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PROFESSORS B. SILLIMAN, B. SILLIMAN, JR.,

AND

JAMES D. DANA,

IN CONNECTION WITH

PROF. ASA GRAY, OF CAMBRIDGE,
PROF. LOUIS AGASSIZ, OF CAMBRIDGE,
DR. WOLCOTT GIBBS, OF NEW YORK.

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WITH A MAP.

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II. MINERALOGY AND GEOLOGY.

1. *Lecontite, a new mineral;* by W. J. TAYLOR, (Abstract from "Mineralogical Notes" in Proceedings of Acad. Nat. Science, Philadelphia.)—This new and interesting mineral is remarkable as being a double sulphate of ammonia and soda with potash, containing two equivalents of water and yet homœomorphous with the group of anhydrous sulphates. Prof. Dana has very kindly made the annexed measurements of two crystals which I sent to him soon after receiving the mineral from Dr. LeConte. I made a verbal communication on the subject before the Academy of Sciences at Philadelphia on the evening of February 16th, but owing to a mistake, it did not appear in print—though it is recorded in the rough minutes of this meeting—before the May number of the Academy's Proceedings. It was at that time supposed to be a new mineral from the difference of angle found by Prof. Dana between it and other homœomorphous sulphates, and from a qualitative analysis that I made, from which it was considered a double sulphate of potash (the potash I then thought was in excess) and ammonia, and anhydrous (in this judging erroneously from the form).

The composition is now definitely determined by a thorough quantitative examination, which, by the courtesy of Dr. F. A. Genth, I have made in his laboratory, whom I would here thank for the facilities afforded me in the investigation.

Lecontite occurs in crystals varying greatly in size, some being an inch in length and narrow prisms, others short, not exceeding one-sixteenth of an inch and quite broad. The former crystals are more perfect in form than the larger ones, and the angles better defined.

The following are the measurements of Prof. Dana: the crystals, as he mentions, did not admit of measurement by a reflected image, so that it was necessary to use a candle.

Crystallization trimetric; form right rhombic prism—

$i\text{-}\breve{2} : i\text{-}\breve{2} = 115°$

$i\text{-}\breve{2} : I = 160°$ by measurement.

$\frac{1}{4}\text{-}\bar{1} : \frac{1}{4}\text{-}\bar{1} = 127° 30'$—$128°$, or over $i\text{-}\bar{1}$, $52°$—$52° 30'$

$I : I$ (calc. from $i\text{-}\breve{2} : i\text{-}\breve{2} = \begin{cases} 76° 48' \text{ over } i\text{-}\breve{2}, \\ 103° 12' \text{ over } i\text{-}\bar{1}. \end{cases}$

The faces I are small and indistinct except on one side.

Taking $\frac{1}{4}\text{-}\bar{1} : \frac{1}{4}\text{-}\bar{1} = 128°$ we have $I : I = 103° 12'$, $O : 1\text{-}\bar{1} = 117° 7'$.

In hardness the crystals are from 2 to 2·5; when free from the exterior organic matter they are clear and colorless; the smaller crystals are partially coated by a very thin crust of organic matter, from the matrix; taste, saline and rather bitter; permanent in the air. Composition:

Ammonia, per cent,	12·94	contains oxygen	3 98	8·93	
Potassa, "	2·67	" "	0·45		
Soda, "	17·56	" "	4·50		
Sulphuric acid, per cent	44·97	" "	26·94		
Water, "	19·45	" "	17.28		
Organic residue, "	2·30				
Inorganic residue, "	0·11				
Phosphoric acid,	*a trace.*				

There is consequently an oxygen ratio of $NH_4O : SO_3 : HO = 8{\cdot}93 : 26{\cdot}94 : 17{\cdot}28$, which is almost exactly as 1 : 3 : 2 from which we have the general formula $RO, SO_3 + 2HO$.

[It may be interesting to mention that there is an artificial salt with a general formula, exactly corresponding to this $RO, SO_3 + 2HO$, and of the same form, which, though rare, has been described by several chemists: it contains no potash, being solely a double sulphate of ammonia and potash with two equivalents of water; it is mentioned in Gmelin, vol. iii, p. 119, (Card. Edit.,) Séguin, Ann. Chem. 91, 219; Reffault, Ann. de Chem. et Phys. 20 (432)—(435) describes the salt and its preparation. Berzelius (3,286) mentions that the crystals are derived from right rhombic prisms.]

This mineral was first brought to this country in January last by Dr. John L. LeConte, on his return from Honduras; he discovered it in the cave of Las Piedras, in the vicinity of Comayagua. It occurs in trimetric crystals, imbedded in a black matrix resembling bitumen in appearance, which Dr. LeConte considers to be the decomposed excrement of bats which infest this cave in great numbers, and have most likely inhabited it for ages; the cave near the entrance was, at the time of his visit, being worked for the nitre, which was obtained "directly by lixiviating the earth taken from near the mouth of the cave." "The matrix containing the crystals merely furnished a black tar-like semi-fluid mass without nitre." On some of the crystals were observed minute hairs of the bats adhering, and I observed more hair when removing the crystals from their matrix.

In honor of Dr. LeConte, who has been the means of adding this species to mineralogy, I propose to call the mineral Lecontite.

2. *Conducting Power of Rocks.—Altitude of Mountains not Invariable;* by Charles Maclaren, (Edin. N. Phil. Jour., vol. vii, p. 170).—Mr. Hopkins of Cambridge has made some rather interesting experiments on the *conductivity* or conducting power of different substances for heat, of which an account was laid before the Royal Society of London in June last. Without attempting to describe his processes, we give his more important results, and in decimals, the conductivity of "igneous rock" (trap or granite, we presume), saturated with moisture, being taken as unity.

Chalk, in the state of *dry powder*,	- - -	·056
Clay, " "	- - - -	·07
Sand, " "	- - - -	·15
Sand and clay, "	- - - -	·11

The conductivity of the following rocks is given in two states—*dry*, and *saturated*, with water:—

	Dry.	Saturated.
Chalk, in block, - - - - - -	·17	·30
Oolite rock, - - - - - - -	·30	·40
Hard compact limestones, - - - - -	·50	·55
Siliceous New Red Sandstone, - - -	·25	·60
Freestone, - - - - - - -	·33	·45
Hard compact sandstones (Millstone Grit), -	·51	·76
Hard compact old sedimentary, - - -	·50	·61
Igneous rocks, - - - - - -	·53	1·00