It was found possible to apply one of the color tests of santonin directly to the drug with very satisfactory results as indicating the comparative santonin content and the consequent activity of the drug. This test is based on that of Pain (Pharm. J., 1901, 67,131), and is as follows:

Place 0.5 gm. of santonica (whole or ground) in a test tube, add 5 cc. of spirit of nitrous ether and boil gently. No color should be developed or not more than a slight greenish yellow color due to the solvent action of the alcohol on the resins of the drug. Now add 10 drops of alcoholic potassium hydroxide solution and again boil. In an active drug a rose red color is developed in direct proportion to the amount of santonin present. In the sample under question, scarcely any color was noticeable at all, while the other samples gave results agreeing proportionately with the amount of santonin found by assaying.

The foregoing condition of a practically worthless drug with a fine physical appearance is not new, for it has long been known that physical appearance is not always a criterion of value. It is new, however, as regards santonica, which is usually judged on physical appearance only, and it is suggested that in the future purchasers of santonica apply the color test as being much simpler than the long and tedious process of assaying by any of the available methods. They would thus be enabled to reject a worthless drug in a few minutes. The assay can be applied later to such samples as show positive results by the color test. In this connection I would commend Thaeter's method (Archiv. der Pharmacie, Vol. 237, p. 626, and Vol. 238, p. 383), as the most satisfactory.

LIQUOR FERRI IODIDI.

GEORGE M. BERINGER, A. M., PH. M., CAMDEN, N. J.

The use of the Solution of Iron Iodide for the extemporaneous preparation of the syrup is undoubtedly increasing. The dispensing doctors and the druggists who are either "too busy" or "too lazy" to make syrup of iron iodide by the official process have willingly relegated to the manufacturer the preparation of the concentrated solution of ferrous iodide, and have thus curtailed their own practice of the art of pharmacy to the simple admixture of such a concentrated solution with syrup.

As long ago as 1888 this custom was sufficiently in vogue to be recognized by the National Formulary, and, in the first issue of that work in that year, a formula for Liquor Ferri Iodidi was included. The note accompanying that formula stated: "On mixing 1 volume of this solution of iodide of iron with 5 volumes of syrup, the product will contain about 60 grains of iodide of iron (ferrous) in each fluidounce, and will be practically, measure for measure, but not weight for weight, identical with the official syrup of iodide of iron."

It will be thus seen that the extemporaneous preparation of syrup of ferrous iodide in this way had, even at that time, the endorsement of a quasi legal authority.

In the third edition of the N. F., published in 1908, the formula has been retained. In the earlier copies of this edition the foot-note stated, "This solution

contains about *85* percent of ferrous iodide. On mixing 1 volume with *15* volumes of syrup (U. S. P.), the product will be practically identical with syrup of ferrous iodide (U. S. P.)" Subsequently, this wording was changed and in the later copies the note reads, "This solution contains about *81* percent of ferrous iodide. On mixing 1 volume with *11 volumes* of syrup (U. S. P.), the product will be practically identical with syrup of ferrous iodide (U. S. P.)"

As a matter of fact, both of these statements are incorrect. The N. F. III formula is directed to yield 1000 cc. of product; if this be changed and the finished product made 1000 gm., then the solution will contain 81 percent of ferrous iodide.

The manufacturers have quite generally adopted for the solution of ferrous iodide a strength of sixteen times by volume that of the official syrup of iodide. That is, their labels direct that to prepare syrup iron iodide, 1 fluidounce of the liquor be mixed with 15 fluidounces of syrup. This is only another evidence that the American physicians, druggists and manufacturers persist in using the apothecaries' measure and think in its terms rather than in the decimal terms of the metric measure. The intent of the National Formulary evidently was to supply a formula for a preparation of the same strength as supplied in the trade.

Several other minor defects in the N. F. formula should be considered. The direction to filter the *boiling solution* of ferrous iodide through paper is a manipulative error that brings trouble. In my experience, hot solutions of ferrous iodide of the strength directed invariably eat right through paper filters, even if of several thicknesses. Either the solution has to be diluted greatly or cooled before filtering through paper, or else the hot solution must be filtered through glass wool or asbestos wool, returning the first portion of the filtrate until it comes through clear.

The amount of hypophosphorous acid directed to be used in the formula is not the equivalent of that directed as a preservative in the official formula for the syrup. Consequently, the solution is prone to undergo change if kept in bottles that are opened frequently, as is apt to be the case. Hence, the solution should be preserved in small glass stoppered bottles, which should be completely filled and kept tightly stoppered.

The proposition has now been made that the U. S. P. IX should direct that syrup of ferrous iodide be prepared from a concentrated liquor, and, consequently, a formula for a concentrated solution of ferrous iodide will have to be adopted as a new admission in the Pharmacopoeia. Our concern is, that the most satisfactory formula be adopted.

The value of glycerin as a preservative for solutions of iron salts has long been recognized by the practical pharmacists and the manufacturers of the various solutions of ferrous salts. As early as 1857, J. C. Leaming (Proceedings, A. Ph. A.), proposed the use of glycerin as a preservative for solution of ferrous iodide, and in the year following, Henry Thayer (American Journal of Pharmacy, 1858, page 390), proposed that the ferrous iodide should be prepared or formed in the presence of glycerin. At the semi-centennial celebration of the A. Ph. A. in 1902, there was on exhibition a sample of glycerole of ferrous iodide made by Prof. William Procter, Jr., January 15, 1865, and although at that time more than thirty-seven years old, it was in an excellent state of preservation.

It is to be remembered that the title liquor ferri iodidi in those early days was applied to an entirely different preparation from what we are now designating under the same title. The solutions of that period were much weaker and were commonly preserved with glycerin, honey or sugar, and these preceded and were displaced by the formula for syrup of ferrous iodide, which was subsequently made official. The value of glycerin as a preservative for ferrous salts, and likewise of iodide solutions, is now fully recognized. Its use is proposed in the pharmacopoeial formulas for diluted hydriodic acid and for the syrup of hydriodic acid, and likewise in a number of the N. F. formulas for elixir containing iron salts. I have found it of value as a preservative in iron iodide solutions and in the formula submitted herewith, it is used along with hypophosphorous acid in proper amount to render the solution permanent. In this concentrated solution of iron iodide the glycerin serves another useful purpose, namely, it prevents the crystallizing out of the salt, thus assuring solution.

The following formula is submitted for a concentrated solution of iron iodide of such a strength that one volume diluted with fifteen volumes of syrup will produce a syrup of ferrous iodide practically identical in strength with the syrup of ferrous iodide now official. The strength of 1 in 16 has been retained, because of its present extensive use and likewise to maintain the legal standard of much of the solution of iron iodide that is already in commerce.

LIQUOR FERRI IODIDI.

Solution of Ferrous Iodide.

An aqueous solution containing 107.8 Gm. of Ferrous Iodide ($Fe.\ I_2$=309.69) in each 100 Cc.

Iron, *in the form of fine, bright wire, cut into small pieces*	250 Gm.
Iodine	884 Gm.
Hypophosphorous Acid (50%)	85 Cc.
(if 30% acid be used) then use	140 Cc.
Glycerin	100 Cc.
Distilled Water, a sufficient quantity	
To make one thousand cubic centimeters	1000 Cc.

To the iron, contained in a flat-bottomed flask, add 1000 cc. of distilled water, then gradually add the iodine, keeping the temperature down by setting the flask in a vessel of cold water. When the iodine has all been added, allow the mixture to stand for 12 hours, then heat to boiling until the clear liquid is of a bright green color. Then *cool* the solution and filter through a double filter paper and wash the flask and iron residue with several portions of distilled water and pass the washings through the filter. Add the glycerin to the filtered solution and rapidly evaporate in a porcelain dish on a sand bath to about 850 cc. Allow the solution to cool to 90° C., then add the hypophosphorous acid; mix thoroughly and when cool add sufficient distilled water to make 1000 cc.

The finished prduct should be kept in small glass-stoppered bottles entirely filled. It is an emerald green liquid, specific gravity about 1.9 (actual determination of product gave 1.906).

Syrup of ferrous iodide made by diluting 1 volume of this liquid with 15 volumes of syrup (U. S. P.), showed a specific gravity of 1.35, thus practically tallying with the U. S. P. statement for specific gravity of the syrup of iron iodide, and maintaining it of the International Standard of 5 percent of ferrous iodide.

In the above formula, the hypophosphorous acid is advisedly directed to be

added to the concentrated iodide solution after it has been allowed to cool to 90° C. If it is added to the iron iodide solution before concentration, the hypophosphorous acid is more or less decomposed. The Pharmacopoeia states that hypophosphorous acid begins to decompose between 130-140° C. The decomposition appears to commence below this temperature and in experiments where it was added to the solution before evaporation, the decomposition was quite marked. If the manipulation be changed and the hypophosphorous acid added before concentration, then the evaporation must be done on a water-bath.

A LABEL VARNISH SUBSTITUTE.

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The ordinary label varnish is quite unsatisfactory in appearance and application. Labels may be made water and acid proof by the application of a saturated solution of solid white paraffin in petroleum ether of boiling point from 40 to 50 degrees Centigrade. The process consists in simply touching the label with a small piece of cottain saturated with the solution. The petroleum ether evaporates almost instantly, leaving an invisible coating of paraffin which retains the new lustre of the label as well as making it water and acid proof.

INFLUENCE OF CLIMATE ON VARIOUS CHEMICALS.

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A knowledge of the chemical and physical properties of the various compounds of the materia medica constitutes a prerequisite of qualification of the professional pharmacist. To this must be supplemented an adequate knowledge of the best methods to be employed for their preservation, and as a rule, the educated pharmacist becomes very skillful as the years pass and his experience is extended.

The manufacturing chemist, however, occupies a somewhat different position in that, no matter with what scrupulous care his products are made, they are distributed over a wide domain, and are subjected to variations of climate which