

Commercial sample.*	Amount claimed.	Amount found.
1	0.48 per cent	0.50 per cent
2	0.32	0.28
3	?	0.32
4	1.45	1.45

* Preparations 2, 3, 4 contain agar-agar as emulsifiers, Preparation 1 contains the mucilage of the seaweed Irish Moss.

The comparisons should always be made in fresh solutions, because the color of the diluted alkaline phenolphthalein solutions slowly fades through the action of CO₂ from the atmosphere.

LITERATURE CITED.

- (1) Warren, "Reports of the Chem. Lab. of the Am. Med. Assoc.," 17, 18, 20 (1924-1925).
- (2) Zotier, *Bull. soc. chim.* [4], 7 (1910), 993-995.
- (3) Kollo, *Apoth. Ztg.*, 24, 283 (four different methods), *Pharm. Praxis*, 7 (1908), 341-344.
- (4) Rosenberger, *Chem.-Ztg.*, 54 (1930), 345.

THE SAMPLING OF OPIUM.

BY FREDERIC ROSENGARTEN.

The Testing or "Assay" of Opium is a subject that has received and is receiving considerable attention. From time to time many discussions on this subject have taken place and more are impending. As little or nothing has been said about the practical aspects of sampling the drug, the writer's experience may prove of some service to those interested.

No matter how consistent the method of testing may be, results cannot be correct if the sample under observation does not truly represent the lot of opium in question. Not only does every piece of opium vary from all the other pieces in a shipment, but each piece varies more or less in itself, from circumference to its center. This is particularly true of opium originating in Mediterranean countries. Such descriptions as Persian Opium, which are reputed to be packed for shipment from bulk that has been more or less thoroughly mixed, are more uniform.

The writer observed the collection of opium, during the harvesting season, in Asia Minor some thirty years ago, and from personal observation it gives him pleasure to confirm the procedure in connection with the collection of the juice, as described in "Flückiger's Pharmacographia," published in London, 1874. He should add that local merchants, as well as shippers, are skilled in the "grading" of opium, a process not based on any scientific method, but upon the appearance and consistency of the drug. As reliable shippers usually "grade" their shipments so that every chest in a shipment contains the same proportion of good, medium, indifferent and poor pieces, the sampling of such uniform shipments is much simplified. On the other hand when shipments are packed in a haphazard manner it may become necessary to dry and powder the entire shipment, in order to obtain a representative sample after the powdered drug has been thoroughly and uniformly mixed in a mechanical mixer. Notice must be taken of the fact that if opium is abused during the drying process the percentage of morphine will be diminished. The drug should not be overheated. The most desirable method of drying is to employ a vacuum dryer.

If inspection indicates that every chest of opium in a shipment is quite uniform it is advisable to set aside one chest out of every five for the purpose of sampling. According to this procedure one chest out of a shipment of five chests would be withdrawn for sampling, two out of a shipment of ten, etc., etc.

A quarter section is cut from each piece of opium contained in the sample chest. Ordinarily opium is packed in chests of 150 lbs. or 160 lbs., and the sample will amount to approximately 40 lbs., which is then thoroughly mixed in a Werner & Pfleiderer mechanically driven dough-mixer until a completely uniform mass is produced. As considerable heat, involving loss of moisture, is developed during the mixing, allowance should be made for such loss.

Samples for analyses may then be drawn from the homogeneous mass. These should be at once packed in hermetically sealed tins or bottles, thus precluding a further loss of moisture.

In order to check this method of sampling I have at intervals carried out the above procedure and then have dried the entire lot of opium in question, milled and mixed it and have compared the results (after allowing for the loss of moisture in drying) of the tests with the tests of the original "Gum." The tests were remarkably uniform, and confirm, to my mind, the satisfactory results of the above procedure.

Occasionally lots of opium have been received, which in addition to not being "graded" have been so "crumbly" through age or other reasons, that proper sampling of the drug in its natural condition was precluded. Under such circumstances the entire lot was dried, milled and mixed for the purpose of obtaining uniform samples.

Persian Opium from reliable shippers, packed in bricks, wrapped in waxed paper, is remarkably uniform. It may be sampled by perforating each piece in a case, one case out of five of the same mark, by means of a cork borer of about $\frac{1}{4}$ -inch diameter. The samples thus obtained must, of course, be thoroughly mixed (by hand or in a small power mixer) under the same precautions described earlier in this article, before they are sent to the laboratory for test.

THE STANDARDIZATION OF VOLUMETRIC SULPHURIC ACID SOLUTION.*

BY JOSEPH L. MAYER.

On page 508, the U. S. Pharmacopœia, after stating how volumetric sulphuric acid solution should be prepared says "ascertain its exact strength by titration against freshly standardized normal sodium hydroxide, methyl orange T. S. being used as indicator. The strength may also be ascertained and adjusted after titration against an accurately weighed amount of reagent anhydrous sodium carbonate. It may also be standardized gravimetrically by precipitation and weighing as barium sulphate."

On page 505, the U. S. Pharmacopœia, directs that the sodium hydroxide solution which is employed to standardize the sulphuric acid be standardized as follows: "Determine its strength by titration against a hot solution of an accurately weighed quantity of reagent potassium bitartrate."

* Read before the New York State Pharmaceutical Association meeting, June 1931.