

microscopical examination to be composed of unleavened rice bread. A careful search of a number of samples revealed the presence of several pieces of the outer smooth part of the bread, which had been in contact with the baking pan. Other samples contained a mixture of unleavened wheat and rice bread. These spurious samples varied quite as much in color as the pure papain. In some cases the bread had been scorched in order to make it more closely resemble the darker commercial variety, while other samples were grayish-white and resembled the whiter papain of commerce. Still other samples examined showed that the rice bread had been saturated with papain and dried. Selling rice bread for papain yields large profits. Rice bread costs about eight cents per pound. (No yeast or salt is used in its preparation.) This same eight-cent bread when sold as papain brings over two dollars per pound, thus netting a profit to the adulterator of about 2400 per cent. Schemes for extracting gold from sea water, or selling gold bricks are christian acts compared to the getting-rich-quick, and the safe (to date) practice of selling rice-bread for papain.

The surest and the quickest way to put a stop to the present practice of adulterating papain is to make the drug official.

THE TESTING OF LINSEED OIL FOR GLOSS OIL.

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In the examination of linseed oil the writer has found some difficulty in detecting "gloss oil," prepared from rosin, even if present in considerable quantity, by employing the pharmaceutical test, that is the Liebermann-Storh reaction.

Although Lewkowitsch¹ and Spayd² give directions for applying the above test somewhat different than found in the U. S. P. the modified method does not give satisfactory results in case of gloss oil.

Spayd's² modification is as follows: "by taking 2 cc. of the suspected oil and boiling with 10 cc. of acetic anhydride, adding about 10 cc. of water and allowing to thoroughly cool; then drawing off the aqueous portion, filtering through a wet filter and cautiously adding a drop of concentrated sulphuric acid to the clear filtrate. If the rosin or rosin oils to the amount of 0.5 percent. to 1 percent. are present a beautiful fugitive color will be produced.

The objections to the old method, that is the one of slightly warming with glacial acetic acid and adding a drop of strong sulphuric acid to the clear portion, are: First, nine times out of ten, the acid is not clear. Second, in a number of experiments that I made using other oils such as cottonseed, tongue, lard and linseed, I found they gave color reactions hindering the fugitive development to such an extent that one could not definitely say whether resin or resin oils were present or not. By using the modification, I was able to positively detect as low as 2 percent. of resin or resin oils in a mineral oil mixture, and as low as 3 or 4 percent. in linseed oil."

¹Lewkowitsch Oils, Fats and Waxes, page 384.

²Chemical Engineer, Vol. 3, page 224.

Even when gloss oil is present up to fifty percent. the above reaction is negligible.

The simple test of adding nitric acid to the suspected oil furnishes a more positive index of purity. In applying acid, four or five drops of the oil should be dropped into the cavity of a porcelain plate and one drop of concentrated nitric acid allowed to run down the side of the cavity without agitation. This test was applied to gloss oil also to 5, 10, 25, and 50 percent. gloss oil and the balance linseed oil.

Gloss oil will give a fugitive violet-red,³ tint 2, changing to a red-violet tint 2.

Fifty percent. gloss oil with 50 percent. linseed oil, the color produced is as pronounced as in pure gloss oil.

With 25 percent gloss oil and 75 percent linseed oil the color is green-yellow, medium, after standing four or five seconds. Permanent for some time.

With mixtures of 10 percent. gloss oil and 90 percent. linseed oil and 5 percent. gloss oil and 95 percent. linseed oil the color produced with concentrated nitric acid is yellow, tint 2. Color not fully developed until after several seconds.

The U. S. P. saponification test for rosin products in linseed oil is too indefinite in case of adulteration with small quantities of rosin products which are more or less saponifiable.

It appears it would be desirable to have an official quantitative method for determining mineral oil in linseed oil. Allen's⁴ method of saponification and extraction with ether appears practicable.

Linseed oil, mineral oil and rosin products, in many cases have so near the same specific gravity and refractive index that these constants are of no value in the detection of mixtures of the above oils.

THE RELATION OF PHARMACOGNOSY TO THE PRACTICE OF PHARMACY.

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How often students and practitioners of pharmacy ask the question, "What bearing does pharmacognosy have upon the general drug business?" How often do they sneeringly remark, "Why should I study the methods of cultivating, collecting, preserving, and valuing crude drugs!" It is the writer's object to point out that pharmacognosy considered as a major division of the science of pharmacology does have an important bearing upon the Practice of Pharmacy.

To Professor Alexander Tschirch, of Bern, Switzerland, is due much of the credit for developing pharmacognosy into a distinct science. Tschirch calls attention to the great departments and sub-divisions into which pharmacognosy may be divided, namely pharmacobotany,—including pharmacochemistry, pharmacophysiology, and pharmacoagriculture,—pharmacochemistry, pharmacogeography, pharmacoethnography, and the history of pharmacognosy.

³See Color Standards—Mulliken's Identification of Pure Organic Compounds.

⁴Commercial Organic Analysis, Vol. 11, Part 1, page 112.