parison with the whole plant, are recorded.

The roots and crowns, which are not now official, yield tinctures conforming to the U. S. P. standard of activity when free from excessive soil.

The roots and crowns amount to between 5 and 10% of the crop.

Data are recorded on the relative weights of the separate parts of freshly harvested plants and plants air-dried to a grindable state; the moisture contents of recently harvested plants and their parts and plants and their parts air-dried to a grindable state and total and acid insoluble ash content of the whole plant and its parts.

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THE ASSAY OF MERCURIC SALICYLATE.

BY E. F. KELLY AND J. C. KRANTZ, JR.

The U. S. P. process for the assay of mercuric salicylate is faulty in that it oes not accomplish what it sets out to do, *viz.*, to produce mercurous chloride and estimate this iodometrically.

The Pharmacopoeia directs that a weighed quantity (about 0.5 Gm.) of mercuric salicylate be heated on a water-bath with a mixture of nitric and sulphuric acids, until dissolved. The solution is never complete, no matter how long the mixture is heated, since the mercuric nitrate produced is not soluble in the acids. What does happen is, the mercuric nitrate remains on the bottom of the container, after the oxides of nitrogen fumes cease to be evolved, and is dissolved immediately on the addition of water. A higher temperature than 100° C. will considerably shorten the process.

Having then a solution of mercuric nitrate, measuring about 150 mils, 30 mils of solution of hydrogen dioxide are added to insure a complete oxidation. To this, the Pharmacopoeia directs that 5 mils of diluted hypophosphorous acid be added, and then 5 Gm. of sodium chloride, dissolved in 20 mils of water. Here the real error occurs in the official process; for when the diluted hypophosphorous acid is added the solution immediately becomes dark, due to the separation of finely divided metallic mercury.

If the sodium chloride solution is quickly added some mercurous chloride may also be precipitated, but the quantity is small. It is true that the metallic mercury, after being collected on a filter and washed, can be estimated iodometrically, but it is taken up so slowly that several hours are required, even if a mechanical shaker be used.

If, however, the order of the addition of the diluted hypophosphorous acid and the sodium chloride solution is reversed, that is, if the sodium chloride is added first and then the reducing agent, a dense white precipitate results, free from metallic mercury. This, when collected and washed, can be estimated immediately with tenth-normal iodine volumetric solution.

The late Dr. Frontis Lentz had occasion to assay some twenty-five samples of mercuric salicylate, produced by several manufacturers, during the period of the war, and found these modifications of the official process to be satisfactory

in every instance, whereas he failed on perhaps ten occasions to obtain concordant results when using the process as it appears in the ninth revision of the Pharmacopoeia.

It was therefore suggested by Dr. Lentz that the U. S. P. process be modified, to read as follows:

Heat about 0.5 Gm., accurately weighed, in a mixture of 15 mils of sulphuric acid and 10 mils of nitric acid, over a small flame until the oxides of nitrogen fumes cease to be evolved and the liquid is of a pale yellow color. Cool the mixture, dilute it with 150 mils of distilled water, add 30 mils of solution of hydrogen dioxide and mix well. Now add 5 Gm. of sodium chloride, dissolved in 20 mils of distilled water, then add gradually, with constant stirring, 5 mils of diluted hypophosphorous acid. Stir thoroughly, then allow the mixture to stand until the precipitate has subsided. Filter and wash the precipitate with distilled water. Transfer the precipitate and filter to a flask, add 50 mils of tenth-normal iodine volumetric solution and 2 Gm. of potassium iodide, agitate the mixture until all the precipitate has dissolved, then titrate the excess of tenth-normal iodine volumetric solution with tenth-normal sodium thiosulphate volumetric solution.

DRUG TOPICS.*

No. 3. Evaluation of Wintergreen Leaves.[1]

BY R. W. ADAMS.

The leaves of *Gaultheria procumbens* have possibly never been regarded as an important drug. To-day the average drug clerk of our cities may not know it. If found at all in a drug store it is most likely contained in compressed packages the inside of which is rarely, if ever, seen by the salesman behind the counter.

Wintergreen oil has been replaced for the most part by sweet birch oil and artificial methyl salicylate. But, although the production of true wintergreen oil from the leaves of *Gaultheria procumbens* is still an agricultural or, more correctly, a forest industry of some local importance in certain states, this fact adds nothing to the significance of the drug as such.

Nevertheless wintergreen is still an article of commerce and the person who has occasion to purchase a bale ought to know whether the price asked for the drug is at all indicative of its quality. Drug brokers may judge the leaves by their appearance, yet the best appearing leaves may be valueless so far as available volatile oil is concerned. The writer has even met persons who thought that a nice-looking green leaf was of first quality because the drug had the peculiar wintergreen odor. In most cases, there is reason to suspect that neither collector, broker, nor purchaser cares a rap about the quality of the leaf so long as the price admits of a satisfactory business transaction. The writer knows of at least one bale of about 150 pounds of North Carolina leaf that was sold by a "reliable" firm for a fair price, when the leaves were almost useless for the purpose for which they had been purchased. No doubt the leaves had passed through various hands, yet no one seems to have given any thought whatever to the quality of the leaves. Even though wintergreen leaves are not used where a question of life and death is involved, the mere matter of business honesty seems to demand more consideration than has

* From the Laboratory of Edward Kremers.

[1] Extracts from R. W. Adams, "Oil of Wintergreen from Gaultheria." Thesis University of Wisconsin, 1910.