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quartzites and itabirite series, its rarity here is very noticeable. The quartz sand obtained by washing the decomposed gneiss, as well as that from the quartzite bed at Santa Luzia, was in well formed doubly terminated crystals.

The gold of this region is excessively fine. A number of specimens from São Gonçalo and Santa Luzia examined microscopically showed distinct crystalline grains, with sharp, well defined angles. Nothing of a leafy character or resembling the flakes on limonite described in the preceding article were noticed. The grains range in size from 0·05 millimeters for single crystals up to 0·4 millimeters for agglomerations of several crystals, and present the same characters as those obtained by dissolving the arsenopyrite of the Morro Velho vein.

As a company has been recently organized to reopen the São Gonçalo mines by the hydraulic method it is to be hoped that further details regarding this interesting region may soon be obtainable. As already mentioned, a few small gold-bearing quartz veins occur, and in future examinations under more favorable circumstances it may be possible to determine something bearing on the question as to whether or not these veins have been enriched from the adjacent rock.

Art. LV.—*On Colemanite, a new Borate of Lime;* by A. Wendell Jackson.

A new borate of lime has recently been determined by J. T. Evans, of the California Academy of Sciences. His analysis fixes its formula as follows:

$$2CaO \,.\, 3B_2O_3 \,.\, 5aq.$$

It differs from pandermite in containing five instead of three molecules of water. Its main interest lies however in its morphological relations. Mr. Evans kindly sent me a crystal for investigation and subsequently I obtained from another source twenty other crystals. They are all small, colorless and in the main with faces in good condition. The examination in the polariscope showed that the crystals were monoclinic. The plane of the optical axes is normal to the clinopinacoid and makes an angle of 83° 25′ with the chief axis (in front).

With a primitive form having

$$\bar{a} : \bar{b} : \bar{c} = 0{\cdot}774843 : 1 : 0{\cdot}540998 \text{ and } \beta = 69^\circ\ 50'\ 45''$$

I have determined already the following forms:

Pinacoids: $\infty P\bar{\infty}$, $\infty P\grave{\infty}$, $0P$.

Prisms: $\infty P\grave{3}$, $\infty P\grave{\frac{7}{3}}$, $\infty P\grave{2}$, $\infty P\grave{\frac{19}{10}}$, ∞P, $\infty P\bar{2}$.

Clinodomes: $P\grave{\infty}$, $2P\grave{\infty}$.

Hemidomes: $\frac{68}{11}P\bar{\infty}$, $6P\bar{\infty}$, $4P\bar{\infty}$, $2P\bar{\infty}$, $P\bar{\infty}$, $-P\bar{\infty}$.

Hemipyramids: P, $2P$, $-P$, $-3P$, $-\frac{19}{6}P$, $2P\bar{2}$, $3P\grave{\frac{3}{2}}$, $4P\grave{2}$, $\frac{3}{2}P\grave{\frac{3}{2}}$, $2P\grave{2}$, $3P\grave{3}$, $-3P\grave{3}$, $3P\bar{3}$, $4P\bar{4}$. $-3P\bar{3}$.

The crystals are all highly complex; one of them has twenty-four different forms upon it. At least two distinct types are represented; one in which the basal pinacoid and the hemidome $P\infty$ are largely developed and the other with basal pinacoid and most of the hemidomes either absent or very small. The primitive prism ∞P is largely developed upon all and determines the prevailing columnar habit of the crystals.

Art. LVI.—*On the Decay of Quartzyte, and the formation of sand, kaolin and crystallized quartz;* by James D. Dana.

Facts from the quartzyte regions of Massachusetts, Connecticut and Vermont fully sustain the observations of Mr. O. A. Derby on itacolumite, published in this volume (page 203), and appear to throw light on the nature of the change producing it.

1. *Sand from quartzyte.*—The occurrence of loose quartz sand and friable sand rock in connection with the Berkshire County quartzyte has long been known, and for many years the product (obtained mostly from crushing the friable rock) has been used for making glass. The most extensive localities and those earliest worked are in the town of Cheshire, a few miles north of Pittsfield, as mentioned in Professor Hitchcock's Geological Reports of 1832 and 1842. The sand-works are situated just west of the railroad station, also one mile and two miles south of it, and two miles to the eastward, near the borders of the town of Savoy. The oldest working is three miles south of Cheshire, and until 1832 it was the only one in Berkshire. At the quarry two miles south of Cheshire village the rock is friable to a depth into the hillside of at least 300 feet; and at this, and other such localities, I have found it unsafe to rely on the present position of the layers for evidence as to the true position, the weakened beds tending to slip out of place by gravity.

I have visited also a locality, formerly worked, in the town of Savoy, about six miles east of the village of Cheshire; and another four and one-half miles east of Dewey's station (Housatonic railroad), near the center of the town of Washington and just south of Ashley Lake. I have found the friable quartzyte also at a kaolin deposit in the quartzyte region of high northeastern Sharon, in Connecticut, and impure varieties at numerous other localities.