The saturated solution of the new gas in water, when mixed with alkaline solutions, does not immediately lose its colour, or neutralize the alkalies, but after a time the hyperoxymuriates are formed, and the colour disappears.

In consequence of the doubt which now occurs concerning the true nature of euchlorine, the author declines giving a name to the present compound, till he can have an opportunity of making some new experiments on that subject.

Farther analytical Experiments relative to the Constitution of the prussic, of the ferruretted chyazic, and of the sulphuretted chyazic Acids, and to that of their Salts; together with the Application of the Atomic Theory to the Analyses of those Bodies. *By* Robert Porrett, *jun. Esq.* *Communicated by* W. H. Wollaston, *M.D. Sec. R.S.* Read May 11, 1815. [*Phil. Trans.* 1815, *p.* 220.]

In a former paper the author endeavoured to show that prussic acid would combine with black oxide of iron, or with sulphur, and form with them peculiar acids, to which he gave the names of ferruretted and sulphuretted chyazic acids; and he examined in what proportion the elements of these new acids are combined, as well as the proportions in which the acids unite to different saline bases.

Mr. Porrett's present object is to add the results of two new analyses, made with great care, and to correct those inaccuracies of experiment, which are at all times unavoidable, by the assistance of the theory of Dalton respecting the relative weights of atoms, and of Berzelius respecting multiple doses of oxygen.

The first compound here examined, is prussiate of mercury. Ten grains of this salt were decomposed by hydrosulphuret of soda, and yielded 9·3 of black sulphuret of mercury. The residual liquor being treated with sulphate of copper, yielded 9·7 of sulphuretted chyazate of copper, which by former analyses is known to contain 1·38 prussic acid.

In order to determine the quantity of red oxide of mercury indicated by the weight of black sulphuret obtained, 25 grains of corrosive sublimate were decomposed by hydrosulphuret of potash, and yielded 21·5 grains; and since the quantity of red oxide contained in the sublimate is known to be $79\frac{3}{4}$ per cent., it is inferred that 9·3 black sulphuret are equivalent to 8·62 red oxide; and hence that 100 grains of prussiate of mercury consist of 13·8 prussic acid, and 86·2 red oxide of mercury.

For the purpose of determining the constitution of prussic acid, Mr. Porrett effected its decomposition by mixing prussiate of mercury with red oxide of mercury, in such proportion, that by the assistance of heat, the whole of the prussic acid might be converted into carbonic acid, azote, and water. By a number of trials he found that this was not completely effected till the quantity of red oxide added amounted to five times the quantity contained in the prussiate. In the decomposition of prussiate of mercury alone by heat, it is only

one sixth part of the prussic acid, which is decomposed by the quantity of oxygen in the oxide present as a constituent of that salt, and hence five more equal quantities are requisite to effect the complete decomposition of the whole. In all cases it is observable that the quantity of azote produced is exactly equal in volume to the quantity of prussic acid gas decomposed, and the quantity of carbonic acid exactly the double of the same measure. Together with these is produced a quantity of water, containing twice as much oxygen as is contained in the carbonic acid.

The author takes pains to describe, with much precision, the precautions which he found it expedient to employ for effecting the entire decomposition of the prussic acid, the mode of preparing the red oxide, of grinding the materials, of charging the tube that he employs as a retort, of applying the heat to the several parts in succession, and of receiving and examining the products.

The results of this analysis of prussic acid, show that

100 grains consist of 34·8 carbon.
40·7 azote.
24·5 hydrogen.

In a Table which follows, the author exhibits, at one view, the results of his analysis of prussic acid, and of ten different compounds into which it enters; and at the same time a comparative statement of those proportions which may be supposed more near approximations to the truth, from theoretic considerations of the number of atoms contained in each of the salts under examination.

On the Nature and Combinations of a newly discovered vegetable Acid; with Observations on the Malic Acid, and Suggestions on the State in which Acids may have previously existed in Vegetables. *By* M. Donovan, *Esq.* *Communicated by* William Hyde Wollaston, *M.D. Sec. R.S.* Read June 1, 1815. [*Phil. Trans.* 1815, *p.* 231.]

The acid here noticed by the author being obtained in greatest quantity from the fruit of the *Sorbus aucuparia*, is denominated by him sorbic acid, in order to distinguish it from other known vegetable acids. To prepare it, he presses the ripe fruit, previously bruised, in a linen bag, and thereby obtains nearly half its weight of juice. With this juice he mixes a solution of acetate of lead, and obtains a precipitate of sorbate of lead, which requires to be frequently washed with cold water. The purified powder is then boiled in a large quantity of water, which dissolves a part as a super-sorbate, leaving undissolved a sub-sorbate. The liquor being filtered and suffered to cool, deposits brilliant crystals of purified sorbate of lead.

To the crystals thus obtained he adds a quantity of dilute sulphuric acid, sufficient to separate nearly the whole of the lead; and having then separated the remainder by a current of sulphuretted hydrogen gas, he obtains the acid in a state of purity.

The acid to which this bears the nearest resemblance, is the malic; and indeed these two acids appear to the author to have been con-