found to contain crystals. Dissolve these in chloroform, wash the solution with potash, and concentrate, rectangular and perfectly white flakes of pentabromised safrol, $C_{10}H_5Br_5O_2$, will separate.

This body melts at 169° or 170°, is but slightly soluble in alcohol or ether, even at the boiling point, and dissolves in about fifteen times its weight of chloroform, with simultaneous production of a very small quantity of another bromised derivative melting at 109°. Upon subjecting safrol to the action of sundry other reagents, no satisfactory results were obtained. Nitric acid, even when much diluted, renders it resinous, with production of oxalic acid; it dissolves in the fuming acid, yielding a non-crystallisable derivative, soluble in alkalies at moderate temperature. When heated with chloride of zinc or phosphoric anhydride, it quickly decomposes, leaving much carbon; sulphuric acid produces the same effect. Fusing potash attacks it with difficulty; a distillation of the essence over melting potash modifies its boiling point; that which formerly distilled between 230° or 234°, now comes over between 245° and 250°, and even at from 247° to 248°. The analysis of this body gives the same figures as that of the essence.

On Some Constituents of Ergot.*

BY J. CARL HERRMANN.

The author extracted 20 oz. finely powdered ergot with ether and obtained 6 oz. of a brown-yellow thickish non-drying oil, of an aromatic odor and acrid taste, at 18° C. of 0·92496 spec. grav., which at a lower temperature separated floccules of a solid fat.

4 oz. of the oil were saponified with caustic soda; during the boiling, traces of ammonia and trimethylamina were observed in the vapor. The crude soap had a brownish-yellow color, which remained in the mother liquor on salting out the soap; this gradually became sticky in the air. The fatty acids were separated by sulphuric acid and repeatedly boiled with water; the first portions of which assumed a golden-yellow color and separated a brown powder, which was similar in color to powdered ergot, retained a little fat, had an acrid bitterish taste, the odor of the oil, was insoluble in water and dilute acids, readily soluble in alcohol, ether and alkalies, and may be regarded as coloring matter.

The aqueous liquid was distilled, and small quantities of butyric and acetic acid, were found in the distillate, while nearly half an oz. of glycerin was obtained by concentrating the residue left in the retort and treating it with strong alcohol.

The fatty acids were filtered in a water bath funnel, combined with carbonate of soda, and the soda soap in alcoholic solution precipitated by acetate of lead. The resulting plaster was washed with water and exhausted by ether. The undissolved powder contained 1·45 water, 59·10 oxide of lead and 39·61 fatty acid (mean). On evaporating the ether the lead soap was left of the consistence of a soft extract, and yielded 1·72 water, 19·37 oxide of lead and 78·46 fatty acid (mean).

To determine the nature of the fatty acids, a portion was pressed between bibulous paper and repeatedly crystallized from hot alcohol; the dry crystals fused at 62° C., and congealed between 57 and 58° C.; they consisted of pure hydrate of palmitic acid. Ultimate analysis proved the correctness of this inference.

The extract, like lead soap, was decomposed by muriatic acid, and the fatty acid taken up by ether; it proved to be oleic acid.

The proportion of lead oxide to the acids is 5:4, and the fatty acids are 1 palmitic to 3 oleic acid; the composition of the plaster is therefore, $C_{32}H_{31}(2\ PbO)\ O_3 + 3\ C_{36}H_{33}(PbO)\ O_3$. By the action of ether this was decomposed so as to yield a basic palmitate and an acid oleinate.

The coloring principle contained in the oil was obtained by treating it with ammoniacal alcohol, and evaporating the alcohol. It corresponds, the solubility in ether excepted, with Wiggers' ergotin, and to it the oil owes its color, aromatic odor and acrid taste.

The author also disproved the assertion of Manassewitz, that the oil of ergot was not saponifiable by caustic potassa.

Since Manassewitz did not succeed in isolating Wenzell's cebolina, the author operated upon 30 oz. powdered ergot by nearly the process described by Wenzell (in Amer. Journ. Ph., May, 1864) and isolated the alkaloid, which possessed the appearance and reactions indicated by Wenzell. Herrmann also digested the precipitate by bichloride of mercury in Wenzell's process, with carbonate of lead, exsiccated the mixture and exhausted with 90 pr. ct. alcohol, which dissolved cebolina, together with a trace of chloride of lead. The author promises further researches on cebolina, also on Wenzell's ergotina and ergotic acid.

1000 grs. powdered ergot contained 50 grs. water, and yielded 22·01562 ashes, consisting of chloride of sodium, silica (14·67 pr. ct.,) and potassa (30 pr. ct.,) soda, lime, magnesia (4·88 pr. ct., alumina, iron, manganese combined with phosphoric acid (45·12 pr. ct.).

*From Wittstein's Viertelj. Schr: in Am. Jour. Pharm.

Assay of a Pure American Opium.*

From Poppies grown at Hancock, Vermont, by Mr. C. M. Robbins.

BY WILLIAM PROCTER, JR.

On the 18th of January the writer received a sample of about an ounce of opium from Messrs. Rosengarten & Sons, with the information (in the form of a copy of a letter from Messrs. Howe & French, of Boston, Mass.) that it was received from Mr. C. M. Robbins, of Hancock, Vermont, who raised the poppies producing it from foreign seed, which had cost ten dollars per ounce. The opium was obtained by scarifying the capsules in the manner it is done abroad, and the exuded juice collected and dried in the sun, when it turns dark coloured. No leaves, or capsules or other foreign substance is admixed, but its consistence is that of an extract rather soft than firm, but the softness does not appear to be due so much to moisture as to its caoutchoucoid character, as after long drying it lost but five per cent. of its weight, and broke with a short, shining fracture when quite cold. The entire crop of this experiment was 11 ounces, and in its odor and taste closely resembles good Turkey opium. In a letter from Mr. Robbins, since shown to me by Messrs. Rosengarten & Sons, he says, "I planted about 15 square rods of land [about one-tenth of an acre] in poppies, rows two feet apart, hills one foot apart. It was in growth from June 1st to October 1st. The heads were punctured only once a day, in the afternoon; we cut several small gashes in the sides, being careful not to cut through the inside. The opium was scraped off next morning and dried on plates in the sun. In my opinion we did not get half the opium that might have been obtained. The poppy seed was not planted early enough by two or three weeks. The poppy grows well and seems hearty, and requires dry soil."

One hundred grains of this opium was rubbed with water in a mortar until the whole was emulsionized. After standing several hours with occasional agitation it was thrown on a tared filter, a after draining, the dregs were well washed with water, dried, and weighed 38 grains. The liquid thus obtained was carefully evaporated, at a moderate heat, to six fluidrachms, mixed with its bulk of alcohol and filtered; 30 grains of aqua ammoniæ, sp. gr. 960, mixed with three times its bulk of alcohol was slowly added with constant stirring until a decided excess was obtained well stirred, and allowed to stand 24 hours. The ammonia caused an immediate granular precipitate, which increased on standing. At the end of the period mentioned, it was collected on a tared filter, thoroughly washed with cold water and dried. The precipitate was of a uniform light drab color, and weighed 18·2 grains. It was now boiled in repeated portions of ether, washed on a filter with that liquid and then dried, when it weighed 16.25 grs. This substance has the properties of morphia, being reddened by nitric acid, blued by sesquichloride of iron, but is colored. It was therefore dissolved in repeated portions of boiling alcohol, the solution filtered and evaporated and crystallized. The filter was well washed, and, on drying, the brown matter weighed 0·5 gr., making the yield of crystallized morphia 15·75 grs.

The ethereal washings of the morphia precipitate yielded nearly 2 grains of crystalline matter, which formed a clear yellow solution with nitric acid, consisting chiefly of narcotina, with a little brownish amorphous matter around the edge of the dish.

The liquid from which the morphia precipitated was found to yield a deep red coloration with sesquichloride of iron, and was treated with a slight excess of chloride of calcium, the gelatinous precipitate collected on a filter, washed, suspended in a fluidounce of water, at 190° F., an excess of dilute hydrochloric acid added, filtered hot, and allowed to stand some hours. The crystalline granular precipitate of bi-meconate of lime was collected and treated with hot diluted hydrochloric acid, when the meconic acid in colored crystals, separated on standing, was washed and dried.

The original undissolved residue of the opium, weighing 33 grains, was now treated with coal oil, benzine, nearly pure, until exhausted, and the dark liquid evaporated until all the benzine was removed. A soft elastic residue of caoutchouc was obtained, weighing 11 grains. This probably contained some narcotina and other principles as resin and fixed oil, but it was not further treated—the chief object of its extraction being to show by its quantity a sufficient cause for the softness of the opium in the absence of the usual percentage of moisture.

* From the American Journal of Pharmacy, March, 1870.