

ART XXXVII.—*Famatinite from Goldfield, Nevada*; by
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During last year, through correspondence with Mr. Herbert N. Witt, geologist for Goldfield Consolidated Mining Co., the writer obtained a number of specimens of ore minerals from the Goldfield district, with the idea of investigating the mineral goldfieldite, reported by Ransome¹ from that region. With regard to the specimens, Mr. Witt writes as follows:

"I am sending you under separate cover some specimens of the copper ore that occurs here. I believe that you will find that this consists principally of famatinite. However, we have found that almost any specimen of this ore will upon analysis give, not only copper, gold, and sulphur, but arsenic, antimony, bismuth, and tellurium. I do not believe that the mineral goldfieldite exists but is probably a mixture of famatinite, bismuthinite, and calaverite or sylvanite, with possibly some tetrahedrite. All of these have been recognized here and the one specimen that I have had in polished surface under the reflecting microscope indicates such a mixture. . . . You may be able to detect some of the whitish telluride in the famatinite specimens. This will then, I believe, give you all the constituents of the so-called 'goldfieldite'."

One of the specimens had, on one side, some very minute crystals, of a blackish-gray color and metallic luster, partly embedded in kaolin. These were carefully tested in the hope that they might be goldfieldite but although strong reactions were obtained for antimony, arsenic, copper, and sulphur, no bismuth or tellurium could be detected in the very small amount of material available. The crystals therefore seem to be of the same substance as the main mass of the specimen on which they occur, an arsenical famatinite. The crystals vary in greatest diameter from about 1 mm. down to about 0.1 mm., and are so attached to the matrix that they could not be detached without breaking. The larger crystals furthermore had curved faces which gave no dependable reflections. After repeated trials a small crystal was found giving moderately good reflections. In the literature at hand no axial ratios are given for famatinite. Dana² gives the forms observed by Rath, as $a(100)$, $c(001)$, $m(110)$ and $l(130)$, but gives no axial ratios, nor does he give any angles. Rath's original paper is not accessible to the writer, hence the angles found on the

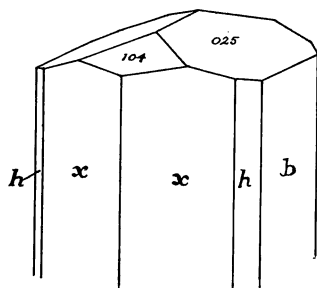
¹ Ransome, F. L., U. S. G. S., Prof. Paper, No. 66, 1909.

² System of Mineralogy, 6th ed., page 149.

Goldfield crystal are compared with the observed angles of enargite. The close agreement with enargite in the prism angles is shown below.

| | Observed, famatinite | enargite (Dana) |
|---------|----------------------|------------------|
| $x:x''$ | $60^{\circ} 24'$ | $60^{\circ} 17'$ |
| $h:h'$ | $59^{\circ} 12'$ | $59^{\circ} 43'$ |

This will serve to show the orientation of the crystal and to indicate that the famatinite from the Goldfield district is isomorphous with enargite and the value for



the a axis does not differ greatly from that of enargite. With this known orientation the domes observed were plotted on a stereographic projection and gave the indices (104) and (025). The reflections obtained from these faces were poor and the angles obtained were not considered sufficiently trustworthy to serve as a basis for calculating a value for the c axis. Both in the projection and in the accompanying drawing the axial ratios of enargite were used. The figure reproduces the form and appearance of the crystals. The locality is not given more nearly than one of the mines of the Goldfield Consolidated Co.

The base upon which the crystals, described above, are implanted is similar to the majority of specimens in the lot received. It consists of fine-grained, pinkish gray famatinite. When polished and examined under the reflecting microscope, the distinctly pink mineral is seen to contain graphic inclusions of a silver-white mineral which in its microchemical reactions agrees with bismuthinite. The ore reacts for bismuth but not for tellurium. The pink mineral contains both arsenic and antimony, the antimony preponderating. One of the samples consists of a fine clayey gouge containing finely triturated native tellurium. Nothing was observed in the specimens which seemed to correspond to the mineral goldfieldite.