

Note on a British Occurrence of Mirabilite.

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IN August, 1900, several specimens of this mineral were found attached to gypsum-rock supplied to me from the quarry at Kirkby Thore, in Westmoreland, by Messrs. Joseph Robinson & Co., Ltd., of Carlisle, who kindly inform me that the bed of this rock is about 20 feet thick, being overlaid by about 22 feet of marl, &c. There is very little anhydrite, not more than 2 or 3 inches, which, as a rule, is found in the middle of the bed of gypsum. Although I have used this rock for commercial purposes for years past in regular quantities, yet the mirabilite was never previously noticed.

The best specimen consisted of a layer, of about $\frac{5}{8}$ inch in thickness and about 2 inches long and broad, of perfectly clear, pellucid and colourless mirabilite, attached to the parent rock, a moderately coarse grained, dark grey gypsum; the specimen probably represented a portion of a lenticular cavity, originally completely occupied by the mirabilite, as the surface of the rock where the mirabilite rested exhibited minute clear crystals of gypsum. The mirabilite was of irregular form, having been partially dissolved here and there, and the exposed surface was more or less changed, by loss of water, to a white powder. On fracturing the salt, however, it was found, as already stated, to be perfectly limpid and colourless, with marked conchoidal fracture, and exhibiting on some of the fragments a perfect cleavage in one direction.

The following results were obtained, on analysis of clear unaltered fragments, by my assistant, Mr. G. P. Best. The water was estimated by careful heating up to 110°C in a platinum crucible, the residual salt dissolved in water acidulated with hydrochloric acid and the sulphuric anhydride precipitated as barium sulphate; the filtrate was treated with ammonium carbonate and the barium thus removed, and finally the sodium determined as chloride. Other constituents could not be detected.

Salt taken for analysis	Weight	Percentage composition.	Calculated for $\text{Na}_2\text{SO}_4 + 10\text{H}_2\text{O}$.
H ₂ O found	.. 4865 = 4865	.. H ₂ O = 55·28	55·90
BaSO ₄ "	.. 6450 = 2657	.. SO ₄ = 30·19	29·81
NaCl "	.. 3100 = 1219	.. Na = 13·85	14·29
	<u>8741</u> ..	<u>99·32</u>	<u>100·00</u>

The mirabilite is therefore a very pure Glauber Salt. Crystal faces were not observed, a fact easily understood when the great solubility and liability to efflorescence of this salt, and the peculiar natural conditions necessary for its preservation, are considered ; and which would lead to the supposition that crystalline gypsum-rock is singularly impervious to percolating waters.

The only previous mention of mirabilite as a British mineral appears to be by D. C. Glen and John Young, Junr.¹ in a " List of Minerals and Rock Specimens found in the Central, Southern, and Western Districts of Scotland " ; but the only information they give is " Mirabilite. Hurlet."

¹ Catalogue of Western Scottish Fossils. By J. Armstrong and others (Brit. Assoc. Adv. Sci.), Glasgow, 1876, p. 160.
