

2. On the Extraction of Mannite from the Dandelion. By Messrs Smith; with an Analysis of the Mannite, by Dr Stenhouse. Communicated by Dr George Wilson.

Messrs Smith stated that they had extracted from the dandelion, a large amount of a crystalline sweet substance, having all the physical characters of mannite. It was analysed by Dr Stenhouse, and found to contain carbon, hydrogen, and oxygen, in the proportions which characterise the accepted formula for mannite; viz., $C_6H_7O_6$, so that it certainly was the substance it was supposed to be.

Messrs Widmann and Frickhinger, it was stated, had anticipated Messrs Smith in the separation of mannite from the dandelion juice, and were led to believe that the mannite did not pre-exist ready formed in the dandelion; but was formed in the juice as the result of a peculiar fermentation which it underwent. This result was confirmed by the Messrs Smith, who experimented with large parcels of the plant, and found that even from quantities of the fresh root, so large as 40 lb., no mannite could be extracted, if the expressed juice were prevented from fermenting; whilst, if fermentation were permitted, the same weight of roots yielded a large quantity of mannite, which appears to be derived from the sugar, inulin, &c., of the dandelion, which were converted into mannite, gum, and lactic acid.

The Messrs Smith stated, in conclusion, that they had not been able to confirm the statement of Poley, that the dandelion contains a bitter crystallizable substance, such as he had described under the name of Taraxacine.

3. On some new Voltaic arrangements with Chlorous and Chromic Acids, with an account of a Battery, yielding electricity of great intensity, in which the negative, as well as the positive element is Zinc. By Dr Thomas Wright. Communicated by Dr G. Wilson.

The author, after referring to the principle on which the intense batteries of Daniel and Grove are constructed, and to the disadvantages connected with the use of the porous cells in those arrangements, stated that he had some time ago instituted a series of experiments, with a view to the construction of a voltaic circle of high electro-motive force, capable of being excited by a single solution, similarly to the battery of Mr Smee. Having employed a great

variety of solutions, he was led to consider mixtures of chromic or chlorous acid with dilute sulphuric acid, best adapted to the purpose he had proposed.

The chromic acid battery was arranged by twisting round one end of a cylinder of coke a copper conducting wire, soaking the part in boiling wax, and afterwards covering it with varnish, to protect the wire from the acid: the coke was then surrounded by a cylinder of amalgamated zinc, and firmly fixed in its place by wedges of varnished cork. To form the exciting liquid, a measure of strong sulphuric acid was added to an equal measure of a hot saturated solution of bichromate of potash: the mixture was then diluted with four measures of water, and set aside to cool. The coke and zinc cylinders placed in a tumbler of the solution possessed a high degree of electro-motive force, a single alternation being capable of decomposing acidulated water with platinum electrodes. The author stated, that the arrangement was not constant, its action gradually declining after immersion. But he considered that a small pair was well adapted for the excitation of electro-magnetic apparatus, from its possessing about three times the intensity of Smee's arrangement. In an experiment made by him with Dr Wilson, a series of four pairs, roughly put together in half-pint tumblers, decomposed acidulated water, at the rate of two cubic inches of mixed gases per minute with a cold, and four with a hot, charge of the chromic acid solution. No gas was evolved from the amalgamated zinc surface in either case. One of the advantages of the battery was, that a series of cylinders, however extensive, might, as in Wollaston's arrangement, be immersed and removed from the solution at once, and the energetic effects of first immersion obtained at pleasure. Platina, or boxwood charcoal might be used in place of coke: a small series of thirteen pairs (charcoal and amalgamated zinc), each exposing a surface of about a quarter of an inch square, afforded a shock equal to a Cruickshank's battery of fifty pairs of four-inch plates, a perceptible shock being even felt from four pairs.

The solution of chlorous or hypochloric acid (Cl O_4) was prepared, by pouring a drachm of powdered chlorate of potash into a wine glass containing an ounce of concentrated sulphuric acid, and in ten minutes afterwards plunging the mixture into seven ounces of water. A pair of plates (amalgamated zinc and thin sheet-brass) excited by the last solution gave a powerful current, until the chlorous acid was exhausted. The author had, however, more than once failed to ob-

tain any current from such an arrangement. A mixture of chlorate of potash and concentrated sulphuric acid formed a good charge for the negative side of Grove's double cell.

The author then proceeded to describe the platinized zinc battery. He was led to its discovery by observing that zinc (not amalgamated) has a tendency to assume an inactive state in some solutions containing a large quantity of sulphuric acid. Two or three arrangements were described, in which the negative plate consisted of zinc in various fluids, viz., dilute sulphuric acid, hypochloric acid and sulphuric acid, solution of sulphate of copper and sulphuric acid, &c. The most powerful battery of this class was formed by a negative plate of zinc included in a porous cell, containing a mixture of one measure of nitric acid with four of sulphuric acid, and associated with a double plate of zinc in a solution of potash or common salt. Such a circle was found to have an intensity equal to the battery of Professor Daniel, but by simply brushing the negative plate with a very dilute hot or acid solution of chloride of platinum, *the electro-motive force of the battery was doubled*, a single cell being then capable of decomposing water with platinum electrodes. A platinized zinc battery of three cells was placed on the table, the arrangement of the porous and outer cell being that of Professor Grove. The positive plate of each outer cell was folded over into the porous cell, and formed the negative plate of the pair next in series; there was therefore no necessity for binding screws, solderings, or mercury cups in the whole arrangement. The platinized zinc of each cell exposed a surface of 2.5 in. by 3.7 in. The series of three cells gave a cubic inch of mixed gases in 37 seconds, but the author considered that the battery would give two cubic inches of gas per minute, when the charge of the arrangement had become warm by the passage of the current. After use, the zinc plates were well rinsed in clean water and allowed to dry, and it was considered advisable to give them a slight brushing with the solution of platinum before their being again used. The platinized zinc battery was a *constant* arrangement.

The following Donations to the Library were announced:—

American Journal of Science and Arts. Conducted by Professors Silliman and Dana. Second series. Vol. VII., No. 19. 8vo.—
By the Editors.

- Proceedings of the Academy of Natural Sciences of Philadelphia.
Vol. IV., Nos. 3, 4, 5. 8vo.—*By the Academy.*
- Journal of the Statistical Society of London. Vol. XII., Part I.
8vo. *By the Society.*
- Quarterly Journal of the Geological Society. No. 17. 8vo.—
By the Society.
- The Ethnological Journal. No. 9. 8vo.—*By the Editor.*
- Journal of the Indian Archipelago and Eastern Asia. Vol. II.,
Nos. 9, 10, 11, 12. 8vo.—*By the Editor.*
- A Monograph of the British Naked-eyed Medusæ, with figures of all
the species. By Edward Forbes, F.R.S. 4to.—*By the Author.*

Monday, March 5, 1849.

The Very Rev. Principal LEE, V.P., in the Chair.

The following communication was read:—

Biographical Notice of Dr Chalmers. By the Very Rev. E.
B. Ramsay.

The writer of this paper commenced by stating his purpose of viewing Dr Chalmers as a public character only, and to avoid all questions which belonged to the peculiar relations in which he stood to his own religious communion; and after a brief outline of the various circumstances of his life, and the dates belonging to each, the paper proposed to consider Dr Chalmers,—

- I. As an Author.
- II. As a Political Economist.
- III. As a Speaker.

I. Under the first head were noted the peculiarities of Dr Chalmers's mode of treating a subject, and the distinguishing points of his style, the abundance of his *imaginative* faculty, and the effects which were produced by it upon his writings.

II. Under the head of political economy, the principal object was to exhibit Dr Chalmers as a true Christian philanthropist. The circumstances connected with his management of the poor in St John's parish, Glasgow, were detailed; and the influence which that experi-