

it under pressure, or packing with cotton pledgets, dipped in the solution, and great care is taken to see that all unhealed and granulating surfaces are reached.

The time of five minutes is allowed for the penetration of the zinc solution, and if it has been injected, under pressure, into bone sinuses, a tourniquet must be applied and the solution allowed to enter the circulation only slowly, otherwise collapse will result. Because of the caustic character of this solution and the danger of direct introduction into the circulation it cannot be used in fistulas connected with the bladder, or intestine, nor can it be used in the presence of erysipelas, or other acute spreading infection.

Color Delineation.—At the end of five minutes, the following solution is applied, in the same manner as the zinc chloride solution:

Saturated Alcoholic Solution of Methylene Blue.....	20
Potassium Hydroxide.....	3
Phenol.....	5
Ether, sufficient to make.....	100

When this solution evaporates it leaves the exposed granular surfaces dark blue-black, dry bloodless on manipulation, and sterile, and beneath a grayish white tissue which has been sterilized and devitalized by the zinc chloride.

Excision of Infected Area.—The entire diseased area is now removed, the wound closed, and a moist, non-irritating, antiseptic dressing applied for the first week, or until all tissue reaction has subsided. The solution used consists of:

Hydrated Chloral.....	1
Alcohol.....	10
Glycerin.....	25
Saturated solution of boric acid.....	65

This is injected into the gauze dressings every two or four hours by means of rubber tubes which are inserted when the dressing is applied.

The part where the operation occurred should be kept quiet, elevated, and warm, and there should be no probing, squeezing, or introduction of tubes. The dressings should be changed daily and the adjacent skin must be kept clean and coated with a 2 percent yellow mercuric oxide ointment.

NOTE.—The details of this treatment and formulas have been taken from a report on the subject read by Dr. Babcock at the recent meeting of the American Medical Association but not yet published.

ALCOHOL IN THE PHARMACOPOEIA.*

BY HENRY KRAEMER.

The study of the use of alcohol in Pharmacy has engaged the master minds in our profession. It is more than 50 years ago that Dr. E. R. Squibb¹ in one of his classical papers discussed the subject of "the proposed economy of alcohol in percolation, as applied to the extracts and fluidextracts of the Pharmacopoeia." He called attention to the fact that "the increase in the price of alcohol since the last revision of the U. S. Pharmacopoeia has materially interfered with the use of the officinal extracts and fluidextracts by the greatly increased cost of preparing

* Read before Scientific Section, A. Ph. A., New York meeting, 1919.

¹ Proc. A. Ph. A., 1865, p. 201.

them and unless some plan can be found whereby either the cost or the quantity of alcohol may be reduced it appears probable that these classes of convenient and useful preparations will be disused or debased." For nearly 40 years he studied the subject of percolation and economy of alcohol devising new pieces of apparatus and improved methods of manufacture. No one more fully recognized the importance of alcohol as a solvent and the difficulties that would accrue in the making of standard preparations by the placing of restrictions on its use as a solvent. He advocated that the government reduce the price of alcohol for certain uses in the arts. Probably no one industry has suffered more than the drug trade by virtue of the internal revenue tax on proof spirit. One of the greatest deterrents in our advancing to the forefront in the manufacture of chemicals has been the fact of the excessive tax on alcohol. Twenty-five years ago the chemical industries of this country had forged ahead obtaining fourth place in the manufacture of fine chemicals and of products in which alcohol plays a part. There was no question but that for the exorbitant tax at that time of 90 cents per gallon on proof spirits, equivalent to about \$1.70 on alcohol of 94 percent, we could have forged ahead in our manufacturing industries, taking the first place. At the same time that there was a concerted action to obtain this protection to American industries the pharmacists and manufacturers of Germany had secured duty-free alcohol and there were no unsurmountable obstacles which occurred to their legislators in establishing the line between legitimate manufacture and that coming within the province of internal revenue tax. The war just closed has revealed the tremendous disadvantages our industries have been laboring under because of the restrictions placed on the use of alcohol. The amount of alcohol required in the preparation of medicines and in the arts and manufactures is enormous and the restrictions which have been placed on its use have come because it is feared that some of this alcohol might be used as a beverage, escaping the revenue tax. Contrary to popular belief that it would be impossible to prevent fraud in this direction I am very well satisfied that it would be impossible for any one to practice fraud any length of time and not be caught up with. Alcohol as a solvent has no equal in pharmacy, furthermore as a preservative there is nothing that can replace it which is less toxic and free from harm to the patient. Some years ago it was proposed to use acetic acid on an extensive scale as a menstruum. After a most painstaking examination at the hands of the most skilled manufacturing pharmacists it has been shown to be inferior to other acids as solvents and that the preparations made from them are therapeutically impossible. The class known as "Vinegars" have been known from antiquity and of the long list only one of them has survived, namely, *Acetum Scillae*, and it is stated in the United States Dispensatory that "Vinegar of Squill is certainly inferior to the alcoholic preparations of this drug in its effects upon the heart and kidneys." Similarly it has been proposed to use glycerin on an extensive scale as a preservative. But as I have said on very many occasions glycerin is not a preservative except in very great concentration and its use is out of the question excepting as an adjunct to other preparations.

The Pharmacopoeia is a work dealing with the definitions and descriptions of drugs and gives approved formulas for the making of preparations from them. The preparation of this work is intrusted by the medical and pharmaceutical

professions to the most able persons who are willing to undertake the editing of the information available and capable of confirmation. It must be left to these men of known ability, sound judgment, and wide experience to determine what drugs they will include and the preparations which shall be made official. Furthermore, it must be left to them absolutely to determine what menstrua and preservatives they shall employ. No restrictions should be placed upon them as they are the compilers of a law book, recognized by those who have to do with the upholding of national and state food and drug laws. Of course the use of alcohol and preservatives according to some people might be abused, but I know that it can be safely left to the Pharmacopoeial Convention to see to it that nothing be sanctioned that is inimical to the public health. No outside influence, no matter how commercial or vast its interests might be, can do anything to influence the majority of members on any single question which has to do with the fostering or encouraging of any abuse that might arise from either the inclusion of any drugs or the use of any solvent that might be employed in the manufacture of galenicals. It might seem desirable to some who have an overpowering sense of appreciation of the evils which result from the use of alcoholic preparations which can be used for beverage purposes, that in the next Pharmacopoeia we should reduce the number of alcoholic preparations or eliminate them entirely, and I am frank to say that I share in this view. I nevertheless must, in the interests of suffering humanity, state that it is impossible with the knowledge which we have to-day to attain this position. Furthermore I should say that I know that some of us will give our best thought and our undivided efforts to the elimination of all of those preparations which are likely to be abused. One not accustomed to research and not familiar with the literature of Pharmacy cannot appreciate what a difficult problem it would be for the Revision Committee of the U. S. P. to materially change the methods of preparation of the medicaments now recognized as official and depart from the processes which have thus far been perfected. You might as well ask the Committee to make a 10 percent solution of pure gold in water when scientifically we know that not more than 1/100 of one percent will dissolve in water.

Up to this point I have discussed the subject of alcohol in the Pharmacopoeia entirely from its necessity in the manufacture of medicines. It may be that you prefer that I should have considered it from the angle of the probable legislation in connection with the prohibition problem. I am well aware of the desire on the part of the Anti-Saloon League of America to obtain all the information possible concerning the necessity for the use of alcohol in Pharmacy. Inasmuch as a letter was directed to me by the General Counsel of this League, and as I have replied to Mr. Wheeler, I will give this part of the correspondence.

NOVEMBER 19, 1918.

DEAR SIR:

Is alcohol necessary in patent medicines and drugs to preserve their therapeutic properties? Can a substitute for alcohol be used successfully? Your opinion with reasons will be greatly appreciated.

Yours cordially,

(Signed) W. B. WHEELER,
General Counsel.

PROFESSOR HENRY KRAEMER,
Ann Arbor, Michigan.

This is my reply to Mr. Wheeler's letter of November 19.

DECEMBER 3, 1918.

MR. W. B. WHEELER,
30 Bliss Bldg.,
Washington, D. C.

MY DEAR MR. WHEELER:

Replying to your letter of November 19, would say that I can readily appreciate your interest in the subject of the presence of alcohol in patent medicines, as their use is liable to certain grave abuses.

It is conceded by all pharmacists that the proper extraction of medicinal ingredients in most crude drugs requires alcohol in greater or less proportion, and the percentage of alcohol that must be used as a menstruum in extracting such drugs must be determined in each individual case. In various other liquid preparations alcohol in a greater or less percentage is considered necessary to hold active ingredients in solution, and the quantity necessary must be determined in each case. Practically every liquid preparation made, unless it contains a large proportion of some essential oil or other preservative, requires the presence of alcohol as a preservative.

At the present time there is no known substitute for alcohol, as the solvent for certain medicaments. Now and then some substitute has been recommended, but in nearly every case where this has been admitted, the substitutes have proved failures, and the drug trade have abandoned them.

I would sum up the whole matter by saying that the various constituents and the proportion of each in the medicaments commonly recognized by the medical profession and in the National Formulary and the U. S. P. are the consummation of all the wisdom of the past one hundred years and that it would be very unsafe to abruptly depart from this. Assuming that the secret remedy or the "patent medicine" is very similar in nature to a recognized official preparation of a similar kind, the same rule would hold good as to content of alcohol. A demonstration that a patented remedy is lacking in content of generally recognized therapeutic ingredients should serve to condemn it, whether it contains alcohol or whether it does not.

Very truly yours,

As I view the discussions which have been reported concerning alcoholic legislation in connection with the prohibition problem, I do not think that we need fear that in framing prohibition laws it will be impossible to obtain and use alcohol for legitimate manufacturing purposes. Of course it is necessary for us to keep all of those who have to do with the framing of such legislation well informed in regard to the facts in the case. The manufacturing interests as well as the representatives of the U. S. Pharmacopoeial Convention have clearly indicated what is essential, and the editor of the *American Druggist*, in an editorial in that Journal for July, has summarized the present situation as follows:

It is safe to predict that nothing radically detrimental to the interests alluded to will be incorporated in the new federal legislation. While all provisions of the prohibition law will be enforced so far as they relate to the manufacture and use of intoxicating liquors, means will be provided for the legitimate uses of industrial alcohol and for the punishment of the illicit user and nostrum faker.

In a report of the hearings at Washington appearing in a contemporary, the following paragraphs put the matter concisely and forcefully:

"Even the drastic prohibition bills submitted by representatives of the Anti-Saloon League, or drafted upon data submitted by the league, provide ample exemptions for the users of alcohol industrially, with due safeguards to prevent the manufacture and sale of alcoholic compounds, no matter what the guise, that could be employed as beverages. The exemptions

named under the Volstead (internal revenue) bill are specific in removing from the jurisdiction of the act:

"Denatured alcohol or denatured rum produced and used as provided by existing laws and regulations.

"Medicinal preparations manufactured in accordance with formulas prescribed by the United States Pharmacopoeia or National Formulary or the American Institute of Homeopathy that are nonpotable and incapable of being used for beverage purposes.

"Patented and proprietary medicines that are nonpotable and incapable of being used for beverage purposes.

"Toilet, medicinal and antiseptic preparations and solutions that are nonpotable and incapable of being used for beverage purposes, contained in bottles or packages, upon which are printed conspicuously and legibly in English the quantity by volume of alcohol in such preparations.

"Flavoring extracts for use only in cooking and for culinary purposes that are nonpotable and incapable of being used for beverage purposes.

"Vinegar manufactured from cider."

Probably the simplest statement of the present day situation regarding the use of alcohol in Pharmacy is the one published in the *N. A. R. D. Journal* for July 3, 1919, page 590. The editor says,

"It is admitted by everyone who has any knowledge whatever upon the subject, worthy of thoughtful consideration, that alcohol is used in medicine as a solvent and preservative and not for its intoxicating effect and that its use both as a solvent and a preservative is absolutely necessary. Furthermore, notwithstanding the statements made to the contrary by numerous irresponsible parties, no suitable substitute has ever been found which would satisfactorily replace alcohol for these purposes.

"Now it is argued by some, and very properly so, that, admitting this to be true, still it is necessary that proper restriction and safeguard be placed around the manufacture and sale of such preparations to prevent their sale and use for beverage purposes. This contention is frankly admitted, but we maintain that ample protection of this character has already been placed around the use and sale of alcoholic medicinal preparations by the provisions of the Food Control Act, passed by Congress and effective since September 8, 1917.

"The Food Control Act, it will be recalled, provides for the production, and all dealers handling such non-beverage alcohol are required to file bond with the United States Government and obtain permit to use and sell such alcohol and the dealer, be the manufacturer or retailer, is thus obligated to the Government to prevent the sale and use of such alcohol for beverage purposes and the manufacturer or dealer who sells such alcohol or preparations made therefrom is not only liable to the forfeiture of his bond, but also to criminal prosecution.

"Now, it is this non-beverage alcohol that is used in the manufacture of medicinal preparations and, therefore, alcoholic medicinal preparations are subject to the law and regulations governing the sale and use of non-beverage alcohol.

"In view of these facts, we still maintain that there is no justification for further legislation regulating the sale of alcoholic medicinal preparations and for including such preparations in the definition of intoxicating liquors, thereby casting a stigma and slur upon a perfectly legitimate calling and connecting it with the discredited liquor business. These are our reasons for so strenuously objecting to this particular provision in the various prohibition enforcement bills and we have not as yet heard any argument advanced from any source that our position in this respect is not well taken."

In closing I must refer to the very excellent paper by Mr. C. M. Woodruff read at the last meeting of the American Drug Manufacturers' Association on "The Future of Alcoholic Medicinals." In this we have a very lucid exposition of the situation at present and he has shown that the pharmaceutical interests are thoroughly alive to the alcoholic situation from every angle.

Of course, we may expect, as was pointed out by Mr. Adams in a paper read

before the Scientific Section of the American Pharmaceutical Association last year¹, "that as long as a drop of alcohol is sold, there will be demands to stop it, but careful supervision on the part of the pharmacists will disarm many such objectors and the real mass of the people will be satisfied." The only probable solution is as pointed out by Mr. Adams in the more extended use of denatured alcohol, but it is impossible to introduce a denaturing substance which will not interfere with its use in the preparation of medicines for internal administration. As a matter of fact we should look upon all medicines in which alcohol is used as a solvent and preservative as having been denatured by the extraction of the therapeutic substances entering into them.

In conclusion, we may summarize the situation that in the preparations recognized by the medical profession and included in the United States Pharmacopoeia, and we might add also in the National Formulary, regarding the various constituents and the proportions of each in the medicaments, as well as the solvents, preservatives, and vehicles, all represent the consummation of the wisdom and experience of the past one hundred years and that it would be very unsafe to abruptly depart from this. Assuming that the secret remedy or the "patent medicine" is very similar in nature to a recognized official preparation of a similar kind, the same rule would hold good as to the content of alcohol. A demonstration that a patented remedy is lacking in content of generally recognized therapeutic ingredients should serve to condemn it, whether it contains alcohol or whether it does not.

PROGRAM OF THE SECTION ON PRACTICAL PHARMACY AND DISPENSING.

As Chairman of the Section on Pharmacy and Dispensing of the A. Ph. A., I am sending out an invitation and urgent request to all who are interested in the practical work in the store to present papers before this Section next May.

Because of the meeting coming so much earlier than usual, it will be necessary to have the titles of papers furnished me not later than the middle of March, and it is desirable that the papers be received at the same time or as soon after as possible.

Some subjects which have been suggested are:

1. Constructive criticisms of the U. S. P. This is particularly pertinent as the U. S. P. Convention follows the next week.
 2. The part which the pharmacist is to play in the revision of the U. S. P.
 3. Consideration of new remedies.
 4. Papers dealing with prescription work.
 5. The pharmacist as a clinical chemist. Papers from those who have had experience along this line are especially desired.
 6. What professional work can the pharmacist do to take the place of that which is passing into the hands of the large manufacturer?
 7. A discussion of the affiliation of the drug clerk organizations with labor unions, and drug clerk strikes.
 8. Is it desirable to have laws regulating the hours which the pharmacist may work?
- Papers bearing on any phase of Practical Pharmacy will be very acceptable.

[Signed] E. A. RUDDIMAN, *Chairman*.

¹ J. A. Ph. A., Vol. VIII, p. 109.