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EXHIBITING A VIEW OF THE

PROGRESSIVE DISCOVERIES AND IMPROVEMENTS

IN THE

SCIENCES AND THE ARTS.

CONDUCTED BY

ROBERT JAMESON,

REGIUS PROFESSOR OF NATURAL HISTORY, LECTURER ON MINERALOGY, AND KEEPER OF THE MUSEUM IN THE UNIVERSITY OF EDINBURGH;

Fellow of the Royal Societies of London and Edinburgh; Honorary Member of the Royal Irish Academy; of the Royal Society of Sciences of Denmark; of the Royal Academy of Sciences of Berlin; of the Royal Academy of Naples; of the Geological Society of France; Honorary Member of the Asiatic Society of Calcutta; Fellow of the Royal Linnean, and of the Geological Societies of London; of the Royal Geological Society of Cornwall, and of the Cambridge Philosophical Society; of the Antiquarian, Wernerian Natural History, Royal Medical, Royal Physical, and Horticultural Societies of Edinburgh; of the Highland and Agricultural Society of Scotland; of the Antiquarian and Literary Society of Perth; of the Statistical Society of Glasgow; of the Royal Dublin Society; of the York, Bristol, Cambrian, Whitby, Northern, and Cork Institutions; of the Natural History Society of Northumberland, Durham, and Newcastle; of the Imperial Pharmaceutical Society of Petersburgh; of the Natural History Society of Wetterau; of the Mineralogical Society of Jena; of the Royal Mineralogical Society of Dresden; of the Natural History Society of Paris; of the Philomathic Society of Paris; of the Natural History Society of Calvados; of the Senkenberg Society of Natural History; of the Society of Natural Sciences and Medicine of Heidelberg; Honorary Member of the Literary and Philosophical Society of New York; of the New York Historical Society; of the American Antiquarian Society; of the Academy of Natural Sciences of Philadelphia; of the Lyceum of Natural History of New York; of the Natural History Society of Montreal; of the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanical Arts; of the Geological Society of Pennsylvania; of the Boston Society of Natural History of the United States; of the South African Institution of the Cape of Good Hope; Honorary Member of the Statistical Society of France; Member of the Entomological Society of Stettin, &c. &c. &c.

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On Sulphato-Chloride of Copper, a new Mineral. By ARTHUR CONNELL, Esq., Professor of Chemistry in the University of St Andrews.* Communicated by the Author.

Some minerals were lately put into my hands by Mr Brooke for chemical examination. Amongst these was one which, on examination, I found to be a new combination, viz., a sulphato-chloride of copper.

This mineral occurs in small but very beautiful fibrous crystals of a fine blue colour, which is pale when the fibres are delicate, but much deeper when they become somewhat thicker. Their form, Mr Brooke informs me, is a hexagonal prism with the edges replaced, thus belonging to the rhombohedral system. They possess considerable translucency, and have a vitreous lustre. The crystals are too small, and the quantity of them at my command too inconsiderable, to enable me to state their specific gravity, hardness, or fracture. Their locality is Cornwall; but I do not know what part of that county. Mr Brooke is aware of the existence of only a very few specimens of the mineral. One is in the British Museum.

Like Atacamite, this mineral colours the blow-pipe flame as well as the simple flame of a candle, a fine greenish blue, indicating the presence of chloride of copper. Reduced to powder, and mixed, in sufficient quantity, with charcoal powder, and then heated in the close tube, it gives decided, although not strongly marked, indications of the presence of sulphuric acid by the smell, and partial bleaching of brazil-wood paper, the remainder of the paper being reddened, doubtless by muriatic vapours. Alone, in the close tube, it yields a little water, and other appearances resembling those afforded by Atacamite. Heated alone on charcoal before the blow-pipe, it decrepitates strongly, but when previously deprived of the greater part of its water by gentle heat, and then powdered, and moistened, and heated on charcoal, it

* Read to the Chemical Section of the British Association at Oxford, in June 1847.

gives no traces of arsenic, although arseniate of copper is associated with it in the specimens. The residue is a dark reddish slag or globule.

The crystals are not soluble in boiling-water, but dissolve entirely, and pretty readily, in nitric or muriatic acid, especially by the aid of gentle heat. The solutions have the colour belonging to copper solutions, and in the act of dissolving, a very few bubbles of gas may be observed to arise, indicating probably the presence of a minute quantity of carbonate. The solutions yield, with barytic salts, a white precipitate insoluble in acids; and the nitric solution gives, with nitrate of silver, a white and curdy precipitate, insoluble in acids or water, but dissolved by ammonia, Ammonia, in excess, added to the original solution, gives the fine deep blue of copper.

These appearances, in conjunction with the blow-pipe reactions, are sufficient to shew that the constituents of the mineral are sulphuric acid, chlorine, copper, and a little water. I had not enough of material to determine the proportions of these constituents, but there can be no doubt that the mineral consists essentially of sulphate and chloride of copper, with a little water. Whether the copper salts are neutral or basic, it is impossible to say. The chloride is apparently the more abundant of the two salts. As above stated, there seems also to be a trace of carbonate.

On the Decomposition of Water by Platinum and the Black Oxide of Iron at a white heat, with some observations on the theory of Mr Grove's Experiments. By GEORGE WILSON, M.D., Lecturer on Chemistry in Edinburgh. Communicated by the Royal Scottish Society of Arts.*

The remarkable discovery recently made public by Mr Grove, that water in certain circumstances, when raised to a white heat, is resolved into its constituent gases, has naturally excited much attention. It furnished the unexpected confirmation of the truth of an opinion expressed by James Watt so far back as 1783, that if steam could be made red hot [white hot] so that all its latent heat

* Read before the Royal Scottish Society of Arts, 10th May 1847. This paper was previously communicated to the Chemical Society of London, in whose Transactions for 1847 it was published. G. WILSON.