Sodium Salicylate.

Brand.	Cc of sample.	Gm. sample.	Cc $N/10$ Br. V. S. T. = 1000.	Cc $N/50$ $Na_2S_2O_3$ $5H_2O$ T. = 0.975.	Per cent sodium salicylate.
L	25	.05	25	32.8	99.2
L	25	.05	25	32.8	99.2
B	25	.05	25	32.6	99.4
B	25	.05	25	32.3	99.7
M	25	.05	25	32.7	99.3
M	25	.05	25	32.6	99.4

Strontium Salicylate.

					Per cent strontium salicylate
L	30	.06	25	36.0	99.3
L	30	.06	25	36.4	99.0
S	30	.06	25	35.8	99.44
S	30	.06	25	35.9	99.36
M	30	.06	25	36.4	99.0
M	30	.06	25	36.2	99.12

1 cc $N/10$ Koppeschaar's Solution V. S. = .002301 Gm. salicylic acid.
1 cc $N/10$ Koppeschaar's Solution V. S. = .003311 Gm. strontium salicylate.
1 cc $N/10$ Koppeschaar's Solution V. S. = .002666 Gm. sodium salicylate.

SUMMARY.

Of all the methods tried, the one we find satisfactory is the following "Bromate" volumetric assay:

About 0.4 Gm. of substance, accurately weighed, is dissolved in H_2O to make 200 cc. Of this solution 25 cc, representing 0.05 Gm. sample, are placed in a 250-cc glass-stoppered flask, preferably one with a long narrow neck. Tenth-normal Br V. S. (25 cc) is added, followed by 3 cc of concentrated hydrochloric acid. Insert the stopper and let stand 20 to 30 minutes with occasional shaking. Remove the stopper, add 5 cc of potassium iodide solution (1.5) and 1 cc chloroform and insert stopper again. Shake until the precipitate is dissolved in the chloroform, remove stopper and rinse it and the neck of the flask with distilled water. Titrate with $N/10$ thiosulphate, V. S., using starch T. S. as indicator.

With strontium salicylate it is preferable to use 30 cc of the solution of the sample, equivalent to 0.06 Gm. of the salt.

COLUMBIA UNIVERSITY COLLEGE OF PHARMACY, JUNE 1922.

CRUDE DRUGS—THEIR SELECTION AND MILLING.*

BY J. L. HOPKINS.

Mankind, from the dawn of his intelligence to the present day, has turned to nature for the means of obtaining relief from his ills. There is hardly a plant that grows that has not somewhere, or somehow, or at sometime, been tried out and sometimes the endeavor to establish its therapeutic worth has resulted in fatalities. To-day botanicals are examined microscopically and by chemical analysis, and human lives are no longer sacrificed in an effort to determine drug values. Some observations along these lines are in keeping at this time.

Every pharmaceutical chemist is aware that the percentage of "active principles" found in botanical drugs varies to such an extent as to render the preparations from many of them of most uncertain value unless the definite amount of active principle is determined by assay. This element of uncertainty attending

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the use of drugs which are not of uniform medicinal activity, notably aconite, belladonna, colchicum, digitalis, ergot, gelsemium, hyoscyamus, nux vomica, opium, etc., is well understood, and standards are provided to insure preparations of definite and uniform potency. Assayed drugs have proved their value as instruments of definite potency, and by their use the manufacturers of pharmaceuticals can produce finished products which are effective, accurate and elegant, in conformity with the standards of the United States Pharmacopoeia.

Too great care cannot be exercised in discriminating between species of drugs which are offered from the foreign market. The scarcity of certain European plant drugs has led many to accept American specimens of the same species, under the erroneous impression that there is no difference whatever between the remedial power of the foreign and the domestic articles. There is, in the case of a number of plant drugs, a difference between the remedial power of one grown in its natural geographical range and one of the same species grown elsewhere. It does not necessarily follow from the mere fact that the American and the European species yield the same alkaloidal or glucosidal totality and exhibit no morphological dissimilarities that the remedial power of the two are identical; for the remedial power of some plant drugs cannot be measured entirely by their alkaloidal or glucosidal content. A European and an American plant drug may be botanically identical, but therapeutically unlike, and, under these conditions, it is not the part of prudence to substitute the latter for the former in the manufacture of remedial agents. The plant drugs should be, in every instance, true to representation of source.

Crude drugs, to be at their best, must be collected under the most favorable conditions. As a matter of fact, the inferior quality of many drugs is often directly traceable to their being gathered at improper seasons, and even from the wrong part of the plants or trees. For instance, the bark of wild cherry yields far more of the active principle, hydrocyanic acid, when gathered in the autumn, than when gathered in the spring. Wild cherry bark produced in April 0.0478 percent hydrocyanic acid, and from a sample gathered in October 0.1436 percent, or about three times the amount. The specimens of bark assayed were taken from the same tree, and from the same part of the tree. It is therefore highly essential that the various parts of medicinal plants should be gathered at the time we know is most favorable to the attainment of their full therapeutic value.

Speaking in a general way, the roots of annual plants should be dug immediately before the flowering period, and those of biennials and perennials late in the fall or early in the spring. The bark of trees should be gathered in the spring, and of shrubs in the autumn; flowers just before they are perfectly developed, and seeds when fully ripe. A failure on the part of a collector to be guided by these principles is often directly responsible for the variable quality of crude drugs.

Milling is a very vital part of drug manufacturing, and the life of the drug—the active principle—is often destroyed by poor milling. When the drug has proved to be of satisfactory quality it next passes to the millers, whose experience and good judgment must be exercised in order to avoid injury to their medicinal properties. The volatile constituents of drugs are often the active principles, and care is necessary to prevent their loss during the process of drying and milling. Special mills must be used for certain articles, such as poisonous and non-poisonous—those of light color—articles strongly aromatic and pungent— and those com-

paratively free from odor. The fibrous and inert part of drugs must be prevented from entering the medicinal part, and this cannot be successfully accomplished if the capacity of the mill be overtaxed, or if iron mills of high speed be employed. A cause of injury to the drugs during the process of milling is the excessive heat from friction, whereby the volatile constituents of many drugs are driven off and their color and medicinal value are materially impaired. The use of iron mills is prohibited whenever a trace of iron is objectionable.

A most important feature and value in grinding crude drugs is the accuracy of granulation in keeping with the requirements of the United States Pharmacopoeia. In order to obtain a proper granulation for percolation, and to secure the entire medicinal properties from many drugs, it is often necessary to use different mechanical processes; without such care, an irregular granulated powder results, which either clogs up the percolator or allows the menstruum to pass through too freely. Crude drugs should be milled in strict accordance with their nature.

WHAT IS ALOES, U. S. P.?*

BY E. N. GATHERCOAL AND R. E. TERRY.

The U. S. Pharmacopoeia continues to recognize three commercial aloes—the Socotrine Aloes, which from time immemorial has been obtained from the little island of Socotra in the Indian Ocean; Curacao Aloes, obtained from the Dutch West Indies, a few small islands off the coast of South America; and Cape Aloes, indicating several commercial kinds obtained from British South Africa. A very well-known commercial aloes, namely, Barbadoes, similar to Curacao, is now produced in such small quantities that it has been dropped as one of the commercial kinds mentioned in the Pharmacopoeia. Recent importation statistics indicate that the bulk of aloes used in America is from the Dutch West Indies. For instance, in 1919, 1,686,800 lbs. of aloes were imported, of which 1,296,891 came from the Dutch West Indies, 4,767 lbs. from the Barbadoes and 176,132 lbs. from British South Africa. The remainder was imported from other countries, principally England, and included whatever small amount of Socotrine Aloes was received into this country. Furthermore, the range of prices indicates why so much of the aloes is imported from the Dutch West Indies. Thus Curacao is priced in the current wholesale price lists at 20 to 25 cents, Socotrine Aloes is quoted at $1.34 to $1.43 and Cape Aloes is quoted at 32 cents, per pound.

As to the therapeutic value of aloes there is a wide divergence of opinion. While Socotrine has a very long history and enjoyed for many centuries a high repute, modern investigators claim that therapeutically it is of no more value than West Indies Aloes or South African Aloes. In reviewing the literature it becomes evident that each of the commercial kinds of this drug has its strong advocates.

From their physical appearances it becomes frequently very difficult to distinguish between these three kinds of aloes. The drug is prepared by evaporating the juice which is exuded from the large thick leaves cut off from the plant. Sometimes the juice is allowed to ferment before or during the process of evaporation. Sometimes the evaporation is spontaneous in the hot sun, sometimes it is hastened

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