by straining, which separates the solids from the fluids.

Clarification by filtration is explained in the chapters on animal and vegetable charcoals, and the preparation and arrangement of filters.

Finings effect clarification of liquors, by involving during coagulation, the particles that are floating in the liquid, and rising with them to the surface or subsiding.

Eggs possess this quality to the greatest extent, caused by the particles of albumen becoming more minutely divided. Eggs when used should be whisked to a froth, and used in the proportion of two to six per barrel of forty gallons. When the shell is used it should be finely powdered. Eggs are sometimes solidified by heat, by manufacturers, for future use.

_Egg powder._—Take any number of eggs, and beat them to a froth, and dry them by a gentle heat or in the sun; they are then powdered, and one eighth of wheat flour is added, and made to a paste with water and dried in the form of cakes or balls. Egg powder is used in the same manner and for all the purposes of eggs.

_Isinglass_ is a gelatinous substance, prepared from the sounds or swimming bladders of fishes. There
are different varieties of isinglass; the best is book isinglass. One hundred grains of this article dissolve in ten ounces of water, forming a tremulous jelly when cold. That in cakes is brownish, and of an unpleasant odor, and is employed from its low price in the clarification of inferior liquors. The purest isinglass is whitish, semi-transparent, of a shining, pearly appearance, and destitute of smell or taste. The inferior kinds of isinglass are yellowish and opaque.

Isinglass is soluble in boiling water, acids, and alkalies, and is insoluble in alcohol; its watery solution putrefies. The proportions for its use are one to six ounces per one hundred gallons; it is beaten to shreds and dissolved in a pint of boiling water; when this is cold, it becomes a stiff jelly. Whisk this jelly to a froth in a sufficient quantity of the fluid intended for fining; then add it to the mass and stir the whole well for a few moments, and then bung; in twenty-four to sixty hours the particles will have subsided.

Milk, when used for fining, should be boiled a few minutes, and added while hot to the barrel, in the proportions of one pint to forty gallons.
Alum is used in the proportions of four to five ounces per hundred gallons. Being finely pulverized, alum is incompatible with the "beading mixture." Liquors that contain starch, mucilage, &c., should not be "fined" with alum.

Wheat flour is sometimes used in the form of paste with water—one pint per one hundred gallons.

Filtering Bags.—Take a square yard of Canton flannel, and cut it in two pieces (diagonally) from one corner to the other, and sew up the two edges, thus forming a triangle-shaped bag; then sew a hoop of suitable size in the mouth of the bag, and fix a suitable handle of rope or twine.

If all the coloring matter, and fluids used to impart coloring to liquors, was sufficiently strained and filtered, finings would be rarely, if ever, used; the hurried manner in which color makers manage their business, using inferior materials, and taking advantage of all the "tricks of trade" that may be suggested. Coloring derived from such a source as this must entail a vast deal of unnecessary labor and expense upon the manufacturer. The manufacturers of coloring should be provided with all kinds of filters, strainers, &c., to cleanse and purify their coloring of its own and foreign matter. As good color is one of the principal essentials of all good liquors,
the manufacturer would find the coloring made under his supervision to be preferable to any other.

All colors, except brown, from sugar, should be filtered through a bed of white sand from six to fifteen inches in depth; this can be done in a keg or barrel; the cleaner and clearer the sugar the finer the color. Thus fine brown and loaf, or clarified sugar, which is used for coloring very choice bottled liquors, is the most exquisite brown we have. The objection to the burnt sugar found in commerce is, that it contains a large portion of minute particles of charcoal that would pass through the strainer, and can easily be detected with the naked eye, in liquors that have been colored by this article. This was the result of preparing the color from molasses, or filthy dark sugar.

Giving body, age, and a mucilaginous, oily appearance to wines and liquors.—The above desirable qualifications are imparted by filtration or digestion—the former plan being preferable. In the case of wines, only a small portion should be filtered, say one sixth of the whole, and this is to be added to the mass and allowed to stand for a few days; the simplicity of the operation will be apparent in the first attempt.

In operating in proof spirit, the process consists in rapidly filtering the mass through any substance
that contains mucilage that is not precipitated by alcohol—viz. starch and gluten.

Wheat bran, as found in commerce, placed in a barrel filter to the depth of eight or ten inches, and the surface of the bran covered to the depth of one or two inches with slippery elm bark, and the filtration maintained with rapidity, yields a superior liquor, of a fine, dry taste. Liquor prepared by this process, cannot be used for a great length of time; the difficulty of fining down, &c., has caused this plan to sink into disuse. Where a sufficient time is allowed for the color extracted from the husk to subside, no finer spirit can be produced, when we keep in view the economical and simple plan used for attaining such desirable ends.—The most common process is filtration through oatmeal and rice—in some instances the mixture is favored with a small portion of wheaten flour; in all large manufactories, the spirit runs from the charcoal through the rice filters. These filters are made to suit convenience. A common barrel, etc., will answer every purpose, and is made in every respect that the charcoal filters were; the first layer at the bottom is of sand, varying in depth from four to twelve inches. This sand rests on a perforated bottom, a few inches above the main bottom, and is covered with a blanket—that is to say, the sand has a blan-
ket at the top of it and another beneath it, and next comes a bed of oatmeal or rice flour, with a proportion of one tenth of the whole added in wheaten flour—either the oatmeal or the rice flour are embedded to the depth of from twelve to fifteen inches. Where the rice flour is used, chopped straw should be used in layers alternately with the flour—otherwise, the flour would become one impenetrable mass, by the addition of fluid. The durability of either oatmeal or rice flour in filtering, can only be obtained by close observation, and ascertaining when the starch is being near exhausted.

The use of chopped straw in layers, greatly facilitates the filtration of fluids through glutinous masses. Some operators run the spirit through one bed of ground rice or oatmeal, and one of whole rice to the depth of twelve to twenty inches—and then through the usual depth of sand. The different plans are offered to the operator rather with the view of furnishing all information that might be at all desirable; not that any formula has any decided advantage over the other, but that plan that appears the most convenient, from circumstances, may be adopted.

All the different formulas in this work are in practical operation in different parts of the country; and yet the proprietors would not be able to give an
opinion, what advantages his recipe possessed over any other, or why so many different modes were adopted to obtain the same results. The choice is often the result of circumstances, and from long usage a formula becomes almost sacred with some operatives.

It will be noticed that this plan of filtering is remarkable for its economy and simplicity, and the general directions for the novice are few and simple. Keep the filtering substances from lying too compact by a few layers of chopped straw, and also apply the straw in any instance where the filtration progresses slowly, or appears choked. All substances to be acted upon by filtration should be separated from each other by suitable and secure coverings of close-grained fabrics. Blankets are generally preferred, owing to the long nap, which becomes entangled and prevents the escape of the particles.

*Slippery Elm* stands deservedly high with manufacturers on the continent. It yields a mucilage that combines freely with alcohol, and enters into many extemporaneous receipts. The decoction is prepared by boiling in water, and is used to give the appearance of age to liquors. It is the most serviceable, however, used by infusing it in the spirit, or placing the bark over the surface, or mixing through in the
place of straw, to allow the filtration to progress freely through the filters.

_Sugar, Honey, Syrup, &c.,_ are all used for the purposes of giving body, age, and other desirable qualities to wines and liquors, and have been noticed under their appropriate heads.

**COLORING.**

Perfectly transparent liquors can never be obtained with indifferently prepared coloring. Standing first on the list, is brown or brandy coloring (carmel), or burnt sugar. This color is too often prepared from indifferent articles, viz. molasses and filthy sugar, and burnt to suit the convenience of the operator, rather than a standard rule; and when prepared in this manner, the best adapted strainers ever invented would not effectually remove the charcoal (from being over burnt), and other dissolved filthy impurities that are to be found in the scrapings of refineries, sugar-houses, &c. This is the material that the color-maker uses. Molasses, in no instance, should be used in the manufacture of coloring. Clean and fair brown sugar will yield a rich and transparent brown, of great depth and beauty.

The prudent rectifier will never make use of any kind of fluid coloring, without it is perfectly trans...
COLORING.

parent, from filtering and straining. This plan of throwing the ingredients together promiscuously, and relying on finings for transparency, is but a poor one.

To the uninitiated, relative to burning coloring, I might say that one hour and a half will suffice, over a brisk fire, to any given quantity of sugar. When sufficiently burned, may be known by the effervescence ceasing. At this point, you should dash in the same quantity of water that there was of sugar; the water dissolves the mass and prevents incrustation, and the heat should be discontinued.

The Preparation of Liquor Coloring.—Red Sanders Wood comes in round or angular sticks, internally of a blood red color, and externally brown from exposure to the air; compact and heavy, of a fibrous texture; it is kept in the shops in the state of small chips, raspings, or coarse powder. It has but little smell or taste, and imparts a red color to alcohol, ether, and alkaline solutions, but not to water. Coloring is obtained from sanders wood, in the proportion of one pound of the wood to one gallon of proof spirit, and allowed to stand for twenty-four hours, and then drawn off and filtered through sand, to the depth of twelve to fourteen inches, or fined with boiled milk. The sanders wood should be subjected to the action of the spirit as long as it continues to yield any color.
This color is used for brandies, combined with burnt sugar, also for coloring cherry bounce, wines, &c.

YELLOW.

Gamboge.—The best gamboge is in cylindrical rolls from one to three inches in diameter, sometimes hollow in the centre, or flattened, or folded double, or agglutinated in masses, in which the original form is not always distinguishable. They are externally of a dull orange color, which is occasionally displaced by greenish stains. In this form, it is sometimes called pipe gamboge. Another variety is imported under the name of cake or lump gamboge; it is in irregular masses, weighing two or three pounds or more. This latter variety only differs from the former, in the greater amount of impurities contained. The inferior kinds of gamboge may be known by their greater hardness and coarser fracture, by the brownish or greyish color of their broken surface, which is often marked with black spots, and by their obvious impurities.

Gamboge, in its pure form, is brittle, with a smooth, shining fracture; the color of the mass, when broken, is a uniform reddish orange, which becomes a beautiful bright yellow when powdered, or when the surface is rubbed with water. From the brilliancy of its color, it is highly esteemed—it has no smell and little
taste—it produces after remaining in the mouth a short time, an acrid sensation. So intense is its coloring principle, that one part communicates a perceptible yellowness to ten thousand parts of water or spirit.

Yellow is prepared from gamboge, in the proportion of eight ounces to the gallon of spirit, allowed to stand twelve hours, and the clearest portion of the fluid drawn off and strained through a fine flannel bag, and the gamboge remaining is treated to spirit until the coloring is completely extracted.

Gamboge is used for coloring some fine brands of peach brandy, wines, and cordials, and used in compound colors, viz. orange, green, lemon, &c.

Brown from Alkanet Root.—The root comes to us in pieces three or four inches long, from the thickness of a quill to that of the little finger; somewhat twisted, consisting of a dark red, easily separable bark; it is usually much decayed internally, very light, and of loose, almost spongy, texture. The fresh root has a faint odor and a bitter astringent taste, but when dried, it is nearly inodorous and insipid. Its coloring principle is soluble in alcohol or ether, but is insoluble in water.

The tincture of alkanet has its color deepened by acids, and changed to blue by alkalies, and again restored by neutralizing the latter substances.
Alkanet is prepared by crushing the root, and adding one pound to a gallon of alcohol, standing twenty-four hours, decanting, and fine with boiled milk; depth of color and transparency are objects sought for, and the finings should be continued until the tincture is bright. If depth of color is sought, add sulphuric acid, drop by drop, until the desired warmth is attained. As in all other instances, the remaining root should be subjected to the action of alcohol as long as the root yields any color.

This color is used for port wine particularly, also for wines and cordials either singly or combined, forming compound colors.

Logwood yields a color well adapted for a certain class of wines, and is very extensively used; it yields its color to water or alcohol, but in greater quantities to boiling water.

Red beets will produce a fine red color, by mashing or cutting into slices and infusing into the liquid that is to be colored.

When they are to be used for coloring fermented liquors, viz. champagne, wines, &c., the beets should be added before fermentation has begun, that is, while these liquors are being formed by fermentation.

Blue.—The best blue is prepared from indigo; other blues have been proposed and used with but
COLORING.

little success, the objections to them are a want of body and brilliancy. The action of light, and probably some principle that the liquor contains, may be incompatible with the color. These, or some unexplained causes, tend to the decomposition of the color, and hence the dull, cloudy, and faded color of some brands of cordials, &c.

Indigo is insoluble in alcohol or water. It is of an intensely blue color, but assumes a coppery or bronze hue when rubbed by a smooth, hard body, as the finger nail. The solution of indigo is known as chemic blue, and is prepared thus:—

To eight ounces of oil of vitriol, in a glass or earthen vessel placed in cold water, add gradually one ounce of pure indigo in powder, stirring the mixture at each addition with a glass rod; cover the vessel for twenty-four hours, then dilute with an equal weight of water. Instances may occur, where the acid would be objectionable in the above solution. Carbonate of potash, soda, or ammonia, if added, will neutralize the acid. This, if prepared with clear water, will need no farther preparation as it is beautifully transparent.

Indigo is used for coloring cordials the different shades of blue, also with gamboge in solution, for forming green, and with a solution of red sanders wood or cochineal for forming a purple color.
Rose Pink, &c., is prepared from cochineal. Cochineal has a faint, heavy odor, and a bitter, slightly acidulous taste; its powder is of a purplish carmine color, tinging the saliva intensely red. Cochineal is soluble in water and alcohol, and more so in boiling alcohol. From this formula, the operator can produce any desired shade, from the lightest pink to the deepest carmine.

Boil one ounce each of cochineal and salt of tartar in a quart of water for twenty-five or thirty minutes, then add one ounce cream of tartar and the same of alum; this is intended for bottled cordials, &c. Where it is desirous to color by the barrel, pipe, or hogshead, the cochineal may be inclosed in muslin and thrown into the cask. Two ounces of cochineal will color a hogshead a very fine pink; of course the quantity can be increased or diminished to produce the desired shade. The tints formed by cochineal, in combination with any other color, will have more brilliancy than any other colors used, viz. in orange, gold, purple, fawn, salmon, &c., &c.
ON BARRELLING LIQUORS,

GIVING AGE TO NEW BARRELS, AND BRIGHTENING OLD ONES,
CLEANSING AND SWEETENING OLD BARRELS, BRANDS
AND BRANDING BARRELS, MARKS THAT ARE NOT CUSTOM-
HOUSE MARKS.

Where old barrels are to be used, the hoops should
be well driven and nailed. If the barrels should ap-
pear slack, swell them with water. If they are
pipes, restore, if needed, the plaster of Paris on the
heads, by mixing plaster of Paris with water to the
consistence of thin mortar, and apply as necessary.
It will set or harden immediately. If the plaster is to
be colored, stir in uniformly Venetian red or any color
to suit taste (in the plaster while it's being mixed). If
the heads of the barrels are to be plain, and they are
old ones; examine carefully for the retailer's faucet-
opening. Plug this up carefully, allowing the plug
to sink about the twentieth of an inch in the head
of the barrel, thus allowing a small space to be filled
with black putty (this is a mixture of lamp black and putty); bring the whole even and smooth with the head of the barrel, then have a stencil pattern ready with the word COG., or any other word that will answer; and allowing the letter O to cover the putty. The O in the pattern should have the centre left out, thus forming a black circle. The object of this is to completely hide all traces of the faucet hole; and, if done with neatness, it will succeed admirably.

For giving age to new barrels, keep them in a damp, dark cellar, and dash water on them occasionally, or wash them several times, daily, until the desired appearance is obtained, with a solution composed of two gallons of water, three pounds of sulphuric acid, and one pound of sulphate of iron. When this solution is used, it will be useless to keep them in a cellar.

For scrubbing old barrels, use a very strong solution of sulphuric acid, or pure acid will answer best. The barrels should be well rubbed during the application of the acid. The acid acts by corroding the surface of the staves, and the friction or rubbing removes the corroded surface. Barrels subjected to this process soon tarnish.

All barrels, except new ones, and those old ones that yield a fine aroma, should be well cleansed from
all odors, or they will, to a considerable extent, injure their proposed contents. Take, owing to a greater or less extent of the fetor, from a half to one glass of sulphuric acid, and pour into the barrel and bung down tightly, and roll the barrel in such a manner that the acid will reach all parts of the inside of the barrel. The acid can be decanted and kept for future use. Recollect to rinse out the barrel first with pure water before the acid is used. Another mode is to smear or saturate strips of cotton fabric with sulphur, rendered fluid by heat. Attach the end of one of these pieces to the under part of the bung; ignite the opposite end, put it in the barrel, and bung tightly.

The manufacturer should pay the strictest attention to the manner in which all of his brands and stencil patterns are executed. Neatness, correct proportion, and delicacy of touch should characterize the mechanical portion of them; and where instances may arise that the heads should be painted, nothing but the prettiest colors should be used. A few examples are offered. They can be adapted to suit convenience. A beautiful rose pink or peach blossom can be made by adding equal proportions of vermilion and drop lake, well ground together, to white lead, until the shade sought is produced. Paris green, mixed with turpentine and oil, is the
most brilliant green. The different shades of yellow are made from yellow ochre or chrome yellow; to be first ground, and then mixed with white lead, and brought to any shade required. These fine colors, for the most part, are used for cordial barrels. Domestic brandies, from long usage, are put up in wood colored heading. The American fancy brands of whiskey are often put up with neatly varnished oakheads, which makes a very neat appearance. A small portion of burnt amber is added to the varnish to give the heads a darkish hue to be in keeping with the dull and oldish looking staves. The appearance just mentioned is imparted to the staves by sulphuric acid, &c., as above; that is, where the spirit is denominated "old," the manufacturer should have a complete set of brands and branding plates for foreign and domestic liquors. The imitation liquors should, if necessary, have the brands burnt in the head of the barrel; and some dealers have adopted the plan of marking the head of the barrel in the same style as the custom-house marks, and reads something like the following:—"Mary Pell, New York, June 9, 1851." Any other names, of course, would answer. All that is necessary is to have them resemble, as much as possible, what they are intended to represent. It is supposed that the barrels to be used are new ones, which always should
be the case where the article has been prepared with
great care. It (the spirit) should be offered in neat
and bright packages.

For giving age to new barrels, a dilute tincture of
muriate of iron with its own bulk of water, and
apply with a brush or rag uniformly over the barrel.

ON THE USE OF ACETIC AND SULPHURIC ACIDS IN
LIQUORS.

The above acids are added to liquors, under the
false impression that they add to the strength, or
that they supply the strength of the deficient alco-
hol. In small proportions (see Formula), acid greatly
improves some liquors. In some instances, where a
spirit has an unpleasant taste, it acts by destroying
the cause; or, where a liquor tastes flat, the acid
yields quite a pleasant taste. Spirit that contains
either a deficiency or an excess of saccharine matter
has its peculiarities corrected by acid; in the former
instance, the acidulous taste, by the addition of the
acid, completely covers the deficiency; and in the
latter instance, an excess of acid destroys (to the
taste) the saccharine matter.

Acids should be used whenever a pleasant vinous,
acidulous taste is desired in liquors. Where econo-
my is sought, use sulphuric acid. Acetic acid or
strong vinegar yields a taste and smell. The combined odor of the acid and the spirit is similar to acetic ether, and would be a desirable flavor for any liquor.

The discussion would digress from the object of this work to inquire into the propriety of the use or disuse of a mineral acid in this business. The argument that proscribes the use of it in this instance would apply with equal force to its use in the manufacture of soda and mineral waters; and as found in some brands of lemon syrup and the acidulated beverages that are prescribed by the medical faculty. The proportion used in spirit is comparatively small to that used for other manufacturing purposes, as a glassful of the spirit does not contain a greater quantity than one drop!
IX.

ON THE USES OF SUGAR, MOLASSES, AND HONEY

IN THE MANUFACTURE OF

WINES AND LIQUORS.

There are two modes presented to the operator for giving a body, age, and a mucilaginous, oily appearance to liquors,—the first process consisting in charging the fluid with a given amount per gallon of saccharine matter. The application of this process will not answer where the manufacture of low proof or low priced liquors is contemplated, as it would incur an additional expense varying from twelve to twenty-five per cent. The second process consists in charging the liquid with starch by filtration. This process is fully detailed in another chapter on that subject; and it will be seen that the same ends can be attained by the latter process that are by the former, and at a comparatively trifling cost. To give to neutral spirits the attributes of a
fine distilled and aged liquor would be to apply the principles of both processes, viz. to subject it to the starch filtration, and to charge the spirit with a small per centage of honey or sugar.

The honey has a decided preference, owing to its peculiar, though feebly aromatic taste, which is followed by a slight prickling or sense of acrimony in the throat. It is better adapted to the manufacture of wines, fine gin, brandies, champagne, cordials, &c., &c.

In some instances, the honey may need clarification; for which, full instructions will be found under the head of “Clarifying Honey.” When used, either the honey or sugar should be dissolved in perfectly clean, clear water, for if either should contain any filthy impurities they will, in a proportionate degree, render the fluid containing them muddy; and, for this reason, molasses should never be used, not even in the most minute quantities. Neither is molasses suited for coloring when burned; this is owing to the excessive amount of caramel or burnt sugar that the molasses contains—this caramel being the obvious effects of evaporating the cane juice from direct heat.

The filtering process presents innumerable advantages in preparing low proof or cheap liquors, as the fixtures necessary are remarkable for their simplicity; and the filtration, if properly managed, will
gives to the spirit a luscious taste and a fine bead. The only difficulty to guard against is to prevent the color of the liquor becoming heavy. This is derived from the husks of bran that the wheaten flour contains. For this reason, rice flour is extensively used, though inferior to wheat. The heaviness alluded to above will, in the course of time, subside.

One part of wheaten flour to six of rice flour, and three parts of whole grains of rice thoroughly mixed, will be found the most expeditious formula for packing filtering stands.

**TO CLARIFY HONEY.**

The clarification is only necessary when the honey is intended for bright, transparent champagne, gin, &c. Gently heating the honey, and straining through muslin, will generally remove the impurities; or mix six eggs with two gallons of water, and add the water to ten gallons of honey; mix well, thin, and apply heat, but do not bring it to the boiling point; then skim, and if necessary, strain.

Heat renders honey perfectly fluid, so that the wax and other light impurities which it contains, rise to the surface, and may be skimmed off, while the heavier substances, which may have been accidentally
or fraudulently added, such as sand or other earth, sink to the bottom.

*French Method of Clarifying Honey.*—Take of honey 3,000 parts, water 750 parts, carbonate of lime, powdered and washed, ninety-six parts; mix them in a suitable vessel, and boil for three minutes, stirring constantly, then add ninety-six parts of fresh burned bone black, in powder, and boil for a few minutes; lastly, add the whites of three eggs, beat up with 500 parts of water, and bring the liquid to the boiling point; withdraw the vessels from the fire, and after the mixture has cooled for fifteen minutes, strain through flannel, and repeat the straining until the liquid passes perfectly clear; should it not be of the proper consistence, it should be concentrated sufficiently by quick boiling. The use of the carbonate of lime is to saturate any acid in the honey which might favor the formation of glucose, and thus increase the tendency to granulation.

*Second Process for Clarifying Honey.*—Boil twenty-five pounds of honey, to which half the quantity of water has been added, with a pulp obtained by stirring three sheets of white blotting paper, with water, over a slow fire, till the pulp is reduced to minute fibres; when the mixture cools, put it into a
woollen filtering bag, previously moistened, and allow the honey to pass. It comes away perfectly clear; the paper pulp may then be washed, and the dark wine-colored liquid subjected to a second process.

Honey clarified by the first process described, is as clear and colorless as syrup made with refined sugar, but still retains its flavor.

TO ASCERTAIN THE PURITY OF FRENCH BRANDY.

On analysis pure brandy has been shown to contain alcohol, water, volatile oil, tannin, heavy oil of wine, acetic ether, and coloring matter.

An imitation of brandy is composed of alcohol, with various proportions of grain oil, starch, sugar, honey, tannin, coloring, acetic ether, raisin spirit, or heavy oil of wine, &c., &c.

The sugar, honey, pepper, &c., will be perceptible to the taste, if the liquid be evaporated to dryness, the tannin will be known by the liquid forming a dark line, by the addition of the sesquioxide of iron; the starch will be known by the addition of iodine in solution, and the presence of grain oil will be denoted by nitrate of silver.

TESTS, ETC.

*Nitrate of Silver Test for Detecting Grain or Fuse.*

8*
Oil in Liquors.—Take of nitrate of silver, ten grains; pure water, one ounce; dissolve the nitrate of silver in the water; to half a glass of the liquid supposed to contain grain oil, add twenty-five drops of the solution of nitrate of silver; if there be any grain oil, it will be converted into a black powder, and will be seen floating on the surface of the liquid.

The action of the silver is not always immediate; the glass should be exposed to a strong light, the better to enable the operator to observe any of the powder that might be floating on the surface of the liquid. It has been observed, that the action of the oxide of silver is not immediate; from one to twenty-four hours is sometimes necessary in testing a sample that may have been well rectified, either by distillation or filtration.

Iodine Test for Starch in Liquors.—Iodine, one ounce; alcohol, five ounces; dissolve. To half a glass of spirit, add a few drops of the solution of iodine, if starch is present the product will be purple, and dark purplish spots or specks.

Now it must be obvious, that when the tests mentioned fail in denoting the presence of these articles mentioned, the spirit is unadulterated, as the articles sought for by these tests, viz. sugar, honey, and starch, are those that are used both in America and Europe,
QUANTITY OF ALCOHOL IN WINE, ETC. 179

by all classes of manufacturers, in adulterating liquors.

TO ASCERTAIN THE QUANTITY OF ALCOHOL IN WINE,
BEER, CIDER, CORVIDALS, ETC.

Take of the liquid to be examined, one hundred parts, and a solution of subacetate of lead, formed by taking litharge, fifteen parts; acetate of lead, twelve parts; water, two hundred parts; boil for twenty minutes, or until reduced to one half. Take of this twelve parts, agitate together, and strain through muslin; then take potash, that has been brought to red heat in a ladle, and add it in powder to the liquid, as long as it continues to dissolve; the alcohol will be seen floating on top of the mixture. The quantity of spirit can be estimated by means of a graduated tube.

The most certain way to determine the quantity of alcohol contained in a given quantity of any liquid, is to separate it from the non-volatile constituents by distillation. Any kind of small still can be made available for this purpose. Take for the purpose three hundred parts of the liquid to be examined, measured in a glass tube carefully, and slowly distil over one hundred parts, or one third of the liquor in the still, making use of a graduating tube as the re-
recipient of the distilled liquid, and stopping the operation when the distilled liquor reaches the hundredth degree; then obtain the amount of alcohol the distilled liquor contains, by means of the hydrometer, and dividing the result by three, you have the per centage of alcohol that the liquid contains. If, for example, the hundred parts of distilled liquor contained thirty parts of alcohol, the liquid submitted to distillation contains ten per cent. of alcohol; but if, from want of attention, there should be distilled over more than one hundred parts of the liquor, it will not answer to divide the alcoholic strength of the product by three to obtain the percentage of the alcohol of the liquor submitted to distillation. You must employ as a divisor the number which expresses the relation of the volume of the distilled product to the bulk of the wine. If, for example, you have one hundred and six parts of distilled liquor, containing (by the hydrometer) thirty-three parts of alcohol, you divide 300 by 106, which gives 2.83, and then divide 33 by 2.83, which gives 11.66; the last number expresses the percentage of alcohol of the liquor submitted for examination.

CHARCOAL AS A DECOLORIZING AGENT.

Owing to a variety of causes,—the fluctuations of
the market, an over stock of one particular kind of
unmerchantable liquor, or a quantity of liquor too
highly colored, or to point to the emergency that
might arise, would be impossible; and hence the neces-
sity of a knowledge of the articles used in decolorizing
liquors, viz. animal charcoal or bone black. Animal
charcoal by no means necessarily possesses the de-
colorizing property, as this depends upon its peculiar
state of aggregation. If a piece of pure animal matter
be carbonized, it usually enters into fusion, and from
the gaseous matter which is extricated, becomes
porous and cellular. The charcoal formed has ge-
nerally a metallic lustre, and a color resembling that
of black lead. It has little or no decolorizing
power.

The most powerful of all the charcoals for dis-
charging colors, are those obtained from certain ani-
mal matters, such as dried blood, hair, horns, &c.,
&c., by first burning them with carbonate of potassa,
and then washing the product with water. The next
most powerful decolorizer is bone black, in which
the separation of the carbonaceous particles is effect-
ed by the phosphate of lime present in the bone.
Vegetable substances may be made to yield a good
charcoal for destroying color, provided before burn-
ing they be well mixed with pumice stone, chalk,
flint, calcined bones, &c., &c.
182 MANUFACTURE OF WINES AND LIQUORS.

It results from the foregoing facts that the decolorizing power of charcoal depends upon a peculiar mode of aggregation of its particles, the leading character of which is they are isolated from one another, and thus enabled to spread over a greater extent of surface. It is on this principle that certain chemical substances act in developing the property in question, when they are ignited in a state of intimate mixture with the substances to be charred. Thus it is perceived that there is no necessary connexion between animal charcoal and the decolorizing power; as this charcoal may or may not possess the peculiar aggregation of its particles, on which the power depends.

Bone black, for instance, has this property, not because it is an animal charcoal, but in consequence of the phosphate of lime present in the bone, the favorable state of aggregation is induced.

Animal charcoal will, by digestion and filtration, remove the bitter principles from infusions, &c. Its power of acting on chemical compounds and solutions is much more decided in its purified state.

Bone black is composed of phosphate and carbonate of lime, charcoal, and carburet of iron.

Bone black, when used for decolorizing, should be deposited in a filter to the depth of from five to fifteen feet. On a small scale, a common forty gallon