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Fig. 1, represents the rain gauge in perspective.

Fig. 2, is a vertical section.

G the body of the gauge, F its funnel, L the lid or cover, v the valve, hinged to the lower orifice of the funnel, s the spring to close the valve, w a wire to conduct the drainings of the funnel into the body of the gauge.

ARTICLE VIII.

On Baryto-Calcite. By H. J. Brooke, FRS. &c.

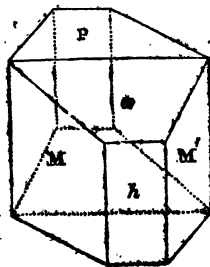
(To the Editors of the *Annals of Philosophy*.)

GENTLEMEN,

July 15, 1824.

MR. BROUGHTON, before he left London, favoured me with specimens of a mineral from Cumberland which had been considered to be carbonate of barytes, but it was very evident that the crystals did not resemble the ordinary figures of carbonate of barytes, and the substance was, therefore, regarded by Mr. Broughton as something new.

The external surface of the specimens is coated with sulphate of barytes; but the internal mass frequently contains cavities which are lined, and nearly filled with crystals. The primary form of these is an *oblique rhombic prism*, as shown in the annexed figure, the cleavage being parallel to the planes P, M, and M'.



P on M, or M'	102°	54'
P on a	147	34
P on h	106	8
M on M'	106	54
M on h	143	27

All the crystals I have seen are modified on some of the edges and angles, and are lengthened in the direction of the edges of the modifying planes, presenting the character of prisms terminated by the bright planes P, a, M, and h, of the figure. The modifying planes are, however, so numerous, irregular and dull in my specimens, that I have not obtained sufficiently good or corresponding measurements to enable me to ascertain their character, and they are, therefore, omitted in the drawing.

The mineral is translucent with a slight tinge of a yellowish-brown colour.

Its lustre rather more waxy than carbonate of barytes.

Its hardness is between that of carbonate and fluato of lime.

Its specific gravity, as ascertained by Mr. Children, is 3.66.

The name baryto-calcite has been given from its chemical composition, as ascertained by Mr. Children.

* The mean specific gravity of carbonate of barytes carbonate of lime is 3.5.—C

Chemical Examination of the Baryto-Calcite. By J. G. Children, FRS. &c.

With the blowpipe this mineral exhibits the following characters.

In the forceps, in the oxidating flame, it neither fuses nor decrepitates; its surface becomes green, and the point of the flame, beyond the assay, assumes a light greenish-yellow colour. In the reducing flame the superficial green colour disappears. The assay, after being ignited, browns moistened turmeric paper.

Heated to redness, *in a glass tube*, it merely gives off a little moisture.

By heat the assay becomes strongly phosphorescent, shining with a pale-yellow light, very similar to that of the common glow-worm.

With soda, on the platina wire, in the *oxidating* flame, it gives a bluish-green opaque mass. In the *reducing* flame the green colour is discharged.

With borax, in the *oxidating* flame, dissolves readily into a perfectly diaphanous globule of a beautiful light amethystine colour. The globule retains its transparency in the *reducing* flame, but entirely loses its colour.

With salt of phosphorus, dissolves very readily; the globule is perfectly transparent, and in the *oxidating* flame yellow while hot; when cold, colourless. In the *reducing* flame the globule is colourless, and, while hot, transparent; when cold, its transparency is slightly disturbed.

Analysis.

To ascertain the proportions of its elements, I dissolved the mineral in muriatic acid, diluted the solution very largely with distilled water, and precipitated the barytes by sulphate of ammonia; boiled the precipitate to take up any sulphate of lime that might have been thrown down, filtered, and washed the precipitate, till the washings ceased to give any cloud with oxalate of ammonia, adding the washings to the solution from which the sulphate of barytes had been separated. The solution, being first reduced by evaporation, was then boiled with a solution of carbonate of potash, which threw down the lime in the state in which it originally existed in the mineral. Treated in this manner, 20 grs. gave

	Grains.
Sulphate of barytes 15.55 grs. = carbonate of barytes	13.18
Carbonate of lime.	6.72
	19.90

A minute portion, not exceeding one or two-tenths of a grain,

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remained undissolved, and consisted chiefly of sulphate of barytes. Traces of iron and manganese were also obtained, as previously indicated by the blowpipe, but I could not detect any appearance of magnesia. The mineral effervesces of course very strongly with acids, and, when finely pulverised, its powder has a very light flesh-coloured or rosy tint.

According to Brande's Table of Prime Equivalents, the weight of the atom of carbonate of barytes is to that of carbonate of lime as 100 : 50, or as 2 : 1. The theoretical composition of this mineral, therefore, (disregarding the insoluble sulphate, and the metallic oxides, as not essential to it) accords very nearly with that obtained by experiment, as appears below :

	Theoretical.	Experimental.
Carbonate of barytes	66·66	65·90
Carbonate of lime.	33·33	33·60
	99·99	99·50

Hence we may consider it as containing an atom of each element.

ARTICLE IX.

On the Transmission of Electricity through Tubes of Water, &c.
By Mr. Lewthwaite.

(To the Editors of the *Annals of Philosophy*.)

GENTLEMEN,

Rotherhithe, July 9, 1824.

ALLOW me to intrude myself on your pages to correct an error committed by Mr. Woodward in the last number of the *Annals*.

Mr. W. says, the effects of electricity on loose gunpowder when transmitted through tubes of water, were communicated by me to Mr. L. some time previous to the publication of his letter.

The natural inference to be drawn from this sentence is, that I am indebted to him for the experiment in question. This, I can assure Mr. W. is not the case; it was originally communicated to me by Mr. Tuther about fourteen years ago. The experiment relative to the conducting power of ether, alcohol, and acids, published in the *Institution Journal*, originated while I was experimenting with the water tube, nor had I the least idea that Mr. W. was investigating the conducting power of those fluids until some time after the publication of my letter.

I am, Gentlemen, your humble servant,

JOHN LEWTHWAITE.

P. S. An account of the experiment of firing loose gunpowder by the water tube may be found in *Imison's Elements of Science and Arts*, vol. i. p. 469.