MINERALOGICAL NOTES, No. III.

BY WALTER B. SMITH.

1. *Rutile from St. Peter's Dome.*

Among a lot of minerals collected in the Pike's Peak region last fall by Mr. J. G. Hiestand, were a few jet black tetragonal crystals closely resembling, in form, the zircons from that locality and supposed to be such. An analysis, however, of carefully selected crystals, made by Mr. L. G. Eakins, in the Denver laboratory of the U. S. Geological Survey, gave the following results :

TiO_2	94.93
FeO	3.77
SiO_2	1.37
H_2O	.71
	100.78

S. G. at 19° C. 4.288

It will be seen from this analysis that the mineral is a ferriferous rutile coming between the varieties nigrin and ilmenorutile in the percentage of iron present, though near the former in specific gravity.

The simplest crystals show a very short prism, ∞P, in combination with the pyramid P. Other crystals have in addition the prisms $\infty P2$ and $\infty P7$. Except the last two forms, which are generally striated, the planes are regular and give results with the reflection goniometer agreeing closely with the calculated angles for this species. The largest crystals measure about 10^{mm} parallel to the vertical axis. The accompanying minerals are microcline in rough reddish crystals, arfvedsonite, and a few very small, brownish, translucent zircon crystals; all associated in a white opaque quartz gangue.

All the crystals found were in a loose piece of rock on a spur of St. Peter's Dome, and not far from the fluoride

locality at Eureka tunnel. The best crystals are now in the Society's collection.

2. An association of epidote and quartz.

Some years ago workmen at the Colorado Coal and Iron Co.'s iron mine at Calumet, Colo., while stripping the hillside for a new tunnel entrance, uncovered many fine, transparent quartz crystals lying loose in the dirt. Many of them showed fine internal fibres of a greenish mineral and a few had small imperfect epidote crystals about their bases. Since that time considerable search has been made by local collectors, and a few additional crystals have been brought to light but none so good as the first ones found.

During a recent visit to this mine the writer, in company with Mr. N. D. Wanemaker, spent considerable time digging over the old dumps and prospecting for new deposits of these minerals. We were rewarded by finding several new "pockets," one of which contained many fine quartzes and the best epidote crystals yet found in the West. The minerals were found in single crystals as a rule, imbedded in a soft amorphous limestone, filling the cavities from the sides of which they had evidently been detached. These cavities occur irregularly but all are in a well defined stratum of a peculiar rock, varying locally, but made up in general of crystalline epidote, calcite and pyroxene, overlying a stratum of limestone beneath which is the large magnetite vein opened up by the iron mine.

The largest of a half-dozen epidote crystals of nearly the same size is 41^{mm} parallel to the orthodiagonal, all the crystals being lengthened in this direction. They are either opaque or but faintly translucent; the color is that peculiar pistachio-green characteristic of this species. These large crystals all have the same habit, being twinned parallel to $P\infty$; the two planes of $\infty P\infty$ thus brought into contact form one side of the crystal and show only as cleavage faces.

The largest quartz crystals are five or six inches long

and not unlike the clearer varieties from Arkansas, though a tapering form is the rule and none show a double termination. They are chiefly interesting on account of showing many hair-like fibres penetrating them in different directions, but coming usually from the base. These fibres are of greenish color and may be epidote, as in some cases they spring directly from fragments of this mineral found occasionally attached to the quartz crystals.

3. *New phenacite from Mt. Antero.**

The few small phenacite crystals from Mt. Antero studied by Mr. S. L. Penfield and described in his valuable paper on "Phenacite from Colorado"† were unrecognized by the finder, Mr. N. D. Wanemaker, and happened to be saved by being attached to beryl crystals, hence no particular search was made for them. As the spot where they were found is between 13,500 and 14,000 feet above sea-level and covered by snow except during a short time in the summer no one has since visited the place until the past season when Mr. Wanemaker, at my suggestion, made another trip to this locality with the especial purpose of collecting this very rare mineral. He was on the mountain about two weeks and found in all several hundred specimens, exhausting, as he thinks, the locality. All the best material is now in my possession, and as it is doubtful if any more can be found, an exhibition of the best specimens and a few additional notes concerning this mineral and its associated species may not be out of place.

The crystals are from two localities, both well up toward the summit of the mountain. The spot from which the original material came furnished the most crystals; many of them being very much larger and better than the first found. The largest one, attached to a small remnant of an originally fine aquamarine crystal, is of quite perfect development and measures 21^{mm} parallel to the prism by

* Read at the Dec. meeting.

† Proceedings, Vol. II, Part II, 1886.

15^{mm} across. A few others are nearly as large and all have the same development as the ones studied by Penfield (*l. c.*). Some of the small ones are clear and colorless but the majority are opaque or transparent only in spots, closely resembling ordinary rock crystal. A few of the larger crystals are on aquamarine but most of them are small and occur on a white, opaque, poorly crystallized quartz gangue so closely crowded together as to form a crust, but with here and there a larger individual developed. A thin, white siliceous deposit is found coating many specimens but is easily scaled off except on the rougher rhombohedral planes. On this crust a few small octahedrons of light-green fluorite are occasionally found. A limited amount of limonite is found filling crevices and also as large but imperfect cubes, which may correspond to the common pseudomorphs of this mineral after pyrite, though this cannot be determined from the specimens in my possession. The only other associated species is a white, undetermined mineral occurring in small, peculiar blades on a single specimen.

Some of the larger single crystals of phenacite, containing partial casts of hexagonal prisms—showing that they originally formed on beryl now removed by decomposition—have a later generation of drusy phenacites partly filling these casts indicating that the material of their composition may have been derived in part, at least, from this decomposition of the aquamarine.

Nearly every aquamarine crystal found here in association with phenacite shows more or less signs of decomposition, the process in many instances being interesting. In some cases it produces an apparent cleavage parallel to each prismatic face, thin successive coats being readily scaled off. The cause of this is understood from an examination of a cross-section of a fresher crystal, which reveals the fact that the outer part is made up of many thin coats enclosing the crystal and representing its different periods of growth, and that the decomposition proceeding along