pressure and the bottles bursting in consequence. This is always a most anxious time. The bottles are placed in preliminary stacks until this danger is passed and then they are placed in secondary stacks. Both stackings are arranged horizontally so that the sediment can work towards the neck of the bottle. The bottles are even marked with chalk so that the one side remains upwards. The duration of the bottle fermentation ranges from six months to two years.

At the end of that time the bottles are placed in a slanting position on special stands, with neck tilted slightly down. The purpose is to induce the sediment to collect on the lower side of the bottle and to travel towards the neck. A short shaking and turning movement is given each bottle once each day for six weeks while the neck is gradually inclined further downwards until finally the bottle is vertical with the neck pointing straight down. The shaking and turning of the bottles require great skill but in spite of this the men develop tremendous speed and handle incredible numbers per day. The use of a proper variety of yeast aids tremendously in the settling which is the object of this part of the process.
Fig. 44.—The disgorging, liqueuring, corking, stringing, and wiring of champagne. (From Vizetelly, The History of Champagne, Henry Sotheran & Co., London.)
The bottles are now taken to the uncorking room and chilled to fix the carbon dioxide more firmly. Uncorking is an art. The workman holds the bottle in a slanting position and gradually loosens the cork until it together with the sediment is blown out by the pressure. A finger is inserted to scoop out any remaining sediment and to stop the wine flowing out. Large establishments freeze the neck of the bottle and disgorge the sediment in a semi-solid form. At the same time the bottle is turned upright and temporarily closed. The champagne is then dosed by adding a wine solution of sugar and possibly also some brandy and the bottle is permanently corked. A skilled operator now takes the bottles and swings them above his head Indian club fashion, which operation thoroughly distributes the sugar solution throughout the wine. The bottles are then aged for some time in order to develop and blend the taste further and to bind the carbon dioxide.

**Imitation Champagne.**—This is made by carbonating white wine, or even cider, under pressure in the same manner that soda water is made. The gas which is forced into solution by this process never is as firmly absorbed as is the natural carbon dioxide in true champagne. Hence the wine very quickly loses its sparkle and becomes flat and lifeless. Nevertheless these imitations are sold in large volume at considerably lower prices than the genuine goods since they can be made without either the losses by explosion, etc., the high labor cost, or the long storage of true champagne. The processing, however, is rather a branch of the carbonated beverage industry than of the wine industry. A stricter interpretation of the term “Imitation Champagne” is sometimes used which confines it to sparkling wines made by the champagne process but outside the French Champagne District.

**CIDER**

This term, in the United States, has generally been applied to the beverage produced from the unfermented juice of apples. As such, it is conceded that its consumption exceeds that of any other beverage juice. However, most farmers permit the cider which they make for their own use to ferment or become “hard.”
Abroad the word "cider" is applied directly to the fermented product. The juice of the ripe apples from which cider is made contain from 7-15% of sugar, the average being around 11%. Hence the cider, if completely fermented can contain from 3.5-7.5% of alcohol, and the average product has about 5.5%.

The factors which affect the quality of the finished cider are, in general, the same as those which affect wine, namely: variety of fruit, quality of fruit, degree of maturity of fruit, and the organisms and temperature of fermentation. To make good cider, first quality, clean apples of a suitable variety, grown especially for cider making, must be selected. There are possibly as many varieties of apples as there are of grapes, if not more. The most important American varieties from their cider making possibilities are:

**Sweet, sub-acid:**

**Acid:**
- Winesap, Jonathan, Yellow Newton, Stayman, Northern Spy, and York Imperial.

**Aromatic:**
- Delicious, Golden Delicious, Lady, Black Gilliflower, White Pearman, and Bana Bonum.

**Astringent:**
- Florence, Hibernal, Soulard, Red Siberian, Hyslop, Transcendent, Launette, Martha, and Yellow Siberian.

**Neutral:**
- Ben Davis, Black Ben, Jana, Willowturg, Missouri, Alexander, Wolf River, Buckingham, and Limberturg.

In the absence of any of the above varieties, which are called "vintage apples," any variety of winter apples is preferable to a summer variety. With the single exception of winesap apples, all the others are improved by suitable blending of varieties so that the desired qualities of flavor, acidity, sweetness, and astringency are brought to a balance.

The selected fruits are washed, if not already clean, rasped
to a pulp, rather than crushed, and the pulp is pressed. The yield of juice varies with the apples and the type of pressing equipment used from 2-4 gallons per bushel. The juice is run into barrels or vats and either allowed to ferment naturally, or seeded with a pure culture of wine yeast at the rate of one pint of culture per fifty gallons of juice. The fermentation must proceed at an even lower temperature than that of wine, namely 50°-60° F. in order to avoid injury to the product. The fermentation proceeds in the usual violent manner, an abundant foam of yeast cells, pectins and albuminoids rising over the liquid as the reaction goes on. Then when most of the sugar of the must has been exhausted, in about a month, the foam subsides and the insoluble materials which it carried settle to the bottom of the barrel. At this time the batch is racked in a manner similar to wine (see p. 170) and allowed to carry on a quiet second fermentation at a lower temperature, ca. 45°-50° F. This second fermentation requires from three to six months and should not be entirely complete even then. Hence, if the cider is racked and bottled at this stage it will carry on a little further fermentation in the bottle, producing a beverage with some of the sparkle and life of champagne. A cider made with care, in the manner described, will be sound and stable, and unlikely to acetify (turn to vinegar). It may happen, however, that some clarification is needed. Formerly, skim milk in the proportion of one quart to about fifty gallons of cider was the preferred method of fining. Nowadays modern filtering equipment with such assistants as purified diatomaceous earth (kieselguhr) is used.
CHAPTER XII

LIQUEURS AND CORDIALS

General Statement.—Liqueurs and Cordials constitute a group of alcoholic beverages of a somewhat exotic nature. They are usually made from rectified alcohol, refined cane sugar and flavoring and aromatic substances extracted from fruits, herbs, seeds and roots. On account of their high content of sugar they are rarely consumed in any quantity and serve either as appetizers or as after dinner relishes.

Liqueurs as a class are very largely of foreign origin and manufacture and their terminology is somewhat confusing. In this country the names “liqueur” and “cordial” are practically interchangeable. Abroad, liqueurs generally are products made on the continent and especially in France, while cordials are products originating in the United Kingdom or elsewhere. Another possible distinction is that the liqueurs as a group are more perfume-like in character and exclude the cordials which are made with sharper flavors such as caraway, etc.

Classification.—The aim of all cordial and liqueur manufacture is a product in which the various separate constituents are so blended and united that only a summation is tasted by the drinker rather than a number of discordant single flavors. The varying degrees of success with which this object has been achieved and also the variations in concentration of the liqueur in alcohol, flavor and sugar have resulted in the recognition, especially in France, of a number of grades of liqueur, as follows:

1. Ordinaires
   a. Ordinaires
   b. Liqueurs doubles
2. Demi-fines
3. Fine
4. Superfine

1. Average
   a. Single Strength
   b. Double Strength
2. Good
3. Very good
4. Excellent
These grades are independent of the process of manufacture although it may be stated that the highest grades as to smoothness of flavor can in general only be made by the distillation process.

Manufacture.—There are three general methods by which cordials can be made:

1. The distillation process.
2. The infusion process.
3. The essence process.

In brief statement, the distillation process consists in macerating the selected aromatic flavoring substances in alcohol for a fixed period. The liquid is then distilled and the aroma and flavor of the herbs, seeds, fruits, etc., will be found in the distillate. This is then sweetened and colored and may also be diluted and blended with alcohol and water, and other materials as required.

Certain aromas and flavors do not lend themselves to extraction by distillation and in these cases the infusion method is resorted to. In this process the aromatic substances are steeped in a solution of alcohol and sugar to which they impart their flavoring and aromatic principles. The solution may be colored and is then strained to separate the marc or solid residue.

The "liqueurs par infusion" do not have the fine bouquet, flavor and taste found in the "liqueurs par distillation," with the exception of infusions of red fruits. These form a group of very fine liqueurs when they are made according to the best methods of the art. Typical of the finest are Cherry Brandy, Guignolet (brandy from black cherries) and Cassis (brandy from black currants).

In the essence process, essential oils, either natural or synthetic, are added to the alcohol, which is then sweetened and colored. This kind of liqueur is generally of inferior quality as compared with the others and should only be made under exceptional circumstances or when a cheap product is required.

Whatever general type of manufacture is selected, a special art is required to produce fine quality products. A series of operations are involved which must be conducted with skill, care, intelligence and knowledge because the characteristics of the finished product depend very largely on the technique of preparation,
independent of the variation in quality of the raw materials. This
last is a difficulty which always confronts the liqueur manufac-
turer. No standard formula can be relied on to produce a liqueur
of unvarying quality for the reason that the herbs or seed, etc.,
which flavor it may not have grown under like conditions, or have
ripened equally, etc.

The series of operations involved in the preparation of
liqueurs may include most or all of the following:

Infusion (Maceration)
Distillation
Blending
Coloring
Clarification
Filtration
Aging (True or Accelerated)

Infusion is the process by which the flavoring ingredients are
extracted from their natural raw materials and brought into solu-
tion in the alcohol-water mixture desired. The details of the
process depend very largely on the material which is being ex-
tracted. The strength of the alcohol used may vary according to
the solubility of the flavor in diluted alcohol and also according
to the solubility of such undesired materials as resins, bitter prin-
ciples, etc., which may be present in the herbs. Similar considera-
tions dictate in each special case whether the extraction shall be
performed hot or cold or whether it shall be carried on for days
or only a few hours.

Distillation for liqueur purposes is usually on a small scale
employing a pot still, which, however, in the most modern practice
may be equipped with a reflux condenser to permit partial extrac-
tion at a boil. Whenever extraction is carried on in the still it
is desirable that the latter be equipped with a steam or hot water
jacket to avoid the possibility of burning as by direct heat.

Blending includes the addition of sweetening, and coloring
matters, other flavors, smoothening and softening agents, etc.,
to the distilled flavored alcohol. In France it is very often car-
rried out in a hermetically sealed cylindrical copper vessel called
a conge, see Fig. 45.
Note that it is fitted with a sight-glass; i.e., there is an opening about three inches wide running down the side of the vessel and in this opening is a glass on which is etched a scale marked off in liters. By means of this sight-glass it is possible to determine the exact proportions of alcohol, syrup and water in the conge and also to observe what is happening to them.

Filling, mixing and emptying are all done by hand in the small establishments. Where the output is greater, the tanks containing the ingredients are connected to the blending machines by piping and the feed is under air pressure so that it is only necessary to open each valve for the liquid to run into the blender. While this takes place the operator reads the quantity on the sight-glass. Stirring is usually by means of a mechanical agitator although sometimes it is accomplished manually.

Perfect blending requires the mixing together of the various ingredients until they form an intimate and homogeneous whole. In carrying out this operation the following rules will prove of value:

(1) Always add the sugar in the form of a syrup. It is better to prepare the syrup by dissolving the sugar in hot water, rather than cold water, as this seems to favor intimate mixing and results in a liqueur of finer quality and smoothness.

(2) Always blend cold so as to avoid any evaporation of alcohol and aromatics and to prevent any spoilage which may ensue.

(3) Observe one of the following orders of addition: (a) put the aromatic spirit in first, (b) add the extra alcohol and stir for about ten minutes, (c) add the syrup and stir again, (d) add the required quantity of water and stir again in order to thoroughly incorporate the various ingredients. Some liqueur manufacturers favor a reverse order of procedure: (a) water, (b) sugar and glucose, (c) alcohol and alcoholic tinctures, (d) aromatic spirits, etc. Once the blending has been completed the coloring is added and stirred in.

The liqueur is allowed to rest for two or three days after mixing in order to give the ingredients time to blend thoroughly together. Thereafter, it is sampled to determine whether it has the desired combination of characteristics. If it is unsatisfactory.
the operator must make such additions and modifications as his experience suggests.

In the United States especially and also in many places abroad it has been found that the use of a closed blending tank is not essential, particularly for the spicier liqueurs sometimes classed as cordials. An open, copper-lined tank is used and agitation supplied either mechanically or manually. The order of addition of the ingredients remains important, however. This probably derives its weight partly from the necessity of preventing the precipitation of alcohol-soluble flavors from a strong solution by too great dilution with water; and partly to allow the escape of air dislodged from solution before the flavors are attacked and oxidized. Whatever method of blending is followed the finer liqueurs require aging to unite their constituents firmly in a perfect blend and give them smoothness.

Aging of liqueurs depends only slightly on chemical reaction, but more on the effect of time to cause the desired union of flavors. Hence it may very well take place either in bottles or casks. The time required is seldom more than a few days to a few months. As with all changes in which time is involved, the elevation of temperature causes acceleration of the change. Hence, in the home of liqueurs, France, a special technique has been developed and given a name, "Tranchage" for the accelerated aging of liqueurs. The process is not universally applicable since it causes rancidity in some liqueurs, e.g., anisette and crème de menthe. It also spoils chartreuse whose volatile oils will only commingle with time rather than heat. With care, however, it is an excellent and much used method.

Tranchage is accomplished by heating the liqueur gradually to a temperature of 70° to 90° C. in a hermetically sealed vessel. Heat is supplied either by a water or a steam jacket. When the set temperature has been reached the heating medium is withdrawn and the liqueur allowed to cool slowly.

The treatment is usually given in an apparatus called a "conge à trancher," see Fig. 45. This vessel is fitted with a safety valve, a thermometer, a sight-glass and a steam coil, and is the type mostly used in medium sized plants. The larger manufacturers
use a cylindrical tank fitted with legs, a large, quick-closing manhole on top and a safety valve, and an inlet tap for the compressed air. Below is an exhaust valve for the air.

The usual sight-glass with scale graduated in litres is on the side. The bottom is fitted with valves for drawing off the liqueur, either by gravity into jugs or under pressure. There is a separate tap for drawing off wash water. A steam coil is provided for heating and a mechanical agitator for mixing.

The method of operation is as follows: The feed taps for the ingredients are opened successively and the required quantities of each liquid are run in. Then the contents of the vessel are agitated. When blending is completed the steam valve is opened and the mixture is heated until the temperature reaches
the maximum allowable. Then the liqueur is either run off into
casks under air pressure or is allowed to rest in the conge, whence
it is run off, colored, filtered, and either barrelled or bottled.

Coloring of liqueurs is done to add what the jargon of the
advertising profession calls "eye appeal" to the liqueur. Unless
it is done with knowledge of the properties of the color used it is
a risky business. On occasion the stronger colors may alter the
taste and break up the harmonious blend of aromatics in the
liqueur. Again the colors may be affected by light in storage
and bleach or precipitate in the bottle. Infusions of red fruit
tend to bleach to pinks and the violet ones tend to darken. The
yellows tend to turn brown. Many of these changes can be
averted by suitable skill or by proper selection of colors. Above
all, where artificial aging is used, it is desirable to add color after
the liqueur has cooled so that the effect of heat on the color will
be avoided. With some vegetable colors the addition of about
0.01-0.02% of alum to the liqueur is claimed to give permanence
and stability.

Clarification or fining of liqueurs is practiced not only to give
them limpidity and brilliancy so that they are agreeable to the
eye, but also to render them immune against changes caused by
substances which they may hold in suspension.

Clarification methods precipitate these insoluble substances so
that they can be removed by filtration. Both these operations are
preferably carried out after the liqueur has completely cooled
following tranchage, or better still after resting and settling for
several days.

Various substances are used: albumen, white of egg, fish glue,
gelatin, and skimmed milk, or the modern filter aids such as talc,
asbestos, kieselguhr, etc.

Sample procedures: To fine one hectoliter (25 gals.) of
liqueur are as follows:

Take three whites of egg and whip them up in a liter (quart) of water;
pour it into the liqueur; stirring all the time; allow it to rest and settle
for 24 to 48 hours; then decant.

Fining by means of white of egg works very well with cloudy
or milky liqueurs. It also works well with liqueurs made by the infusion process, but in this case only one white of egg must be used to avoid altering the coloring material, which is partially precipitated by the albumen.

Fish glue or isinglass is more often used. It works very well with strongly alcoholic liqueurs but its preparation is somewhat lengthy and calls for considerable care.

The best method of procedure is as follows:

Macerate the fish glue for 24 hours in ten times its weight of water, taking care to renew the water two or three times because the glue will otherwise putrefy and acquire a nauseating odor. When the glue becomes soft, wet, and white, it is put into a mortar and pounded for some time so as to disintegrate it and separate all fibres. In this condition, small quantities of fresh water are added to it gradually, with stirring until a milky suspension or solution results. This liquid is strained through silk or fine linen cloth. The coarse undisintegrated particles of glue left upon the silk or linen strainer are put back into the mortar and pounded again. Water is then added in the same manner as before and the whole procedure is gone through again until very little residue remains. The suspension is now stirred vigorously and a solution of tartaric acid is added, the stirring is continued until the glue goes into solution.

The final product is not a white, limpid, easily flowing liquid but a kind of thin, transparent jelly which should be free of every trace of animal fiber. The materials should be used in about the following proportions:

<table>
<thead>
<tr>
<th>Material</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish glue</td>
<td>10 grams—( \frac{1}{3} ) oz.</td>
</tr>
<tr>
<td>Tartaric acid (dissolved in half a liter of water—1 pt.)</td>
<td>1 gram—15 gr.</td>
</tr>
<tr>
<td>Water</td>
<td>{ 1 to 1½ liters—1 to 1½ quarts }</td>
</tr>
</tbody>
</table>

for one hectoliter (25 gals.) of liqueur. The jelly solution is poured into the liqueur which is then well stirred up and finally allowed to rest for two or three days.

Another method replaces water as a solvent by either white wine or water to which some vinegar has been added. In this case it is not necessary to add tartaric acid. Ten per cent of alcohol added to the dissolved fish glue will preserve it from putrefy-
To fine with gelatin soften 30 grams (1 oz.) in a liter (1 quart) of warm water; add the mixture to the liqueur; stir in vigorously and allow to rest for several days. This type of clarification agent is best adapted for white liqueurs of low alcohol content.

Milk is also a good clarification agent for white liqueurs of low alcohol content. It should be added in the proportions of one liter (1 quart) of milk to each hectoliter (25 gals.) of liqueur. It is advisable to boil the milk and the liqueur should be well stirred while the addition is made. Milk makes a particularly good fining agent for the curaçao.

Always fine cold because hot fining results in the liqueur acquiring an albuminous taste which is very difficult to eliminate.

Filtration of liqueurs is done in order to give them the final "polish" that ensures brilliant clarity and absence of turbidity. The means by which it is accomplished range from a simple felt or flannel bag to more mechanical filters of larger capacity. In any type of filter the true filtration is done by some powdered material added to the liqueur which builds up a cake on the meshes of the filter apparatus and holds back the slimy suspended matter without clogging. Hence it is always necessary to return the first runnings of the filter one or more times until an efficient coating of filtering medium has been produced and the filtrate is absolutely clear. The felt bag filter is used in the same manner as the domestic jelly bag. That is, it is suspended with a hoop to keep its mouth open and filled with a bucket. It drains into another bucket. In spite of its primitiveness it is an effective filter for small lots of material. The next type of apparatus used for filtration is a copper cone fitted with a faucet at the bottom. To use this filter close the faucet and line the cone with filter paper or preferably pack the bottom with pure cellulose or filter paper reduced to pulp with a little water. The cone is filled with liqueur and the faucet opened. Figure 46 shows such a cone filter.

Figures 47 and 48 show a slightly more advanced type of filter and its method of application. It consists of a tinned
Fig. 46.

Fig. 47.—Wire mesh liqueur filter shown in Fig. 47.

Fig. 48.—Method of connecting and operating liqueur filter shown in Fig. 47.
copper cylinder fitted with a faucet at the bottom and valves at the side and top. The cover seals it hermetically. The interior consists of two metallic screens, one with horizontal and vertical shoot and warp wires; the other, a cone, with diagonal shoot and warp. It is necessary to disperse some kind of filtering material in the liqueur, so that this material deposits on the screens and aids in the production of a clear filtrate. Paper pulp, asbestos wool, talc, diatomaceous earth, etc., are satisfactory for this purpose. The method of application is shown in Fig. 48. If necessary, it is possible to arrange the filter and casks in battery form, so that the receiving barrel of one filter serves as the feeding barrel of another filter.

Similar filters are used in which the capacity is increased by supporting the wire filter cloth over a thin hollow rectangular frame and placing a number of these in a container so that the liquid flows freely into the outer chamber, and after passing through the filtering surface is collected from the interior of the frame and drained into a storage vessel.

CURAÇAO

In order to summarize the actual application of the general process outline given above, the manufacture of Curacao is detailed here because this liqueur has probably become the one best acclimated on American soil and is made here in larger volume than any other. The Curacao fruit is one of the family of bitter oranges. They grow chiefly in the West Indies and the price for genuine Curacao peels is quite high so that distillers generally substitute up to 50% of other bitter orange peels in the cheaper liqueurs.

Manufacture.—The outstanding characteristic of Curacao liqueurs is a mild bitter taste derived from the maceration of the fresh Curacao peel in 190 proof alcohol. Very little of this extract needs to be incorporated into the finished liqueur on account of its intense bitterness. The complete process of making Curacao liqueur as stated by Wolff (Spirits (1934) II, No. 6, 73) is as follows:
FORMULA TO MAKE 100 GALLONS
CURAÇAO TRIPLE SEC. 40% ALCOHOL BY VOLUME
EXTRA FINEST QUALITY

a. [24 oz. Extra thin genuine fresh Curacao peels
12 oz. Extra thin fresh Orange peels
Grind and macerate for 2 days with
2.5 gal. Alcohol 190 proof (95%)
Draw off 2 gallons of Extract. To the remaining macerate add:
20 lb. Extra thin fresh Curacao peels
15 lb. Extra thin fresh Orange peels
10 oz. Mace
2 oz. Cloves
38 gal. Alcohol 190 proof
40 gal. Distilled water

Digest for six hours at very gentle heat, place in a steam jacketed still, add another 5 gallons water, and distill slowly for 2 hours with partial reflux until all the alcohol is driven over. Rectify the raw distillate to 35% alcohol by volume and filter clear over Kieselguhr to remove terpenes. Clean still and then rectify the filtered distillate to 58 gallons, 60% alcohol by volume.

The extract and distillate are blended as follows:

BLENDING FORMULA

2 gal. Extract a.
58 gal. Rectified distillate 60% b.
1 gal. Genuine Jamaica Rum 74%
4 gal. Grape distillate 60%
2 gal. Port wine
5 gal. Glucose 42° B.
18 gal. Syrup made from
   250 lb. best grade sugar
   25 lb. milk sugar
   1 lb. Citric Acid C.P.
   13 gal. Distilled water
Caramel color as needed.

This formula will yield 100 gallons.
A cheaper product is made as follows:

\[ a' \]

1.5 lb. Extra thin Curacao peel

Macerate for two days with 1.5 gal. alcohol and draw off

1 gallon extract.

To the remaining macerate add:

\[ b' \]

20 lb. Extra thin Curacao peel
10 lb. Dried expulped Curacao peel
10 oz. Mace

2.5 oz. Cinnamon
2.5 oz. Cloves

13 gal. Alcohol 190 proof (95% vol.)
15 gal. Distilled water

Direction for distillation same as preceding formula except that 20 gallons of rectified distillate at 60% are obtained.

**Blending Formula**

1 gal. Extract \( a' \).
20 gal. Rectified distillate 60% \( b' \).
0.5 gal. Genuine Jamaica Rum 74%

2.5 gal. Grape distillate 60%

24.5 gal. Alcohol 190 proof (95%)

2 gal. Port wine

23 gal. Syrup made from

300 lb. sugar
20 lb. milk sugar
1 lb. Citric acid C.P.

29.5 gal. Distilled water

Caramel color as needed.

Newly made Curacao liqueurs have a raw unpleasant taste of peel which the addition of milk sugar helps to overcome. Heating the liqueur in vacuo to 135° F. also accelerates aging the product.

**Liqueur Formulae**

There follows a selected list of formulae for the manufacture of liqueurs. In the case of many liqueurs a number of alternative formulae are cited according to the method of manufacture and the grade or quality of product. In using these formulae, the warning must be observed that no amount of direction can substitute safely for care, skill and experience.

In explanation of the following formulae it is also important to note that the words "spirit of" refer to an alcohol distillate
from the flavoring material. The term essence refers to a solution of the essential oil in alcohol. Directions for coloring have been omitted, as the user will naturally follow his judgment in this matter. The section on coloring in this chapter and the list of colors in Chapter IV may be helpful in this connection.

**Absinthe**

*First Quality*

- Wormwood: 28 lb.
- Hyssop: 6 lb. 8 oz.
- Lemon balm: 6 lb. 8 oz.
- Anis (green): 40 lb.
- Chinese aniseed: 12 lb.
- Fennel: 16 lb.
- Coriander: 8 lb.
- Alcohol (90%): 80 gal.
- Water: 25 gal.

Macerate for 48 hours. Distill. Color with an infusion of wormwood and green herbs.

**Cream of Absinthe**

*First Quality “Synthetic”*

- Essence of absinthe: 45 min.
- English peppermint: 45 min.
- Anis: 4 dr.
- Sweet fennel: 1 dr.
- Distilled lemon: 4 dr.
- Alcohol (85%): 4 gal.
- Sugar: 45 lb.
- Water: to make 10 gal.

**Absinthe**

*Average Quality*

- Essence of absinthe: 45 min.
- English peppermint: 45 min.
- Anis, green: 4 dr.
- Lemon: 4 dr.
- Fennel: 1 dr.
- Alcohol (85%): 2.5 gal.
- Sugar: 10 lb.
- Water: to make 10 gal.
ALKERMES DE FLORENCE

_Elixir of Life of Florence_

Essence of calamus ........................................ 22 min.
" " " Chinese cinnamon ........................................ 15 min.
" " " cloves ..................................................... 40 min.
" " " nutmeg ..................................................... 22 min.
" " " roses ....................................................... 30 min.

Extract of jasmin ........................................... 4 dr.
" " " anis ......................................................... 4 dr.

Alcohol (85%) ............................................... 4 gal.
Sugar .................................................................. 45 lb.
Water ................................................................ to make 10 gal.

Color with cochineal

**ANGELICA LIQUEUR**

_Excellent Quality_

Angelica root .................................................. 10 lb.
" " seed ............................................................. 8 lb.
Coriander seed .................................................. 1 lb.
Fennel ............................................................. 1 lb.
Alcohol (90%) .................................................... 28 gal.

Macerate, distill and rectify to 36 gallons after addition of water. Add 400 lb. of sugar in syrup and make to 100 gallons with distilled water.

_Very Good Grade_

Spirit of angelica root ....................................... 10 gal.
" " " " seeds ......................................................... 10 gal.
Alcohol (85%) .................................................... 13.5 gal.
Sugar .................................................................. 342 lb.
Water ................................................................ to make 100 gal.

_Good Grade_

Spirit of angelica roots ...................................... 2 qt. 25 oz.
" " " " seeds ......................................................... 2 qt. 25 oz.
Alcohol (85%) .................................................... 1 gal. 3 pt.
Sugar .................................................................. 20 lb.
Water ................................................................ to make 10 gal.

_Average Grade—Double Strength_

Spirit of Angelica seeds .................................... 1 gal. 3 pt.
Alcohol (85%) .................................................... 3 gal. 5 pt.
Sugar .................................................................. 20 lb.
Water ................................................................ to make 10 gal.