

Coming

MAD SCIENCE IN THE PURSUIT OF GREAT BEER

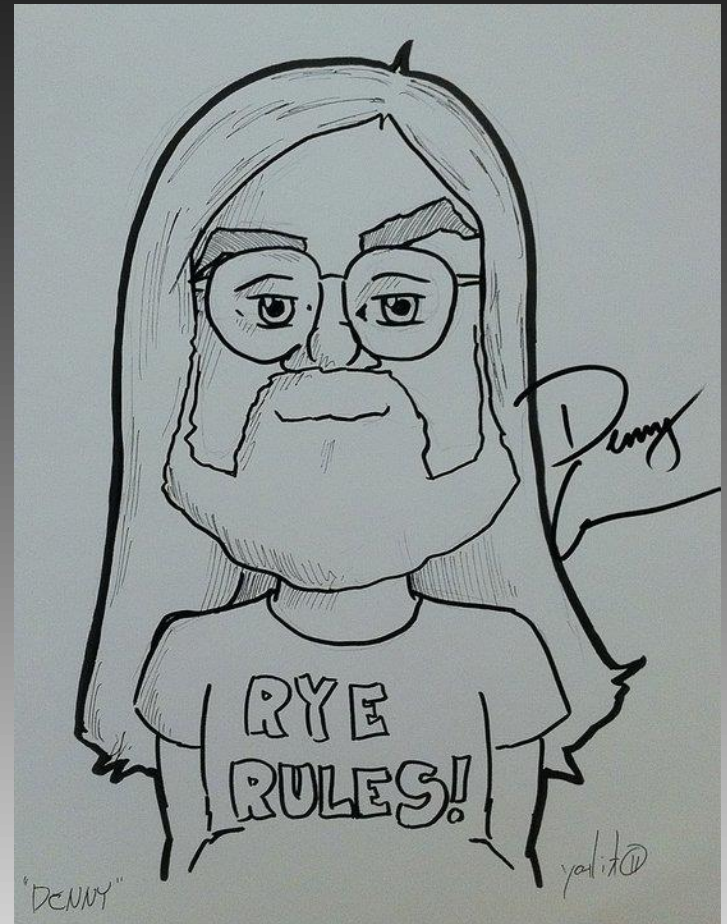
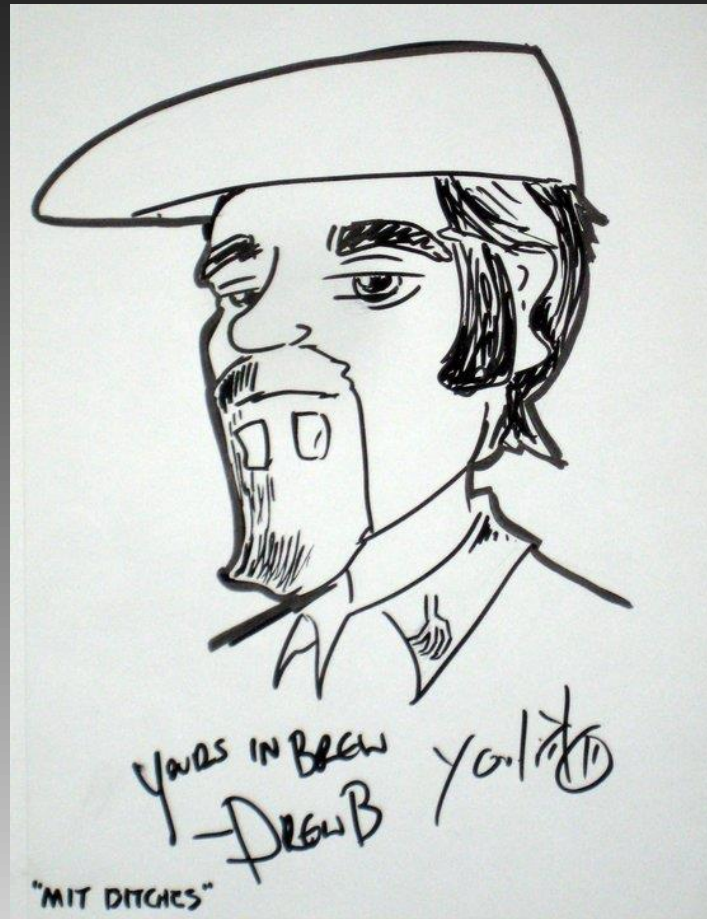
EXPERIMENTAL HOMEBREWING



BY DREW BEECHUM
AND DENNY CONN

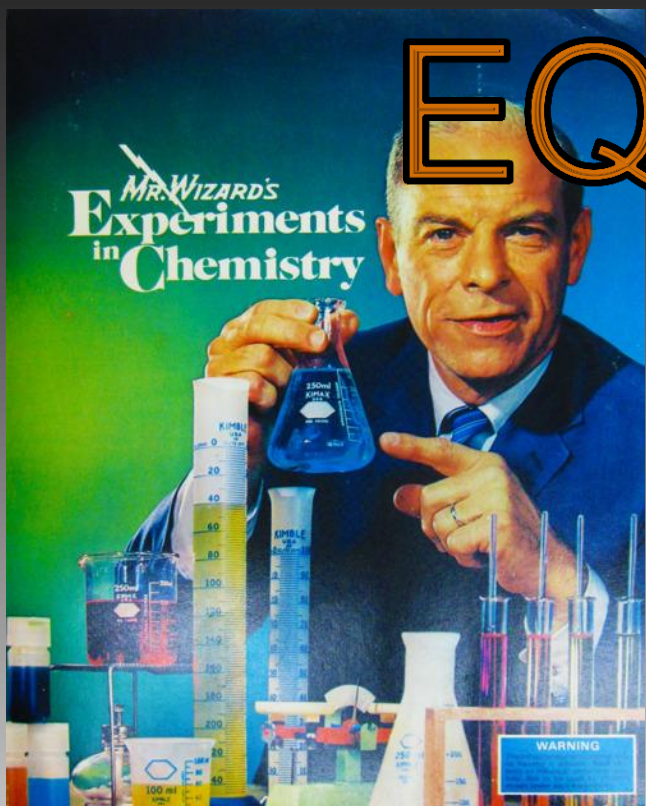
This November

Mad Scientists

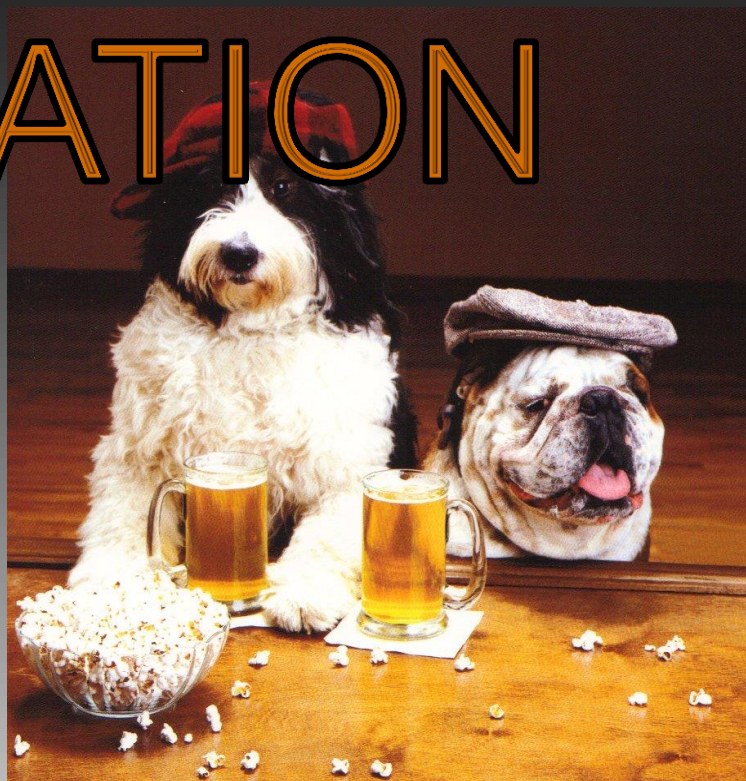


The Book

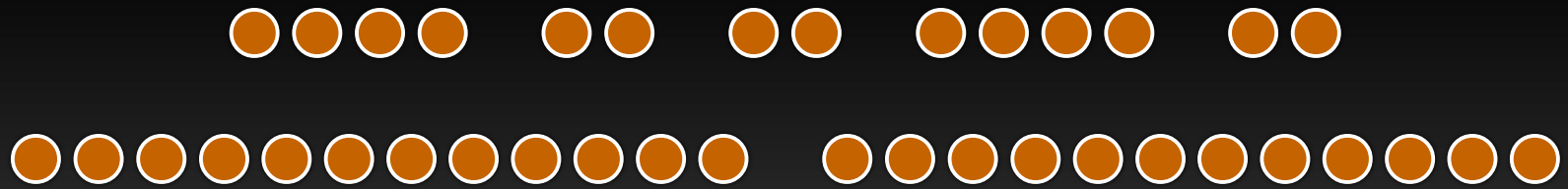
EQUATION



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- Wild, wacky, dangerous, crazy pants ingredients and techniques to make unique (heh heh) beers

and

- Careful, objective comparison and evaluation of techniques and ingredients to discover what REALLY works for you

What We Don't Mean

We're not here to tell you what you like or what to do...

We're here to help you figure it out for yourself!

C'mon – would you trust us to know what we're talking about?

The “WACKY”

Experimental

Brewing





Inspirations

Current Inspirations

- Drew : World Beverages like –
 - Chica Morada Purple Corn, Pineapple
- Denny: anti wacky, “because I can” beers

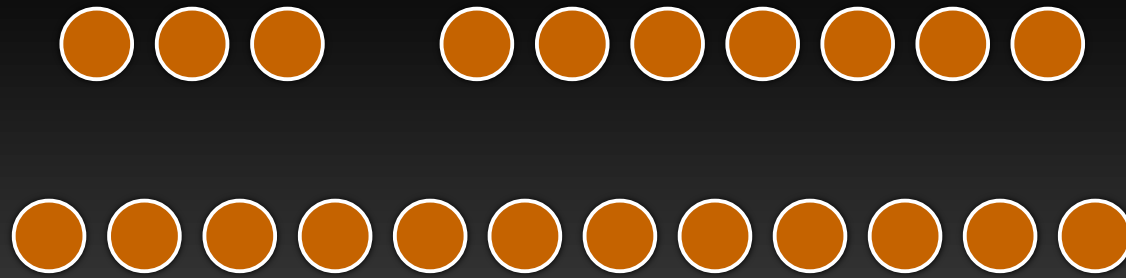
Don't be willy nilly about it!

- Set a goal – “Taste” the beer in your mind before you start thinking about what goes into it.
- Know your ingredients and have a reason for using each of them.
- Sometimes less is more. Sometimes more is more.
- Look at what's been done before and how it was done. Don't copy, be inspired!

An Inspired Recipe

Wee ShrooMy





- Randy Mosher's "Nirvana"
- Scott Braker-Abene's
"Traquair House Clone"
- Living among the shrooms

For 5.5 gallons, 26 IBU, 15.9 SRM, 9.6% ABV

GRAIN BILL

20 lbs Simpson's Golden Promise Malt (see Notes)
4 oz Roasted Barley (450°L)

HOPS

1.1 oz Northern Brewer Pellet 10% AA 45 minutes

OTHER INGREDIENTS

½ tablet Whirlfloc 10 minutes
2 lbs Chantrelle mushrooms (see Notes)

YEAST

WY1728 Scottish Ale in 3-qt starter

INSTRUCTIONS

- Mash for 90 minutes, vorlauf until free of grain pieces, then run off wort to boil kettle.
- Remove 1 gallon of first runnings to a separate pot for boil-down. (See Notes.)
- Boil for 90 minutes. You can add the wort previously removed for the boil-down at any point during the main wort boil.
- Chill to 55–58°F. Pitch decanted yeast starter.
- Aerate well with the method of your choice.

NOTES

- This is a high-gravity beer, and aeration is crucial to a good fermentation. Ferment at 55°F until final gravity is reached. This could take 2–4 weeks. When final gravity is reached, add 2 pounds of prepared chanterelle mushrooms (see note) to a sanitized secondary container and rack the beer onto the mushrooms. Leave the mushrooms in for 2 weeks, then transfer the beer to another container for cold conditioning. Condition at 35–40°F for at least a month. Keg or bottle with a moderate carbonation level.
- While this recipe can be made without Simpson's Golden Promise malt (and I've done that several times), the results are so much better using Golden Promise that I urge you to seek it out and use it for this recipe. Between the Golden Promise and the chanterelles, this is not an inexpensive beer to brew, but the results are worth every penny you spend.
- For the boil-down, remove 1 gallon of the first runnings to a separate pot. Boil until the wort is reduced to a quart or less. It should be almost a syrup by the time you get done. Add to the boil kettle during the main boil, before chilling the wort.
- For the mushrooms, thoroughly brush the dirt off 2 pounds of chanterelle mushrooms. Do not wash them, or if you must, use as little water as possible. Roughly chop the mushrooms. At this point, you can give them a *light* spray of Star San if you wish, but make sure the mushrooms are very dry. Put them in a vacuum-sealed bag, seal it, and freeze the mushrooms for at least a week. Remove the mushrooms from the freezer at least a day before adding them to the beer. Put the mushrooms and any liquid in the bag in a sanitized secondary container and rack the beer onto them.
- Depending on what your water chemistry is like, you may need to add some calcium chloride (CaCl_2) to the mash and/or kettle. Shoot for a total of about 50 ppm each of calcium and chloride.
- If you have access to other varieties of mushrooms, try a porter with candy cap mushrooms. Use the same mushroom procedure I describe for the Wee Shroomy and apply it to your favorite robust porter recipe.

An Inspired Recipe

Bratty Brat



Bratty Brat

- What does “Bratwurst Beer” mean?
- Let’s start with the assumption
 - no meat
- Where do we go from there?
 - Provide flavors inspired by
 - Bread
 - Sausage and “Fattiness”
- What’s the origin of Bratwurst?
 - Nuremburg, not Wisconsin

BRATTY BRAT BEER

By Drew

This beer was born of a silly commercial that lampooned homebrewers with one crazy brewer offering his buddies a Bratwurst beer. It was meant as an “ohh, look at this wild crazy thing.” Naturally, I took that as a challenge and made this deconstructed bratwurst beer using all the spices of a German Brat with hint of bread and grain and spicy rye.

For 5.5 Gallons at 1.057 O.G., 13.8 IBUs, 4.0 SRM, 5.9% ABV

GRAIN BILL

6.0 lbs Pilsner Malt
5.0 lbs Wheat Malt
1.0 lbs Rye Malt

MASH SCHEDULE

Rest 124°F 20 minutes
Rest 150°F 60 minutes (raise via decoction)

HOPS

0.25 oz Magnum 14% AA 60 minutes

OTHER INGREDIENTS

½ tablet	Whirlfloc	10 minutes
⅛ tsp	Allspice, lightly crushed	5 minutes
⅛ tsp	Black Pepper, lightly crushed	5 minutes
⅛ tsp	Caraway Seed, lightly crushed	5 minutes
⅛ tsp	Celery Seed, lightly crushed	5 minutes
⅛ tsp	Clove, powdered	5 minutes
⅛ tsp	Ginger, powdered	5 minutes
⅛ tsp	Nutmeg, grated	5 minutes

YEAST

WY1010 American Wheat for a neutral profile, WLP380 Hefeweizen IV for a mild German Hefe profile, or WLP410 Belgian Wit II for a spicier finish

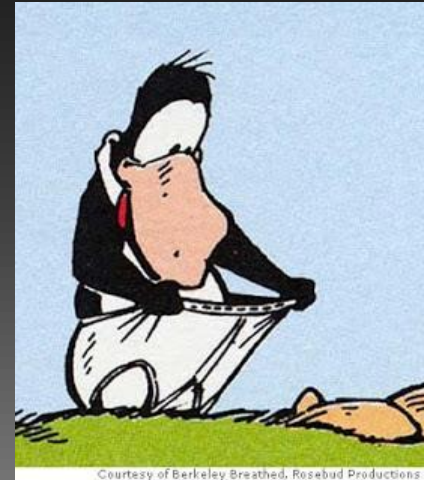
ADDITIONAL INSTRUCTIONS

- Take the first quart of runnings and reduce to a cup, allow it to get scary dark to add a bit of smokey complexity to the beer.
- Ferment cool and check spicing. Adjust via tincture.

“Wacky” Techniques

– Fortify!

- Fortification for Fun
- Finally a use for Everclear/Diesel!
- Traditionally a wine technique – Sherry, Port, etc.
- Gun for 17-18% ABV and stuff the Penguin!



Randallize!

- Hops!
- Why not more?
- Fruit
- Coffee
- Spices



Damn the Torpedoes

- But why focus on “last minute” serving?
- Filter your beer through your flavor
- Sierra Nevada Torpedo the Home Game



Demonstration!

Stand Back It's Science
Time!

Nitro Charged Extracts

- ½ cup Vodka (Nothing fancy)
- 3 Trader Joe's Chai Masala Bags
- 2 Nitrous Chargers
- Quick shake and filter

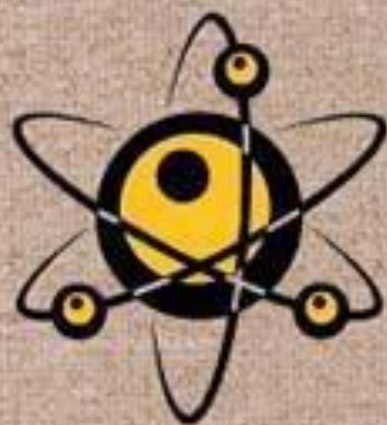
- Note: Stop saying "Chai Tea"

The “SCIENCE”

Experimental

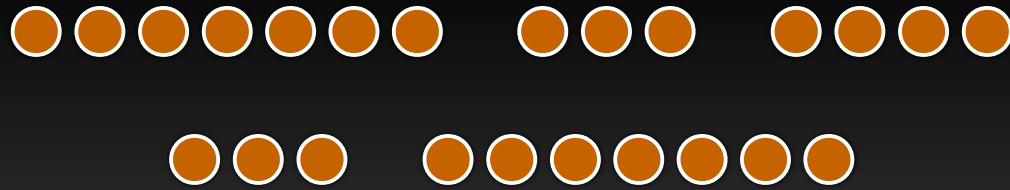
Brewing

Beer

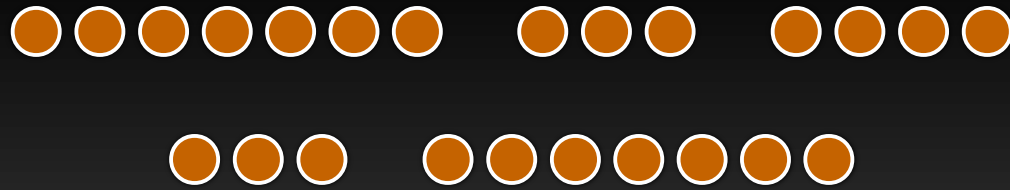


**It's Science
in a glass!**

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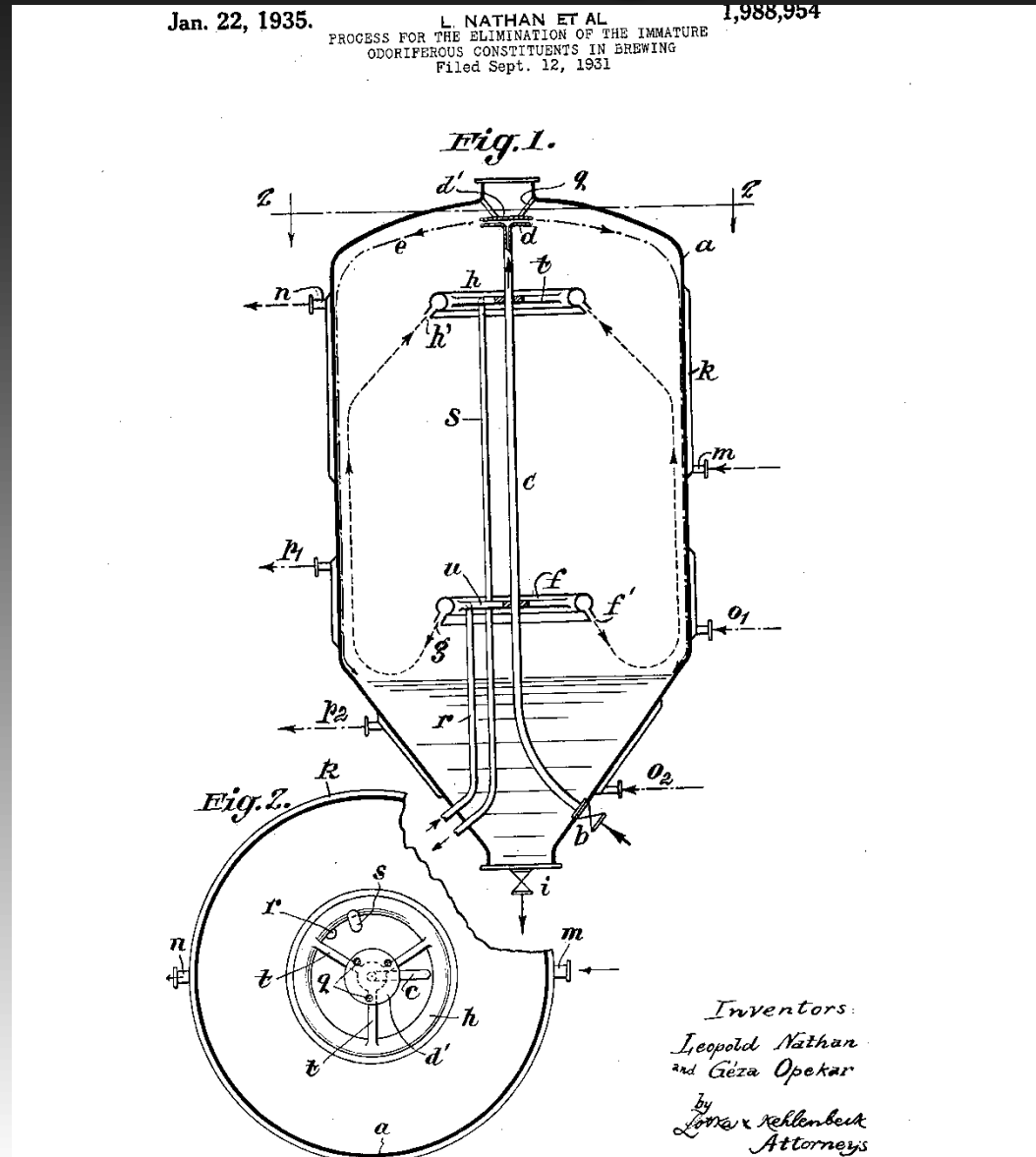
- Beer science is all done at the commercial level
- Not all of that applies to us due to different scale and goals
- This is all kitchen science
 - Not as reliable as if our lab coats were real
 - Scale it to improve “accuracy”



- Thermometer – from thermoscope in 1617 to Fahrenheit in 1724 to Celsius in 1742
- Saccharimeter – 1845
- Louis Pasteur – 1878
 - "Les Microbes organisés, leur rôle dans la Fermentation, la Putréfaction et la Contagion"
- Lager yeast from South America – implications for human migration patterns

Another Breakthrough

- Nathan Fermenter
- Look familiar?
- Designed in 1927
 - Leopold Nathan
- Improved ferments
 - Removal of “gunk”
 - Yeast circulation



The Art of Tasting

For the best results, it helps if it's a relatively quiet and odor free place so your senses won't wander. And don't go smoking a big ol' cigar when you're trying to evaluate!

Step 1: Pour about 4-6 ounces of beer into a clean, clear glass.

You weren't going to drink it from the bottle, were you? Pour vigorously enough to get a moderate head on the beer, but not so much as to interfere with drinking it.

Step 2: Swirl and smell the beer. Write your notes on the aroma.

Gently swirl the glass to release some CO₂. The carbonation helps carry aromas to your nose. Sit back and relax.

Start with three drive-bys: pass the glass under your nose and take a short, sharp sniff of the aroma. Think about the smell. Do that twice more. Write down your impressions. Did it smell sweet? Fruity? Pungent? Dirty? Whatever it smells like, think of it as a description, not a judgment. Don't try sounding fancy with phrases like *tones of a warm Belgian lawn*. However, if the beer smells like fruit punch with grass in it, then write it down. Your notes are to help you remember, not impress the crowd with your sagacity.

Note: If you're having trouble finding the aroma of the beer, try an old trick to help cleanse your sense of smell. Before you sniff the beer, smell your shirt sleeve. No, not your armpit! It's amazing how plain cotton can neutralize your sense of smell and let the aroma of the beer come through.

Step 3: Examine the visual nature of the beer. Observe the color, clarity, and head.

Take a good look at the beer, paying special attention to its color and clarity. Hold it up to a light or shine a flashlight through it to perform a thorough inspection. Examine the head on the beer. Is it tight or loose? Are there big bubbles or small bubbles? What color is it? Does the head last or does it dissipate quickly? Again, jot down your impressions.

Step 4: Smell the beer again.

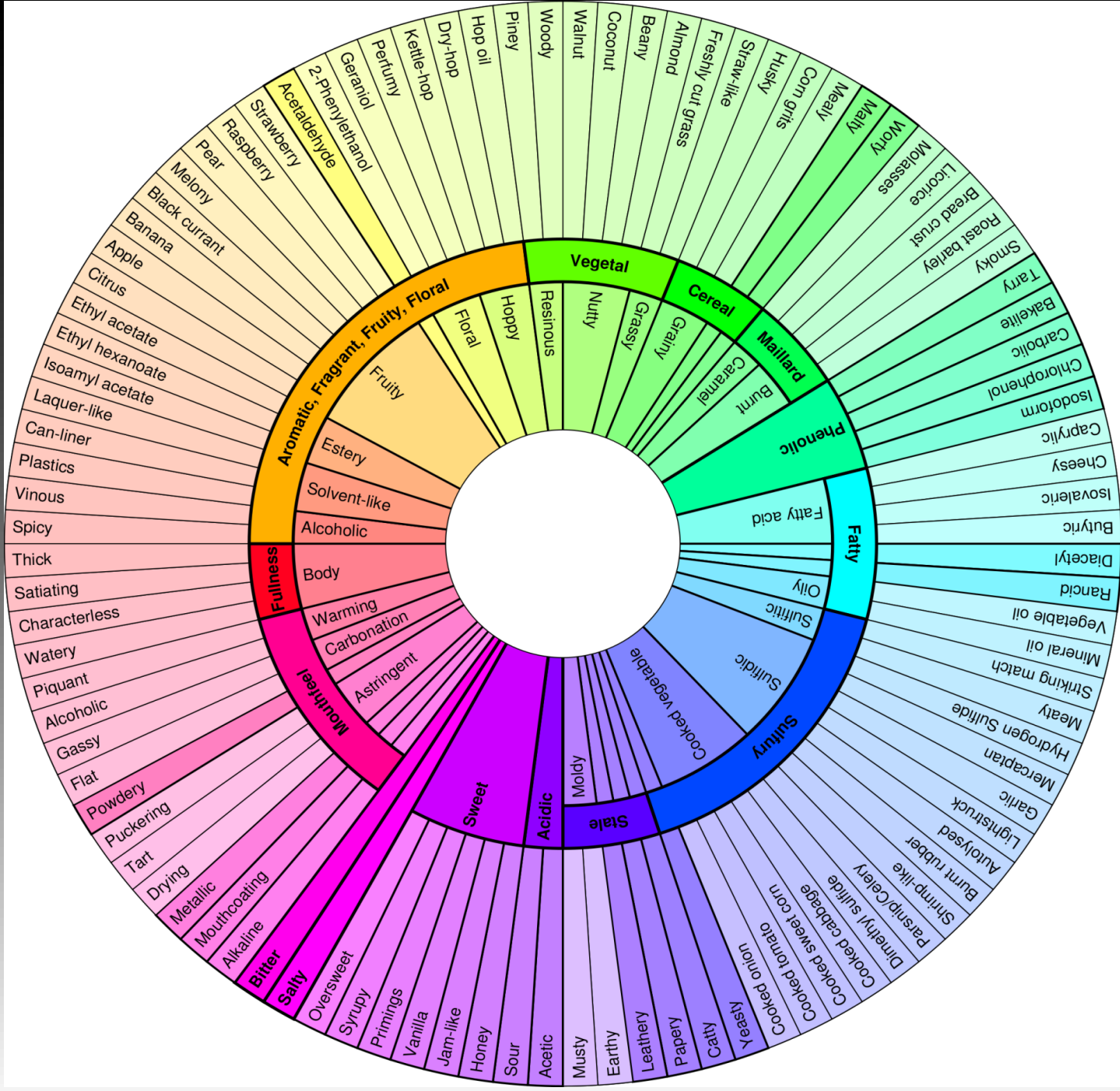
Go back and do another couple drive-bys. As the beer warms and CO₂ escapes from solution, aromas change. You'll want to see if you smell anything that you didn't earlier. Sometimes a particularly strong aroma on your first passes dissipates by the time you revisit the beer.

Step 5: Taste the beer.

OK, now the good part: taste the beer! Take a small sip, maybe about an ounce. Swirl the beer around your mouth so it coats your gums, the roof of your mouth, and all parts of your tongue. Swallow the beer and immediately exhale through your nose. That's called retronasal stimulation (ooh, science!) and will really bring out the aroma and flavors.

Think about what you taste. Is it sweet, malty, sour, bitter, fruity, or alcoholic? What's the mouthfeel like? Is it full-bodied and mouth coating? Is it thin and digestible? Is it highly carbonated and spritzy or is it smooth and mellow? What's the balance like? Is it malty or hoppy? Is the finish dry or sweet?

You may be asking yourself if this is all a bit too wine snobbish like. Yes, yes it is. But the reality is that for just a moment, you need to focus all of your organoleptic sensors on gleaning every last bit of data from the beer.



Aroma

Malty

Light/moderate/heavy/harsh

Bread – light/dark

Cookie

Grain/hay/straw/cereal

Toasted/roasted/burnt/nutty

Molasses/caramel

Chocolate – mild/strong

Coffee – mild/strong

Hoppy

Light/moderate/heavy/harsh

Flowers/perfume/herbs/grass

Pine/spruce/resin

Citrus –

grapefruit/orange/lemon/lime/tangerine

Other fruit – mango/passion fruit

Yeasty

Light/moderate/heavy/harsh

Dough/sweat

Horse blanket/barnyard/leather

Soap/cheese

Earth/mold/cobwebs

Meat/broth

Miscellaneous

Banana/bubblegum

Grape/raisin/plum/prune/date

Apple/peach/pear/pineapple

Cherry/raspberry/cassis

Wine – white/red

Port – tawny/ruby

Cask wood (like oak, for instance)

Smoke/tar/charcoal/soy sauce

Honey/brown sugar/maple syrup

Coriander/ginger

Allspice/nutmeg/clove/cinnamon

Vanilla/pepper/licorice/cola

Alcohol

Dust/chalk

Vegetable/cooked corn

Cardboard/paper

Medicine/solvent/band aid

Soured milk/vinegar

Sulfur/skunk

Appearance

Head – Initial Appearance

Size – small/average/large/huge

Rocky

Creamy

Frothy

Fizzy

Tight

Loose

Head – Color

White

Off white

Light brown

Beige

Tan

Head – Lacing

Excellent

Good

Fair

Virtually none

Head – Longevity

Fully lasting

Mostly lasting

Mostly diminishing

Fully diminishing **Clarity**

Clear – brilliant/sparkling/normal/flat

Cloudy – hazy/murky/muddy

Hue

Light/medium/dark

Yellow

Amber

Orange

Red

Brown

Black

Flavor

Initial, Mid Palate, Finish Flavor

Sweet – light/moderate/heavy/harsh

Acidic - light/moderate/heavy/harsh

Bitter - light/moderate/heavy/harsh

Acetic (vinegar)

Sour (sour milk)

Salty

Finish – Duration

Short

Medium

Long

Lingering

Palate

Body

Light

Light to medium

Medium

Medium to full

Full

Texture

Dry

Watery

Oily

Creamy

Syrupy

Carbonation

Fizzy

Lively

Soft

Flat

Finish

Metallic

Chalky

Astringent

Alcoholic

The “Experiments”

Experimental

Brewing



Why experiment?

- It's important that you know "How You Brew"
- It's important to know what actually works for homebrewers.
- It's important to know what's meaningful
- It's important to share with the community



- Step Mash Impact
- Dark Malt Oxidation
- HSA
- Impact of Sugar Additions
- Fermenter Geometry (Hello, Nathan!)
- Pitch Rate Impacts
- Olive Oil “Aeration”



- 1. Start with the question**
“Do decoctions matter?”
- 2. Then the hypothesis**
“Decoctions do not create a noticeable sensory difference over an infusion mash.”
- 3. Then the Protocol**
 - 1. Do two mashes – one decocted, one infused**
 - 2. Ferment and package the same**
- 4. Then the Evaluation...**



Grownup version of

"One of these things is not like the other... one of these things is different"

Beer 1: A Pilsner made with a decoction mash

Beer 2: A Pilsner made with a standard infusion mash

Question: Does decoction mashing have a perceivable impact on the beer flavor/aroma?

Hypothesis: A decoction mash will produce different flavor characteristics than an infusion mash without decoction

A Quick Word on EVOO

- The Idea: Can a brewer provide a direct source of sterols to yeast for health instead of depending on oxygen additions to encourage creation of sterols.
- The Study: Grady Hull with New Belgium studied the effect on yeast in storage
- Homebrewers went nuts (It's cheap! It's easy! It's completely wrong!)

Student T Test

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{1}{2} (s_{x_1}^2 + s_{x_2}^2) \cdot \frac{2}{n}}}$$

Student Example One

t=0.44

Beer 1	Beer 2
35	20
34	21
38	22
23	33
42	28

Student Example Two

t=0.14

Beer 1	Beer 2
34	22
33	23
37	24
22	35
41	30

**Hey Kids! It's Science
Time!**

Time for a

Demonstration!

And now to test the mettle of a few
“blind” judges

The Experiment



- Shhh! – Don't let the Panel know!
- Question: Does a dirty glass impact aroma and visual characters?
- Setup: "Oily" glass was rubbed with neutral vegetable oil and then wiped "clean" with no soap

Questions? Ask!

Find us at:

ExperimentalBrew.com

Facebook: experimentalbrewing

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