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WITH A PLATE AND A MAP.



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tographic plates will be subjected to a careful examination in order that some estimate may be made of the extent of error to which they are liable. In the case of a solar eclipse, or of a transit of a planet over the sun's disk the photographic method has very great advantages over the observations of contact in many respects, and the errors to which it is subject are worthy of the most thorough investigation. The observation of a contact is uncertain on account of irradiation, and it is momentary also, so that if lost by a cloud, or in any way, the observer is compelled to view for several hours the phenomenon without being able to observe it. On the other hand when the sky is clear a photographic image can be obtained in an instant, and even if all the contacts be lost, valuable results might be secured if the readings of the photographic plates can be correctly reduced. Just here then is the point for experiment, investigation and invention, since it is most desirable that no doubt should remain as to the possibility of correctly measuring and reducing the photographic observations of the transit of Venus.

Mar. 25, 1871.

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## ART. VI.—*On Ralstonite, a new Fluoride from Arksut-Fiord;* by GEO. J. BRUSH.

THE recent exploitation of the Greenland cryolite has not only led to the discovery of crystallized cryolite, but has given to mineralogical science several new fluorides, two of which, thomsenolite and pachnolite, are found in beautiful crystallized forms.

I now call attention to another fluoride observed, a few months since, by Rev. J. Grier Ralston of Norristown, Pa. Mr. Ralston found a mineral in minute octahedrons associated with thomsenolite, and being unable to identify it, he sent it to Prof. Dana, by whom the specimens were passed over to me for examination.

The crystals of the new mineral are octahedral; and in some cases they are very minute, but occasionally one to one-and-a-half millimeters in diameter. They are often implanted on the thomsenolite crystals, and also apparently intercrystallized with this species, making it extremely difficult to separate the new mineral sufficiently pure for analysis. The planes of the octahedron are often tinged slightly yellow, and many of them are dull and iridiscent, owing to an excessively thin film of oxide of iron, and hence exact measurement of the inclinations of the faces cannot be made. But they appear to be symmetrical with equilateral faces, and, in some cases, have all the solid angles replaced by a minute plane. With so regular a habit and the planes alike in lustre I cannot doubt that they are isometric octahedrons, and hence that the small plane on the angles is a cubic plane.

The mineral is colorless to white, with a vitreous luster, and has a hardness greater than fluorite, equal to about 4·5. Specific gravity, taken on 25 milligrams, gave 2·4.

In the closed tube the mineral whitens, yields water at first, then gives off fumes and a copious white sublimate, while the walls of the tube are etched. The vapor in the tube, as well as the water, reacts acid. Even at a very elevated temperature the heated fragment retains its original form and does not fuse. In the open tube the mineral gave similar reactions.

B.B. on charcoal a faint white sublimate was observed. In the platinum forceps the mineral whitens without fusion and colors the flame a soda-yellow; moistened with sulphuric acid this coloration was unchanged. Heated with cobalt solution in the platinum forceps the mineral assumed a bright alumina-blue. In salt of phosphorus the substance was readily dissolved, giving a colorless bead in both O. and R.F. In a soda bead it dissolved with effervescence.

The mineral was found on close examination with a magnifier to be so intimately associated with thomsenolite, that it was deemed impracticable to separate a sufficient quantity for any thing more than a preliminary qualitative examination in the wet way. A small portion, some 30 milligrams, selected with great care to ensure purity, was, decomposed in a platinum capsule by sulphuric acid. It gave off fluohydric acid, etching a glass plate, and on solution it gave with reagents a precipitate of alumina, with evidences of the presence of lime and soda. With the spectroscope, the pure mineral alone gave only the soda line, but when even a very minute speck of thomsenolite was associated with it, the lime line was very marked. The solution from which alumina was separated afforded on evaporation to dryness a minute residue, which, when examined with the spectroscope, gave both soda and lime lines.

It therefore appears that the mineral under examination is essentially a hydrous fluoride of aluminum with probably a small amount of calcium and sodium. Its isometric form, and its infusibility, distinguishes it from all other fluorides yet described as occurring at the cryolite locality in Greenland.

The only mineral which in general chemical characters approaches it is the fluellite from Stenna-Gwyn in Cornwall. This rare mineral, according to Wollaston, is a fluoride of aluminum, but it occurs in elongated orthorhombic octahedrons. These facts are, I think, sufficient to warrant the conclusion that the Greenland octahedral mineral is a new fluoride, and I propose for it the name *Ralstonite*, after its discoverer.