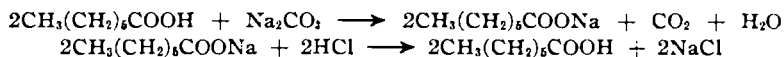
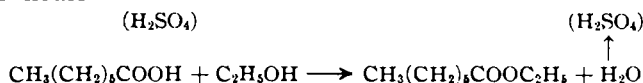


solution in the ether, while the acid being present as its sodium salt remains in solution in the water. To the extracted aqueous solution was then added hydrochloric acid to a distinct acid reaction. The purified oenanthylic acid formed a distinct layer on the surface of the aqueous liquid.



#### ESTERIFICATION OF OENANTHYLIC ACID.

The esterification of the oenanthylic acid may be accomplished in one of several ways. The silver salt of oenanthylic acid may be made and this treated with ethyl iodide, under which condition ethyl oenanthylate results while silver iodide is precipitated. The method that was used in our laboratory was to dissolve the oenanthylic acid in about twice the theoretical quantity of absolute alcohol to which five mils of concentrated sulphuric acid were added and the mixture refluxed for about twelve hours.



#### RECOVERY OF ETHYL OENANTHYLATE.

The alcoholic solution of ethyl oenanthylate was then poured into a quantity of water in order to separate the ethyl oenanthylate from the excess of alcohol present. This mixture was extracted with ether in which the ester is soluble, and the ether layer separated. The ether solution of ethyl oenanthylate was then washed with a very weak aqueous solution of sodium carbonate (not over two per cent.) in order to convert any unesterified oenanthylic acid to the water-soluble sodium salt. This was then separated and the ether layer washed with water. The ethyl oenanthylate was then treated with anhydrous sodium sulphate or fused potassium carbonate. (Fused calcium chloride should not be used.) The ether was then allowed to evaporate and the oenanthylic ethyl ester distilled.

The author acknowledges the assistance of Dr. Smith and Mr. Netz in this work.

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY,  
COLLEGE OF PHARMACY,  
UNIVERSITY OF MINNESOTA.

### ANALYSES OF ONE HUNDRED PRESENT-DAY ALCOHOLIC BEVERAGES.\*

BY HENRY KRAEMER.

In presenting a paper on this subject it is necessary to define one's attitude so that there be no misconstruction placed on the data which are given. Any article, letter, or questionnaire at this time on the subject of alcoholic beverages is to be viewed with suspicion as to its purposes and the influence which prompted it.

The Constitution of the United States as expressed in the 18th Amendment prohibits the manufacture and sale of intoxicating liquors. Respect for the law

\* Read at the Scientific Section of the American Pharmaceutical Association, August 18, 1922, Cleveland, Ohio.

is the basis of American institutions. In his Farewell Address, George Washington said:

"The basis of our political systems is the right of the people to make and alter their constitutions of government. But the constitution which at any time exists, till changed by an explicit and authentic act of the whole people, is sacred, obligatory upon all. The very idea of the power and the right of the people to establish government, pre-supposes the duty of every individual to obey the established government. All obstructions to the execution of the laws; all combinations and associations under whatever plausible character, with the real design to direct, control, counteract or awe, the regular deliberations and actions of the constituted authorities—are destructive of this fundamental principle, and of fatal tendency."

The offspring of the 18th Amendment, known as the Volstead Act to enforce prohibition, declares that liquors containing more than  $\frac{1}{2}$  of 1 per cent. of alcohol are intoxicating. This standard is merely a construction for the purpose of law enforcement and was fixed by the brewers and distillers themselves. It was generally considered to be equitable and in the interest of public policy. The states have acted and many of them have gone further even than the Federal Law does. In at least five different states—Colorado, Michigan, Ohio, Oregon and Washington—the liquor interests have attempted to undermine the Volstead Act by submitting beer and wine referenda and in each instance their efforts were emphatically frustrated by the voters.

The natural impulse of the American people is right. Their judgments are on the side of kindness, helpfulness and even unselfishness. The 15th, 18th and 19th Amendments are some of the evidences of the progress of civilization and reveal the tests of a republican government and show the faith that the pioneers of this country had in their successors.

After the 18th Amendment had been in force for some time it seemed that the practical benefits of prohibition, which were apparent on every hand, would still forever the stills which had been the cause of the misery and crime of the ages.

During the first "dry" year New York had a surplus of nearly fifteen million dollars for financing the budget for 1921-1922, showing that the loss of liquor revenue had not bankrupted the state of New York. The compensation companies noticed quite a reduction in the number of Monday morning accidents after the national prohibition law went into effect. The number of inmates in work-houses and jails had been decreased and the institutions turned in many cases into schools and recreation buildings. Men were spending their time with their families at motion picture places and other places of amusement, instead of in drinking dens as formerly. The savings deposits showed an increase and it was estimated that prohibition would save the country more than six billion dollars a year. There was less want and suffering, more joy and happiness and it was estimated that 95 per cent. of the people endorsed, without reservation, national prohibition.

This 5 per cent., representing the law-breakers in our country, were not idle. They were marking time and were working with a certain class of the legal profession to see how they could get a wedge into the Volstead Act. Then we awakened to find that the saloon-less-ness of the country was somewhat fictitious. Our police courts were soon filled with a metropolitan crowd of drunks. The inebriates claimed that they were drinking home-brew beer or raisin whisky; as a matter of fact they were getting 4 and 5 per cent. beer and 35 to 45 per cent. whisky

in bond. Nearly all of this came from the outside, Canada shipping a large proportion of it.

In fact the business of running cargoes of rum across the border to the American side has assumed such colossal proportions that hundreds of people are devoting their entire time to the traffic and they are literally amassing fortunes. A round trip from the Canadian to the American side is worth \$2500 clear to the operator of a big car and they are seen parked unmolested in front of the "soft drink parlors." The saloons are flourishing with their old-time vigor, only they are called soft drink parlors. A conservative estimate would be that there is not less than one "soft drink parlor saloon" to every thousand inhabitants and they are run with all their old associated evils and the situation is a really serious one. To-day 50 per cent. of the voters who may be counted upon as defenders of the republic do not seem to know what is going on. The other 50 per cent. are allied with lawlessness and tied either with chains of habit or the fear of the ridicule of the saloon element.

Well may we ask, what is the matter with America? The United States is a prohibition country and the great moral leader of the world. The 18th Amendment marks the greatest national moral adventure since Israel crossed from Egypt or the Pilgrims came to Plymouth. The Constitution declares that intoxicating liquors shall not be made or sold in this country which means that eventually they will not be. This tide of lawlessness must ultimately subside. The traffic at present is involved in the cost of living problem. I have been told with authority that 83 men have been counted in the course of an hour at the bar paying one dollar each for a drink of whisky, which in all probability contained wood alcohol.

The government derives no benefit from this sale of alcoholic beverages. The drinkers are not protected by law and they and their families must ultimately suffer the consequences. Lawlessness and crime are on the increase and the open violation of the prohibition law has made a mockery of the administration of justice. Winking at violations of the law by the voters, public officials and judges is a form of leprosy in our national life which eventually it will cost us a good deal to treat. In the meanwhile it is hazardous to ride in an automobile, it is unsafe to eat in a restaurant unless you know its character and it is unwise and unpatriotic to view with jest the apparent inability of our authorities to uphold and enforce the Prohibition Law.

About a year ago I received a request from the district attorney if I would make some examinations of the alcoholic beverages which were being sold. During this time we have examined a hundred or more representing probably all of the kinds which are generally sold. We have also testified in court and become familiar with the liquor situation as it is now being conducted and the character of the violators of the 18th Amendment. The beverages sold may be grouped into three classes.

1. Spirituous liquors.
2. Malt liquors.
3. Wines and fruity beverages.

Of one hundred beverages, 50 per cent. were malt liquors; 42 per cent. were whisky, and 8 per cent. were cider and wines. Of the last class 4 per cent. were wines and these were homemade and used on a very limited scale. There is ap-

parently no demand for wine and the evidence points to the fact that the introduction of the beer and wine amendment was merely an excuse to legalize the liquor traffic, in those states where this referendum were put to the votes of the people.

The spirituous liquors had an alcoholic content from 31 per cent. to 70 per cent. of alcohol. They included the old "white lion" which consisted of dilute alcohol and is now sold under the name "white mule." A year ago American whisky in bond could be purchased as well as some good Canadian whisky. There is little or no whisky in bond to be purchased on the market and an increasing amount of the whisky is a fictitious article. This was to be expected and is the history of fraud and adulteration wherever it has been practiced. Men who break the law are usually not content with exorbitant profits or considerate of the health of their customers. They will weaken their products and fortify them with substances which deceive or even poison their victims. There is no come-back and it is like the fruit peddler who comes before your door and moves on never to return but sells his products along the way to whomever may buy.

A very large quantity of the whisky sold to-day and even beer contains wood alcohol. The best test in our hands has been the Robinson Test, devised by Dr. William C. Robinson of the Department of Public Health of Philadelphia. He uses a potassium permanganate solution to oxidize the wood alcohol forming acetals, the latter splitting up into aldehydes, notably formaldehyde. This solution is then added to acidulated milk and gently heated until the mixture assumes a pink color. Formic aldehyde is the only aldehyde which restores the color of the permanganate and if wood alcohol is present the pink color is very pronounced and cannot be mistaken even when working with electric light. This test is so delicate that one may detect 0.01 per cent. of methyl alcohol. The test is carried out practically as follows:

1. Take 10 cc of the distillate which has been used in determining the alcoholic content and add 3 cc of a 3% potassium permanganate solution.
2. The solution is placed in a test-tube and heated on a water-bath at a temperature between 25 to 30° C., shaking the test-tube from time to time and allowing sufficient time for the complete reduction of the permanganate and the development of the aldehyde odors.
3. The solution is then filtered and usually a clear filtrate will be obtained. This should be colorless and it is usually advisable before filtering to add a few drops of hydrochloric acid in order to precipitate out any excess of potassium permanganate as a brown manganese hydroxide.
4. The filtrate then is poured into a porcelain casserole or evaporating dish and 10 cc each of the following added: distilled water, hydrochloric acid and fresh milk.
5. The mixture which is of a creamy whiteness is then gradually heated over a naked flame to the boiling point with constant agitation. If a bright permanent pink color develops wood alcohol is present and may be detected if only 0.01 per cent of wood alcohol is present in the suspected liquid.

Ordinarily a qualitative test is sufficient and a quantitative test is best made by using a Zeiss immersion refractometer. We have found, however, that it is possible to use this test for obtaining very accurate quantitative tests for the amount of wood alcohol present in alcoholic beverages. This is followed out by testing the smallest quantity of distillate which will give the reaction for wood alcohol.

If 1 cc of the distillate gives the reaction, then this quantity contains at least 0.01 cc of methyl alcohol. Then 100 cc contains 1 cc of methyl alcohol or is a

1 per cent. solution. The following table we use in making the calculation:

Amount of distillate giving reaction.	Amount of methyl alcohol in 100 cc or per cent.
0.5 cc	2 cc or per cent.
1.0 cc	1 cc or per cent.
2.0 cc	0.50 cc or per cent.
3.0 cc	0.33 cc or per cent.
4.0 cc	0.25 cc or per cent.
5.0 cc	0.20 cc or per cent.

In our examinations we have found as high as 11 per cent. of wood alcohol in a 45 per cent. whisky and 0.33 per cent. of wood alcohol in malt liquors averaging 4.5 per cent. of alcohol. One of the most interesting things brought out in this connection has been that the expert testers have been unable to detect any wood alcohol in any of the beverages in which it has been present. Detectives and Internal Revenue officers would sometimes leave the specimens saying, "That's liquor" and depart as though they were mighty glad to get rid of it. The combinations sold are so skilfully made that their exact composition cannot be easily determined and we may conclude that they are mixtures distilled from grain mash mixed with dried fruits, denatured alcohol containing wood alcohol, and in some cases pure whisky. The malt liquors consist of near-beers fortified with wood alcohol; even the Canadian beers which are said to contain 10 per cent. proof spirits come under this class.

It is unnecessary in this assembly to discuss the poisonous nature of wood alcohol. We generally recognize that it is the most deadly poison of daily commerce. Its use, however, in alcoholic beverages is growing and something should be done to protect those who are ignorant of its poisonous nature. Physicians and pharmacists might well engage in some coöperative work with the authorities having the enforcements of the law in their charge. In addition to prosecutions, severe punishments should be meted to unscrupulous dealers who are selling these poisonous mixtures. If someone puts poison in pies and there are some deaths, there is an immediate cry and a stampede. Wood alcohol is just as poisonous as arsenic, in fact more serious. A single teaspoonful of wood alcohol has been known to cause blindness and an ounce taken by a normal individual will produce death. Of course different individuals seem to be variously affected and sometimes there is an idiosyncrasy that increases immunity. We know that wood alcohol is an insidious poison that eventually causes the loss of vision and death.

In some states the laws are such that the reporting of the presence of wood alcohol causes a good deal of trouble in the prosecution, the lawyers for the defendants contending that the beverage is medicated and hence does not come under the prohibition law. In the national prohibition act an intoxicating liquor is defined as one containing  $\frac{1}{2}$  of 1 per cent. of alcohol and is fit for use for beverage purposes. However, under Title 2, Section 4, and paragraph 9 of this section, it is stated:

Any person who shall knowingly sell any of the articles mentioned in paragraphs a, . . . . of this section for beverage purposes. . . . shall be subject to the penalties provided in Section 29 of this Title.

Paragraph "a" relates to denatured alcohol, which is alcohol containing a denaturing substance and wood alcohol would come in this class.

Near my home town it is estimated that 8000 gallons of 9 per cent. beer are exported daily. According to statements made by Charles Henry, the representative of the British-American Brewing Co., from \$1500 to \$2000 a day is being paid to the Dominion government in taxes on beer. This means that one of the border breweries is contributing upward of \$500,000 a year to the Canadian treasury. Words fail me to express my opinion of a saloon nation. Suffice it to say that so long as Canada is a party to supplying this country with prohibited beverages and for the sake of profit engages in this nefarious traffic, there will be an agitation for a modification or even a repeal of the Volstead Act.

From my observations prohibition has come to stay. America may not be "dry" but she will be "dry" before there is any possibility of any change in the law. There is only one way to secure the repeal of any law, much less an amendment to the Constitution, and that is by the enforcement of the law. No matter where the agitation has taken place, there is every indication that all of the various states are standing pat on their previous position as to prohibition.

There is another wedge which the wet advocates are using to restore realcoholization. Inadvertently or with intent a good many physicians are using their profession to weaken the enforcement of prohibition and to engender and further a false agitation on the part of the masses for the repeal and modification of the Volstead Act. They are insisting that wines and beers and other alcoholic beverages are necessary medicinal agents. This contention is false and the action of the U. S. Navy leaves no room for doubt as to the proper procedure for all medical men and the course to be followed if alcohol is needed in medicine. The U. S. Navy has banned whisky absolutely, even for medicinal purposes. The obvious abuses of the requisitions after the prohibition law went into effect convinced the authorities that the only remedy was to eliminate alcohol entirely. Whisky is stricken from the supply table and when a medical officer deems alcoholic stimulation absolutely essential for the preservation of human life, the ethyl alcohol obtainable from supply officers may be prescribed and used in such vehicle as the individual cases demand.

It is not creditable to the medical profession that certain physicians are using the prescription privilege in such a way as to constitute a method of evading the prohibition law. When a physician issues 475 liquor permits in one day there is no question but that here is a deliberate abuse of the permit privilege.

It is to the credit of pharmacy that the majority are opposed to taking out liquor permits or having anything to do with the filling of prescriptions for alcoholic beverages. Wherever there have been violations of the prohibition law either through the sale of alcoholic beverages or medicinal preparations capable of being used as alcoholic beverages, boards of pharmacy have been prompt to act on the individual cases. There is no doubt but that the boards of pharmacy will enforce the prohibition law and cooperate with the federal authorities to stamp out any use of our profession in evading the law and in supplying alcoholic addicts.

It will be recalled that the American Medical Association distributed questionnaires to about 37 per cent. of the physicians of the United States. About 18 per cent. of the physicians regard whisky as a necessary therapeutic agent in the practice of medicine and less than 18 per cent. of the physicians had taken out prescription permits. There is no doubt but the majority of reputable medical

men view the use of alcohol in medicine very much as the U. S. Navy and would prefer to adopt a similar policy at the present time to protect the profession against the abuse of a certain class of practitioners. Furthermore, there can be no doubt that medical men in general are satisfied with the liquor permits permissible under the regulations of the Volstead Enforcement Act and are acting in good faith in using such permits. Supporters of the Volstead Act have no desire to curb the power given to medical men to issue prescriptions for alleged legitimate purposes under permits and if it becomes necessary to make more stringent regulations, the physicians have no one to blame but those in their own ranks who have abused this privilege. In the meanwhile the preponderance of evidence points to the fact that the best medical men condemn the prescription of whisky for patients and are not taking out permits for its use.

In conclusion we may say that the sobering of a nation is like the sobering of an individual. There may be relapses and back-sliding. Many hardly seem to realize the seriousness of the violation of the prohibition law. Regardless of what we feel, it is the law of the land and the violating of it is dangerous. It breeds a contempt not only for the enforcement of this law but also for other laws.

KRAEMER LABORATORY,  
MT. CLEMENS, MICH.

---

### THE IDENTIFICATION OF SOME LOCAL ANESTHETICS.\*

BY L. E. WARREN.

During the last quarter of a century many organic substances have come into use in medicine because they possess the power of causing temporary loss of sensation when applied to the mucous surfaces, or by injection into the tissues. These substances are known as local anesthetics. Some are alkaloids occurring in nature, such as cocaine and tropacocaine, but most of them are synthetic bases whose physical and chemical properties resemble those of the naturally occurring alkaloids. The longest known of the local anesthetics is cocaine. Together with other bases this occurs in *Erythroxylon coca* and other species of *Erythroxylon*, shrubs, native to the Andean region of South America. Although cocaine was isolated in 1860<sup>1</sup> it was not until 1884<sup>2</sup> that its local anesthetic properties were sufficiently recognized to be made of practical value. Its use soon became widespread and for some years it remained the only known local anesthetic in practical use. However, cocaine was found to be distinctly poisonous, it produced undesirable side effects, such as mydriasis, cloudiness of the cornea and habit formation, and its salts were not stable in solution.

Tropacocaine was first found in coca leaves from Java.<sup>3</sup> It was found to be less poisonous than cocaine and to possess greater local anesthetic action,<sup>4</sup> without the objectionable mydriatic properties of cocaine. Further, the solutions of its salts were also less prone to decompose. It may be made synthetically by benzoylating pseudo-tropine.

Organic chemists, after working out the constitution of cocaine, attempted to build up a synthetic substitute for it which would be less toxic and perhaps cheaper. One of the first successful ones was  $\alpha$ -eucaine.<sup>5</sup> This was found to be less toxic

---

\* Scientific Section, A. Ph. A., Cleveland meeting, 1922.