

tion filtered. The filtrate was rendered faintly acid with acetic acid, and then excess of barium nitrate added. The precipitate, after being washed with the minimum of cold distilled water, was dried in the water-bath, and found to weigh 10.31 grs. This was treated with nitric acid to remove the meconate, and then ignited, leaving 4.36 grs. BaSO_4 . The 5.95 grs. meconate of barium considered as $\text{C}_7\text{H}_2\text{O}_7\text{Ba.H}_2\text{O}$ is = 3.37 grs. $\text{C}_7\text{H}_4\text{O}_7$ = 8.0 grs. morphia.

(2) From a quantity of good opium the morphia and meconic acid were prepared with as little loss as possible. There were obtained 627 grs. morphia hydrate and 186 grs. crystallised meconic acid. The proportion demanded to form the normal meconate is 262 grs. Experiments with other opiums were conducted as in (1), with similar results, the proportion of meconic acid to morphia being even less than that there described.

It is evident that if the morphia salts could be made to crystallise from a simple extract of opium, much light would be thrown on the matter under discussion. With this end in view, 500 grs. of opium were exhausted with alcohol, the alcohol driven off, and the extract treated with water. The aqueous extract was digested with purified animal charcoal, and then concentrated. After some days, a small quantity of crystals had appeared. These consisted of morphia sulphate. (It should be noted here that while the neutral meconate readily crystallises, the acid meconate has never been obtained in the crystalline state.) This cannot be regarded as an altogether satisfactory experiment, on account of the small yield of sulphate, but considering that the extract is charged with substances which hinder crystallisation, the result is not surprising; the use of any purifying agents which would cause decomposition being, of course, quite inadmissible.

To thoroughly elucidate the question would require an enormous number of experiments; but judging from the facts ascertained, I am of opinion that morphia exists in opium, partly as neutral sulphate and partly as acid meconate.

3. Direct Observations of the Effect of Pressure on the Maximum Density-Point of Water. By Professor Tait.