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THE

AMERICAN JOURNAL

OF

SCIENCE AND ARTS.

CONDUCTED BY

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

AND

JAMES D. DANA.

YALE UNIVERSITY LIBRARY
SECOND SERIES.

VOL. V.—MAY, 1848.

NEW HAVEN:

PRINTED FOR THE EDITORS BY S. L. HAWLEN,

Printer to Yale College.

Sold by H. DAY, *New Haven*.—LITTLE & BROWN, and T. WILEY, Jr., *Boston*.—C. S. FRANCIS & Co. and WILEY & PUTNAM, *New York*.—CAREY & HART, *Philadelphia*.—N. HICKMAN, *Baltimore, Md.*—WILEY & PUTNAM, *London*.—HECTOR BOSSANGE & Co., *Paris*.—NEETLER & MELLE, *Hamburg*.

54

3. Analogies of
the Philosophical or Unifying, faculty.

- (a.) In classification: as for example, in the morphology of plants, and animals, where all the parts are deduced from the germ.
- (b.) In the scientific use of judgment; as, when electricity, heat, gravitation, &c., are referred to a common principle.
- (c.) In pure philosophizing; as in attaining the idea of soul, substance, life.

In the foregoing analysis I have endeavored to exhaust the subject of analogy in its scientific application, by considering every operation of the scientific intelligence in which it would come in play. If it is not displeasing to you, I will endeavor in my next, to make some practical applications of it in the theory of temperature.

ART. XXXV.—*Two new Minerals,—Medjidite (Sulphate of Uranium and Lime)—Liebigite (Carbonate of Uranium and Lime);* by J. LAWRENCE SMITH of South Carolina, Geologist to the Sultan of Turkey.

THE minerals here alluded to were found associated with a specimen of pitchblende from the neighborhood of Adrianople, Turkey; it was quite impure and a portion of it contained crystals of copper pyrites. On the surface of the pitchblende, besides the two minerals in question, there existed crystals of sulphate of lime and a little oxyd of iron.

MEDJIDITE—Sulphate of Uranium and Lime.—This mineral is of a dark amber color, transparent, of imperfect crystalline structure, fracture vitreous, although the surfaces exposed are sometimes of a dull yellow color, arising from the loss of water. It is found on the surface of the pitchblende associated in some places with crystals of sulphate of lime. Hardness about 2.5—sp. grav. not known.

Chemical characters.—Heated gently it loses its water, becoming of a lemon yellow color. Heated to redness it blackens (being converted into oxyd of uranium and sulphate of lime). It is insoluble in water, but dissolves readily in the smallest quantity of dilute hydrochloric acid; (in this way had it been necessary I might have separated it from any adhering sulphate of lime.) The acid solution gives a tolerably abundant precipitate with hydrochlorate of baryta, and a red brown precipitate with ferrocyanuret of potassium; bicarbonate of ammonia forms a precipitate that is redissolved by an excess of the ammoniacal salt; oxalate

of ammonia added to this solution demonstrates the presence of lime. Farther examination detected no other substance.

So far as the small quantity at my disposal enabled me to make out its composition, it would appear to be a salt similar to the following one (Liebigite) with less water, and sulphuric instead of carbonic acid, the acid being derived from the decomposition of the pyrites associated with the pitchblende. Its composition is represented by $\overset{\cdot\cdot}{\text{U}}\overset{\cdot\cdot}{\text{S}} + \overset{\cdot}{\text{C}}\overset{\cdot}{\text{a}}\overset{\cdot}{\text{C}} + 15\overset{\cdot}{\text{H}}$.

This mineral is called *Medjidite* in honor of the reigning Sultan of Turkey, ABDUL-MEDJID, who exhibits a most decided patronage of both the arts and sciences, certainly much more than any of his predecessors.

LIEBIGITE—*Carbonate of Uranium and Lime*.—This mineral is not found crystallized, but occurs in the form of a mammillary concretion, having an apparent cleavage in one direction. It is of a beautiful apple-green color, transparent, with a vitreous fracture. Hardness between 2 and 2.5; sp. grav. not ascertained.

Chemical characters.—The mineral admits of ready separation from the pitchblende, and owing to its color and transparency is easily freed from the smallest portion of foreign matter. Heated gently, it loses water, acquiring a yellowish grey color; heated to redness it blackens without fusing, and on cooling returns to an orange red color; heated strongly before the blowpipe, with or without charcoal, it blackens and on cooling remains so; with borax it gives a yellow glass in the oxydizing and a green glass in the inner flame. Its property of blackening when heated to redness, and assuming an orange red color on cooling, made me suppose that it might contain vanadic acid, but as will be seen a little farther on, its reactions proved this not to be the case; as yet I believe that this property is not known to belong to any other natural combination of uranium.

The mineral dissolves readily in dilute acids and with violent effervescence, affording a yellow solution, that gives a yellow precipitate with ammonia and its carbonate, but the latter in excess, redissolves most of the precipitate, and what remains is found to be carbonate of lime. The carbonate of ammonia solution when boiled redeposits a yellow precipitate. In a neutral solution, sulphuretted hydrogen produces no precipitate, but the hydrosulphate of ammonia furnishes one of a brown color, and the ferrocyanuret of potassium one that is reddish brown.

The above properties show the presence of water, carbonic acid, lime and uranium, farther examination gave no evidence of the presence of any other substance.

The amount of this mineral in a state of purity was too small to allow me to make as minute a quantitative analysis as I should desire, but owing to the simplicity of its composition, the

true nature has been very nearly if not exactly made out. The water was estimated by heating it to 400° Fah.—the carbonic acid by what was lost in dissolving it in hydrochloric acid in a small apparatus properly arranged; to the acid solution bicarbonate of ammonia was added, which redissolved all the precipitate first found; oxalate of ammonia, when added to this, precipitated the lime, (which was afterwards estimated as a sulphate); the solution filtered from this precipitate, was boiled and the uranium deposited itself as a double salt that was heated to redness and the oxyd estimated in the form of olive colored oxyd. (Peligot's atomic weight for uranium was the one employed, 750—ox. 100).

The mean of two analyses, one of 85 and the other of 65 milligrammes, is

		Atoms.	Calculated.
Water,	45.2	20	45.5
Carbonic acid,	10.2	2	11.1
Lime,	8.0	1	7.1
Peroxyd of uranium,	38.0	1	36.3
	<u>101.4</u>		<u>100.0</u>

The composition of the mineral is represented by



The pitchblende upon which the Liebigite is found was analyzed, and at some future time I may have occasion to allude to this analysis with some remarks upon the salts of uranium; for the present, suffice it to state, that the pitchblende contains lime associated with the oxyd of uranium, a circumstance that along with the tendency of oxyd of uranium to form double salts, accounts for the formation of both the Liebigite and Medjidite.

I have thought proper to give this double carbonate the name of the distinguished chemist of Giessen, as a demonstration of the high value I set upon his memoirs and important contributions to the science of chemistry in general.

Constantinople, January 1st, 1848.

ART. XXXVI.—Analysis of the Meteoric Iron that fell near Braunau in Bohemia, on the 14th of July, 1847; by A. DUFLOS and N. W. FISCHER.*

1. *Treatment with Nitric Acid.*—5.16 grammes of the meteoric mass, removed by a hard file from the entire block, were put into a matrass to which was adapted a suitable delivery-tube terminating beneath the surface of water, and were submitted to

* Translated from Poggendorff's *Annalen*, vol. lxxii, p. 475, by W. G. LITTLESON, Esq.