

BEER, BOURBON & BEYOND

BY PENNFIELD JENSEN

It was a woman who drove me to drink, and I never had the courtesy to thank her for it.

—W.C. Fields

Alcohol is a big deal in this country, and throughout the world. Hundreds of billions of dollars in play, innumerable lives enlivened, enriched, and, alas, also destroyed by “demon rum.”

The making and selling of alcohol can be a thrilling enterprise, but it is also a war zone. Not only do the major brands battle tirelessly over market share among themselves, especially as they seek to attract and capture the Millennial Market (all you LDA’s—Legal Drinking Age—out there between the ages of 21 and 32), there is a cultural war. Some call it the Craft Revolution. Others see it as the War On Craft. I have spent the last 13 years of my life deep in the trenches of this revolutionary war, having just a few months ago retired as Emeritus Executive Director of the American Craft Spirits Association. I began in San Francisco, but there have been many stops along the way including a stint at Upland Brewing Company assisting in its transition to new ownership, and as Executive Director of the Brewers Guild of Indiana.

I want to share some of what I have learned over the years and what I foresee coming down the pipe. I’m starting here under the beneficence of *The Ryder* with a three-part series: Beer, Bourbon and Beyond. For those who care, I’ve created a website of the same name (.com) to share in much greater detail what will be here just a scratch on the surface of what many believe to be the cradle of modern civilization: the creation and enjoyment in its many forms and guises of the ultimate frenemy, alcohol.

PART ONE BEER

Beer is proof that God loves us and loves to see us happy.
—Benjamin Franklin

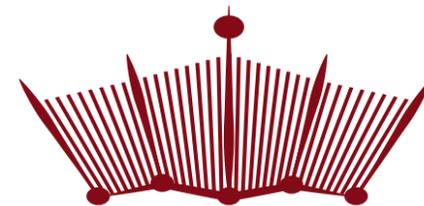
It is commonly said that “beer is food.” The justification for this is yeast. Yeast, that elegant, sensitive, tiny single-celled creature that converts sugar water into carbon dioxide and ... *ta da* ... alcohol! These blessed little critters that have been recorded “singing” (when the fluid temperature is perfect), just as they have been recorded “screaming” (when the temp is too hot).

Although fermentation has been around for untold millennia, that yeast was the cause of fermentation is a relatively recent discovery by Louis Pasteur in 1857 who was investigating why beet juice sometimes made alcohol and sometimes soured.

Although most, if not all, of yeast’s secrets have now been revealed, the fermentation process is worth a closer look. Beer fermentation proposes a charming and rather prophetic metaphor: typically, the brewer dumps (*itches*) yeast into a cozy vat of warm malted-barley sugar water (the *wort*). Yeast heaven! Nothing to do but eat, excrete, and make more yeast. Those excretions, as most everyone knows, are primarily carbon dioxide and alcohol. And therein lies the rub. After a few days, the yeast produce so much alcohol that they pollute their heavenly habitat and either die or go into toxic shock. The process is called *attenuation*. At the point where the attenuation is complete, and the yeast are totally wrecked, victims of shock and awe, the merciful brewer

lowers the temp to 0° C, (which puts all the living ones to sleep) and pours himself a sample pint of the consequence of that pollution: *beer*. Perhaps the Master Brewer similarly will show up and thank us for our work here with the planet...but on that score I have serious personal doubts.

But, hey, it’s all beer; it’s all good. Which brings up a monumental conundrum among aficionados: lagers vs. ales. Until very recently, lagers have reigned more or less uncontested upon the throne of beers. With the advent of craft brews, predominantly ales, that has begun to change...dramatically. There are now over 4,100 craft brewers in the United States. They make hundreds of different styles, and now generate almost 28% of all beer sales, and growing. The big guys are feeling the heat. Case in point: Constellation Brands’ billion-dollar acquisition of San Diego’s Ballast Point Brewery, (Yep, one billion. Hard to fathom.)



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1. Behold the rain which descends from heaven upon our vineyards, there it enters the roots of the vines, to be changed into wine, a constant proof that God loves us, and loves to see us happy
2. A recording of screaming yeast can be downloaded from my website beerbourownandbeyond.com
3. You can view “The African Booze Tree,” a video clip of elephants and baboons and giraffes getting totally wrecked on fermented figs on my website.

Fundamentally, the difference between lagers and ales is the kind of yeast that’s used. Lager yeast (*Saccharomyces pastorianus*) got started in the 1500’s somewhere in that part of greater Europe more or less around Pilsen, from whence hails pilsner. Ale yeast (*Saccharomyces cerevisiae*) also called Baker’s Yeast has been around since the beginning of civilization, and a powerful argument holds that the desire for beer is what kick-started staying in one place to grow the grain necessary to make the beer that sped non-stop from Mesopotamia 7,000 years ago to Budweiser sponsoring the Super Bowl, i.e., civilization as we know it.

The other part of the distinction between lagers and ales is cold brewing vs. warm brewing—often referred to as “top fermenting” (ales) and “bottom fermenting” (lagers). But the top-bottom distinction is not as precise as the cold vs. warm one. Cold-brewed lagers (under 10° C) give us those EZ Drink’n crisp, clean and sometimes slightly skunky flavored beers, and the “light” beers that have virtually no discernable flavor whatsoever. Lagers also age longer and at far lower temperatures in the eponymous process called “lagering.” Ales (brewing between 15° - 25° C) ferment faster, and tend to be fruitier, with big hugs all around for maltiness, hoppyness, and depth of flavor and color. But here’s the mystery within the conundrum: *S.pastorianus* does not exist wild anywhere in Europe! It has only existed in the vaults of the European brewers and their minions, and has been thus secreted since the early 1500s. So, where did it come from?

Saccharomyces (sugar-eating yeasts) thrive on oak trees. In 2011 a team of scientists found a strain of *S.pastorianus* growing wild on oak trees in Patagonia. Who would have guessed? So, to paraphrase an expert, “How the hell did it get to Europe 600 years ago?” [How about the Spanish and Portugese *conquistadores* desperate for oak to repair their ships, or the

Dylan Swift, *Nick’s English Hut*





Kelly McKiernan, Lennie's (BBC)

barrels they used to carry home the booty from a plundered continent? All good vectors for the good Sr. Pastorianus being a stowaway. Any takers for that theoretical scenario? No matter how it got there, get there it did, and the rest, as they say is history. And today those good Dutch, German, and Belgian lagers can be found all around the globe.

Ales have taken a different trajectory. Popularized in England as pale ale, or Bitter, then enhanced famously during the Raj by adding more preservative hops to create India Pale Ale, and now the flagship IPAs of so many modern craft brewers. Hops, ah yes.

The *wort* (the barley malt sugar water) is the heart of every beer known to man. It is here where most of the bittering and flavoring elements that define a beer's style *and quality* get introduced. The key bittering agents are hops, of which there are at least 32 varieties—many under duress thanks to climate change, especially in the Northwest where several of the more popular hop varieties are grown. And there is a metric for judging bitterness, IBUs (International Bittering Units), which most brewpubs proudly post, along with the ABV levels (alcohol by volume) for each style on tap. But the *wort* is where other flavorings are introduced as well: coriander, orange curacao, chamomile—for wheat beer—and all sorts of crazy-ass things that irrepressible brewers like to toss in such as pumpkin, mulberries, raspberries, persimmons, and so on. Not to mention the classic Belgian “sour” beers with their ancient lineages that use wild yeast to make a beer then pack in fruit for a (secondary) barrel fermentation that can age for a year or more. When done right, sour blends with sweet to a fructuous delirium.

Barley, specifically *malted* barley, is the brewer's grain of choice although other grains are also used, such as rye, or in the case of the popular wheat-based styles such as *wit* (white) or *heffeweisen*. In aggregate, the mixture of ground-up grains is called the *mash*. And the vat in which the *mash* is transformed into *wort* is called the *mash tun*.

A grain of barley looks a lot like a football that is rounded at one end. Basically, it's a shell made of cellulose surrounding a cache of starch. The starch is a kind of battery, storing energy waiting for folks to come along and start using it. Those “folks” are enzymes, wormy-shaped proteins of enormous power. There's a little packet of these at the tip of the kernel, along with a genetic package containing a barley embryo (the light bulb). When triggered by a pleasant shower of warm water,

the enzymes wake up and start their work: slowly and carefully converting the starch in the kernel to sugar to feed the little green shoot that will grow and grow until it anchors itself in the earth and builds through the warm days into those amber waves of grain we sometimes sing about.

However, if, say, after three days, one halts this barley germination process by exposing our little sprout to high heat something new and exciting has happened: the barley kernel is now *malted*. The Scots famed use of burning peat for this imbues the malt with a flavor that once tasted can never be forgotten, and bless, bless, bless them for that! (But all that is in Part 2.) When malted barley is ground and mixed with hot water, the enzymes—now freed from their measured constraints—convert the *mash* of crunched up starch to sugar water in a process that's virtually instantaneous. The *wort* is drawn off and the spent grain (mash to mush) discarded. (Many brewers provide the spent grain to cattle and buffalo ranchers.) The *wort* is boiled—to sanitize it—and hops *et al* added to make a giant pot of malted barley tea that once cooled, will serve as the short-lived heaven for our yeast.

But I should not gloss over the significance of *wort* creation, for here is where the art of brewing meets the science of it. So far, my description of *wort* is similar to saying automobiles use internal combustion. But

THERE ARE DIFFERENCES BETWEEN MY KIA SOUL AND A MUSTANG GTO, NAMELY “MUSCLE” AND “PERFORMANCE.” AND THIS IS WHERE THE ART OF BREWING MEETS THE SCIENCE OF IT.



In an episode of the Sitcom “Cheers,” Cliff explains “the buffalo theory” to Norm.

Well, you see, Norm, it's like this: A herd of buffalo can only move as fast as the slowest buffalo. And when the herd is hunted, it is the slowest and weakest ones at the back that are killed first. This natural selection is good for the herd as a whole, because the general speed and health of the whole group keeps improving by the regular killing of the weakest members.

In much the same way, the human brain can only operate as fast as the slowest brain cells. Now, as we know, excessive intake of alcohol kills brain cells. But naturally, it attacks the slowest and weakest brain cells first. In this way, regular consumption of beer eliminates the weaker brain cells, making the brain a faster and more efficient machine.

And that, Norm, is why you always feel smarter after a few beers.



Top Left to Right

Caleb Staton, Director of Sour Operations; Eli Trinkle, Cellarman; Pete Batule, VP of Operations

Bottom Left to Right

Adam Covey, Quality Assurance Manager; Nicholas Nehring, Assistant Brewer/Cellar; Cody Chestnut, Assistant Brewer/Cellar

there are differences between my Kia Soul and a Mustang GTO, namely “muscle” and “performance.”

Yeasts vary widely in their ability to tolerate alcohol. “Muscle” yeasts produce higher than average ABVs, and as taste trends have red-shifted toward hoppy, higher alcohol beers, such as Trappist-style tripels and Imperial IPAs, these yeast strains have become popular. However, to get the higher ABV, the brewer needs heavier worts, that is he needs more available sugar. Comparing the weight or *specific gravity* of a particular *wort* to the weight of plain water provides a metric differential between the two. At the conclusion of fermentation a second measurement is taken and the difference between the incoming *wort* and the outgoing *beer* determines how much of the sugar has been converted to alcohol, call it *performance*. What the yeast does not consume is called *residual sugar*.

The true artistry comes when the brewer can combine just the right amount of “heavy” *wort* with just the right amount of hops so that the yeast attenuate leaving the least amount of residual sugar behind. Call it “balance.” Achieving that fulcrum point of perfect balance among all the variables is the Holy Grail for most brewers, and is the main reason you should pay attention to the specialty and seasonal releases from our great local breweries. Some say perfection has been achieved: Dark Lord Imperial Stout from Three Floyds in Munster, Indiana, but it is only released once a year, on Dark Lord Day. Some people wait in line all night to secure a few precious bottles (very limited release) at the brewery. If you're up for it, this year Dark Lord Day is April 25th.

About now is when most of my audiences start glancing at their watches or longingly at the bar with its glinting bottles and beckoning taps, hoping for a pint. I don't blame them, and that's what I would like to do as well, join up and to take in the truly best part of the great process of brewing: drinking and savoring the combined artistry of brewer and brewed.

Cheers.

Next up in our March 21st issue: Bourbon! (Actually, whiskey—or whisky if you wish—in all its myriad and delightful forms.)