SUMMARY OF RESULTS—*Continued.*

| Sample. | 1st assay. | 2nd assay. | 3rd assay. | Total deterioration. |
|---|---|---|---|---|
| No. 5 C. Same drug as No. 5 A and No. 5 B. "Defatted" 50% alcohol menstruum | 7–13–16<br>66.6% | 11–29–16<br>50% | 2–1–17<br>45.4% | 7–13–16 to 2–1–17<br>21.2% |

It will be noted from the above results that every sample except one, *i. e.*, No. 3 B, showed marked deterioration, some samples deteriorating as much as 75 percent in seven months. These results will, therefore, tend to prove that in most cases tincture of digitalis not only deteriorates but deteriorates very rapidly.

The results also show that the "fat-free" or "defatted" tinctures of digitalis *do not* deteriorate more rapidly than the regular U. S. P. VIII tincture, as the ten "defatted" tinctures only show an average deterioration of 32 percent for the seven months' period of test, whereas the five U. S. P. VIII tinctures show a deterioration of 44.6 percent for the same period of time.

From the results of these experiments we can, therefore, draw the following conclusions:

(1) Most tinctures of digitalis deteriorate very rapidly.

(2) "Fat-free" or "defatted" tinctures of digitalis do not deteriorate at a greater rate than the U. S. P. VIII tinctures.

PHARMACODYNAMIC LABORATORY,
H. K. MULFORD COMPANY,
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## AN IMPROVED LIME METHOD FOR ASSAYING OPIUM.*

BY WM. MASKE, JR.

This assay method has been the outcome of several which the writer has read and experimented with but the foundation of the assay outlined herein is a somewhat crude process by A. Guerin as given in the *Jahresberichte der Pharmazie*, Vol. 48, Page 45. As this writer collects 52 Cc. filtrate instead of the 50 Cc. as advised in this paper, and the first quantity can not readily be measured accurately, one can just as well collect 50 Cc., an amount which can be accurately measured in a volumetric flask or sucked up in a volumetric pipette, and add the correction factor, which amounts to the same thing as collecting 52 Cc. of filtrate.

The lime method of assaying opium for its morphine content is probably used more than any other method of assaying this drug. The U. S. P. uses a lime process which gives good results in the hands of experienced workers, but which for a beginner is apt to prove cumbersome. Moreover, the method takes more time and work than is necessary. The writer has successfully used the following modification of the lime method, which is simpler, less cumbersome than the U. S. P. method, and gives just as accurate results:

*Method:* Weigh out 7.5 Gm. of opium and dry at 60° C. Transfer the dried opium to a mortar containing 5 Gm. of fine, clean quartz sand and 3 Gm. of slaked lime. Triturate the three ingredients thoroughly until a finely divided homo-

* Read before Scientific Section A. Ph. A., Indianapolis meeting, 1917.

geneous mixture of opium is obtained. Brush the contents of the mortar on a piece of glazed paper and from there into a glass-stoppered Erlenmeyer flask of about 150 Cc. capacity. Add 75 Cc. of distilled water and shake vigorously for fifteen minutes, and then every ten minutes during three hours (or continuously in a mechanical shaker). Filter off 50 Cc. of the solution into a 50 Cc. volumetric flask. This represents approximately 5 Gm. of opium.

Transfer the whole of the filtrate to a separator, washing the flask with a small portion of distilled water. Add 15 Cc. of ether and shake thoroughly. Now add 1 Gm. of ammonium chloride and shake frequently for half an hour; then set it aside in a cool place overnight. Plug the stem of the separator fairly tight with a pledget of purified cotton and allow the liquid to drain off. Wash the funnel and its contents with morphinated water until the drippings are colorless, then wash with two small portions of distilled water to replace the morphinated water. Dislodge the cotton plug in the separator stem by blowing vigorously into the top of the separatory funnel and catch it in a clean Erlenmeyer flask.

Close the stop-cock and add 25 Cc. of tenth-normal sulphuric acid, V. S., replace the stopper and agitate until the crystals in the separator are dissolved. Then dissolve the crystals in the stem of the separator by holding the funnel at an angle, allowing the acid to run out slowly into the Erlenmeyer flask and at the same time rotating the separator. Wash the separator with three 10 Cc. portions of distilled water; also wash the stem of the separator, adding all of these washings to the contents of the Erlenmeyer flask. Agitate the flask until any remaining crystals are dissolved and titrate the excess of acid with fiftieth-normal potassium hydroxide, V. S. Make a correction by adding to the actual number of Cc. of acid consumed one twenty-fifth of this amount. Each mil of tenth-normal sulphuric acid, V. S., consumed corresponds to 0.028516 Gm. of anhydrous morphine.

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## TOLU AND SUGAR COATING IN THE DISGUISING OF MEDICINES.

BY BERNARD FANTUS, M.D.

The disguising of disagreeable medicines is, in general, a problem of sneaking the agent past the guardianship of the palate, without changing the substance to such an extent as to impair its medicinal activity. One means of doing this is by some coating insoluble in the saliva but soluble in some of the other digestive juices. Capsules and pills solve this problem for the adult. For children, the problem of coating of medicines is thus far unsolved.

For quite a time I have worked upon the coating of tiny granules of medicament with insoluble material: Have tried cacao butter, paraffin of low melting point dissolved in ether, liquid petrolatum, and, though each of these did something in the direction of subduing tastes, none of them was satisfactory. Of late, I experimented with resins, such as mastic and tolu, and believe I have found in the latter an agent that meets the requirements. Mastic does not seem to be more efficient than tolu, and is much inferior to it in flavor.