in the refractometer and with one nicol the signal would be always bright while with crossed nicols extinction would occur with complete rotation of the nicols inasmuch as the phasal difference of the two rays equals 0λ.[1]

In view of the writer's observations it seems to him that the difference in polarization phenomena of fluorite and glass can best be explained by including fluorite with the doubly refracting substances with $\alpha=\beta=\gamma$.

NOTES AND NEWS

A CENTURY OLD MINERALOGY. It is pleasing to discover an old book, especially so if it is on science and much more so if on the science of Mineralogy. Old mineralogies have long been relegated to the class of Wedgewood china; this particular one is entitled "INTRODUCTION TO MINERALOGY" and is a first edition copy printed in London, 1819. The author, ROBERT BAKEWELL, needs no introduction to American geologists as his "INTRODUCTION to GEOLOGY" edited in this country by Professor Silliman of Yale reached its third edition by 1839. In view of the fact that its companion, the mineralogy, is unlisted in Dana's System, it seemed fitting to mention this book partly on account of its rarity on college shelves, but chiefly because the book itself, aside from its rarity, is deserving of notice for the happy, philosophical, and vigorous style in which it is written.

Professor Silliman adequately describes Bakewell as a geologist and writer in the following words that prefaced the third American edition of the geology by Bakewell.

> "The author is distinguished by great independence of spirit, which carries him straight to his object, without any servile regard to previous systems. His theoretical views appear to be generally philosophical and just, and some of them are peculiarly happy."

Bakewell's Mineralogy consists of 668 pages and five large wood cut plates of crystal drawings. The five separate books making up the Mineralogy have the following headings: "Theoretical Mineralogy"; "Essential Characters of Earthy Minerals"; "Natural History and Character of Metallic Minerals"; "Combustible Minerals"; "Saline Minerals."

The book holds additional interest as the author was a contemporary of Haüy, Romé d'Isle, Werner, Kirwan, and Jameson; and in the preface Bakewell describes their methods and theories.

In speaking of Kirwan:

> "So little attention was paid to mineralogy as a science in this country, that Mr. Kirwan's 'Elements,' published in 1784 and 1795, was the first regular treatise on the subject in our language entitled to notice."

[1] Iddings, Rock Minerals, p. 139.