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Art. XXXII.—*Preliminary notice of Beryllonite, a new mineral;* by Edward S. Dana.

A few weeks since the writer received for examination some specimens of a mineral, the identity of which the finder had been unable to establish. A brief study made it clear that the mineral was new, and one offering a number of points of more than usual interest. A complete account of the mineral cannot be given until two or three months later, although the essential characters now known prove beyond a doubt that it is new; a preliminary notice at this time, therefore, seems to be desirable.

The specimens of the mineral in hand consist for the most part of isolated crystals, or parts of crystals, and broken fragments from the size of a pea upwards. The largest crystal found is nearly an inch across, and the largest broken mass has a surface of $1\frac{1}{2} \times 1\frac{1}{4}$ inches and a thickness of $\frac{3}{4}$ inch. The crystals belong to the orthorhombic system, or if they vary from this the deviation is very small. They are short prismatic or tabular in habit. They show one highly perfect cleavage, as perfect as that of topaz; a second nearly perfect but interrupted at right angles to it (measured 90° 0′), a third very imperfect corresponding to the third pinacoid plane apparently at right angles to the others, and a fourth, in the zone of the last two corresponding to a prism of very nearly 60°. Calling the plane of perfect cleavage the base, *c*, and making the cleavage prism, *m*, the unit prism, the second cleavage is brachydiagonal *b*, the third macrodiagonal *a*. The crystals are highly modified: in the prismatic zone there are seven prisms developed, the unit prism *m*, two macro-prisms and four brachy-prisms. The macrodome zone is also highly developed, the planes here corresponding very nearly in angle to the several prismatic planes measured from the same pinacoid plane *a*; in other words, the axes *b* and *c* are nearly equal. Only one brachydome has been noted. Of pyramids there are upwards of ten forming several prominent zones. Many of the crystals are twins and sometimes repeated twins with the cleavage prism, *m*, of nearly 60° as the twinning plane—these are contact twins. A few examples have also been noted of what are apparently penetration-twins having a pyramid in the unit series and inclined on *c* about 60° as the twinning-plane. If we make this the unit pyramid, *p*, the approximate axial ratio is:

$$\breve{a} : \bar{b} : \dot{c} = 0{\cdot}57 : 1 : 0{\cdot}94.$$

The other characters of the mineral are: hardness 5·5–6; specific gravity 2·84; fracture conchoidal; luster vitreous and very brilliant especially on the fracture, except on *c* pearly; color white to colorless; transparent to translucent. The fracture surfaces normal to *c* show a columnar structure. Before the blowpipe it decrepitates and fuses about 3 to a somewhat clouded glass, coloring the flame deep yellow. It gives colorless beads with borax and salt of phosphorus. No water was obtained in the closed tube. It dissolves entirely in hot hydrochloric acid, and the crust of salts obtained on evaporation gives a bright yellow flame, but the spectroscope shows nothing but the sodium line.

A few tests in the wet way showed that the mineral was a phosphate, sodium being present as a base, and also a metal whose oxide is precipitated by ammonia. The other experiments noted above give important negative evidence of the absence of most of the other bases that might be looked for. A test for fluorine with sulphuric acid gave negative results.

Since this examination was made a preliminary analysis by Prof. Horace L. Wells, of the Sheffield Scientific School, has shown the mineral to be an anhydrous phosphate of beryllium and sodium, with probably the formula $NaBePO_4$.

A complete analysis will soon be concluded, and as promptly as possible we propose to give an exhaustive account of this new mineral.

I would suggest the name *Beryllonite*, in allusion to the fact that it contains the rare element beryllium. The name of the gentleman to whom the credit of finding this new mineral is due, and that of the locality, are at his request withheld for the present.

SCIENTIFIC INTELLIGENCE.

I. Physics.

1. *Infra red Solar Spectrum.*—W. de W. Abney (Phil. Trans. Lond., 177, 1886) with the aid of a Rowland concave grating has improved his map of the infra red portion of the solar spectrum. He employed a special emulsion of bromide of silver in connection with a collodium emulsion. The developer consisted of a ferrous oxalate of greater strength than that formerly employed by him. The amount of vapor in the atmosphere exercises great influence upon the length of the infra red spectrum, and especially upon the group from A to wave-length 8200. Four strong lines, X_1 (8497) X_2 (8542), X_3 (8661) and X_4 (8816),