

Whisk(e)y: Finding the Ultimate Dram

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Introduction:

- Whisky people are not born, they're made
 - Think about what your first alcoholic experiences were. What did you drink? Would you drink it again?
 - Palates change every 3 years
 - The baby step approach- get acclimated

History of Alcohol

Clear evidence from Greek alchemists in the 1st century but perfected by the Arab scientist in the 8th Century

- 'Inventor of spirits': Arabic scientist Jabir ibn Hayya (aka Geber) began classifying individual substances. Discovered the vapors separate from water.
 - Was from Kufa which is now known as Iraq
 - 721-803AD
 - Distilled alcohol for perfume
 - Used an alembic still
- The word Alcohol derives from Al-kuhul. Kohl is a fine powder that was used as a purifier. Worn around the eyes to protect from the desert sun.
 - Medieval Europe adopted the word and applied it to the essences obtained by distillation
- 9th century- Arabic poetry refers to distilled wine called araq or ma'al-hayat, which translates as 'water of life', eau de vie or uisge beatha (oosh-kie-bay-ha)

What makes up a whisky:

- Three ingredients- Water, Grain, Yeast
- Variations are determined by the grain, shape of the stills, angle of the lyne arms, length of maturation and types of casks
 - Barley is the most common, but wheat and oats were also used.
 - Early whiskies were flavored with herbs and sweetened with honey

Origins of Whisky:

- The Celts, but no accurate records
- Saint Patrick brought over distillation to Ireland in the mid 5th Century
- In the 11th & 12th centuries, European Monks traveled between Ireland and Scotland bringing the art of distillation with them
- 1494- King's bookkeeper wrote 4 bolls of malt to Friar John Cor wherewith to make aqua vitae. That's the equivalent of 1500 bottles.
- 1530's: King Henry VIII formed his own Church of England so he could have new younger wives
 - Seizing of the Catholic Church's land holdings caused monasteries to be shuttered and monks out of work
 - Catholic ceremonies were banned and Churches were closed

- People drank in religious centers and needed a new venue- the 'pub' was born
- Unemployed monks began making whisky
 - More affordable and easier to transport grain crops
 - Barley became known as the 'drink crop'
- Between King Henry VIII and Queen Elizabeth I, Queen Mary I (Bloody Mary) was quick to kill and bring back a Catholic England.
 - English pubs became known as the place for discontented citizens to vent their frustrations regardless of sect.
- By 1577, the ratio of pubs to people was 1 pub to 187 people
- 1600's: James VI forced Scottish clan chieftains to send their children to English schools and Gaelic language and customs were banned
 - Whisky wasn't banned because the English wanted it
- 1708: England incorporated Scotland into the United Kingdom and funded it with a tax on whisky.
 - Whisky is a form of patriotism!
 - Gaelic speaking farmer's income was distilling uisge beatha
 - English demanded taxes to finance the occupying army that was there

Smuggler's Paradise

- Locals would warn distillers by raising flags or using chimney smoke
- 'Women of Spirit' wore voluminous skirts to conceal containers of whiskey underneath
- Young women strapped on two-gallon belly canteens, which was made to look like a pregnant stomach
- Priests allowed barrels to be hidden in the church and blessed empty coffins used as transport
- Dogs made solo treks carrying pig bladders of whisky and cattle drives were used to conceal hundreds of casks strapped to their bellies
- Moonshiners made 10x the amount of legal distilleries in the 1700's
- 1816 – 1820: 14,000 illegal stills were discovered in the Highlands

Credibility:

- 1820's: Whisky started to age in barrels making it fit for King & Queens
- 1822: King George IV claims that Glenlivet is his favorite
- 1823: King George lifts the ban on Gaelic customs and a new Excise Act was passed, legalizing the use of small stills.
 - A commercial infrastructure was established between distiller, broker, retailer and consumer
- 1827: Aeneas Coffey, an Irish excise officer who confiscated illegal stills, came across the design for a still that could more efficiently create beer. Coffey took the design and replaced beer with hard liquor and then patented it under his own name.
- 1848: Queen Victoria tours the Highlands and falls in love with the area. Scotch tastes really good with barrel aging.

- Orders each royal coach to carry a bottle under the driver seat in case of emergency
- Gives gifts of a bottle of Scotch to each person who hunts with her
- The guests return to England promoting the Queens new drink
- 1853: Andrew Usher creates the first blended Scotch whisky by marrying grain whisky and malt whisky

Malting:

- Barley goes through a malting process to activate enzymes and maximize starch content
- 3 extended immersions over a period of 48 hours
- Germination continues in large drums with cool, humid air blown over the barley (now called green malt) or on a cement floor. The barley generates heat so has to be regularly turned.
 - Takes approximately 5 days for the starch to be made available and shoots and roots emerge
- The growth is stopped by drying the green malt in a kiln
- Peat is used to add a specific smoky flavor when used to light the fire.

What is peat?

- Peat is decayed vegetation, decomposed over thousands of years by water and partially carbonized by chemical changes.
- Peat was the fuel of the Highlands after the Ice Age
- When burned it gives off a perfumed smoke rich in flavor compounds known as phenolics (seaweed, tar, smoked fish, Lapsang souchong tea). The phenolics are measured by Parts Per Million or PPM

Milling/Mashing

- Malted grain is ground into a rough flour (grist) which is blown into a mash tun
- Hot water is mixed in to trigger the enzymes into converting the starches into fermentable sugars
- The wort is cooled and transferred to a fermenter (washback)

Fermenting

- Yeast is added to the wort and ferments for at least two days
- Sugars are eaten by the yeast and converted into alcohol
- The wort is between 7 and 10%abv

Distilling

- First distillation takes place in a wash still, giving an alcoholic liquid (low-wines) of around 23% abv
- The second distillation occurs in the spirit still.
 - During the 2nd distillation, the stillman separates the heart of the spirit from the volatile first part (foreshots) and the oily last part (feints).
 - The unwanted elements are collected and put back into the wash still

- Heavier whiskies will be cut later and lighter whiskies want the esters at the start of the run

Copper is key and reflux is a good thing

- Copper purifies the spirit and acts as a catalyst to extract foul-smelling sulfur compounds and heavy oils. It aids in creating fragrant and fruity flavors.
- Reflux is the act of vapor rising during the distillation, most of it condensing in the still and then trickling back to be boiled up again.
- The amount of reflux depends on:
 - Size and shape of the still
 - Capacity- a high fill makes for less reflux
 - Speed of operation- fast production = less reflux
 - Temperature- warmer spirit, the greater the copper uptake in the condensers
 - Angle of the lyne arms

Types of Stills

- Onion or Plain Still
 - Large and tall onion-shaped stills afford the greatest copper contact and tend to produce the purest spirit. This is the most common in Scotch malt distilling
- Boil-Ball Still
 - The ball creates more condensation, but not more reflux. These stills tend to make a heavier more complex spirit
- Squat Stills
 - The reverse boil-ball, which also creates a complex spirit.
- Lamp Glass Still
 - The tight neck restricts and slows the upward flow of the spirit vapor to create a heavier more complex spirit
- Tall Stills
 - Tall necked stills make for increased reflux, the spirit has more contact with copper which leads to greater purity and elegance, but tends to have less character than what comes out of a squat still
- Ascending Lyne Arms
 - The more the lyne arm angles upward, the more reflux is created, making for a lighter spirit
- Descending Lyne Arm
 - A descending lyne arm encourages the vapor to pass quickly to the condenser, reducing reflux.

Maturation

- The new make (spirits from the tap) are reduced in strength and transferred into oak casks (Sherry or Bourbon)
 - 70% of the flavor comes from the wood as well as all the natural coloring
 - More tannic wood creates a deeper tint
- Bourbon barrels give aromas of vanilla, coconut, pine, cherry and spice

- Color is more golden
- Sherry butts are higher in tannin and give more dried fruits, baking spices, resin and orange peel
 - More mahogany in color

Flavor development happens in three stages

1. Evaporation and the activity of the charred inner surface of the cask removes aggressive, sulphur notes
2. The spirit extracts oak-derived notes from the barrel
3. Compounds from oak and spirit interact with each other, producing a complex array of flavors and aromas

Blending & Bottling:

- Vatting is the act of marrying different barrels of Scotch
- Single Malt means that it's 100% malted barley and comes from the same distillery
- Blended Malt Scotch Whisky: Different single malts vatted together
- Blended Scotch Whisky: Blend of single malt and grain whisky

Regions of Scotland- 4 broad categories

- Highlands: Extends from the Northwest suburbs of Glasgow to Wick in the far northeast.
 - Large range of styles
 - Malty
 - Sweet
 - Grassy
 - Heavy
 - Fruity and citric
 - Fatty/oily
- Islay/Islands: Anything that isn't Islay, the Scotch Whisky Association considers to be part of the Highlands
 - There is no coal on Islay, so peat is used to dry their malt
 - Different range of phenolics, more of a maritime, seaweedy aromas
 - Heavily peated: Ardbeg, Caol Ila, Lagavulin, Laphroaig, Smokehead, Kilchoman
 - Medium peated: Bowmore, Talisker, Highland Park, Machrie Moore
 - Unpeated: Bruichladdich, Bunnahabhain, Scapa, Tobermory, Arran, Jura
- Speyside: Highest concentration of malt distilleries are in this region with two broad stylistic camps
 - Light, fragrant, floral and sometimes malty (Linkwood, Glenfiddich, Knockando, Glenlivet)
 - Richer fruitier styles (Cragganmore, Glenfarclas, Balvenie, Macallan, Craigellachie, Longmorn, Mortlach)
- Lowland/Cambeltown: Only three operational malt distilleries in the Lowlands (Bladnoch, Glenkinchie and Auchentoshan)
 - Historically, this was where most of the grain whisky was being produced in the 1800's. Lighter and more fragrant style.
 - Cambeltown used to be the whisky capital of Scotland with 23 operational distilleries in one town. Now there are only 3. Springbank is the most recognized and produces complex Scotches that combine peat, malt, fattiness and fruit.

Grain Whisky

- Made from a mash of either wheat or corn to which a percentage of malted barley is added

- Needs the enzymes from malted barley to start the fermentation
- Lighter in character and higher in alcoholic strength than malt
- The cereal is cooked in a pressure cooker at high temperatures (avg 144 C) to break them down
- Grist (ground up malted barley) and the cooked cereal go into a mash tun. More hot water (62.8 C) is added and the starches are converted into fermentable sugars.
- The wort is cooled and pumped into fermenters.
- Yeast is added and alcohol conversion takes place.
 - Becomes grain neutral alcohol (vodka/gin)
 - Grain whisky
- Distillation takes place in a Coffey still to make a high strength spirit of less than 94.8% abv
- By law, the distillate has to have an aroma and taste derived from the raw materials used in, and the method of its production.

Migration into the Americas

- 1607: After 3 failed attempts at settling Roanoke, VA and a 20 year hiatus, Colonies were back on the British Agenda
 - Brochures boasted freedom from temptations of gluttony and drunkenness
 - England wanted the New World to produce wine and grow olives
 - Most of the early settlers died from drinking water and starving
- 1609: Governor of VA advertises for two brewers
 - People getting angry that there was no alcohol
 - Wine wasn't palatable
 - Tobacco became Jamestown's biggest export and traded for alcohol
- 1620: The Mayflower lands bringing new settlers and they find 'safe' water
 - Plymouth flourishes and more settlers come
 - Able to grow surplus food and make ale and spirits

Whiskey distillation in the US

- 1640's: 3 out of 5 breweries were distilling whisky in New York
 - Manhattan Island produced their own hops and barley
- 1676: Governor Edmund Andros banned distillation, except with damaged grain due to there not being enough for baking into bread
- 1717 – 1761: Scots-Irish & Germans immigrate to the Americas in droves (250,000)
 - Scots-Irish refers to Scottish who had settled in northern Ireland
 - Also anti-England, helped instigate the American Revolution
 - Were farmers of barley, wheat and oats in their native land
 - The settlers moved further out west to get away from government and find cheap land
 - Maryland and Pennsylvania they grew and distilled rye
 - Virginia had corn
- 1763 – 1776: American Revolution
- Early 1790's: Whiskey Boys formed in Western PA-
 - The events contributed to the formation of political parties in the US
 - Farmers were already war veterans and were fighting for the principles of the American Revolution (against taxation without local representation)
 - 1791: Excise tax on domestic spirits by Alexander Hamilton, 1st Secretary of the Treasury
 - Only the Philadelphia College of Physicians supported the bill
 - The Wilderness Road, the northern route over the Alleghenies from VA had whiskey for sale at strategic points

- Boonesborough grew corn and made spirits
- Whiskey could be traded for land, weapons, labor, food and other commodities
- September 1, 1791: 17 men dressed as women, scalped, tar and feathered Robert Johnson, a collector for President Washington
 - Very little collecting was done for the next two years
- Larger distillers started paying taxes and retaliation struck out
- Tom the Tinker: shooting holes in a still and then had to be fixed
 - Known as mending
 - Wrote letters to the press in favor of a continuing revolution
- July 1794: Whiskey Rebellion begins
 - Federal officials were told to collect the excise tax and to serve writs on those distillers who had refused to pay
 - Farmers banded together and marched to the home of General Neville, the excise-man for Allegheny, Washington, Fayette, Westmoreland, and Bedford counties.
 - Neville killed two men, so the Whiskey Boys burned his house, barn and slave quarters to the ground. They at least drank the general's cellar before torching it.
 - Almost 5000 rebels banded together to march on Pittsburgh
 - President Washington accrued almost 13,000 soldiers to quiet them, but no fighting happened
 - The rebellion decided to give in due to the growth and their allies being focused on the Mississippi.
 - In conclusion to the rebels surrendering, Washington set aside February 19, 1795, as a day of national Thanksgiving

The Mississippi River

- A peace treaty with Spain gave America the right to trade on the Mississippi River
- 1803: America bought Louisiana and there were no more limitations on American trade.
- Kentucky distillers began to ship their spirit downriver on barges to New Orleans in barrels bearing the brand Bourbon County and America's most famous whiskey was born
- In the 19th century, bourbon and rye were booming
- 1810: Federal statistics- there were twice as many gallons of whiskey per year as there were people in America
- Prosperous living due to substituting spirits for beer, wine & cider
 - 1810: 16 pints of whiskey per man, woman and child to 8 pints of beer
- 132 breweries in PA, NY and OH produced 185,000 barrels
- 1820: Consumption rose to more than 5 gallons per head per year
 - 9 million women & children drank 12 million gallons
 - 3 million men drank 60 million gallons
- 1825: 3 million Americans had migrated west of the Alleghenies, generating surpluses of whiskey, tobacco, flour, hogs, beef and lumber.

How Bourbon got its name and color

- Bourbon is named after the French royal family
 - 1785: In gratitude for France's help during the Revolution, The US named a decent sized portion of Kentucky after the House of Bourbon.
- Elijah Craig: Legend has it that he had a fire in his small distillery and damaged barrels. He didn't want to throw them out so filled them with corn whiskey. The burned wood gave color and flavor. His neighbors started copying him after that.

Bourbon business:

- The people of New Orleans liked the whiskey coming down the river and started asking for it by name, 'Old Bourbon'.
- Other people started lying about where there's was coming from and just putting the name 'Old Bourbon' on the barrel
- Bourbon became the general term for whiskey distilled from corn
- 1830's: Americans drank an average of 6 gallons of bourbon a year (24x more than today)
- 1850: Pennsylvania had 3,000 registered stills
- 1862: ¼ of the government's revenue came from taxes on whiskey

Bourbon travels west

- First establishment in the center of the Wild Wild West (Dodge City) was a whiskey tent
- 1876: Dodge had 19 whiskey saloons for 1,200 inhabitants
 - Bourbon became adulterated on its travels west by touching too many hands
 - Western whiskey had been nicknamed; coffin varnish, tanglefoot, Taos lightning and tarantula juice

Regulations

- 1897: Bottled-in-Bond Act was passed by Congress
 - Colonel Taylor, the creator of Old Taylor Bourbon, was instrumental in proving that the Bourbon flavor needed to be protected
 - First federal consumer protection ever created
 - Bourbon became a quality drink

Cocktails

- Invented in the US for those that couldn't stomach whiskey
- First printed in May 6, 1806, The Balance and Columbian Repository on a drinks bill of a political candidate
 - The paper's editor printed a clarification: "Cock tail, then, is a stimulating liquor, composed of spirits of any kind, sugar, water and bitters...it is supposed to be an excellent electioneering potion inasmuch as it renders the heart stout and bold, at the same time that it fuddles the head."
- 1822: Kentucky breakfast, "three cocktails and a chaw of terbacka"
- Thomas Jefferson: tried to get Americans to drink wine instead of spirits by reducing duties on imported wines and set out to find an American equivalent

Temperance movement

- 1920 – 1945: Death of American whiskey
 - Volstead Act closed almost all the distilleries
 - World War II ceased whiskey production
 - Scottish and Canadian whiskies flooded the speakeasies
 - The American palate changed, preferred lighter flavors
 - Rye disappeared

During Prohibition

- By 1926: Americans were consuming 50 million gallons a year of adulterated industrial alcohol
 - Bootleggers learned how to remove, neutralize, or dilute denaturants (ethanol alcohol with additives to make it undrinkable)
 - Each gallon of industrial alcohol produced three gallons of mock whiskey, gin or brandy

- Uses of denaturants include:
 - Fuel for marine and ultra-light camping stoves
 - Sterno
 - A sanding aid
 - Stain removers
 - Cleaning solvents
 - Shellac
 - Kerosene heaters
- 2nd largest domestic source of bootlegged booze was moonshine (spirits from illegal stills)
 - Long and honorable connection with the Appalachian Mountain region
 - Illicit stills that were seized during prohibition:
 - 1921: 95,933
 - 1925: 172,537
 - 1930: 282,122
 - Quality was sacrificed for quantity once the Volstead Act was enforced
 - Shortcuts were taken to mask un-aging such as adding dead rats and rotten meat to the distillate
 - Pet names for shine:
 - Mountain Dew
 - Panther
 - Goat whiskey
 - Jackass Brandy
 - Yack Yack Bourbon
 - <http://youtu.be/P-nGbAf81Zs>
- The Speakeasy was born
 - Cocktails became in fashion because fruit juices and sugar were used to mask poor quality
 - Women began tipping more ardent spirits out of the home and in public
 - Didn't make sense to make weak spirits
- Mixed messages
 - President Harding drank whiskey while vowing he would enforce the Volstead Act
 - Director of Prohibition enforcement in northern CA confessed in public, "that he did drink occasionally" and served liquor to guests because he was a gentleman and not a 'prude'.
- Death Toll
 - By 1923, thirty prohibition agents had been killed in action
 - 1925: poisoned alcohol death toll rises to 4,154 people
- Automobiles facilitated bootlegging. Bootleggers could cover larger distances faster
 - 1921: 9 million cars on the road
 - 1929: 26 million cars on the road
 - Moonshiners sent police on high-speed goose chases through the mountains. They practiced their driving skills on Sundays in friendly competition and crowds gathered to watch. NASCAR started.

American Whiskey Comeback

- In the early 1990's there were only 10 distilleries in Kentucky and 2 in Tennessee
- Now there are over 200 distilleries in the US
- September is National Bourbon Heritage Month

Bourbon Production:

- Rules
 - Minimum of 51% corn with the rest being made of rye, wheat and malted barley
 - Few distilleries use all 4 grains

- Must be distilled to no higher than 80% abv and aged at no more than 62.5% abv in new, charred barrels made from American oak
- Straight Bourbon is at least two years in barrel
- No coloring is allowed
- Can be made anywhere in the US
- Rye is a minimum of 51% rye
- Corn is a minimum of 80% corn

Mash Bill

- Malted Barley
 - Used for more than the enzymes
 - Adds a biscuit sweetness and a dry finish
- Corn
 - Gives Bourbon a soft sweetness
 - Young corn based whiskies are tight and grainy when young, but mellow with age
- Rye
 - It's the attack, gives the Bourbon a bite
 - Rye is very aromatic, but when young has a slight dustiness
 - In Bourbon, rye is detected from the middle of the palate when an intense, acidic and slightly oily quality begins to bite. Gives a spicy lift to the spirit
- Wheat
 - Provides whiskey with a gentle rounded sweetness with notes of honey

Cooking/Mashing

- Corn is ground into a meal and cooked at a high temperature along with a small out of malted barley
- The corn mash is cooled before adding rye or wheat
 - Rye burns at high heat and there is a greater risk of bacteria forming
- After the rye or wheat is cooked with the corn, the temperature is lowered and the rest of the malted barley added for its enzymes

Backset

- The mash is pumped to the fermenters along with the acidic liquid residue (backset) left at the foot of the beer still (a single column still)
- Backset changes the pH level of the mash by making it slightly more acidic. It's used in places where they have hard, alkaline water. (Tennessee/Kentucky)
 - Helps yeast reproduce and lowers the risk of bacterial infection
 - Evens out character between batches
- When backset is added to the cooker instead of the fermenter, it's known as sour mashing
- By law, backset must make up a minimum of 25% of the total mash
 - Too much and the mash will be very dilute and acidic
 - Too little will make the mash too thick and cause solids to stick to the insides of a still

Bourbon Distillation

- First distillation takes place in a single column still called a beer still made of either copper or stainless steel (with copper coating around key areas)
- Mash is pumped at or around the top of the column. As it travels downwards, live steam is pumped into the bottom of the still
- Alcohol is stripped off and breaks upward to the collection plate before passing through a worm condenser.

- What's left at the foot of the column is the backset
- The low-wines are then put through a basic pot still known as a double.
 - Removes impurities and boosts the alcohol level

Wood

- New charred American oak barrels (200 litre max capacity)
- High in color extracts and vanillin and lactones
 - Give the spirit its reddish hue and signature notes of vanilla, coconut, pine, sweet spices, chocolate, tobacco and cherry
- Heavy charring is away to remove any aggressive elements in the white dog (new spirit)
- Jack Daniel Cooperage: <http://vimeo.com/47112320>

Warehousing

- 7 to 9 story rackhouses are used
- Traditional storage: Temperature is controlled by opening or closing the windows
 - Vast temperature fluctuations between the top and bottom floors
- Blending from different areas of the warehouse is done to make a consistent style
- 'Small batch' has no meaning since you can legally use up to 1000 different barrels in one blend.

Tasting

- Don't swirl and stick your nose right into the glass
- Put the glass up to under your nose and smell with your mouth open a little
- Look for flavors past the alcohol

Cereal	Cookies	Breakfast Cereals	Bran	New Leather	Malt Extract	Corn Mash	
Fruity	Stone Fruits	Citrus Fruits	Tropical Fruits	Dried Fruits	Stewed Fruits	Hard Candy	Solvent
Floral	Grass	Rose	Heather	Lavender	Violets	Artificial Perfume	
Smoky	Smoked Foods	Bacon Fat	Bonfires	Burning Leaves	Peat Smoke	Tobacco	Tar
Medicinal	Bandages	Mouthwash	Coal	Tar Soap	Iodine (sea salt)	Antiseptic	
Wood	New Wood	Cigar Box	Cedar	Sawdust	Pencil Shavings	Vanilla	Tannins
Oily	Butter	Cream	Crème Brulee	Soap	Cheese	Leather Polish	
Sulphur	Rubber	Struck Matches	Yeast	Cooked Veggies			

Great Quotes!

- Mark Twain- "How solemn and beautiful is the thought that the earliest pioneer of civilization, the van leader of civilization, is never the steamboat, never the railway, never the newspaper, never the Sabbath-school, never the missionary- but always whiskey!"
- Al Capone- "When I sell liquor, it's bootlegging. When my patrons serve it on a silver tray on Lake Shore Drive, it's hospitality"

- President Jimmy Carter's Mother- "I'm a Christian, but that doesn't mean I'm a long-faced square. I like a little Bourbon."

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Tidbits:

- In the American Wild West, it was not only polite, but imperative to your physical well-being to drink your whiskey with your gun hand.
- In the 19th century, the cure for a snakebite was two pints of 100-proof bourbon
- The pot stills used by Macallan are the smallest in Scotland and are so distinctive, they're featured on the back of the Scottish ten-pound note
- 19th century Irish police received a 'britches allowance', to pay for damages to their trousers while chasing moonshiners
- President Lyndon B. Johnson's favorite drink was Scotch & soda. Drank it in a large white plastic foam cup while driving around his Texas ranch in a convertible. When he was running out, Johnson would slow down and hold his left arm outside the car, shaking the cup and ice. A secret service agent would refill it with ice, Scotch and soda.
- The Manhattan cocktail (featuring whiskey and sweet vermouth) was invented by Winston Churchill's mother
- The term 'brand name' originated among American distillers, who branded their names and emblems on their kegs before shipment (ie, Old Bourbon)
- Whiskey is the international aviation word used to represent the letter 'w'

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