

THE **Rum** UNIVERSITY

Rum Appreciation In The 21st Century

Lesson III



Lesson III - From White to Gold: Modern Day Alchemy

What is Alchemy?

Webster's dictionary defines Alchemy as:

- 1) a medieval chemical science and speculative philosophy aiming to achieve the transmutation of the base metals into gold, the discovery of a universal cure for disease, and the discovery of a means of indefinitely prolonging life
- 2) a power or process of transforming something common into something special
- 3) an inexplicable or mysterious transmuting

In today's modern society, engineers (mainly chemists) are usually the ones operating the distilleries, playing the roles of magicians, transforming sweet grass (sugarcane) into alcohol. Once the alcohol has been created, it is turned over to the alchemist, who then transforms this white substance into liquid gold. But who is this mysterious person and what are his tools? The alchemist himself is Time. His tools are the vessels, which carry their contents, imparting their magic, transforming the elixir.

In this lesson we take a look inside the barrels to see the hand of time performing its magic.

The Tale of a Cask

The most popular, most accepted method of maturing rum to make it more suitable for consumption is by aging it in oak barrels. Different types of rum react to aging in different ways. Light rums with very low levels of congeners may require very little aging and may be acceptable in some markets after just a few weeks in barrels. As you may remember from Lesson II, many of the currently popular lighter rums are not aged at all. Heavier rums, however, tend to require much more aging to become palatable and may be held in barrels for many years (up to 30 or more).

Most of the barrels normally used for rum aging come from the United States, where government regulations specify that bourbon whiskey must be aged in new oak barrels. This legal requirement creates a large supply of once-used barrels. These barrels are charred on the inside and are used for aging rum either with the char intact or after its removal, depending on the preference of the distiller.

Of all types of wood, oak has the strongest influence on the maturation and final flavor of the rum, largely due to the extraction of compounds such as tannins and calcium salts and colorings such as quercitine. The type and quantity of the compounds extracted from the oak depends largely on:



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a) factors related to the aging warehouse: the duration, temperature and humidity

b) factors related to the barrels themselves: type of wood, condition of barrel prior to being filled with rum (charred, un-charred, first use) and size of barrel (amount of surface in contact with the rum)

c) factors related to the rum itself: strength, light or heavy type alcohol

New oak barrels (or "fresh" as they are sometimes called in the industry) naturally have more extractable compounds than old barrels that have been used many times over several years. Thus a light rum stored in new or once-used barrels for a year or two may emerge with much of the odor and taste of a bourbon whiskey (the main characteristics of bourbon are derived from the oak). Since this odor and taste may not be desirable in the final product, it would be a waste to use such a good, fresh barrel on a product that will have to be filtered, such as a white rum. In countries that require the aging of rums (from anywhere between 1 and 3 years), older barrels are usually the ones employed for the "mandatory" aging, and newer barrels are used for products that will go far beyond the minimum required age. White rum in these countries is usually filtered through activated charcoal to reduce the color and flavor of the oak prior to bottling.

The main transformations that take place during aging to make rums more palatable are:

a) **Esterification:** The formation of esters involves a reaction between acids and the ethanol or other alcohols in the rum, and can take considerable amount of time. The presence of esters gives the rum a generally desirable fruity aroma.

b) **Condensation:** In the condensations, molecules such as aldehydes and alcohols may combine to form acetals.

c) **Oxidation:** In oxidation that occur with air passing through the pores in the wood, ethanol may be oxidizing to acetaldehyde, which in turn may be oxidized to acetic acid, to then undergo esterification to ethyl acetate.

The temperature of the aging warehouses greatly affects the maturation process. In the book "Technology of the Rum Industry", author W. H. Kampen suggests that the rate of maturation at 25° C (77° F) may double at 35° C (95° F). What this means is that rums aged in the tropics will tend to mature faster than those aged in cooler, more temperate climates, unless these reside in temperature-controlled warehouses. Higher temperatures, however, also have a negative effect on rum production: evaporation loss through wood perspiration!

Maximizing the contact surface between rum and wood becomes an exercise in 3-dimensional geometry. Have you ever wondered why most wooden barrels you see in the world today are 210 liters (55 gallons) or smaller? That is because at this magical number they offer an optimum balance between contact surface and evaporation rate. Larger barrels/containers are less expensive by volume but will loose less of their contents to evaporation, but will also take longer to age.

Some distillers get around the contact surface problem by adding some charred or toasted oak chips to the barrels. The chips are relatively inexpensive as they can be made from scrap wood and can provide a means of standardizing the rate of maturation.



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Proof

In Lesson II we covered the definition of "Proof" along with the difference between American and British Proofs.

Proof, or the alcohol concentration of a distilled beverage, influences many aspects of rum production, including:

- a) **Evaporation:** the higher the proof, the easier the alcohol will evaporate through the pores of the wood. Conversely, the higher the proof in the barrel, the less barrels needed for storage. Depending on their climate, different distillers decide to store rum in their barrels at different proofs.
- b) **Strength of final product:** if the final product will be an overproof rum, then the rum used in its production will not be diluted to less than the final bottling strength.
- c) **Infusing/Flavoring:** when making spiced or flavored rums, the higher the proof, the easier it is for it to extract essential oils from the flavoring agents.

Why is it important to know the strength of the alcohol?

When the alcohol comes out of the still, it is so strong, that it is inadvisable to even taste it, as it immediately dehydrates whatever skin cells it touches, especially the tongue and cheeks. Alcohol this strong is hygroscopic, which means it draws moisture out of anything it contacts, even the air. For this reason high-proof alcohol must be kept sealed, or it will get diluted from the humidity in the air.

Rum commercially distilled is always bottled for sale at the same proof, and is always safe to drink. Moonshine, or alcohol distilled in clandestine or home stills is not always like that. Many people have gone blind, temporarily and permanently, after drinking alcohol that was too strong, had too many impure elements or both. If present in the distillate, methanol is often the culprit behind these blinding accidents. Other negative effects related to the consumption of illegally manufactured alcohol involve nerve damage, sores and ulcers.

In the 1930s, though, a specific affliction struck moonshine drinkers in a number of Southern states. It is estimated that some 50,000 people were crippled with partial paralysis, mostly in their legs, as a result of drinking "jake". In some cases the paralysis proved to be temporary, but nearly all victims were forced to walk in high-stepping, foot-slapping style that quickly became known as the "jake walk" or the "jake leg syndrome," which is defined as a partial paralysis of the feet and legs.

What is Jake?

Jake is actually Jamaican ginger extract, marketed and sold as a medicinal tonic for any number of ills. It was available in the United States since about the time of the Civil War, and Americans quickly realized that the nearly 70% alcohol content made "the jake" a way to skirt local or federal laws banning the consumption of liquor. Compared to whiskey, jake was often cheaper, and often had a higher alcohol content. Many drug stores sold Coca-Cola or coffee, which people would then use as mixers for the jake, often using a side room in the store to concoct their drink.



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So how bad can moonshine be?

One reporter in the 1920's described drinking moonshine this way:

"The instant he swallowed the stuff he feels as if he were sunburned all over, his head begins to buzz as if a hive of bees had swarmed there, when he closed his eyes, he sees six hundred million torch-light processions all charging at him, ten abreast, and when he opens his eyes the light blinds him and everything seems dancing about."

It's probably obvious that there are no health standards, no regulatory bodies, that govern the production of moonshine. For generations, moonshine has been made in home-made stills, hidden from sight. The forest, or a swamp, is often the easiest place to locate a still; those located closer to home can be found in barns, chicken coops, or buried underground.

Moonshiners often add some "extra" ingredients, either intentionally or accidentally, in the process of distilling their liquor. Some of these have included:

Lye, rubbing alcohol, wood alcohol, paint thinner, bleach, formaldehyde, embalming fluid, chemical fertilizers and manure.

Depending on the type of still used, pine pitch or lead often leeches into the liquor. The lead is particularly dangerous because it is virtually undetectable. If consumed, lead has a very negative cumulative effect in the human body. Due to its molecular makeup, lead is very hard for the body to dispose of, so once ingested it remains in the system often for life.

Hands-on Exercise: Caramel vs. Tannins

So what are tannins?

Tannins are members of the polyphenol family, closely related to the substances that give fruits their color, and can be found in the skins, stalks and stems, as well as in the leaves of such plants as oak and tea.

While there are a variety of sources of tannin available, it is important to remember that each source produces a different member of the family, with different characteristics and taste, so although oak leaves and vine prunings, for example - both of which have been used in the past to make country wines - may contain ample tannin, their particular taste may be undesirable in a finished product.

Measuring Tannin Levels

There are two main methods in use for measuring tanning levels. One of these is the Lowenthal permanganate titration, which dates from 1877 and was the method used at the Long Ashton Research Station from 1903 until its closure in the 1980's. This expresses the tannin in arbitrary percentage units (originally of purified 'tannic acid' which is a polygalloyl glucose obtained from oak galls).

The other method is the Folin-Ciocalteu colorimetric assay which dates originally from 1912 but in its present



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routine form owes much to Emeritus Professor Vernon Singleton of the University of California at Davis. In this form it is commonly used in the wine industry worldwide, and the tannin is expressed in terms of 'total phenolics as gallic acid equivalents (GAE)'.

The taste of tannin is easy enough to identify. Bite into a grape skin, an apple skin, a walnut, and you'll sense the dry bitterness typical of tannin. (In fact, tannin actually creates a very thin film of leather in your mouth, which is why it's the "tanning agent" for turning cow hides into a stylish fall coat and a pair of gloves.) And if you've ever sipped oversteeped tea (which is extremely tannic), you know that it's not the most pleasant thing in the world to drink.

Make very strong tea

If you have loose or bagged tea leaves in your house, prepare yourself a cup of tea as you normally do, except do not add any sugar, and make sure to steep the tea in the hot water 2 to 3 times longer than normal. Once done, take a sip of the tea. It should leave your mouth feeling dry on the surface with a noticeably bitter finish. Make a mental note for this is the taste of Tannin.

Red grapes, apple peels

If you have fresh fruit at home, try eating just the peel of red grapes or red apple. You will notice a similar sensation as when sipping the strong tea: dry bitterness coating your mouth.

Caramel, Functionality and Flavor

The type of caramel we are talking about here is different from the Caramel candy you may be familiar with. Commercial caramel is known as "Caramelized Sucrose" and its function in a beverage is to improve visual appeal. Caramel color also protects other ingredients from light deterioration, emulsifies flavor agents in the preparation of soft drink concentrates and standardizes batch-to-batch color variations when blending rum.

Some Class I caramel colors (the ones used to color alcoholic beverages) contain high levels of Furfural and Furfuryl Alcohol, key compounds found in roasted coffee beans.

To make caramel, choose a saucepan with a very heavy base. Start with ½ cup of sugar. Dissolve this sugar in ½ cup or more of water. It is essential that all the sugar completely dissolves before the syrup comes to a boil. This includes the sugar crystals that can cling to the sides of the pan, as any remaining sugar crystals, once the syrup boils, will turn the caramel grainy.

Bring the syrup to a steady boil without stirring. Watch carefully as the water evaporates, especially when the liquid reaches the stage where very large bubbles form and the syrup becomes heavy and sticky. The syrup will turn very pale and golden at the edges first. Don't stir it but do swirl the pan around a little so the sugar colors evenly. Continue to keep over the heat and cook until it becomes a deep golden color, almost brown. Now the caramel is ready to use. Working swiftly, tip the caramel on to a baking sheet and allow to harden. Once hard it can then be broken into pieces to use.

Take a small piece and place it in your mouth. Make a mental note of the flavor of the caramel. Notice the difference between the bitterness of the tannins and that of the caramel.



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From the Rum Bar: Featured Cocktail - The Daiquiri

In Lesson II we featured the Mojito. Now in this lesson we complete the list of favorite drinks of Ernest Hemingway with the Daiquiri, which he enjoyed drinking at "La Floridita".

Daiquiri #1

2 oz Light Rum
1 1/2 oz Lime Juice
1 tsp Powdered Sugar
Cracked Ice

Fill a mixing glass with ice. Add rum, lime juice and powdered sugar. Shake and strain into a chilled cocktail glass. Garnish with a lime slice.

Daiquiri #2

1 oz Light/Golden Rum
1 oz Triple Sec
Fill Sweet Sour Mix

This drink can be served shaken, on the rocks, blended or frozen. If your preference is frozen just remember to add lots of ice. Garnish with a cherry or fresh fruit of your choice.

Frozen Daiquiri

1 1/2 oz Light Rum
1 Tbsp Triple Sec
1 1/2 oz Lime Juice
1 tsp Sugar
1 C. Crushed Ice
1 Maraschino Cherry

Combine all ingredients (except for the cherry) in an electric blender and blend at a low speed for six seconds, then blend at a high speed until firm. Pour contents into a tall glass, garnish with the cherry and serve.

Frozen Fruit Daiquiris

Basic Ingredients:
30 ml Light Rum
20 ml Lime Juice

20 ml Simple Syrup (50/50 sugar and water. Heat water and sugar until dissolved then let cool)

For Fruit Flavor:

STRAWBERRY:

15 ml Strawberry Liqueur
5 med Strawberries

PEACH:

15 ml Peach Liqueur
1/2 Peach

BANANA:

15 ml Banana Liqueur
1/2 Banana

APRICOT:

15 ml Apricot Liqueur
2 sm Apricot-halves

*1 fluid ounce = 30 ml (approx.)

*Frozen Fruit Daiquiris are mixed drinks, made with fresh fruit, using a blender or mixer and lots of ice.

Shake with ice, strain into cocktail glass and serve straight up. Blend with ice for about 20 seconds, serve straight up in a nice or even fancy glass. Straw.

For variations: you can add lime juice if you think they're too sweet or add Half 'n' Half (after 10 seconds of blending) to make it softer. Garnishing: use fresh fruit as contrast in color to the mix and that compliments the drink.

Hemingway Daiquiri

2 oz Light Rum
3/4 oz Lime Juice
1 oz Simple Syrup*
Splash Maraschino Liqueur
Splash Grapefruit Juice

*50/50 sugar and water mixture. Heat water and sugar until dissolved then let cool.

Add all ingredients to glass shaker. Shake well and strain into chilled martini glass. Garnish with lime wheel.



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Lesson 3 Questionnaire

1. In which way does the aging process resemble alchemy?
2. Where do most barrels used in aging of rum come from?
3. Describe the three main transformations that take place during the aging of rum
4. If identical rums are made in two different climates, which rum will age faster?
5. What do we mean when we say that alcohol right out of the still is hygroscopic?
6. Is it safe to drink moonshine?
7. What are some of the characteristics associated with the presence of tannins in a food or drink?
8. What are the two main methods employed to measure tannin levels?

Answers to Lesson 2 Questionnaire

1. What type of barrels are used to age most of the rum produced today?

A: Oak Barrels, previously used in the aging of Bourbon/American Whiskey.

2. List three pleasant and three unpleasant aromas associated with distilled beverages.

A: Pleasant Aromas usually include:

- Smooth (Butter, Butterscotch, Oily)
- Herbaceous (Tea, Grassy, Minty)
- Fruity (Fresh or Dry Fruit: Peach, Apricot, Prune, Grape, Fig, Apple, Citrus, Orange Peel)
- Muscat (Grape, Raisin, Currant)
- Floral (Rose, Potpourri)
- Woody (Dusty, Plank, Vanilla, Oak, Cedar, Resinous, Cigar Box/Tobacco)
- Toasted (Coffee, Smokey)
- Nutty (Hazelnut, Almond, Walnut, Sherry)
- Sweet (Port, Sweet Sherry, Molasses, Cane juice, Brown Sugar, Chocolate, Caramel, Toffee, Honey, Jam)
- Spicy (Cinnamon, Cloves, Nutmeg, Allspice)

Unpleasant Aromas usually include:

- Chemical/Solvent (Ethanol, Acetone, Ethylacetate, Detergent)
- Sour (Rancid, Venegary, Acetic Acid)
- Pungent



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- Oily (Tobacco Oil, Fishy, Lees, Fusel Oil, Fatty Acid)
- Musty (Paper, Wet Cardboard, Mushroom, Musty Cork, Musty Barrel)
- Sulphury (Sweaty, Hydrogen Sulphide, Sulphur Dioxide, Caggabe, Garlic)
- Phenolic (Tar)
- Other (Plastic, Metallic, Diesel, Scorched, Rubbery)

3. What does A.B.V. stand for?

A: Alcohol By Volume

4. What is the USA standard for proof?

A: It is exactly twice the A.B.V.

5. What do "Ron" and "Rhum" mean?

A: They are Spanish and French equivalents of the English word "Rum".

6. What is the popular name given to white rums in Barbados?

A: See-through.

7. White rum absorbs color during aging. What is the process for removing this color?

A: Filtration, filtering.

8. Name two common misconceptions about white rum.

A: White rum is unaged
White rum is always white

9. List three reasons why white rum is so popular.

A: It is the most inexpensive type of rum to produce, it is very neutral in taste and combines really good with sweet mixers.

10. What are the four key elements of the Mojito?

A: Rum, mint, lime and sugar.



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About Us

We explored the West Indies and discovered real rum. Rum as it was meant to be. Distilled with time honored traditions. Traditions still practiced in the islands of the West Indies today.

Each rum is crafted with its own style, reflecting the unique character of its island origin. We invite you to share these treasures of the Caribbean.

Our thanks to the warm and wonderful people of St. Vincent and the Grenadines, who recently hosted Walt Disney Productions, during the filming of their newest feature movie, "Pirates of the Caribbean".

For a real taste of the Caribbean, try our St. Vincent Sunset rums or visit our newest link, to St. Vincent Distillers, Ltd. at www.sunsetrum.com.

Our rum products represent some of the best rum that the West Indies has to offer. The local flavor of the islands comes through in each one.

Darabella is the lovely lady on the right. She is a fine product of Trinidad & Tobago. She is holding a gold medal winning bottle of St. Vincent Sunset Premium rum, at Rumfest 2001 in Barbados.



For a complete list of our distributors, please visit our website at: <http://www.realrum.com/distributors> We are looking forward to hearing from you.

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