La Nature
2nd Semester 1894
Page 181 - 183

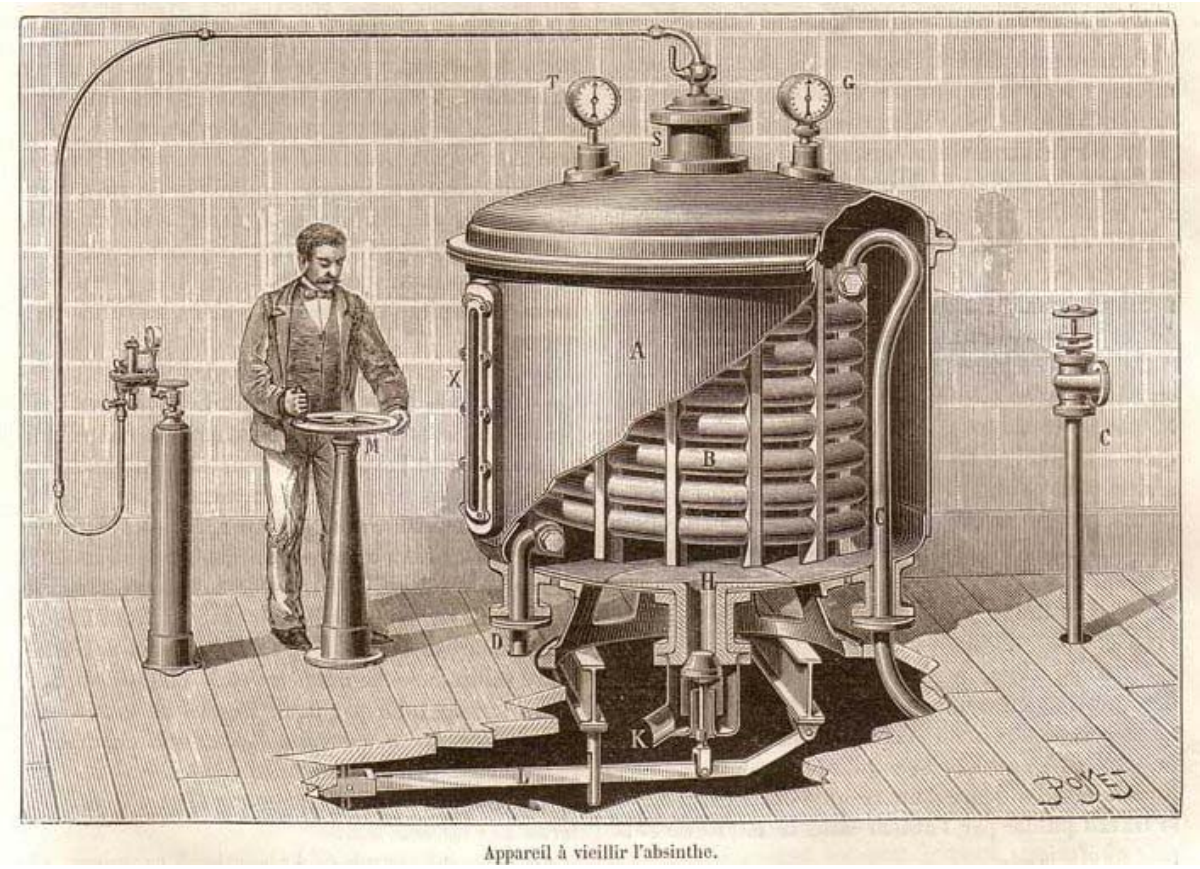
ABSINTHE[1]

AGING. — Counterfeits

Aging apparatus — In our previous article we discussed the question of the aging of absinthe; we will continue and offer some details on the subject by describing an apparatus which we have devised.

We will hold to our general procedure for aging of spirits and liqueurs, that is, the treatment of absinthe with oxygen, pure or modified, under pressure, with the aid of heat.

The figure below shows the apparatus that we use for absinthe. It is composed of a cylindrical tank A which can withstand a pressure of two kilograms and which can hold several hectoliters of absinthe. The liquid contained in this tank is heated by a steam serpentine B; the steam comes in through pipe C and exits through pipe D. The absinthe is introduced through the top of the vessel. The oxygen, compressed to two atmospheres, is sent through a pipe abutting opening S. The temperature is indicated on thermometer T; it should not exceed 70 C. The pressure is shown on pressure gauge G. The liquid can be seen through glass X. The heater can be discharged using a tap, or better using discharge tube H which is uncovered



Appareil à vieillir l'absinthe.

by means of a valve opened by wheel M, which operates lever L; the absinthe then runs out through tube K.

The aging takes 24 hours; the apparatus is charged in the morning and left under pressure until the following morning. Commercial oxygen, compressed to 120 atmospheres in steel cylinders, is used.

The absinthe absorbs, depending on its quality and the degree of aging to be lent, between 25 and 75 liters of oxygen per 100 liters. Oxygen ozonized by passing it through electrical fields in apparatus called electrolyzers, does not yield the results one would expect. On the contrary, the absinthe takes on an acrid flavor.

It is not the same with oxygen modified by passing it over lead dioxides or manganese, heated red hot.

Absinthe made from essences. — Having dealt with aging methods, we will explain absinthe made from essences.

Today much absinthe ordinaire is made by simple dissolution of essences in alcohol. The process has the advantage of not requiring a big facility, but the resulting products do not have the finesse of those made by infusion.

[1]Continuation and end. – Vol, no 1105, 4 August 1894, p. 149

We offer below the recipes used to make various absinthes.

Essence .....Absinthes of.....ordinaire.	Absinthe demi-fine.	Absinthe fine.	Absinthe suisse.
grand wormwood .....50 gr.	25 gr.	25 gr.	20 gr
petite -..... .....»	10 -	10 -	»
star anise ....50 -	40 -	75 -	10 –
anise ....10 -	50 -	75 -	30 –
sweet fennel ....10 -	15 -	25 -	10 –
hyssop..... .....»	3 -	5 -	»
melissa..... .....»	»	5 -	»
peppermint..... .....»	5 -	»	»
angelica..... .....»	5 -	»	»
Alcohol at 96%... .....51 lit.	58 lit.	70 lit.	50 lit.
Water..... .....49 -	35 -	25 -	50 –
Degree of absinthe....40°	55°	65°	45°

To obtain good results, the mixture should be exposed to a temperature of 50 degrees for five or six hours, then left in barrels for fifteen days to age artificially.

Counterfeits. – Absinthe is one of the most counterfeited liquors. The public is used to certain brands, whose fame is such that their names are the best qualification of the drink. But there are firms which sell over 10,000 liters of absinthe a day in the cafés of Paris, but which, in reality, don't deliver even the eighth part of that. The 85 per 100 of this amount is thus: counterfeit product. What goes for absinthe goes for other liquors, such as *la chartreuse*. Pursuit of the counterfeiters is very difficult, because chemical analysis yields, in most cases, no certain indication of fraud and tasting is not admissible as constituting proof.

M. E. Brochon, engineer, has found a method sufficiently precise and certain to detect the counterfeiting of a given absinthe. His means are spectral analysis and photography We will offer a brief summary, following the work published by the author in the *Revue de chimie analytique*.

The coloring in absinthe comes from various herbs which are used to make it and which are macerated in alcohol. It is mostly chlorophyll, but chlorophyll dissolves in alcohol more or less concentrated, at a temperature more or less elevated. However, changing the conditions under which the dissolution is carried out is enough to modify, if not to the naked eye, at least the spectrum of absorption for the various colors of the solar spectrum. The nature of the plants used, their relative proportions, equally affect the modifications made by the essential oils that the various plants yield to the alcohol according to the composition of the solvent, etc.

In examining the spectra of absorption of the color of the absinthe, one can, in a few seconds, determine whether the absinthe is a true example of a standard or whether it is a counterfeit, and even further, one can distinguish mixtures containing part standard product and part product of a different origin.

Here is how the things used in the process are made. The agents are provided with glass tubes 12 millimeters in diameter, five to six centimeters long and closed at both ends with heat. One of the ends is coarsely stretched and soldered; the other, on the contrary, is finely stretched, ending in a long very fragile point; before closing this point, a near vacuum is drawn in the tube, such that to fill it, in taking a sample, all the agents have to do is set it into a glass of absinthe and press the fine point against the bottom, hard enough to break it; immediately the liquid, drawn by the vacuum, fills the tube and the hole which is left is of too small a diameter to expand. Six similar tubes, furnished with numbered labels, are contained in a cigar case.

One starts by measuring the density of the absinthe, using a Mohr balance. This density must be exactly 0.886. It is a first indication which puts the experimenter on his guard by giving him primary information.

To examine the absinthe in a spectroscope, it is placed into a tube of glass in the form of a T, 80 millimeters long, five millimeters in inside diameter and one millimeter thick. It is closed with two thin crystal discs, 10 millimeters in diameter, fixed to the tube with two very flexible rubber rings. There is, in this way a chamber with quite straight walls. To the tube is soldered a tube 50 millimeters long, with the opening sealed with a plug.

This tube is filled with the absinthe to be examined. One places it into the spectroscope, between the collimating slit and the light source. One then examines the spectrum of absorption.

To make this spectrum more sensitive, Mr. Brochon resorts to the following trick. He treats the absinthe with a mixture of ether and glycerin (d=1260). After agitation and rest, there are three layers: the surface layer, which, naturally, is formed by the ether, which absorbs green and has a shade of the purest emerald, while the glycerin takes on a brown color. The alcohol is divided between the two reagents. One examines the etheric solution with the spectroscope, and one has in this manner, a new criteria which permits, always and with certainty, the distinguishing between two absinthes whose respective spectra are not sufficiently different as to strike by eyesight alone

an observer not experienced in this method of research.

From the point of view of an expert, this procedure still has a small fault, which is that it requires an observation always a little delicate, being able to be made only by experienced people. The judges are forced to rely upon the eyes of others. M. Brochon wanted to fix the spectra of absorption using photography, which is one of the most curious and interesting parts of his investigatory process.

Here a difficulty arises for photography using the visible spectrum. Ultra-violet and violet rays act upon silver bromide at a rate many times less than that required for red rays. M. Brochon obviates this disadvantage by mounting upon a frame a sensitive plate with a sliding lid, very smooth and precise, open in the direction of the band of the spectrum, starting at the red end. A clock movement slowly turns a drum with a helicoid spool, but with a varied diameter calculated in such a way that, the angular velocity of the drum being constant, the unspooling of the cord wrapped around the spool is proportional to the chemical activity of the successive rays of the spectrum. Thus the cord, attached to the lid of the frame, pulls it initially only with extreme slowness, in opening it to the reds, and at maximum speed at the other end, in the purples. This acceleration speed, for the rest, is regulated according to a geometric progression. If the apparatus is used empty, without absinthe, the photographed band has as constant an intensity as is practically possible.

By a very simple provision of the apparatus, one causes a ray of light to pass through the collimating slit, a half-millimeter above and below the ray, which, coming from the same source, passes through the absinthe. The spectrum of this ray impresses upon the sensitive plate, below the spectrum of absorption, and consequently one has to do no more than to develop the photographic plate to obtain, with the greatest possible consistency, an image of the complete luminous spectrum, thus created, to be certain of having photographs absolutely comparable and, in every case, providing each one with an indisputable scale of intensity. Moreover, this system has the advantage of fixing, in an unquestionable way, the D line of sodium and, consequently, of providing an indisputable bench mark.

Thanks to the ingenious procedures of M. Brochon, the firms with good brands of absinthe will be able to put a stop to the shameless fraud perpetrated under cover of their names, and the consumers will thereby gain, in being certain of really receiving the merchandise for which they ask and for which they pay.

A.-M. Villon,
Engineer-chemist