MEETING OF FEBRUARY 7th, 1887.

MINERALOGICAL NOTES, No. I.

BY WALTER B. SMITH.

1. Pyrite from Gilpin Co., Colo.

A number of mines in the vicinity of the nearly adjoining towns of Black Hawk, Central City and Nevadaville, in Gilpin County, Colorado, have long been known as occasional producers of beautiful crystals of pyrite. Some of the mines that have furnished particularly fine specimens are: the Saratoga, Grand View, Kansas, Illinois, Roderick Dhu, California, Burroughs, Gunnell and Fanny. The pyrite is found lining cavities that are from time to time encountered by the miners in sinking shafts and driving tunnels. Many of these cavities are mere crevices of limited extent, others are much larger; one found several years ago is said to have been several feet across and completely lined with crystals.

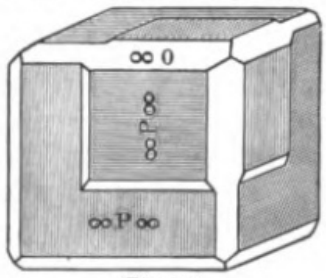
Probably no finer nor more interesting crystals have been procured from any mine in this vicinity than those found last year in the Saratoga. Like specimens from the other mines, the crystals are all in groups, no complete individuals having been developed, though from two-thirds to three-fourths of the entire form of some can be seen. A thin, even deposit of silica is often found encrusting the entire surface, but the crystals, readily freed from this by light tapping or by a little work with a knife point, are left with highly polished faces that for brilliancy are unsurpassed by pyrite from any known locality.

Although no new faces were found, these crystals are remarkable for exhibiting all the kinds of forms in the isometric system, six of the seven possible forms being shown by many single crystals having the following combi-

nation : the cube $\infty O \infty$, the octahedron O, the rhombicdodecahedron ∞O, three pentagonal-dodecahedrons $\left[\frac{\infty O 2}{2}\right]$, $\left[\frac{\infty O 4}{2}\right]$ and $\left[\frac{\infty O \frac{6}{5}}{2}\right]$, the icositetrahedron [tetragonal-trisoctahedron] $2O2$ and the trisoctahedron [trigonal-trisoctahedron] $2O$. From the simple cube to this complex crystal many different combinations are found. On some crystals having fewer forms than the above a diploid or diakisdodecahedron $\left[\frac{4O2}{2}\right]$ was determined. Another diploid at least occurs, but as the ones noticed are very small faces on a large crystal they could not be measured without destroying the specimen. Other crystals show, in addition to some of the pentagonal-dodecahedron planes mentioned, two others $\left[\frac{\infty O \frac{6}{3}}{2}\right]$ and $\left[\frac{\infty O \frac{6}{4}}{2}\right]$. Either a cubic or a dodecahedral form predominates, other forms being always subordinate.

Many of the crystals are large, one being nearly three inches across, and even larger, but irregular, crystals occur built up of small crystals having a common orientation.

Twin crystals, consisting of two interpenetrating pyritohedrons like fig. 90 in Dana's System of Mineralogy, are occasionally found, but generally they have two or three times as many planes owing to the combination of several additional pentagonal-dodecahedrons. This same law—the twinning-axis being a normal to a face of the rhombicdodecahedron—is beautifully illustrated by crystals of a different development occurring rather more plentifully, but still rare. They consist of cubes, more or less interpenetrating, slightly modified by minor faces of dodecahedral or other forms, and by this law are brought into such a position that the striated surfaces of the cubic faces of the



(Fig. 1.)

compound crystal are at right angles to each other (Fig. 1). There is great irregularity in the sizes of the two individuals, one sometimes showing merely as a small square on a single face of the major crystal and usually either depressed below or slightly raised above its surface.

Other crystals from their regularity and frequent occurrence in one lot examined, may be regarded as true twins rather than to suppose the forms result from a parallelism in position and an abnormal development. They are cubes with various subordinate combinations of other forms, and present the appearance of a crystal cut in two parallel to a cubic face, and the one half having been revolved through an angle of 180° neatly joined again to the other. The contact, except for the usual slight irregularities, shows only on the two opposite faces cut at right angles to their striations, but is there very distinct owing to the striæ in the two halves not being, as a rule, continuous. In no case examined were the two halves precisely of the same size, but no great irregularities were noticed. The twinning axis is obviously a cubic axis and the twinning plane as well as the composition-face a cubic plane.

2. Pyrite from Summit Co.

Next to the Gilpin Co. locality that in the vicinity of Montezuma, Summit Co., Colo., is the most noteworthy in the Rocky Mountain region for its production of fine pyrite specimens. All I have examined are from the Josephine mine in the Geneva mining district.

The crystals differ from those found at the Saratoga mine both in manner of occurrence and in development. They are found as single crystals or in groups of twos or threes imbedded in white kaolin which is easily brushed off leaving the specimens bright and completely developed.

The simplest and most common form is the pyrito-

hedron composed of the pentagonal-dodecahedron planes $\frac{\infty O_2}{2}$, often making a form of almost normal symmetry. Some crystals have in combination with this form the rhombic-dodecahedron ∞O. On other crystals, in addition to the above forms, narrow planes of the tetragonal-trisoctahedron $2O_2$ are developed. Sometimes pyritohedrons are found here having rounded depressions instead of the normal pentagonal faces, being filled out only along the angles (Fig. 2).

(Fig. 2.)

3. Alabandite from Summit Co., Colo.

The Society is indebted to Mr. J. S. Randall, of Georgetown, for several massive specimens of alabandite; a considerable quantity of which was found last fall, in a small vein 1 to 6 inches wide, encountered in sinking a shaft on the Queen of the West mine, near Snake River in Summit Co. These specimens have a distinct cubic cleavage and resemble ordinary massive galena except in color which is nearer a steel gray on a surface freshly fractured, but which soon tarnishes to a dull brown or iron black. Among specimens recently shown me by Mr. Randall is one containing a single distinct crystal, about 6^{mm} square, imbedded in the massive material. The forms exhibited are the cube and the tetragonal-trisoctahedron. Unfortunately but one perfect corner of the crystal is shown and it is impossible to tell whether there is a tetrahedral development or not. The associated minerals are small crystals of rhodochrosite in cavities of the alabandite—probably resulting from the decomposition of the latter—small dolomite crystals and a few small pyrites.

Mr. L. G. Eakins tested the mineral qualitatively and found it to be a manganese sulphide.

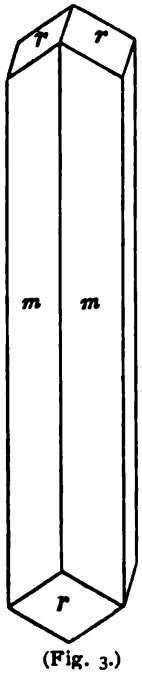
4. Manganite from Devil's Head.

Several years ago while collecting minerals at Devil's Head, Douglas Co. Colo., I found several masses of a dark steel-gray, radiated mineral which Mr. Eakins has kindly analysed qualitatively and found to be manganite. In structure it closely resembles the radiated forms of göthite that are common to the region, and suggests a possible pseudomorphism. It was found in loose pieces unattached to any gangue, in a pocket containing crystals of microcline, quartz, and fluorite, in the well known, coarse, reddish granite of the foot-hills.

I deem this occurrence worthy of note as it adds another species to the list of minerals from the Pike's Peak region.

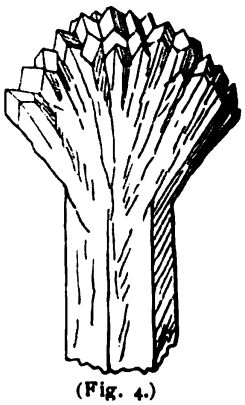
5. Dioptase from Pinal Co., Arizona.

An occurrence of dioptase at the Bon Ton group of mines, near Clifton, Ariz., has been noted by Mr. R. C. Hills.*



(Fig. 3.)

Through the kindness of Mr. J. G. Hiestand, who has just returned from a collecting trip through New Mexico and Arizona, I am enabled to call attention to another occurrence of this very rare mineral. It comes from the dump of a prospect hole near Riverside P. O., on the Gila River, about 100 miles nearly west from the locality mentioned by Mr. Hills.


(Fig. 4.)

The specimens examined consist of a mixed matrix of copper and iron oxides upon which are implanted beautiful, transparent, emerald-green crystals of dioptase exhibiting the simple hexagonal prism $\infty P2$ (*m*), terminated by the

* Am. Jour. Sci., April, 1882.

rhombohedron $-2R$ (r). The relative development in the directions of the vertical and lateral axes will be seen from the figure (Fig. 3).

The crystals are all small, the largest not exceeding 3.5^{mm} long by $.5^{mm}$ thick; the greater number are attached to the gangue by one end, others lying on the side show a double termination. Sheaf-like groups composed of imperfectly developed crystals are common. Some of these groups springing from a rough prism attached to the matrix, show branching at one end only (Fig. 4).