

## AQUEOUS AND ALCOHOLIC ELIXIRS VERSUS AROMATIC ELIXIRS.\*

BY CLYDE M. SNOW AND BERNARD FANTUS.

Elixirs have come to mean in this day something entirely different from the powders and later most unpalatable liquid mixtures which answered to that name in the early days of pharmacy and medicine. Although the name is of most ancient origin, elixirs as we know them were not introduced into medicine until the '60s of the last century.

Simple elixir as an official preparation did not appear in our Pharmacopœia until the 1880 edition was issued. The Latin title was *Elixir Aurantii*. It was made after the following formula:

Oil of Orange.....	1 part
Cotton.....	2 parts
Sugar.....	100 parts
Alcohol, Water, of each a sufficient quantity to make	300 parts

The oil of orange was distributed over the cotton which was then placed in a percolator, and followed by the sugar. Onto this was poured a mixture of alcohol and water in the proportion of one part of alcohol to three parts of water. Percolation then proceeded until 300 parts of elixir were obtained. This formula prevailed for ten years.

In 1890 the title became *Elixir Aromaticum* and the formula was revised. Compound spirit of orange replaced oil of orange, deodorized alcohol was directed, syrup took the place of sugar and precipitated calcium phosphate was introduced as a clarifying agent. In the revision of 1900 purified talc replaced the precipitated calcium phosphate. Since that time there has been no change in the formula.

The fact that the formula has not been changed in more than twenty years might seem to indicate that the elixir is perfectly satisfactory.

It will be our endeavor to show that this is not the case. At the time that Simple Elixir was introduced, it was seized upon because of its pleasant flavor as a most desirable vehicle for exhibiting medicinal agents to the extent that a number of such preparations were of no therapeutic value whatever, because of the weak solvent properties of the elixir with relation to the specific medicament.

Many chemical salts are but slightly soluble in 25 per cent. alcohol and many alcohol-soluble agents are precipitated when mixed with liquids containing as much water as Aromatic Elixir. These conditions were looked upon as being remedied after the mixture had been filtered through purified talc. Of course the liquid was rendered clear and transparent but usually at the expense of the medicinal properties of the preparations.

Because of this restricted solvent action of Aromatic Elixir a serious condition is encountered. In a general way the average dose of the salts which enter the elixirs of the National Formulary is one gram. The salt is usually not sufficiently soluble in Aromatic Elixir so that the average dose may be contained in one teaspoonful of the elixir. In order then that the average dose of the salt may be administered it is necessary to give an increased volume of the elixirs. This complication makes the doses of the National Formulary elixirs range from one to four teaspoonfuls.

\* Read before Section on Practical Pharmacy and Dispensing, A. Ph. A., Cleveland meeting, 1922.

Here we have one of the most serious faults of the National Formulary as viewed by the physician, as witness the attack on the National Formulary elixirs by Dr. H. C. Wood, Jr. (*JOUR. A. PH. A.*, 7, 344, 1918). Furthermore, four teaspoonfuls of the elixir introduce a considerable dose of alcohol which might be objectionable in some diseases, as, for instance, in nephritis.

If now the average doses of the several medicaments were contained in a teaspoonful of the elixirs, this untoward condition would at once be eliminated and, we believe, serve more largely to make the National Formulary elixirs popular with the physicians than would any other modification. Further, in view of the present legal situation aiming at the abolition of the use of alcoholic liquors for beverage purposes, it seems the duty of the Committee on National Formulary to employ the minimum quantity of alcohol for solvent and preservative purposes in any and all of its preparations. The formula for Aqueous Elixir proposed by us for inclusion in the National Formulary is:

Elixir Aqueosum.	
Compound Spirit of Orange.....	10 mls
Alcohol.....	50 mls
Syrup.....	375 mls
Glycerin.....	200 mls
Distilled water to make.....	1000 mls
Purified talc.....	15 Gm.

The use of this elixir would remedy the objectionable conditions above enumerated. All elixirs containing water-soluble salts would be prepared with a vehicle carrying 5 per cent., in place of 25 per cent. of alcohol; furthermore, there would be an actual improvement in the taste of these preparations, as alcohol accentuates the salty taste of the salines. By using the Aqueous Elixir for the elixirs containing the digestive ferments instead of the present Aromatic Elixir, they would be taken out of the class of "booze" preparations and their therapeutic action probably improved, as alcohol in considerable concentration is known to be inimical to the action of ferments, nor does the usefulness of the Aqueous Elixir end here. We hear the complaints of the pharmacists, that pharmaceutical manufacturers are able to sell them such preparations as Elixir of Potassium Bromide cheaper than it can be made in the retail store. An analysis of the manufacturers' product in some cases reveals the fact that, while it contains the required weight of potassium bromide, it does not contain the volume of alcohol it should were it made from Aromatic Elixir in accordance with the formula of the National Formulary. In other words, the manufacturer has come to recognize the fact that there is no need for the 25 per cent. of alcohol present in the Aromatic Elixir for solvent, preservative or therapeutic purposes in such elixirs. He, therefore, uses only sufficient alcohol to carry flavoring agents and this materially lessens the cost of production. In some twenty of the medicated elixirs of the present National Formulary, purified talc or other clarifying agent is used to filter out the portion of the medicament that is insoluble in Aromatic Elixir, thereby reducing the therapeutic activity of the preparation to an undeterminable degree. Furthermore, the activity of these for the exhibition of water-insoluble drugs is deficient, as no attempt is made to introduce an average dose in a teaspoonful of the elixirs.

By way of something tangible we have prepared a sample of Elixir of Buchu. In the first place, please note that the Pharmacopœia describes the average dose of

Fluidextract of Buchu as two mils, while the dose of the fluidextract as represented in the official elixir is only one-half mil when the entire amount of the fluidextract prescribed is present in the elixir. But note the very turbid mixture which results from mixing the fluidextract, alcohol and aromatic elixir of the now official formula. What the content of buchu will be in the elixir after the undissolved portion has been unceremoniously filtered out, is indeed problematical. For extractive preparations of this nature we propose the following Alcoholic Elixir for introduction into the National Formulary:

## Elixir Alcoholicum.

Compound Spirit of Orange.....	5 mils
Benzosulphinide.....	3 Gm.
Glycerin.....	200 mils
Alcohol to make.....	1000 mils

There is at present no sweet vehicle official for the administration of medication to patients suffering from diabetes. The proposed Alcoholic Elixir, sweetened as it is with saccharin, would supply this demand.

This is a sample of Elixir of Buchu prepared with the proposed Aqueous and Alcoholic Elixirs containing the present official volume of the fluidextract. It has not been filtered. We now present a sample of an elixir which seems to us the desirable one; it contains in each teaspoonful the pharmacopœial dose of the fluidextract. It has not been filtered.

Aside from their usefulness in preparing the elixirs of the National Formulary, the two elixirs may be used to good advantage at the dispensing counter. It is common practice to prescribe tinctures of aconite, belladonna, colchicum seed, digitalis, nux vomica, veratrum viride and others of considerable potency with Aromatic Elixir. As all of these tinctures are extracted with menstrua of alcoholic strength differing from the alcoholic content of Aromatic Elixir more or less precipitation takes place when they are mixed. To dispense a prescription of such potency with a precipitate is scarcely compatible with safety. With the two elixirs proposed by us the physician would be enabled to adjust the alcoholic content to correspond exactly with that of the respective medicament, making it possible and easy to dispense a perfectly clear prescription. They also make it possible to dispense a satisfactory mixture when a water-soluble and a water-insoluble agent are prescribed in the same mixture. We present here the plausible mixture of Sodium Bromide and Fluidextract of Cannabis with Aromatic Elixir. The first vial shows a mixture of the average dose of each of the medicaments in a teaspoonful of Aromatic Elixir. You will note that there is a marked separation of some of the active ingredients. This next vial shows the same quantity of the same constituents in Aqueous and Alcoholic Elixirs adjusted to make a presentable mixture.

Finally, for the administration of such water-insoluble drugs as terpin hydrate, the problem of making the elixir therapeutically active by introducing the average pharmacopœial dose in a teaspoonful would be easily solved. The present formula for Elixir of Terpin Hydrate contains only one grain per teaspoonful, while the proposed Alcoholic Elixir will readily carry four grains per teaspoonful, which is the average pharmacopœial dose.

With these tangible evidences of the varied usefulness of these elixirs we bespeak your coöperation in having them introduced into the new National Formulary.

## ABSTRACT OF DISCUSSION.

Motion was made by Mr. Gray, conforming to the recommendations of the authors of the paper, to bring the formulas and purposes of the two elixirs discussed in the paper to the attention of the Committee on National Formulary. The motion was duly seconded.

Mr. Thos. D. Elhenie called attention to an elixir formula containing 6 $\frac{1}{4}$ % alcohol, which he used in preparations dispensed for children.

Dr. Arno Viehoever inquired relative to the solvent action of a weak alcoholic elixir. Alcohol, he stated, was not largely used by the Chinese in medicines, but the volume of doses was larger in consequence, so as to bring sufficient active constituents into the preparations.

Chairman Griffith spoke along same lines.

Dr. Bernard Fantus, co-author, stated that the stronger alcoholic elixir is to be used in preparations requiring such solvent. He gave a history of the work presented by the paper.<sup>1</sup> The suggestion of iso-alcoholic elixirs was not accepted with very general approval—placing the responsibility of selecting the alcohol strength for the elixir on the pharmacist. The two elixir formulas were therefore offered, leaving the selection to the prescriber. The author stated that physicians were interested and the inclusion of a non-alcoholic elixir would be a decided step forward.

E. R. Selzer spoke in favor of an elixir of low alcoholic percentage for saline solutions.

B. E. Höckert contended that the elixirs of the National Formulary could be improved; there was no suitable basic elixir suitable for buchu and hyoscyamus containing salines. He had found Compound Tincture of Cardamom useful in preparations containing buchu, belladonna, digitalis, aconite, etc. He also favored saccharin in some elixirs.

R. W. Terry asked relative to the keeping qualities of preparations containing an aqueous elixir or one weak in alcohol. He did not question the keeping qualities of the elixir but of the elixir in which some substance had been dissolved.

He was answered by the authors in saying that prescriptions were rarely kept for a long time; consideration would have to be given to that, the same as with other dispensing problems.

The question was called for and the motion to refer the paper to the Committee on National Formulary carried.

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## OUR ATTITUDE TOWARD EDUCATION.\*

BY EDWARD SPEASE.

What is our attitude toward education? This is the question that I am asking myself these days and in this short paper it is the idea to set forth this attitude as nearly as it can be seen from the viewpoint of the writer.

First of all it will be necessary to ascertain just what we mean by education and if we make any distinction between the words "education" and "training." It is true that the modern dictionaries do not set a hard and fast dividing line between the two words but a quotation from Herbert Spencer seems to me to bring out what is meant by education. He says "To prepare us for complete living is the function which education has to discharge."

Webster says that "training is a department of education in which the chief element is exercise or practice for the purpose of imparting facility in any physical or mental operation." Thus it would seem that we might have two types of pharmacists if we will, an educated one and a trained one. It is true that the educated pharmacist might not be one expertly trained in certain operations, and

<sup>1</sup> See also "Elixirs of the U. S. P. and N. F.," pp. 277-283, April Jour. A. Ph. A., 1921. Samples of the elixirs under discussion were exhibited by the authors.

\* Read before Section on Education and Legislation, A. Ph. A., Cleveland meeting, 1922.