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	I.	II.			
Insoluble,	1·11	0·48 p. c.			
Chlorine,	not determined.	0·04 "			
Carbonic acid,	not determined.	1·98 "	contains oxygen		1·44
Phosphoric acid,	18·74	18·74 "	"	"	10·50
Oxyd of lead,	not determined.	29·04 "	"	"	2·11
Alumina,	24·69	25·54 "	"	"	11·91
Sesquioxyd of iron,	0·68	0·90 "	"	"	0·27
Lime,	1·49	1·44 "	"	"	0·69
Water,	21·65	20·86 "	"	"	10·55
		99·02			

Deducting 0·72 of oxygen of bases RO for the quantity of carbonic acid found, and considering the carbonate as an impurity, the oxygen ratio of $PbO : Al_2O_3(Fe_2O_3) : PO_5 : HO$ is equal to 2·08 : 12·18 : 10·50 : 18·55 or equal to the atomic ratio of 2 : 4 : 2 : 18 corresponding with the formula

$$3PbO, PO_5+3Al_2O_3, 2PO_5+3(Al_2O_3, HO)+24HO.$$

The calculated percentage of the pure mineral is therefore:

$3PbO$,	334·8	30·44 p. c.
$6Al_2O_3$,	308·0	28·01 "
$3PO_5$,	214·0	19·46 "
$27HO$,	243·0	22·09 "
	1099·8	100·00

14. *Lanthanite.*

To Dr. Montroville M. Dickeson, the discoverer of the beautiful and extremely rare lanthanite from near Bethlehem, Pa., I am indebted for a small specimen of this interesting mineral. I have to add only a few remarks to the investigations of Mr. Wm. P. Blake (Amer. Jour. Sci., xvi, 228) and Prof. James L. Smith (ibid., xviii, 378, 427), as the results of my analyses agree with those of Blake and Smith. Sp. gr. (at 20° Cels.) = 2·605.

In analysis I, the crystals of lanthanite were carefully selected and appeared to be quite pure; in analysis II, the mixture of lanthanite, quartz, and an ochreous substance were treated with very dilute acetic acid, and the percentage given below is that of the soluble portion only, which did not contain anything else than lanthana and oxyd of didymium.

	I.	II.
Lanthana (with oxyd of didymium),	54·95	54·83
Carbonic acid,	21·08	——
Water (from the loss),	23·97	——
	100·00	

On boiling with water, the crystals of lanthanite are decomposed into a white powder, which is probably a basic carbonate. The quantity of material at my disposal was not sufficient to ascertain the composition of it. It is not improbable, however,

that the Bastnaes mineral is the same substance and Hisinger's formula consequently correct.

I hope to be able hereafter to settle the doubts which exist on this point.

Prof. C. U. Shepard states (Report on the Canton Mine) that he has observed this mineral at the Canton Mine, he does not inform us, however, what induces him to take the pink-colored crystals for lanthanite. I have not been able to procure a specimen of it and also did not succeed in finding any indications of minerals containing cerium or lanthana, from the decomposition of which the lanthanite could have been formed.

15. *Bismuthite.*

I have made an examination of the bismuthite from the Brewer's Mine, Chesterfield District, S. C., with results not materially differing from those obtained by Prof. Rammelsberg (Pogg. Ann., lxxvi, 564). The material for examination was kindly furnished by Dr. Asbury of Charlotte, N. C., Prof. Lewis R. Gibbes of Charleston, S. C., and Oscar M. Lieber, Esq. of Columbia, S. C. The appearance of the specimens did not differ much except in the richness of the pieces, some of them containing a very large percentage of the brown ochreous residue, insoluble in dilute nitric acid.

I have analyzed a pale variety (I) and a darker one (II), and made two analyses of each, one by treating the finely powdered mineral with dilute nitric acid (*a*), the other by digestion with strong chlorhydric acid (*b*), by which everything, except the silicic acid, is dissolved.

The quantities of lime and magnesia were found to be very small and have not been determined.

The following are the results:

	I.		II.	
	a	*b*	*a*	*b*
Insoluble in dil. NO_5, containing water,	25·42 (1·59)	——	28·16 (2·62)	——
Teroxyd of bismuth,	64·72	64·24	62·15	61·45
Tellurous acid,	——	0·05	——	0·06
Sesquioxyd of iron,	0·91	6·64	1·30	11·20
Alumina,	0·74	1·18	0·68	2·09
Silicic acid,	0·48	17·78	——	13·99
Carbonic acid,	——	5·08	——	5·12
Water,	——	3·94	——	5·41
		98·91		99·32

Deducting the amount of water, which the residue insoluble in nitric acid contains, from the whole quantity given in the analyses (*b*) we obtain pretty correctly (though somewhat too high) the amount of water combined in the pure bismuthite. We would have therefore: