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VIII. Upon the decomposition of the acetate of barytes by means of soda

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of science, and as rendering the study of music both more pleasant and intelligible !!!

What would any man think of a mathematician who should express the number 8691 in the following manner?

8000
\+ 600
\+ 3 score
\+ 2 dozen
\+ 7.

The difference between a man of *real* science, and one who has the ambition to be thought so, is very great. The first seeks to render difficult subjects, perspicuous and clear. The other, on the contrary, envelops even the most simple ideas in the mysterious garb of *hard words* and *scientific jargon*. If Mr. Farey be of the first of those two classes, I should recommend to him to simplify and amend his tables.

I am, sir, your most obedient servant,
STANHOPE.

VIII. *Upon the Decomposition of the Acetate of Barytes by means of Soda. By M.* DARCET[*].

In a late number of the Annales de Chimie[†], M. Porperes says, when speaking of the formation of the acetous acid in bad digestions, that in order to ascertain the presence of this acid, "he saturated it with pure soda, and afterwards decomposed the acetate of soda by barytes;" and he adds, "that having set the soda free, he dissolved it in alcohol, which, by seizing upon the water of solution, operated the precipitation of the acetate of barytes which was formed."

The result of this experiment is necessarily inaccurate, as the following details will prove.

I suppose that we have a solution of barytes saturated hot: if we pour it into acetate of soda, there is immediately precipitated an infinity of small brilliant and iridated laminæ.

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[*] *Ann. de Chimie*, tom. lxi. p. 247.

[†] See Phil. Mag. vol. xxvii. p. 352.

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If we separate them from the liquor after its complete cooling, if we wash them in the smallest quantity of water possible, and dry them speedily by squeezing them between several sheets of blotting paper, we shall have nothing but pure crystals of barytes without mixture of acetate. I ascertained this in the following manner:

1st, I exposed a part of these crystals to the air: in a few days, the distilled water with which I washed the carbonate obtained, gave no more precipitate by the addition of the sulphuric acid, the carbonates, or alkaline sulphates. The whole mass of crystals had therefore been converted into carbonate, which would not have taken place if they had contained acetate of barytes.

2d, I dissolved two or three grammes of these same crystals in distilled water; the solution blued turnsole paper which was reddened by an acid: there was an excess of alkali therefore.

I added some drops of sulphuric acid to this solution, and there was formed a solution of sulphate of barytes. I tried the liquor again with the reagent paper, and I still found an excess of alkali. I added by degrees sulphuric acid, until there was a slight excess of acid in the liquor: I filtered it, and found no more barytes, but a little free sulphuric acid; this would not have happened if the crystals had contained acetate of barytes: for upon this supposition, at the moment when the excess of acid began to become sensible to the reagent paper, there must have been only a very small quantity of acetate of barytes decomposed, and acetous acid set at liberty. The filtered liquor should therefore have contained a slight excess of acetous acid, and more acetate of barytes not decomposed; which is contrary to the result of experiments.

3d, The mother water of the crystals employed in the preceding experiments, should contain nothing except the little pure barytes which the cooled liquor could hold in solution, besides the whole of the acetate of soda which had been employed. What also demonstrates the analysis of these mother waters, is, to pour alcohol into them as M. Porperes points out, The brilliant laminæ which are deposited are nothing else than crystals of barytes: when tried as I have pointed out above, they only give very pure carbonate of barytes, and not an atom of acetate. If we also try these mother waters with the sulphuric acid, or with the alkaline carbonates, we immediately ascertain that they contain but little barytes, and plenty of acetous acid: this becomes still more perceptible if we evaporate them to dryness, and redissolve the residue in distilled water: for this solution no longer contains an atom of barytes, but merely acetate of soda; the little barytes in it being carbonated during the evaporation.

Hence it follows, that barytes does not decompose the acetate of soda, and that, on the contrary, if we try the inverse experiment it will succeed. In fact, we shall decompose the whole of the acetate of barytes by adding a sufficiency of pure soda for saturating the whole acetous acid.

It is not my object to invalidate the conclusion in M. Porperes's memoir: they appear to be just, and conformable to what is already known. I criticize one of the proofs only they have furnished, and I profit by this occasion to mention that M. Anfrye and myself have already published, in the *Annales de Chimie*, a memoir upon the Affinities of Barytes; wherein we have proved that in the classification of the alkalis, barytes should not be placed before potash and soda, except with respect to the sulphuric and carbonic acids; that in every other circumstance, potash and soda have affinities superior to that of barytes. How does it happen, then, that notwithstanding the facts so clearly demonstrated in our memoir, various authors have continued barytes in its old order of affinities? In my opinion, the results published of experiments ought to be adopted, or refuted by repeating them and showing their errors.

I shall conclude this note by calling to my assistance one of the processes, the excellence of which has been demonstrated in our operations upon barytes on a large scale;—it is naturally inferred from the facts above laid down.

The decomposition of the muriate, the nitrate, and the acetate of barytes, by potash and soda, is so complete and easy, that it is certainly the simplest way of procuring in a laboratory

laboratory the barytes we require. For this purpose we strongly calcine, in close vessels, 100 parts of sulphate of barytes well mixed with 20 parts of charcoal in powder. After an hour's calcination the crucible is allowed to cool; the residue is separated from it; it is then diluted in water, and a sufficient quantity of nitric acid, muriatic acid, or acetous acid, is added to it: the mixture is then slightly heated, which liberates a great quantity of sulphuretted hydrogen and carbonic acid, of which we must be upon our guard. When the effervescence ceases, and the reagent paper announces in the liquor a slight excess of acid, we filter and evaporate it, in order to decompose the sulphuretted hydrogen, and to precipitate the sulphur which was held in solution*. The residue is re-dissolved in the least possible quantity of water, and we add to this solution a saturated solution of caustic potash. There is precipitated, even at the moment of mixture, a great quantity of crystals of barytes; the whole is then allowed to settle at the lowest possible temperature for an hour or two: the mother water is then decanted, the crystals are washed with a little distilled water, and dried by pressing them between several sheets of blotting paper, and they are dissolved in the necessary quantity of boiling water: the filtered liquor deposits the barytes upon cooling, which by this process is far purer and cheaper than that obtained by decomposing the nitrate of barytes, by exposing it alone to a high temperature.

It must be observed, that we ought to prefer the employment of the muriatic or acetous acid to that of the nitric acid; in the first place, because the first two acids form with barytes, salts more soluble than the nitrate, and the washing is easier in this case: secondly, because in the solution, the nitric acid, on being decomposed, oxygenates a part of the sulphuret of barytes, and there is then a portion of acid lost, and a part of the barytes absorbed by the sulphuric acid which is formed.

As to the caustic potash required in this operation, it is

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* We may more easily obtain the same end by pouring into the liquor some drops of nitrate of copper or lead, by allowing the metallic sulphuret to subside, and by filtering over again, &c.

essential that it should be prepared with carbonate of potash free from sulphate; we may render it caustic by following the process published by M. Descroizilles in the *Annales de Chimie*[*]. I have frequently pursued the methods he points out, and I have done so with inereasing advantages.

Observations by one of the Editors of the Annales de Chimie *upon the foregoing Article.*

I have examined the liquor of the flask transmitted by M. Darcet along with his paper. It was more than half filled with small white crystalline laminæ; the liquor greened strongly paper coloured with the petals of mallows. I poured sulphuric acid into it in a slight excess; there was formed an abundant precipitate of sulphate of barytes; at no time was there the least smell of acetic acid. After having filtered the liquor in which the precipitate was formed, I evaporated it in a gentle fire in a platina crucible, and it left no traceof neutral salt. There does not remain a doubt, therefore, that the acetate of barytes is radically decomposed by soda.—L. B. G.

IX. *Upon the Preparation of pure Barytes.*

By M. ROBIQUET[†].

IN a note inserted in a late number of the *Annales de Chimie*[‡], upon the decomposition of the acetate of barytes, by means of soda, M. Darcet points out as a more œconomical and more certain process of procuring pure barytes, to decompose any barytic salt, and principally the muriate, by a caustic alkali: I do not think the preference he gives to this process over the generally employed one, namely, the decomposition of the nitrate by heat, is well founded. On considering the matter in an œconomical point of view, we see that in both cases we must first obtain a soluble salt of barytes: that in the first we cannot employ the liquors so much

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[*] See Phil. Mag. vol. xxviii.

[†] From *Annales de Chimie*, tom. lxii. p. 61.

[‡] See the preceding article.