

by Miller, no doubt in mistake, as an observed form. On another crystal a series of images could be obtained from each of two faces of the triakisoctahedron; and the limiting-values thus determined for the angle corresponding to the one just mentioned were, in one case $13\frac{1}{2}^{\circ}$ - $16\frac{1}{4}^{\circ}$, and in the other $15\frac{3}{4}^{\circ}$ - $16\frac{1}{2}^{\circ}$; on a third crystal two similar angles were measured at $15\frac{1}{4}^{\circ}$ and 19° , thus again indicating the form {2 2 1}.

The range of specific gravity of the crystallised mineral is a little wider than that of the massive as determined by Breithaupt: one crystal presenting no external sign of impurity was found to have a specific gravity of 6.48; a second had a specific gravity of 6.37, but, like the less dense specimens of Breithaupt, evidently contained foreign matter. Two other fairly large crystals had specific gravities of 6.56 and 6.72 respectively; while a small apparently very pure crystal, with smooth lustrous faces, gave a result as high as 6.86.

XIX. *On Rhabdophane, a new Mineral.*

By W. G. LETTSOM, Esq.*

HAVING ascertained from Monsieur Lecoq de Boisbaudran, who had had the kindness to favour me with a specimen of his new metal gallium, that it would be agreeable to him to examine our British blendes for that metal, I applied to various dealers for specimens thereof, and I also asked a few friends to give me their assistance in the matter. Among the latter was Mr. Ludlam, who with his usual liberality sent me three or four specimens.

Among them was one which in its appearance differed from any British blende that I am familiar with. It was in small mamillated globules, brown, with a peculiar greasy lustre. Having a suspicion that possibly it might not be a blende, I submitted it for examination to that Grand Inquisitor the spectroscopist.

* Read November 23, 1878.

[This paper was withheld from publication with the intention that it and the analysis should appear simultaneously. Through some misapprehension this intention has not been carried out, and the analysis has already appeared in the Journal of the Chemical Society for May 1882.—
SEC. CRYST. SOC.]

Letting a bright light fall on the specimen, I looked at it with a pocket-spectroscope, when immediately the bands due to the presence of didymium became apparent. I had thus come across what, at least, was no ordinary blende.

Having submitted the specimen to Mr. Maskelyne, that gentleman was so good as to cause a preliminary chemical examination of the mineral to be made, from which it appears that it contains neither zinc nor sulphur, and is consequently no blende, but that it is *essentially* a phosphate of didymium.

With some pure fragments of the mineral which I have placed in the skilful hands of Mr. Walter Noel Hartley, that gentleman has kindly undertaken to make a complete analysis* of the substance; but as he informs me he has no leisure to go into the matter at present, I am not as yet able to state to the Society what is the precise constitution of the mineral.

Within a few days after showing the original specimen to Mr. Maskelyne, I had the pleasure of learning from him that he had been enabled, I believe by means of the spectroscope, to recognize two other specimens of the mineral in the old collection at Oxford, where they are simply labelled "Blende from Cornwall" †.

On my showing Mr. Ludlam the specimen I had received from him, he informed me that it came from "the Turner Collection," which is now in his possession—and that it is described in the third volume of M. Lévy's Catalogue of that Collection, under the heading of "*Zinc sulfuré No. 75. Mamelonné, brun, fibreux dans la cassure, ressemblant au plomb-gomme, avec plomb phosphaté, Cornouailles.*" I should

* [Professor Hartley's analysis shows it to be a hydrated phosphate of cerium, didymium, and yttrium, capable of representation by the formula $R_2O_3 \cdot P_2O_5 \cdot 2H_2O$, the percentage composition found being:—

Combined water	7·97
P_2O_5	26·26
$Ce_2O_3, Di_2O_3, Yt_2O_3$. .	65·75

$Ce_2O_3 : Di_2O_3 : Yt_2O_3 = 23·19 : 34·77 : 2·39$ nearly.

This seems to be the first time that yttrium has been found in a British mineral.]

† There is a small specimen without label in the Brooke Collection at Cambridge.

not say the specimen resembles plomb-gomme much; neither have I observed any phosphate of lead upon it.

There were two specimens of the mineral in the Turner Collection as well as in the collection at Oxford, the locality attributed to them all being simply "Cornwall;" and as M. Lévy's Catalogue was published in 1837 (that is to say, more than forty years ago), I fear there is but little hope of ascertaining at what mine they were raised: even, however, if that were made out, it seems improbable the workings there should be still carried on.

Neither in the collection at the British Museum, free access to which has been kindly granted to me, nor in that at King's College, nor in the old collection belonging to Mr. Vicary at Exeter, nor in that of the late Sir John Aubyn at Devonport have I been able to find a specimen of the mineral in question.

The name *Rhabdophane*, which this species has received, was selected as one indicating the stripes or bands which it exhibits in the spectroscope.

For the information of such of our chemists as may feel disposed to work upon British blends for gallium, I here subjoin the results that were obtained by M. Lecoq de Boisbaudran in operating upon some of those specimens that I forwarded to him. The quantity of material used for the examination was, I believe, in every case 20 grammes.

- | | |
|-------------------------|--|
| No. 1. Redruth . . | Rather poor. |
| No. 2. Cumberland. . . | Fairly rich. |
| No. 3. Derbyshire . . | No gallium. |
| No. 4. Cornwall (?) . . | Fairly rich. |
| No. 5. Weardale . . . | Rich in gallium. Seems to be a little richer than the preceding. |
| No. 6. Fowey Consols. | Rich. Seems to be somewhat richer still than the preceding. |

M. Lecoq de Boisbaudran adds that some of the English blends thus appear to him to be at least as rich in gallium as the Bensberg blende is, and that, judging from the intensity of the gallium-lines shown, he is inclined to think the Fowey-Consols blende is even superior to that from Bensberg.

I should add that the Fowey-Consols blende here spoken of is the well-known mamillated nodular material of that locality.

Should any member of the Society wish to see a portion of the original specimen, or to examine with the spectroscope sections thereof or of the Oxford mineral, I am prepared to submit them to him.

XX. *On the Dichroism of two European Andalusites.*

By W. G. LETTSOM, *Esq.**

Two years ago or so there was received in London from Brazil a batch of Andalusites, the transparency of which allowed of their remarkable dichroism being well observed. This induced me to make trial as to the amount of dichroism which Andalusites from European localities might exhibit if suitably cut by a lapidary; for none of our Andalusites that I am acquainted with are capable of being examined, as is the case with Brazilian specimens, in their natural state.

I beg leave to lay before the Society a few sections of Andalusite from a locality in Germany the name of which I have not at hand, but which I hope to obtain in a day or two. Those sections show in one image a rich chocolate-brown colour, the other being all but colourless.

Other sections, from Goldenstein in Moravia, exhibit, in one image a deep blood-red colour, the other image in this case too being almost colourless.

XXI. *Crystallographic Notes.* By W. J. LEWIS, *M.A.*†

[Plate VII.]

Pseudobrookite.—A pupil of mine, whilst making a list of the apatites in the Brooke collection preparatory to their registration, called my attention to a specimen of asparagus-stone from Jumilla, Murcia, on which were some minute black crystals of apparently rhombic symmetry. They were clearly not hematite, which is frequently found in thin laminae in the matrix from this locality. The measurements obtained show it to agree well with the mineral discovered by

* Read November 23, 1878.

† Read June 3, 1882.