8. The Castile soap ordinarily found in the trade is not Castile soap according to the United States Pharmacopoeia. Castile soap, of course, derived its name from the fact that it was made from olive oil in Castalia Province, Spain, and later was specified by U. S. P. as a soap made from pure olive oil and sodium hydroxide. The term "Castile" has now come to apply to almost any soap that has a high percentage of cocoanut or olive oil, and that is intended for toilet purposes.

9. Castile soap was originally undoubtedly made by boiling and graining a soap from olive oil and natural alkali, i. e., a mixture of sodium and potassium hydroxides, containing as impurities salts of iron and manganese to which latter was due the mottled or marbled appearance which was characteristic of Castile soap made in the old days.

Today we would consider as genuine Castile, a boiled and grained soap made from olive oil straight or mixed with peanut oil, or sesame oil, or both, using with the sodium hydroxide enough potassium hydroxide to give the degree of translucency and plasticity which a soap of this class should possess, and if a marbled or mottled article was desired, we would have to use with the present day alkalies the chemicals necessary to produce such effect.

Castile soap should be practically neutral, that is, it should contain but traces of free alkali in the form of either caustic or carbonate of soda, and quite free from other soluble or insoluble inert matter of any kind, the sodium chloride content should be only such as is incidental to the boiling and graining process cited above.

In respect to the United States Pharmacopoeia data under the heading "Sapo" advise that in our opinion such providing for a limit of either 4 percent free carbonate of soda or 3 percent carbonate or soda and 1 percent silica or other foreign matter, we would certainly not as soapmakers consider as pure a prdouct containing such an amount of matter other than soap and water.

In conclusion, I wish to state that after duly weighing all the evidence, it is perfectly proper to decide that Castile Soap is properly a synonymon for Sapo U. S. P.. and that a ruling to that effect is desirable.

## ANALYSING MEDICINES.*

DR. J. J. DOBBIE, F.R.S.

The detection of any substance by chemical analysis depends, ultimately, upon obtaining it or some of its combinations or derivatives in a condition recognizable by some characteristic property: for example, form, color, smell, taste, melting-point, boiling-point, solubility, miscibility, or alteration in color or other characteristic when brought in contact with chemical reagents. The detection of the presence of a substance depends ultimately on the senses of sight, smell, taste, and touch.

*Abstract of a statement made before the Select Parliamentary Committee on Patent Medicines, by Dr. J. J. Dobbie, F. R. S., Principal of the Government Laboratories. Reprinted from the *Chemist and Druggist*, London.

There is no essential difference in principle between the method of detecting a substance by ordinary analysis and those of the expert who judges chiefly by smell and taste. The expert might, of course, claim to have special experience in dealing with particular products, and that in some cases might be useful.

Some times a single observation or reaction is decisive, as, for example, in the case of the yellow color imparted by sodium and its compounds to the flame of a Bunsen burner or spirit lamp. In other cases a combination or association of more than one property might be necessary for the proof. Two bodies, for example, might have nearly the same melting-points, such as acetanilid, 113° C., and antipyrine, 114° C., or might produce a similar color when treated with the same reagents. In such cases, for instance, one other reaction is necessary to distinguish between the two bodies.

*Inorganic Substances.* With inorganic substances it is generally easy to obtain a combination of reactions, and the reactions themselves are often sharp and decisive, whereas in the case of many organic bodies it is in practice more difficult to obtain conclusive single tests of a sufficient quantity for corroborative reaction. For example, the quantity of essential oil obtained in the ordinary analysis of medicines is often so small that it is impracticable to determine its physical and chemical constants, such as specific gravity, boiling point, polarization, and so on, and the odor alone has often to be relied upon.

Where it is a question of a single drug, either as a solid or in solution, there will be usually no great difficulty in identifying the drug, provided that it is one of the official drugs or one whose properties have been described in the ordinary chemical or pharmacological literature. For example, no difficulty would arise with regard to inorganic substances, such as salts of bismuth, mercury, zinc, bromides, iodides, alkalies, acids, and so on.

*Organic Substances.* Organic substances of definite composition, either prepared synthetically or extracted from plants, such as acetanilid, salicylic and other acids, and alkaloids; plants or parts of plants, whole or powdered, such as roots, barks, seeds, leaves, and flowers, as, for example, belladonna-leaves, chamomile-flowers, fenugreek-seeds, cascara-bark, and liquorice root offer no special difficulties. Taking the whole range of medicinal substances, in respect to the great majority, there would be no special difficulty in identifying the drug in question with certainty, when the analyst is dealing with single articles the properties of which have been adequately studied and described.

*Vegetable Extracts.* When, however, the drug is a new one, or one which has no known characteristic chemical or physical property, its definite recognition may be difficult or impossible. To the latter group belong extracts obtained by maceration of the plant with alcohol or other solvent. The extract might only contain substances which are common to several plants, and nothing which is characteristic of any one, and it would then be impossible to identify positively by chemical means. When it is a question of a mixture of drugs, the analysis becomes more complicated. In many cases the constituents of a mixture can be detected directly and readily where they have characteristic properties. But in

other cases it might be necessary to separate certain constituents from others which would interfere with the recognition of those characteristic properties. The more complex the mixture is the more difficult as a whole would be the separation. Also, the difficulty is increased when one or more of the constituents are present in very small quantities relatively to the others or, again, when a large proportion of vegetable extract is present which is without definite features. Further, in the case of vegetable substances, the difficulty is greater than with mineral bodies on account, first, of the fact that many substances which are really distinct chemical individuals resemble one another so closely in properties as to make their discrimination a matter of difficulty; and, second, of the greater susceptibility to change under the influence of the reagents used—heat, alkalies, and so on.

Speaking generally, it is quite practicable for chemical analysis, supplemented, of course, by the microscope and the senses of smell and taste where necessary, to deal with most of the mixtures of drugs which are prescribed in ordinary medicines. But when a number of drugs are mixed together the difficulty of analysis increases with the complexity of the mixture, and in certain cases the difficulties eventually become so great that the complete analysis of the mixture becomes impracticable. Even in such cases, however, bodies with certain well-marked chemical or physical characters, and these are possessed by most medicines, can be separated from the mixture and identified. For example, all inorganic bodies can be separated from organic constituents, volatile organic substances from those which are non-volaile, alkaloids from non-alkaloids, resins from non-resins.

When the medicine consists of a mixture of several vegetable extracts which have not so far been found to have any well-defined chemical characteristics, and which are present only in small proportion, analysis may fail to show what the original extracts are; that is, from what plants the original extracts were derived. It would show the presence of sugars, tannins, acids, coloring matters, and so on; but as these might be derived from any one of a number of plants, they do not indicate the precise extracts used, and analysis must perforce remain satisfied with ascertaining the general characters of the mixture.

The degree of accuracy of quantitative determinations depends very much upon the substance which is being dealt with, as well as upon the nature of the other bodies with which it may be mixed. Broadly, it may be said that the proportion of mineral drugs can be determined with no substantial error. For example, calomel, bismuth nitrate, Epsom salt, and zinc oxide are capable of being quite accurately estimated. Organic bodies, however, present a much wider range of variation; while some can be determined accurately, approximations only are possible in other substances. For example, the proportion of a bitter extract, such as gentian, in a mixture can often be determined only by a comparison with other mixtures made up with different proportions of gentian to match the taste of the first mixture. This may give but a rough approximation to the actual quantity of gentian extract; or, again, the proportion of an organic drug might be sometimes arrived at by determining the amount of one of its components—for example, the amount of alkaloid; but the natural varia-

tion in the amount of the component itself may render the determination of the drug only an approximate one.

So far as a general opinion can be given, it would be safe to say that where the presence of an active organic drug in a mixture had been definitely ascertained, in the majority of cases the analyst can, by one means or another, obtain a fair idea of its proportions, although sometimes he must be content with a rough approximation only.

## THE DRUG MARKET.*

HARRY B. FRENCH, PHILADELPHIA.

*Benzoic Acid.* The first Democratic Tariff Bill proposed a duty on benzoic acid and the reduction of the duty on benzoate of sodium and the measure, as will be recollected, passed the House. If it had become a law, it would have had the result of taxing American manufacturers about 1c per lb. for the privilege of making benzoate of sodium. In other words, if both articles had been admitted free of duty, the American manufacturers would have been better off to the extent of 1c per lb. on benzoate of sodium than they would be under the proposed legislation. While this has been changed in the bill at present before Congress, it shows how injurious may be the mistakes that arise from ignorance or lack of due consideration.

*Borax.* The present duty on borax is 2c per lb. Under the proposed law the duty will be reduced to ⅛c per lb. In the face of this borax has been advanced in price. There are those who think that the effect of the removal or the reduction of duties from many articles will not only not reduce the price to American consumers, but may advance the price, because of a world-understanding.

*Citric Acid and Oil of Lemon.* Citric acid and oil of lemon have been extraordinarily high for the last few months. Oil of lemon is now selling at higher prices than ruled immediately after the earthquake at Messina. Citric acid has been selling in this country at a lower price than in England, although there is a duty of 7c per lb. Therefore, the present price is firmly maintained, notwithstanding the fact that in the new tariff bill the duty will be reduced to 5c per lb.

*Opium.* It has been thought generally throughout the country that opium and its products would be largely advanced in price, because of the proposed increase of duty. The present duty on crude opium is $1.50 per lb. The proposed duty is $3.00 per lb. The present duty on morphine is $1.50 per oz.; the proposed duty is $3,00 per oz. The present duty on codeine is $1.50 per oz.; the proposed duty is $3.00 per oz. The present duty on powdered, granulated, or dried opium is $2.00 per lb.; the proposed duty is $4.00 per lb.

Under ordinary circumstances, there is no doubt that this expectation would come true. It must be remembered, however, that during the last two or three years, Smyrna opium has sold at exceptionally high prices. The prospects for

*Abstract from report of Committee on Trade Interests, R. H. Lachey, Chairman. Presented to Pennsylvania Pharmaceutical Association, June, 1913.