Brew Your Own

November 1998, Vol.4, No.11
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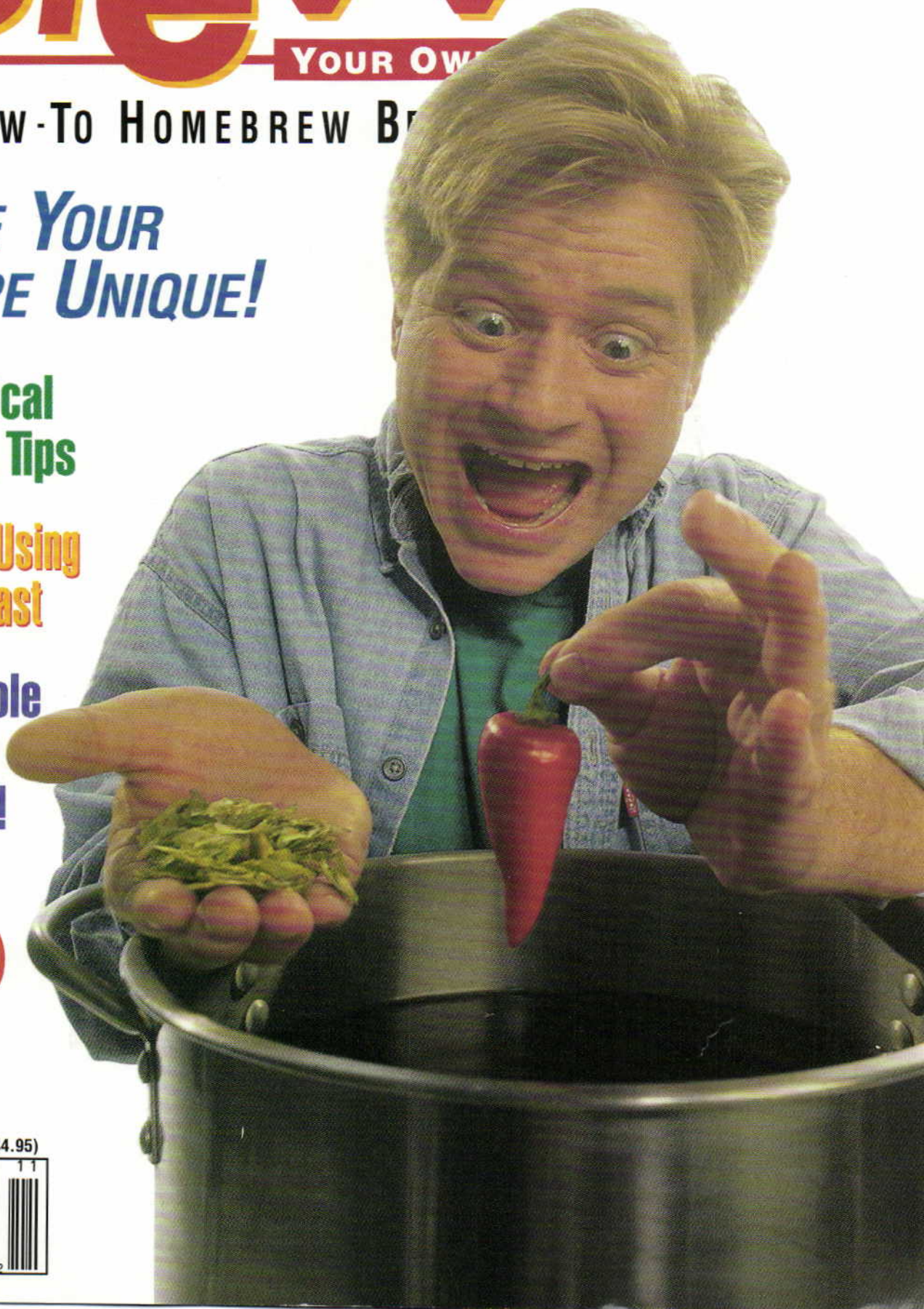

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A bold leap in technology brings you The Brew House beer kit: fresh, all-grain wort without extract or concentrate. Now you can brew all-grain beer in only minutes and make your best recipes even better. Brew House: the next generation of homebrewing.

RIF Vienna Lager

(Recipe for 5 US gallons*)

1 Brew House Pilsner Kit
1 lb. Munich malt
8 oz. Aromatic malt
8 oz. CaraVienne malt
1 oz. Saaz hops
Wyeast 2124 Bohemian lager yeast

1. Crack your grains and place them in a grain bag.
2. Add grain bag to 2 gallons of cold water in a 3 gallon (or larger) pot. Place over medium heat. Bring temperature to 170°F and hold for 20 minutes.
3. Remove and discard grains and boil for 20 minutes. At the end of the boil, add Saaz hops, remove pot from heat and steep hops for 5 minutes.
4. Cool the liquid and use it to make up the volume of the kit. Top up with water if necessary. Do not forget to add the pH adjustment package.
5. Pitch your yeast culture and ferment at 46-54°F.

Your RIF should be ready for bottling in 6 to 8 weeks. With long lagering comes smoothness, rich complexity, and assimilation.

*This recipe is for the 5 US gallon (19 litre) kit. Get in touch and we'll send you the Canadian version. We have other recipes too—just ask.

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Cover photo: Kent Lacin

Brewing: For the Birds?

So you think those nifty opposable thumbs are keeping your place safe at the top of the evolutionary chart? A front-page article in the local newspaper recently explained some new research involving scrub jays. When you hear the results, you'll understand why the article was on the front page.

It seems these birds have a compulsion to hide food. You give them a nut or a bug or a piece of caramel corn (for city jays) and they immediate put it behind something, under something, on top of something, or in something. Sure, doesn't everybody? But here's the amazing part: They always remember where they put it!

Now, this was serious scientific research that went into a lot more detail, but I don't need to know any more. One of the scientists stated that the brains of birds seem to function the same way humans' brains do. Wrong! First of all, I don't have to hide things to not be able to find them. Second, even if I remember where a thing is and I look for it in the right place, I don't necessarily find it. That is until I complain to my wife and she points to it, invariably right in front of my face.

And as for hiding things, let me just mention that I still can't find one of the Christmas gifts I bought for her in 1996.

The point is, I'm thinking about buying a scrub jay to keep track of my car keys.

Memory is a funny thing when it comes to brewing, too. My brewing partners and I had a method for keeping track of things. We used fill-in-the-blank recipe sheets and made notes in the margin. Of course any time we rebrewed the recipe we'd have to stop and have a beer while each of us presented his own interpretation of what the notes really meant.

This month, professional brewer John Oliver offers some hints for those of us who have memories worse than a scrub jay.

He helps brewers create a simple system for record keeping that will help you remember and duplicate your successes and remember and avoid your not-so-successes. The article presents a system you'll like whether you're the scientific, numbers-and-formulas type or like me, the average liberal arts guy with a bad memory. The story, "Keeping the Record Straight," begins on page 38.

And speaking of arts and sciences, this month's cover feature examines the struggle between art and science that makes the craft of brewing fun. "The *Art* of Recipe Design" (page 32) looks beyond the typical recipe calculations to the basic choices that make a beer unique.

This isn't about who has the best trigonometric calculator; it's about understanding the effect that various ingredients have on beer appearance and flavor, then being able to manipulate them like a fine craftsman to produce the result you want.

Check it out; it's a story even a bird brain could love.

Craig Bystrynski

Brew Your Own
The How-To Homebrew Beer Magazine

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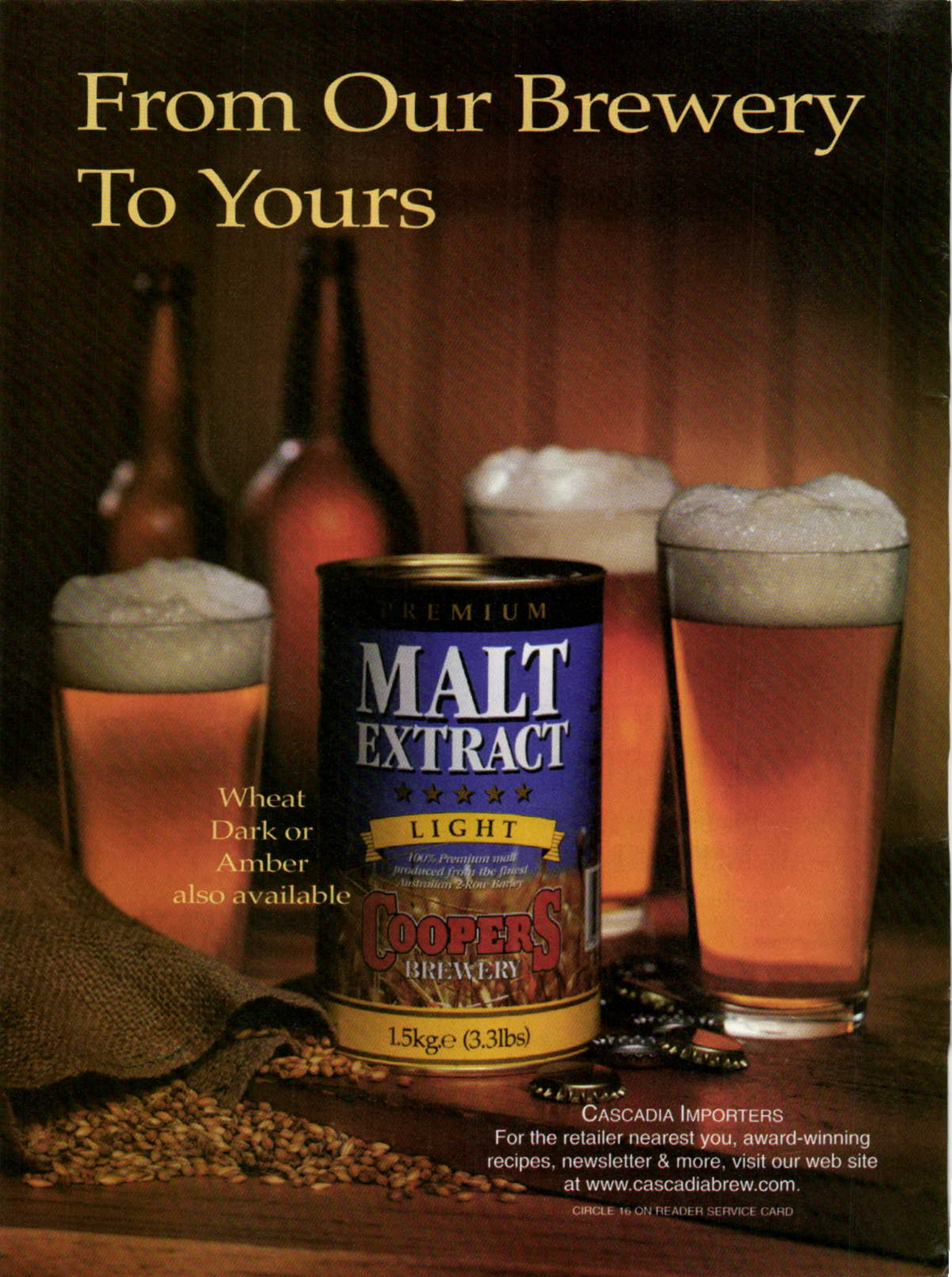
From Our Brewery To Yours



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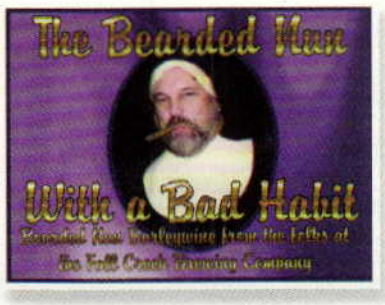
John Hartline
Fall Creek Brewing Co.
Marysville, Wash.

Cheers from the Fall Creek Brewing Co. (We felt that a name would lend some legitimacy to our R and D.)

Being a homebrewer in the Northwest is just about as close to beer heaven as you can get. We are lucky enough to be in proximity to the homebrewers-gone-amuck who were instrumental in getting the microbrewery renaissance kick started and even luckier to be within easy driving distance of hop heaven in the Yakima Valley.

In addition, we have some of the greatest homebrew supply outlets to be found anywhere. What's it all add up to? Witness here, homebrew gear to the extreme. What could be better than 15 gallons at a time and beer friends to drink it so you can brew more beer? Our motto: "Drink all you want...we'll make more!"



John Hartline shows off his tap handles, brewing setup, and label. When you're surrounded by good beer it's easy to find brewing inspiration.

Brew Who!

Who do you brew with? Neighbors, friends, homebrew club members, your significant other, maybe your loyal dog? Tell us how you met, your favorite brewing story, or why you brew together. There's a cool BYO T-shirt in it for you. Send your story (150 words) and photo to Pot Shots, c/o Brew Your Own, 216 F Street, Suite 160, Davis, CA 95616. Or send us e-mail at edit@byo.com. Be sure to include your mailing address and daytime telephone number!

Lisa Hughes
Westchester, Calif.

I brewed a batch of Raspberry Wheat Ale and gave a six-pack to a friend. This is the e-mail I received in thanks.

From: Annette Hunter
To: Lisa Hughes
Subject: cheers

Raspberry. Quite bold of you. The funny thing is that if this were 100 years ago I could see this interest in brewing as an interest in needlepoint or some other domestic proclivity.

I became so inspired by the parallel and the pure beauty of craft, any craft, that I decided to scribe a poem.

This is dedicated to all who have done a good job and to those who really haven't done a good job and to those who just did a bad job and to those who were too lazy to even get off the couch.

This is dedicated to anyone who understands what I'm feeling, who knows what I'm saying and what I intend to say in the future. This is to all of you.

By Annette Hunter
beer drinker

So natural, useful and a joy
to behold
this malted amber jewel
A courage provider
an acquaintance uniter
a fire for a few.

Oh please warm my heart
with your thick golden glow
Let me taste your wicked ways.
Induce delirium
your tricky truth serum
I've dreamt of you for days.

HEY GOOD LOOKIN'

Be the first on your block to dress in a cool BYO T-shirt. It's not only stylish, it's free! All you have to do is send a story (150 words) and photo for Pot Shots. If we publish it, we'll send you a T-shirt, no questions asked! Be sure to include a photo, your name, address and daytime telephone number. Mail to:

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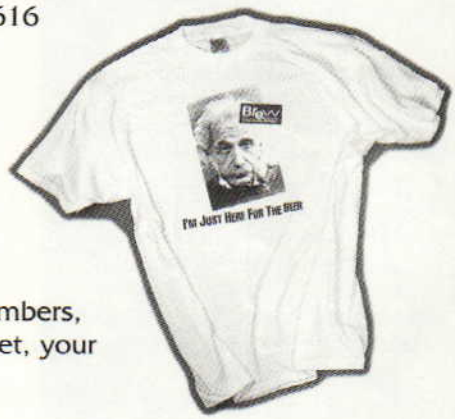

This Month's Category:

Who do you brew with? Neighbors, friends, homebrew club members, your significant other, maybe your loyal dog? Tell us how you met, your favorite brewing story, or why you brew together.

How To Reach

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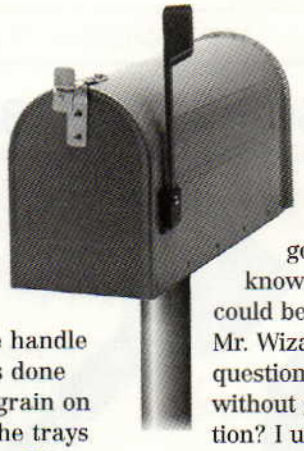

Spent Grain

Dear Brew Your Own,

My husband, the brewer, called "Cooking With Spent Grains" (September '98 BYO) to my attention. Here's how we handle spent grain. As soon as he is done brewing I spread the damp grain on squares of waxed paper in the trays of our round food dehydrator. The grain is dried and ground in my small spice grinder (hey, we use what we have). The dry product can then be stored in the cupboard, taking up very little space. It can be added to anything in any quantity you desire, such as cookies, cakes, pie crusts, and breads. Start with a small amount and work up to the desired taste and texture.

Dorothy Brown
Elkton, Ky.

Looking for Spreadsheets

Dear BYO,

A (very) long while ago ("Create Your Own Brewing Spreadsheet," October '96 BYO) you published a series of spreadsheets to help with recipe formulation and said that they were available for download. Well, eons later here I am getting around to looking for them and can't find them. Is there somewhere I can find them?

Myke Blakeman
via e-mail

Try our Web site (www.byo.com), where we have reposted the original spreadsheet, which was created by professional brewer Scott Lowry.

Mr. Wizard: Ramblin' On?

Dear BYO,

I enjoy the range of articles that BYO provides, from homebrewing goofups to technical articles to news to Style of the Month.

I read that you are putting the Style of the Month section back in (beginning in January). Thank you very much! This was a very interesting part of the magazine, and I was sorry you had decided to take it out.

Hey, Mr. Wizard, get to the point! Do you know how many questions could be answered in the Mr. Wizard section if the questions were answered without giving a full dissertation? I understand that sometimes a question can get involved, but most people just want a simple answer to their questions and one they can understand. Sometimes Mr. Wizard doesn't even answer the person's question. I feel the answers, in most cases, go far beyond what was asked and sometimes may confuse the reader. Just get to the point!

Doug Hiebert
Lakewood, Colo.

In Search of Hops

Dear BYO,

I just finished reading "Design Your Own Brewer's Garden" (May '98 BYO). I have brewed my own beer since 1992, and I started a hop garden in 1995. I grow Cascade, Nugget, Mount Hood, and a "wild" type found around here. Last year a friend of mine gave me a hop rhizome called "Savinjski." Right now the cones are fantastic, and my friend is gone with the wind. Have you ever heard of this hop, and is it an aroma or bitter type?

Laurent Livernoche
Maskinongé, Quebec

You would need to take some leaves and cones to a hop scientist to get a definitive identification, but based on what your friend told you, you probably have Styrian Goldings, which are neither Goldings nor from Styria. The hop is actually a Fuggle cone from the former Yugoslavian area of Slovenia. (Savinja is the Slovene name for Styria, which is in Austria.) Maybe the Solvenians figured that Styrian Goldings sounded better than Slovenian Fuggles. Although Goldings fetch more on the market, Fuggles are a very nice, aromatic hop used for both bittering

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CIRCLE 10 ON READER SERVICE CARD

and aromatics. Styrian Goldings can be used for beers with alpha acids ranging from 4.5 to 6 percent. If yours are extremely aromatic, then they may be a new variety from Savinja known as "Super Styrian" because of the high alpha-acid content. There are several varieties of these, and they have Northern Brewer or Brewer's Gold parentage.

Topping Up

Dear BYO,

When your beer is racked to a second container, are you supposed to top off the brew to eliminate the air? Are you just supposed to leave the container three-fourths full and replace the air lock?

George Fuller
Blue Springs, Mo.

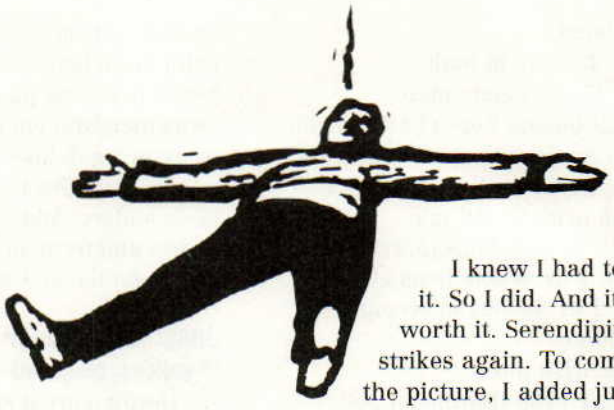
As you are probably thinking, leaving headspace will allow the beer to become oxidized, so you should never leave air on top of your beer in the secondary. What do you do if you don't have enough beer? If you use CO_2 to serve beer at home, you could purge the carboy beforehand with some gas and then purge the headspace again when you are done transferring and replace the air lock. Another option is to make more than five gallons and ferment in a six-gallon or larger carboy, a size that is readily available. Then when it comes time to rack to secondary, a five-gallon carboy, there is always enough beer. In fact you might just have to take a deep breath and pour some out — or drink it green!

Correction

Our apologies to anyone who brewed the Silly Old Bear Honey Wheat from Recipe Exchange (October '98 BYO); the published recipe was a tad (or so) maltier than the original. Due to a production error, the recipe listed an extra seven pounds of light malt extract and one pound of crystal. The step-by-step remains the same, except delete the steeping grains. Oh yes, and it should read prime, then bottle, not the other way around!

In a Brewing Funk

by Scott R. Russell



What do you do when you brew several bad batches in a row? You check your recipes, you clean everything top to bottom, sanitize again and again, throw out all your old yeast starters, and take time off. And you run out of drinkable homebrew. Yes, this can happen to you, too. It happened to me last summer. I was at my wits' end. Five or six batches in a row, DMS, sourness, skunkiness. I did everything wrong at least once, I'd bet. Come fall I had nothing in the house to offer guests. I had to actually buy beer.

The more I thought about it, the more depressed I got. I even thought about giving up brewing — not for very long, but I did think about it! I decided to give it another shot, being careful, double- and triple-checking every step, every measurement, every piece of equipment. I threw out all my old tubing, all my old air locks and stoppers, steam-cleaned my chiller, and soaked all my fermenters for a week.

And then a friend handed me nine pounds of fresh raw honey. Normally this would have been really cool, except that I realized I had to use it right away, had to get it fermenting before I got any more beer going, because — well, just because. But I had started a Belgian ale yeast, planning to make a dubbel. What to do? Well, I woke up with a start in the middle of the night and thought to myself (groggily), "Use the Belgian yeast to make mead!" Then I went back to sleep. When I woke up for good the next morning, I remembered my thought and shuddered in horror — blasphemy! Waste a good Belgian dubbel yeast on mead? Waste good honey on an experiment, and a risky one at that? I rejected the idea and went about the process of waking up. But the idea kept coming back. I tried to picture it — what would it taste like, smell like?

Well, to make a long story short, I knew I had to try it. So I did. And it was worth it. Serendipity strikes again. To complete the picture, I added just a touch of spice like I would for a witbier. Mead is, of course, easier to brew than beer, although it takes much longer for it to become drinkable, 13 months in this case. Be warned: If you are a mead or Belgian beer purist, you probably won't appreciate it. Make it anyway, though, and send it to me. 'Cause I sure appreciate it!

Reader Recipes

Hoppy, Hoppy, Joy, Joy

(5-gallons, extract with specialty grains)

Here is one of my favorite recipes. Hope you like it!

Briggs Smith
Fir Crest, Wash.

Ingredients:

- 4 lbs. light dry malt extract
- 2 lbs. amber dry malt extract
- 2 lbs. honey
- 0.5 lb. crystal malt, 70° or 80°

Funky Mead

(5 gallons, spiced honey "wine")

Ingredients:

- 1/2 tsp. gypsum
- 1/2 tsp. winemaker's acid blend
- 9 lbs. fresh raw orange blossom honey (best variety)
- 1 lb. clear or light candi sugar (optional)
- Very small quantities of grated bitter orange peel, coriander, ginger (to taste)
- 1/2 tsp. yeast nutrient
- 1 pint or more Belgian strong ale yeast slurry (I used a recultured yeast from a bottle of Unibroue's "Eau Benite")
- 3/4 cup corn sugar for priming
- Pinch dry champagne yeast

Step by Step:

Bring 3 gal. of water to boil, and add gypsum and acid blend. Add honey and candi sugar; boil 15 min. Skim off the thick foam every few minutes and discard it. Remove from heat; add orange peel, coriander, and ginger, cool in an ice-water bath. Add 2 gal. of chilled, pre-boiled water to lower the temperature to 70° F or so. Add yeast nutrient.

Cool further, making sure you get the temperature between 60° and 65° F, then pitch the yeast slurry. Seal the fermenter, attach an air lock, and set it in a cool, dark place.

Ferment at 60° to 65° F for six weeks, rack to a carboy, and age 12 weeks. Re-rack to another carboy, age another eight to 10 weeks, then add a little dry champagne yeast (in bulk, not to the bottles, please!), prime with corn sugar, and bottle. This will be a sparkling mead, obviously, effervescent like champagne. Before opening, chill well. Funky, weird, unusual, different, in that order.

Lovibond
- 0.25 lb. dextrin malt
- 0.25 lb. chocolate malt
- 1 oz. Chinook hops (12.5% alpha acid) for 60 min.
- 1 oz. Northern Brewer hops (7.6% alpha acid) for 30 min.
- 2 oz. Cascade hops (5.2% alpha acid): 1 oz. whole hops at end of boil, 1 oz. pellets in secondary fermenter
- 1 tsp. Irish moss
- Wyeast 1338 (European ale)
- 2/3 cup corn sugar to prime

Step by Step:

Place cracked grains in a grain bag in 2 gal. of cold water. Bring temperature to 150° F and hold for 10 min. Remove grain bag and add dry malt extracts. Stir thoroughly and add water to fill brew kettle.

Total boil is 60 min. Bring to boil and add Chinook hops. Boil 30 min. and add Northern Brewer. Boil 10 min. more and add Irish moss. Boil 20 min. more. Add honey and Cascade whole hops and remove kettle from boil. Cool the wort. Strain hops and place cool wort in fermenter with enough water to bring to 5 gal. Pitch yeast at 70° F.

Ferment five to seven days. Rack to secondary. Add 1 oz. Cascade pellets and ferment about 14 days. Prime, bottle, and age three weeks.

Jump Start Lager
(5 gallons, all-grain)

Here's a great recipe based on a Dortmunder but with wheat instead of carapils. If you have good efficiency, you might not need a 90-minute mash. I think the secret is in the lagering, so try to adhere to the lagering guide.

Bill Blunk
Warner Robins, Ga.

Ingredients:
- 6 lbs. two-row German pale malt
- 1.5 lbs. Munich malt
- 0.25 lb. two-row German wheat malt
- 2 3/4 oz. Saaz (2.2% alpha acid): 2/3 oz. for 60 min.; 1 1/3 oz. for 30 min.; 3/4 oz. for 10 min.
- 1 tsp. Irish moss for 20 min.
- Wyeast 2007 Pilsen (or True Brew Pilsen or Wyeast 2308 Munich Lager)
- 2/3 cup priming sugar

Step by Step:

Mash grains in 1.25 qts. of water per pound of grain at 153° F for 90 min. or until starch conversion. Sparge with 5 gal. of 170° F water.

Total boil is 60 min. Add 2/3 oz. hops and boil 30 min. Add 1 1/3 oz. and boil 10 min. more. Add Irish moss and boil 10 min. more. Add 3/4 oz. and boil 10 min more. Cool wort to 50° and pitch yeast.

Let wort ferment for two weeks at 50° F. Transfer to secondary and lower temperature to 38° F for 30 days. Prime and bottle.

OG = 1.038
FG = 1.012 ■

Not Really the Good Old Days

Mr. Wizard

I know American beers are lighter today than before Prohibition, but are there records of the recipes used before all these changes? I look at labels on some of the bottles in my collection and see that some breweries claim to be more than 100 years old. I just wonder how much better the beer might have been, say when Pabst was first started in 1844.

Pat McMackin
via e-mail

Beer history is usually a subject I avoid, because my view of beer history is not in line with the mainstream, romanticized views of brewing in the old days. But this is one of those questions that really is hard not to respond to, so here it goes.

For starters, Prohibition caused tremendous financial hardship for the domestic beer industry, but Prohibition didn't force brewers to brew light beers. There are many pre-Prohibition recipes floating about, and the differences between beer recipes of that era and beer recipes today are really not that great. American brewers of European descent were using starch adjuncts such as rice and maize (corn) decades before Prohibition. These adjuncts, among other things, lighten beer color and flavor. Bear in mind that maize is native to the Americas. Even though Columbus introduced maize to Europe, it was principally grown in southern Europe, which is wine, not beer, country.

The other great American adjunct, rice, grows very well in wet, tropical climates such as the American south and monsoon Asia, where about 90 percent of the world's rice crop is grown. Needless to say, brewers from Germany and England didn't have much experience with rice before coming to the New World.

Brewers, a tremendously resourceful group, have used all sorts of starch sources over the several thousand years of beer brewing. The notion that rice and corn additives somehow make beers less beer-like has always puzzled me. After all, the loosest definition of beer is any alcoholic beverage whose carbohydrate is derived from cereal grains (as opposed to wine, whose carbohydrate comes from fruit sugars). In any case American brewers began using adjuncts long before Prohibition.

Historically, World War I and World War II had a tremendous effect on brewing around the world. Most nations at war instituted ration programs intended to protect the supply of all resources needed for waging war and maintaining public health. Food is pretty darn essential for human life, and anything relating to food became part of rationing around the world.

Although barley isn't a common food source for humans, it is a major livestock feed source. Barley for beef or barley for beer? In times of war barley for beef was more important.

Lawmakers in England used this logic during World War I to justify increases in the duty on wort gravity, limit the hours of operation of taverns, and limit the volume of beer that could be brewed. One consequence of the tax on wort gravity was a decline in the original gravity of English ales. Some American breweries even used potatoes in place of maize and rice during World War II.

Another key event during World War II was a large swing in the beer-drinking demographic. Young men were drafted for the war, and many young women were recruited for building the American war machine and worked in factories. Women, who tended to prefer lighter beers, soon became a very large part of the American beer-drinking market. Many beer historians tie the lightening of American beer flavor, particularly hopping rates, to this great change in beer drinking.

After the war ended the American palate was drastically changed. The bland trend was not reserved for beer alone. American food in general was bland, perhaps because Americans were accustomed to bland foods during war-time rationing. Today, flavorful coffee, tea, cheese, bread, meats, specialty vegetables, beer, wine, and ethnic cuisines of all sorts give the American consumer tremendous variety.

Are American beers bland? Most microbrew drinkers would say yes. Ninety percent of domestic beer sales fall into the bland category, and Bud drinkers like their Bud.

Was Pabst bland in 1844? No one alive today can comment on its flavor, but most American lagers of that period did contain adjuncts and probably had less character than their European counterparts.

How much better were the beers back then than they are today? Read on!

In 1844 commercial refrigeration did not exist, pure yeast culturing had not been developed, the most basic understanding of beer spoilage by bacteria had not even been conceived, the word biochemistry did not exist, and there was absolutely no concept of how yeast biochemistry influenced beer flavor. In short, brewing science had not been born.

In 1844 beer was fermented in wood or concrete fermenters left exposed to the atmosphere. These fermenters were very difficult to clean, and bacteria were certainly full-time residents in breweries of the period. Without an understanding of microbiology, ease of cleaning didn't matter because the brewers did not even know the true objective of cleaning.

In 1844 beer was packaged in wood casks and exposed to air during serving. Oxidation and the proliferation of aerobic bacteria that turn alcohol to vinegar must have been commonplace. In 1844 breweries used tools that would be classified today as crude. Life in the brewery was hard.

In 1844 the beer consumer could not imagine what he did not have, and the beer industry did very well. Breweries that consistently made highly ranked beer stood out from the crowd, but all breweries of that period certainly had their difficulties. Modern brewers and beer drinkers need not look to the past with rose-colored glasses but instead should be in awe of the advances made over the past 150 years by the brewing industry.

Brewers were among the most inquisitive and open-minded thinkers of the 19th century in the fields of chemistry, biology, and food-processing technology. Enzymes were identified and defined by brewing scientists; Louis Pasteur revolutionized the world with his *Etudes sur le Vin* and his *Etudes sur la Biere* in the mid-19th century (these studies later gave rise to milk pasteurization); Emil Christian Hansen developed pure culture techniques for yeast in the late 1800s; and S.P.L. Sørensen, a colleague of Hansen at the Carlsberg Laboratories in Copenhagen, suggested the pH scale in 1909. All of these achievements were applied to different industries and spawned new ideas in the field of science.

Today, brewing benefits from advances in raw-material quality, advances in the understanding of brewing science, and advances in brewing technology.

Almost every homebrewer today understands that beer is damaged by oxidation. This most basic kernel of knowledge was not known by the commercial brewing industry at the turn of the century. Today, oxygen

pick-up is minimized by design in the brewhouse, in the design of beer transfer systems, filters, and packaging lines.

I am very happy to be a beer drinker in 1998!

Mr. Wizard

I've recently come into some money that's burning a hole in my brewing pocket. I've been extract brewing for two years now and of course want to make the move to all-grain.

My questions are about the RIM (recirculating infusion mash) system. How exactly does it work differently than a regular three-vessel system, is it worth the cost (about twice the price), and is it overkill for a homebrewer? If this were you, and you could do what you wanted, what would you suggest?

Chip Town
Jackson, N.J.

The recirculating infusion mash (RIM) system is a cleverly designed system that allows the homebrewer to use the temperature profile or step-infusion mash method without having a heated mash tun. Most RIM systems have a mash tun, a brew kettle, and a hot water pot used to heat the mash and sparge water. The only vessel that is unique is the mash tun. At first glance it looks like a normal mash tun made from a stainless steel pot or old keg, but closer examination will reveal a pump and a heater. These two elements are the heart of the RIM system.

Mashing begins normally in the RIM system but usually at a lower temperature because the mash is later heated. When the first temperature rest is complete, the recirculating and heating begins. Basically, wort is pumped from beneath the mash tun false bottom, through an in-line heating element, and on top of the mash bed. This process is continued until the wort entering the pump equals the temperature of the next step of the mash profile.

Some fancy RIM systems have little programmable logic controllers (PLCs) that will automatically run the mash profile, whereas the simpler (and more affordable!) systems are manually operated.

The in-line heater uses the principle of external heat transfer. Many large breweries use external heaters for wort boiling because these heaters are cheaper to install compared with internal wort boilers, operate with more energy efficiency, and are more easily cleaned (the cleaning solution is pumped through the heater) than their internal heater cousins. RIM systems undoubtedly are small-scale adaptations of large, industrial external vessel heaters.

Everything so far has been based in fact — like explaining how a coffee maker works. What follows is my opinion. Opinions are like... — anyhow, everyone has an opinion.

The sole purpose of the RIM system is to heat the mash. Most RIM systems come with hot water pots heated with a propane heater, and they have the wort pump and wort heater loop. In my opinion the extra equipment isn't worth the additional cost.

Mashes can be reproducibly heated according to a recipe with a direct flame as long as the mash is carefully stirred, the flame is kept low, and the temperature is monitored. This is how most commercial breweries heat their mashes, except they use steam and PLCs instead of propane, paddles, and patience.

Mashes can also be heated by adding boiling water while stirring. Although not my preferred method this works, and some notable craft brewers brew very good beers with this method. Then there is the decoction mash, the first reproducible method for multi-temperature mashes. Considering the fact that decoction mashing predates the thermometer, its reliability is hard to question.

Mashing is certainly one of the most significant steps in brewing; after all, wort production is the only event occurring in the brewhouse, and no other part of the beer-making process is bestowed with the name "brew."

If I had enough loot to buy a RIM system plus some other odds and ends, I would probably give it a try. However, if the RIM system was all that I could afford, I would most likely spread the purchase over several items. I have always felt that things like wort chillers, good fermenters, a temperature-controlled fermenting area, and a decent bottle filler are pretty important items involved in brewing great homebrew — sort of like having a good set of high-performance tires on your new Porsche!

If you have enough money to brew your wort and ferment it too, then go for it! If not, I would settle for a less expensive system and spend some of the savings on other tools to outfit your homebrewery. ■

Mr. Wizard's Address

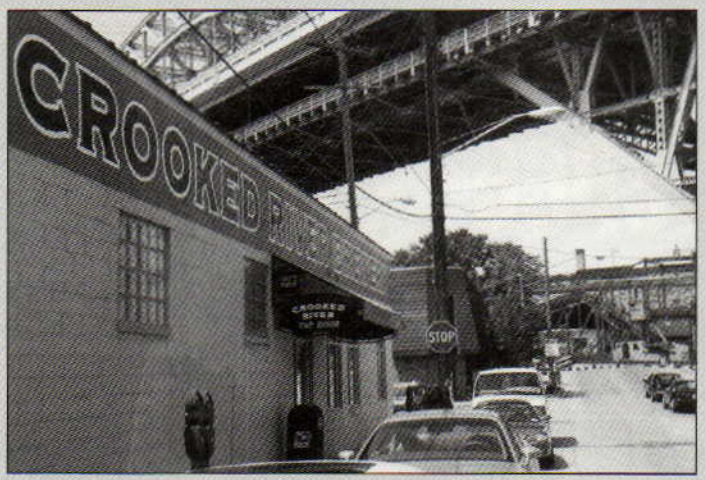
Do you have a question for Mr. Wizard? Write to him c/o *Brew Your Own*, 216 F St., #160, Davis, CA 95616. Or send e-mail to wiz@byo.com.

Mr. Wizard, BYO's resident expert, is a leading authority in homebrewing whose identity, like the identity of all superheroes, must be kept confidential.

Crooked River Flows to Cleveland

by Thomas J. Miller

Crooked River Brewing Co.



Stephan Danckers

Brewer: Stephan Danckers
Brewery: Crooked River Brewing Co., Cleveland, Ohio
Years of experience: 14 years professional brewing
Education: MS in Brewing Science, University of California, Davis; brewing school at Weihenstephan
House Beers: Settler's Ale, Black Forest Lager, Lighthouse Gold, Cool Mule Porter

Stephan Danckers, in the early 1990s, knew one thing without a doubt: He wanted to brew beer. He wasn't sure if he would open a brewpub or a microbrewery, but the Fulbright Scholar from the Technical Brewing School at the University of Munich and former brewhouse supervisor for Stroh's Brewing Co. knew he wanted to be a part of the craft-beer industry. The question was where.

"We looked through the Midwest, and it was obvious that Cleveland was experiencing a Renaissance," says Danckers. The city had suffered the ravages that befell many Rust Belt metropolises in the 1970s. The steel business collapsed, and Cleveland was left with a legacy of empty factories and polluted waterways. On one fateful day the Cuyahoga River, which flows through the downtown flats district, actually caught fire.

But the 1980s brought cleanup and revitalization, and by the time Danckers began looking for a brewery location in the early '90s, the city was enjoying a period of vigorous growth and massive investment.

"At the time it was something like the 13th largest metropolitan area, and it only had one brewpub. We saw it as a huge market with a bunch of beer drinkers who needed to be exposed to craft-brewed beer," he says. "It was truly a beer vacuum that was wide open with opportunity. And the customer profile was excellent. They displayed a strong sense of brand loyalty, and that was important to us."

Crooked River Brewing Co. was born in 1994. Located in the Flats, the brewery derives its name from the Mohawk word Cuyahoga, which translates to English as Crooked River.

Though the local brewpub, Great Lakes Brewing Co., was succeeding, Danckers and his partner had decided on a microbrewery. "In the end we decided a brewpub went against our entire focus," he explains, "which was to produce the best beer possible and sell it. Running a restaurant would just confuse things."

Danckers formed an Ohio limited partnership and organized a small number of big investors. Operating on a shoestring budget of $900,000, he pieced together a warehouse brewery that boasted five 60-barrel fermenters and one bright beer tank.

"The money was enough to

The Tips

- To avoid a stuck sparge choose recipes with no more than 50 percent wheat malt, use a coarse grind, avoid step mashes, and sparge slowly.
- Keep temperature cool. Use a wort chiller, and lager in a refrigerator if possible.
- Use a true Weihenstephan-style hefe-weizen yeast to produce the vibrant flavors that mark good hefe-weizen.

build a brewery," he recalls, "but we should have had more. We needed lots of cash just to operate the brewery and even more to market. And you can't do that effectively on a tight budget."

Despite the uphill battle, Crooked River has found its niche. The brewery produced 2,000 barrels during the last five months of 1994 and has grown at a steady 30 percent pace ever since. In 1997 production reached 6,000 barrels.

With its growth the brewery has witnessed astonishing change. Today it boasts eight unitanks, two horizontal lager tanks, and three bright tanks. Two years ago, Crooked River upgraded from a simple four-bottle filler to a state-of-the-art Krones bottling line, replete with a depalletizer, rinser, filler, and capper. The brewery also abandoned the difficult and time-consuming task of self-distributing and handed the reins to a local distributor.

"We had a couple of trucks and drivers and would deliver anywhere within 50 miles of the brewery," says Danckers. "But we couldn't completely service our accounts. Our distributor gives us the 100 percent coverage that we could never achieve (ourselves)."

Crooked River produces Ballpark Draft for exclusive sale at Jacob's Field and Arena Draft for Gund Arena. The brewery is also the official and exclusive beer sponsor of the Cleveland Grand Prix Indy Car Race until the year 2000.

The house beers include three ales and a lager. Settler's Ale is a high-gravity, hoppy English ale, exactly what you imagine a craft brewery should produce. Black Forest Lager represents Danckers' attempt to recreate one of his favorite Munich beers. "It's too heavy to be a Helles and too light to be a Märzen," he explains.

Lighthouse Gold is a lightly hopped, refreshing ale that was entered as a Kölsch in this year's Great American Beer Festival (GABF). "It's the bottled version of our Arena Draft," says

Danckers. "People kept asking if they could get our draft in the bottle. Finally, some light bulb went off in our heads and we decided to sell it to the general public."

Cool Mule Porter is Crooked River's dark beer and the gold medal winner at the 1997 GABF in the Robust Porter category. It has a rich flavor and complex texture that complement the beefiest steaks and heartiest ribs.

Seasonal drafts round out Crooked River's selection and offer visitors to the brewery's newly opened tap room some exciting new flavors. Their Pumpkin Ale is a local favorite and the Hefe-weizen reflects Danckers' Bavarian background.

"We brewed the hefe-weizen two years ago in celebration of Cleveland's Bicentennial, and lots of people liked it," explains Danckers. "We didn't make it last year because of capacity reasons, but we brought it back this year."

House Beers

House Beers	Malts	Hops	Original Gravity	Alcohol by Volume
Settler's Ale	two-row, carastan 30° Lovibond, crystal 50° Lovibond, Vienna	Eroica, East Kent Goldings, Cascade	1.060	5.6%
Black Forest Lager	two-row, carastan 13° Lovibond, crystal 70° Lovibond, Munich	Mt. Hood, Hallertauer, Saaz	1.054	5.1%
Lighthouse Gold	two-row, carastan 13° Lovibond	Mt. Hood, Perle	1.046	4.3%
Cool Mule Porter	carastan 30° Lovibond, crystal 135° Lovibond, Munich, chocolate, black	Cascade	1.058	5.1%

Tips on Brewing Hefe-weizen

Danckers employs a blend of 50 percent two-row and 50 percent wheat malts to achieve a starting gravity of 1.048 and an alcohol by volume of 4.5 percent. "I don't think you need to worry about the percentage of wheat malt that you use," he says. "I know people who use more and some who use

less, but the real flavor of a Bavarian hefe-weizen comes from the yeast."

Among the dangers of brewing hefe-weizen, the worst begins with the sparge. Because wheat malt contains no husk, a stuck mash is a distinct possibility. In this case the grain tends to settle thickly in the mash-tun, preventing the flow of sparge water through the grains.

Choosing recipes with 50 percent or less wheat malt is the easiest way for homebrewers to avoid this debacle. Instead, rely on a higher percentage of malted barely and the natural filter it provides. Similarly, another suggestion is to maintain a coarse grind on your wheat malt and malted barley. This might sacrifice some yield, but it will prevent you from pulverizing your wheat malt into fine powder, which will set like concrete during the sparge. More important, the larger barley husks will create a thicker filter bed.

"I'd also say that you don't want to beat up your mash," says Danckers. "Keep the mash as simple as possible, with few, if any, steps. Try a one-step infusion and then raise the temperature to mash out. And the less you stir and mix the mash, the less thick it will become."

Proper sparge water temperature will help keep your sparge hassle free. A temperature between 168° and 170° F reduces viscosity of the wort and loosens the mash. "We made the mistake once of sparging with 150° F water," recalls Danckers, "because we were trying to hurry things up. And we paid the price for it."

Running a slow sparge is equally important. Recirculate the first several gallons of wort at a slow rate until it clears, and keep it moving at a trickle until you introduce the sparge water. Step up the rate slowly, being careful not to suck the grain bed onto your mash screen.

For his hefe-weizen Danckers uses the Wyeast Hefeweizen yeast and produces a stylistically accurate brew. With this summer seasonal he finds he can safely reuse the yeast through seven generations and believes he could at least double that if he were brewing year-round.

"Growing the wheat yeast is really important to prevent lag times when pitching," he says. "We step it up from three barrels to 30, and the crop we get from that we can use for a full batch. But you have to be careful what you grow it in. We don't have the hefe-weizen (wort) all the time, so we use our Lighthouse Gold because it's the lightest and won't produce any flavors in the hefe-weizen."

Growing your own yeast is as simple as procuring some powdered light malt extract. Clean and sterilize a growler, boil and chill the extract, and add the yeast. Attach

a fermentation lock and when fermentation ends, harvest the yeast and repeat if necessary. Enough yeast for a five-gallon batch should be about two inches high in a growler.

"We keep the yeast viable for future batches by drawing off the trub and sediment that settles in the unitank in the first few days," explains Danckers. "We dump for the first 72 hours during fermentation before we collect yeast. By then we know that what we are getting is the strongest and healthiest yeast."

For homebrewers, dumping trub and dead yeast means storing your carboy upside down during fermentation. According to Danckers, this is the best solution for harvesting healthy yeast. Ask your homebrew supplier about kits that make this carboy conversion possible.

The perfect brew, of course, will fall to shambles if you ignore the importance of fermentation temperatures. If you ferment in your closet or in the kitchen, temperature spikes can ruin a perfect brew with strange flavors and odd aromas.

For the best hefe-weizen, assemble a wort chiller that will drop your wort temperature to 70° F. Danckers suggests a counterflow chiller, a cold refrigerator, or a large container filled with ice that will hold your boiling vessel. But remember, the slower your temperature drop, the more susceptible your beer becomes to unpleasant microorganisms.

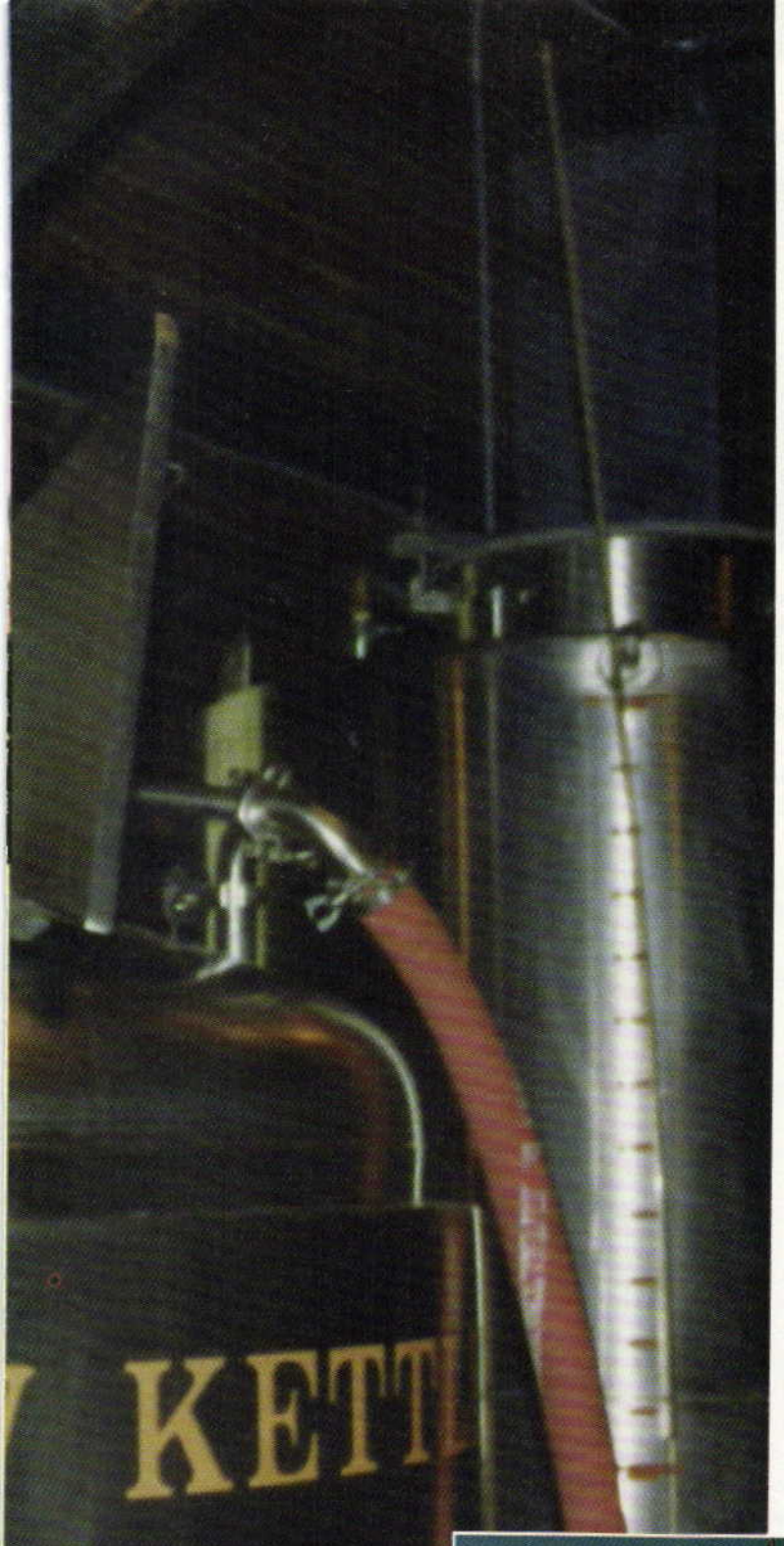
Next, equip yourself with a refrigerator that will keep temperatures around 68° F. For about $20 you might purchase an external thermostat that regulates a refrigerator's internal temperature. Or if you can go without milk for a while, you could sacrifice your family's refrigerator for the homebrewing cause.

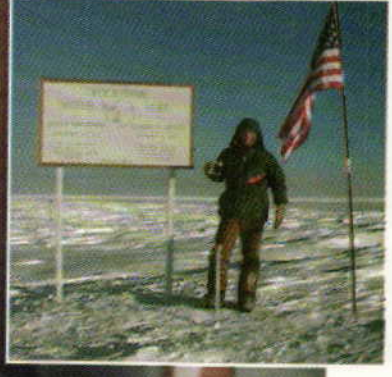
"It matters incredibly what (temperature) you ferment at," says Danckers. "We did a test batch and didn't have any temperature control. The beer probably got pretty cold and then warm. We ended up with a completely different flavor than we expected. It was super banana tasting, tangy and wild."

A true Bavarian hefe-weizen should burst with the flavors of banana and clove. American wheat beers, which are often fermented with a standard ale yeast, are light but bland, lacking the vibrancy that true hefe-weizen yeast imparts on the finished brew. For the best results use a Weihenstephan-style hefe-weizen yeast or a comparable product. And regulate fermentation temperature to keep the yeast's exotic but enticing flavors in check.

Crooked River Brewing Co. is located at 1101 Center St., Cleveland, Ohio 44113. (216) 771-2337. Or visit the brewery on-line at www.crookedriver.com. ■


BREW





Up from the Bottom of the World

by Jason Dorpinghaus

from South Pole Brewer, Dec. '96 BYO

"Imagine being sent to the very bottom of the world to spend 12 months living and working with 25 perfect strangers. For six months there will be no end to the blinding sunlight...the other six months there is no end to the infernal darkness of night. There is no cable TV. No going out for a night on the town. No brewpubs for thousands of miles. What on earth are you going to do? That's easy — homebrew."

• • • • •

"Station supplies ran out about six weeks before the end of winter and enthusiasm was waxing so production went into high gear. I wanted to be ready; the first flight in would triple the population. What would a station opening party be without Domebrew? When the beer ran out, I spent all weekend brewing batch after batch and using everything I had as fermentation vessels. The new containers allowed me to brew 70 gallons to get us through the last few weeks. All that is left for station opening is Domebrew, and when that's gone so am I."

As I look out across the tree tops at Pikes Peak from the roof of my apartment building in Denver on this

Two years ago Jason Dorpinghaus was homebrewing at the South Pole. Today, his career path has taken a twist — he's brewing for a living.

Brewing in the dome, home of the South Pole's Dome Brewer's Association, requires preparation; there are no flights in or out for eight months.

90° F, sunny and calm August day I can't help but wonder where I might be if it weren't for the United States Antarctic Program. After all, if it weren't for the poor quality beer they forced upon us in the early years, I may never have picked up homebrewing. I also wonder what all of my friends are doing at the South Pole.

Kicking back with a "Domebrew" perhaps? Probably not, considering it's 7:30 on a Monday morning there. More likely they are sitting around the breakfast table staring off into space, silently thinking, "only 10 more Mondays to go!" Still a month from sunrise. The thought sends shivers up my spine. Not that I didn't like it there (at least most of it), but if I weren't brewing for a living now I might be having breakfast there and wondering what all my friends were doing back in the states.

When I last brewed in Antarctica we were nearing the end of a very long and cold year. Gearing up for the arrival of new faces, fresh fruit, and toilet paper. Oh sweet TP. All was set. I had 70 gallons of Domebrew chilled and waiting. We had spent three intensive weeks clearing buildings of snow and smoothing out the skiway. It was the last Saturday night alone at the bottom of the world. Monday, god willing and the creek doesn't rise, *they* would

If Only I Knew Then...

When I started homebrewing I was so clueless. I thought that I had it down until I started brewing for a living. There was so much to learn.

Here are the four main things I had to get a handle on, in order of importance: sanitation, yeast selection, mash temperature, and recipe formulation.

So many times beer turns out less than desirable because of the lack of sanitation or the sanitizers themselves. I stay away from iodophor and chlorine because of the flavors they can impart to the finished beer and the effect they have on yeast during fermentation. I recommend an acid sanitizer available at many homebrew shops. It's a little more expensive but well worth it.

I suggest throwing away any dry yeast that you have and purchasing pure culture liquid yeast. Drying yeast can kill many of the yeast cells and mutate others. Dry yeast is also prone to bacterial contamination. Once you switch to liquid yeast, you'll never switch back. Learning how to harvest and propogate yeast will allow you to cut your cost and cut the fermentation time. If this is done properly (keeping sanitation in mind), you will be able to use the same yeast for several generations without a problem.

Liquid yeast is available from homebrew suppliers for a few dollars. The best thing is that the yeast found in homebrew-size packages is the exact yeast sold to microbreweries.

If there is a brewery close to you and you like the beer, you might be able to get some yeast from the brewer. It never hurts to give him a few samples of your wares in return for his time. Many breweries use just one strain of yeast, so you may want to try a few others with the same recipes to see which strain you like best.

Varying the mash temperature by a couple of degrees can change the outcome of your beer dramatically. Keeping the temperature of the fermentation down is also very important to the health of the yeast and to keep esters in check. A good way to keep temperature constant is to use a water bath. Place your carboy in a tub of water. Adding cold or hot water to the bath will temper your fermentation and keep your yeast happy.

When sparging make sure that your run-off is not too fast. I must have read about it 100 times but never got it through my head to slow down. I always tried to run off too quickly and more often than not I had a stuck mash. Very frustrating.

I never whirlpooled my wort to remove the hops and trub. It's well worth the extra 15 minutes before cooling. Removing the hot and cold break material before fermenting reduces the harshness of your finished beer and reduces the possibility of chill haze. The quicker you cool your wort from boiling to fermentation temperature the better. Use a heat exchanger. Don't forget to sterilize it.

— Jason Dorpinghaus

come! Or would they?

Sunday morning arrived; an ominous dull gray replaced the bright blue sky of the day before. A storm had arrived. Visibility had dropped to a mere 50 feet. The entire station looked as if it had disappeared. Tension mounted as we tried to contact McMurdo, a base on the coast of Antarctica, to see if flights were still on. The skiway was being destroyed with a mess of sastrugi (drifts). Flights were to be postponed for one day. Yeah, right.

On Sunday night our Domebrew supply had dwindled to 60 gallons. Monday morning the storm had come to stay. I got lost walking to work some 150 yards away. I found myself climbing a 25-foot pile of snow that I couldn't see! After a minute I reoriented myself and realized, "Oh yeah, I put that here."

Depression, even anger over the storms set in. We were ready, really ready, to go! What evil could have created a storm of this nature? We could imagine how Robert Falcon Scott and his crew must have felt when they lay dying, trapped in their tents, pinned down by a storm similar to this but only 11 miles from "One Ton Depot." Okay, it wasn't that bad; we still had 50 gallons of Domebrew left.

Tuesday. Ditto. There were 40 gallons remaining. By Wednesday morning there was blue sky, but a lot of digging out remained. We would have flights Thursday if the weather held. All day and into the night we dug out the skiway until there was no more time or energy left. The guests would be here soon.

Thursday morning was hurried and we felt giddiness as finishing touches were put on the station and we all donned our gear and headed out to see if we could spot the plane from "Pappa 3" (30 minutes out). "There it is!" rang out over and over for 30 minutes until the plane finally buzzed the station. Shouts of joy crackled over the radio as high fives, hugs, and nervous dances abounded. After several passes the plane landed and out of its belly emerged the brightest red and most fully clothed people we had ever seen. "Don't they know it's summer? What are all the clothes for? It's only 60 below!"

I couldn't greet the new crew until about an hour later, as it was my job to unload the baggage, fresh food, and cargo from the aircraft. As I approached the aircraft in my tracked forklift I was swallowed by the contrail created behind the plane. What an experience that I'll never forget.

After a couple days of turning over the station — showing them where their computers were, watching new movies, and finishing off the Domebrew — we packed our gear and prepared to leave. With a tearful goodbye to the few who were staying behind for a longer turnover or even the entire summer,

we were gone.

After what seemed to be the longest three-hour flight I had ever taken, we landed on the coast of Antarctica in McMurdo. All the commotion! Where did all these people come from? The heat! It must have been 10° F! We hadn't felt an above-zero day since rest and relaxation here 10 months before. Even here almost everyone was walking around fully bundled up. We were running around in shorts with no hats.

I could run and breathe at sea level without losing my breath. It was also moist out. It must have been 10 to 15 percent humidity. Two days there trying to decompress a bit before being thrust back into society and then the last flight out to the real world, New Zealand.

I had planned to travel to Nepal and India, but after leaving the ice I realized I was in no condition to travel. I was toast, and I knew it. Decisions were hard to make, and I just wanted to go home. It had been a long year. So after traveling around New Zealand for five weeks rafting, hiking, sightseeing, and pub crawling, I knew it was time to go. I was home in time for Christmas, which greatly pleased my mother, and started readjusting to life.

Dorpinghaus brewed more his first two days of work than he had his whole homebrew career.

Readjustment took longer this time. It took about six months before feeling normal. I took a couple of road trips across country, skiing, biking, and visiting old friends from the Ice and new friends, too. I bought a Jeep and got a job. Not just any job, no; I'm brewing for a living!

My boss at the South Pole had introduced me to his friend who just happened to be the head brewer at the Denver ChopHouse and Brewery. I kept in touch while in Antarctica and sent in my resume after returning to the states. After

months of waiting, he called me up and offered me the job. Sure it was about half the salary I was used to and promised to be a lot of grunt work but hey, so what? The first two days of work I brewed more beer than I had brewed in all my homebrewing put together.

After a year of brewing for the Denver ChopHouse and Brewery, I'm ready to move into a head brewer position when the chance arrives. The ChopHouse is part of Rock Bottom Inc., so there are plenty of opportunities for advancement.

Some people have asked me why I want to work for a large company like Rock Bottom and not a smaller brewery where you have more creative control over the beer. Well, I've learned how to make great, clean beer every time, and I have gotten to make two specials from my own recipes. The first was an abbey ale and the second a Scotch ale. Both of which turned out beautifully.

Their are only two brewers on staff, so I've had a chance to learn everything. We brew about 50 31-gallon barrels of beer a week. Seven beers are kept on tap year round, and we also offer a rotating special and rotating cask-conditioned ale. Like most brewing positions, the job is only about 30 percent brewing. Ten percent is paperwork and training of waitstaff, and the rest is cleaning.

It can be incredibly tedious but rewarding as well. Often I'll sit at the bar and listen to what people have to say about the beer. It's so great to watch the bartender hand a beer to a patron and have the customer take a sip and say, "Yeah!" Or have someone remember the abbey from last year and say that they loved it. That makes all of the scrubbing, keg cleaning, grain hauling, and sweeping worthwhile.

So do I still homebrew? Well, not exactly. Creating specials is like homebrewing but with all the toys and on a much bigger scale. Just working full time as a brewer during the week and quality control on the weekends (heh heh) keeps me busy enough! I do like to work with homebrewers, though. Some come to the brewpub to pick up yeast or specialty malts not available at homebrew shops, and others bring in their Cornelius kegs for refill when their brewing falls behind. Some just like to pick my brain, and I love to talk beer.

The Antarctic program may be out of my system, but brewing is here to stay.

7 Ways to Improve Your Kegging

by Randy Whisler

I remember very distinctly the first time I used a soda keg for storing my completed beer. I remember it well because it was one of the best homebrewing choices I have ever made. It literally cut three hours off of my bottling time. I think my exact thought on the matter was, "48 small bottles to clean or one big bottle to clean? I'll go with the big bottle."

I have never looked back, either. It just seems like too much work to wash all those little bottles, risk a separate contamination in each one, boil malt, or time the next brew to steal gyle (the wort used to condition finished beer and raise the alcohol content). So now I use soda kegs almost exclusively for my homebrew. Here are some tips on efficient kegging that I've picked up over the years.

1. Sanitation

Based on the complaints I hear about using kegs, the root of most major problems is a contamination in the keg. This is most likely due to an inadequate cleaning process. The soda keg has several small orifices, nooks and crannies, and gaskets. They all have to be cleaned and sanitized. The easiest way to do this is to take the keg completely apart and rinse all the parts separately with hot water. If the dispense tube is dirty, push a coat hanger with a

RICK HUDSON ILLUSTRATIONS

string attached down the tube. Then remove the coat hanger, but leave the string behind. Now you can effectively floss the inside of the tube. Rinse occasionally with hot water — spitting is not necessary!

Whatever you do, do not clean with bleach. The pH of bleach is not conducive to keeping the stainless steel intact, and you will almost invariably find corrosion appearing in the welds of the keg if you use bleach. Instead, clean well with hot water and sanitize with iodophor. (You can also use caustic soda, if available, although it is crucial to exercise extreme caution with caustic.) Remove all gaskets and valves from the tubes and lid top, clean them, and boil them or soak them in an iodophor solution.

2. Storage

Once you have cleaned the keg, the easiest way to keep it ready until its next use is to put it back together. Do not rinse the gaskets or valve

parts with water after the iodophor soak; leave the iodophor rinse on them. (Another option is to boil these parts. Some brewers avoid iodophor particularly here because it can change the flavor of the beer over time.) When the keg is back together, fill it with an iodophor solution (25 parts per million iodophor). This solution will remain in the keg until the keg is ready for use.

You should also, when filling the keg with the iodophor solution, press the in and out valves on the top of the keg and make sure the iodophor solution flows through them. This ensures that you have sanitizing solution in all parts of the keg. Then fill the keg all the way to the top with iodophor solution (if you have not already), put the lid on, and shake vigorously. This shaking ensures that you have covered the top of the keg (there will always be some air trapped in the keg). Shake again before you empty the iodophor.

3. Portability

While ease of cleaning and sanitizing may be a persuasive argument for kegging, I have heard people complain that kegs are too large to bring to small gatherings. I was never deterred by this, but that may be one reason most of my friends consider me a tad weird:

"Yep, howaya guys doin'? No I just brought one keg over tonight. Don't worry; we don't have to finish it. What? No, just use it as a centerpiece on the table. You can drape the hose under the table. That way the CO_2 bottle won't detract from the table setting..."

The point is that the keg can be unwieldy to bring from place to place, but that is no reason not to keg your beer.

Actually, with a few add-ons to your keg system you can have beer ready to go to a dinner party in less than five minutes. All you need are a couple of quart or half-gallon mineral water bottles (preferably the non-flavored variety) and a couple of special filling caps. These caps are available at homebrew-supply stores. Fill the plastic bottle with your favorite beer from your keg, making sure there is no air in the bottle. This is easily accomplished by filling the bottle as full as possible, then giving the bottle a slight squeeze to bring the liquid level right to the top. Put the filling lid on the bottle and hook up the lid to your CO_2 canister. Set the pressure for 10 to 18 psi (pounds per square inch) and shake the bottle vigorously for about two minutes. You now have a small amount of beer to take anywhere — although it won't make such a striking centerpiece. Also, some beer contests will now let you submit beer in this manner.

4. Carbon Dioxide System

What do you do if you find yourself with a soda keg but no CO_2 system, which costs much more than the keg itself? You can approach this problem a couple of different ways.

If you have two soda kegs and no CO_2 system, you can ferment your five-gallon batch down to within 10 points or so (2.5° Plato) of your final gravity in your five-gallon glass carboy. Then pour half the batch into each keg and seal the kegs. The final fermentation will build the carbonation in the beer and the keg.

Filling the soda keg half full creates a gas reservoir, and the beer can be dispensed under carbonation almost to the very end. If you try to fill the whole keg, the beer will be flat very early in its life.

When using this technique you should, as much as possible, keep the kegs from moving, because yeast and trub will be settling in the bottom.

5. Cask Conditioning

Another benefit of using a keg is your ability to create cask-conditioned beers. Here is one way:

Let the fermenting wort run to terminal gravity. Let the fermented product clarify for a week or two. Then add finnings into the fermenter. Let the fermenter stay in the cooling area for another day. This should give you fairly clear beer.

Rack the beer into the keg. Along with the finished beer you need to add a bit of dried malt. To do this, add one to 1¾ cups dried malt (depending on your carbonation preference) to about two cups of water. Boil the resulting syrup for at least two minutes. Pour the syrup into the keg along with the beer.

There should be enough yeast remaining in the finished beer to create carbonation in the keg. Let the keg sit at room temperature for a day and then set the keg in its final resting place, preferably at 55° F.

This setup works best if you start drinking the beer within two days and continue to drink it at a steady rate. The beer is still fermenting so as you remove beer from the keg, the carbonation drops, but the yeast will create a bit more CO_2 as the day goes on. As the volume of gas space in the tank increases, the CO_2 reservoir becomes larger. If everything works well, you should have enough gas produced to nearly empty your keg. However, if it goes completely flat, you can always open the keg and rejuvenate the beer with more dry malt.

6. Foam and Pressure

The scenario is this: I arrive at a party and attempt to get a glass of the brewer's finest. What I actually end up getting is something I could shave with. Foam, the scourge of the keg system. Foam is so prevalent for a couple of reasons. The first has to do with CO_2 pressure, and the second has to do with the inner diameter of the dispense hose. Both problems are fairly easy to fix.

The carbonation problem is relatively straightforward. Many people carbonate their beer to a certain pressure, say 15 psi, and then try to dispense at this same pressure. This does not work well because of the

Putting more pressure on top of your beer as it is dispensed can help eliminate excessive foaming.

dispense-hose diameter. Regardless of size, the hose will create some friction as the beer passes through the hose. The smaller the inner diameter of the hose, the more friction is produced on a given volume of beer. This friction effectively drops the pressure of the beer in the line. When the pressure has dropped enough the beer will reach a point where the CO_2 will break out of solution and foam.

Putting more pressure on top of the beer as it is being dispensed will eliminate this problem. If your beer is at 15 psi, then try setting the dispense pressure at about 18 psi. Remember, however, that over time the head pressure will equilibrate with the beer (bring it up to the same pressure as the head pressure).

7. Foam and Dispense Hose Diameter

At pressures above 18 psi, the dispense unit runs into the other side of the problem: The beer is ripping through the line and hits the dispense head. The line and the dispense head create friction. This causes a pressure drop and turbulence. The result is that the CO_2 once again breaks out of solution. One way to limit the friction in the line is to get a dispense line with a larger inner diameter.

The other option is shortening the line as much as possible. If you do both, your beer will flow much more smoothly. Long-time keg users often have dispense lines that are about two inches long. Another benefit of this short dispense line is that it does not fall into the ice and swill in the keg cooler container. Happy kegging.

Randy Whisler is the production manager and head brewer at SmuttyNose Brewery in Portsmouth, N.H. He holds an MS in brewing from the University of California, Davis.

The Art of Recipe Design

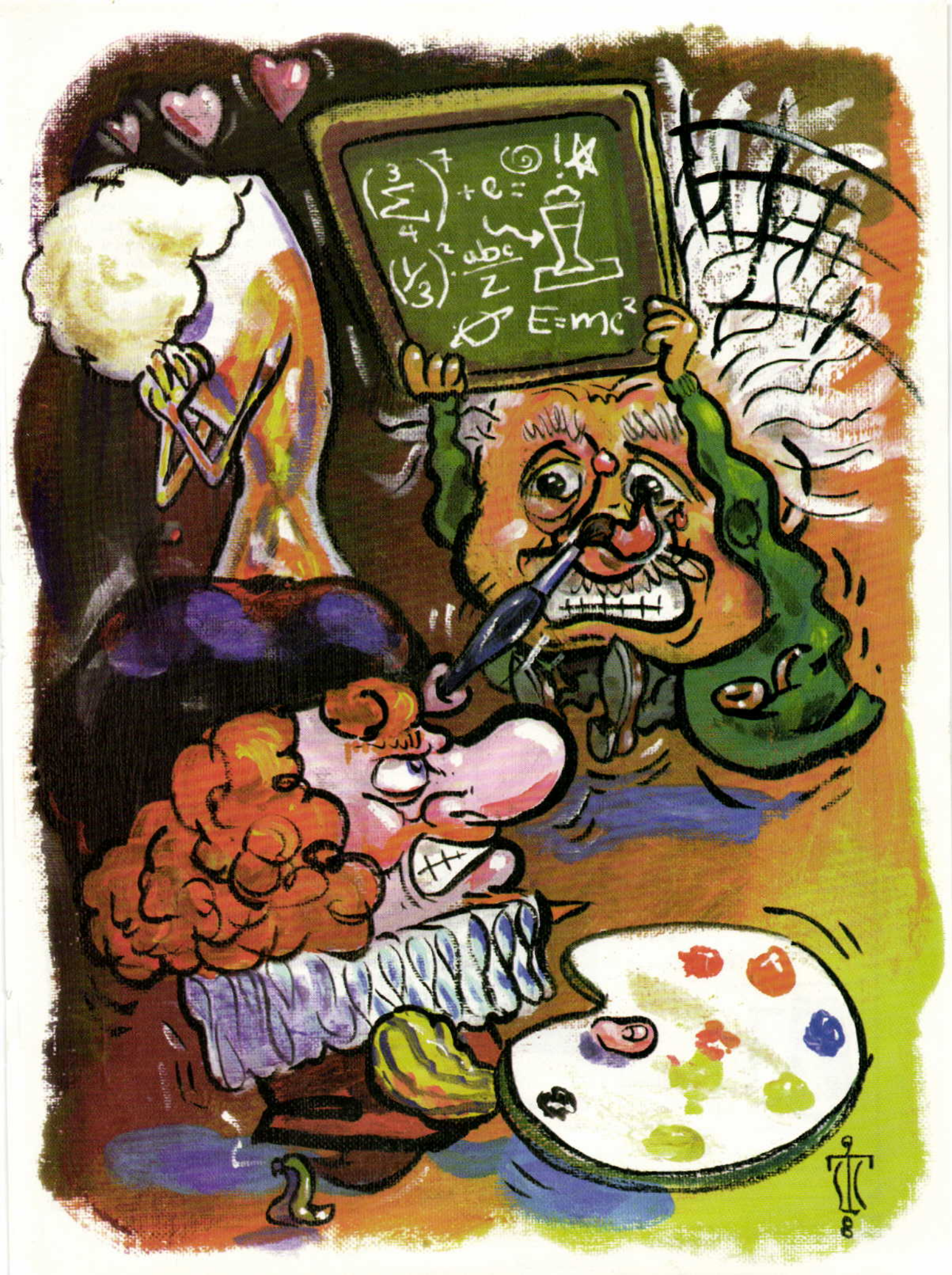
It's the Great Divide: classical vs. romantic, yin and yang, two radically different ways of looking at the world. Yep, we're talking about science and art as they apply to beer making. Is brewing a science, or is it an art? Well, obviously there's a lot of both involved, and the scale of those two extremes tips one way or the other depending on the times and the beer, brewery, or homebrewer.

In a way, maybe the science/art thing is why we started this whole homebrewing, brewpub, and microbrewery movement. Perhaps it was all a reaction to the brewing of beer having swung too far toward science at the expense of art and creativity. Mainstream American beers through the 1970s were certainly a great example of that effect. The science of mainstream breweries was, and is, very good, ensuring consistency of the product batch after batch. By the time many of us came along, though, the creativity of the big breweries was long gone.

According to its advertising, the typical big brewery started with some German immigrant whipping up one heck of a batch in the 1880s or 1890s and winning a gold medal or something with it. Creative brewing, usually of quite a few varieties of beer, continued until just past World War I, when the brewery was shut down by Prohibition. Those few breweries that reopened in the 1930s standardized their product to a light American lager style, very good in its way but kind of boring

by Sam Wammack

SHAWN TURNER ILLUSTRATIONS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and with very little difference among brands. The stage was set for us rebels of the 1970s and '80s to start brewing our own, often in styles that didn't exist, and to apply art in the extreme over science.

Well, the pendulum swings, and homebrewing is getting awfully scientific now compared with the wild early days. Retailers who deal with homebrewers every day sure hear a lot of talk about SRMs, sparge efficiency, and yeast glycogen levels. A lot less common is the phrase, "I wonder what would happen if I threw some (whatever) in." Now, that's not to advocate that we get wild again with our brewing. In the early days of the modern homebrewing movement, we weren't afraid of creativity, but we produced some beers of inconsistent quality, mostly because we didn't always pay enough attention to good brewing practices. Still, it's unfortunate to see homebrewers following recipes simply because they may not know

how to design their own. Creating is where the fun is!

Good brewers know that you can't cut corners with the basic brewing practices. Strict sanitation, a good boil, rapid cooling to pitching temperature, proper balance between malt and hops, correct fermentation temperature, the right yeast for the style — these are the things that make good beer. Within those good practices, though, there's lots of room for art and creativity. The art is what makes the beer unique and your own.

How can you bring a little more art into your brewing and learn practical recipe design? Published recipes are a great starting point. There are lots of good recipes in homebrewing publications, so pick a beer style that interests you and a recipe that sounds appealing and brew it. It's generally best to follow the recipe exactly the first time. This gives you a starting point to work from and, after all, the author of the recipe liked it well enough to publish it, so it must be pretty good. When the beer is finished, bottled, and aged, taste it carefully while enjoying it. It's probably a good beer in that style, but is there anything about it that you think would be interesting if it were a bit different? Sure there is.

First, notice the basics. Judge it according to your taste; that's who you're brewing to please. Does the beer seem too heavy or too thin? If so, make a note to adjust the next batch. Malt extract beers can be adjusted easily by increasing or decreasing the amount of malt extract, so with the next batch adjust the amount of extract used by one pound, up or down, in a five-gallon batch. Grain beers can be adjusted by increasing or decreasing the amount of base malted barley used. To be noticeable, two-pound adjustments of grain are usually needed for five-gallon batches.

How is the balance between malt and hops in that recipe? How do you like the hop flavor and aromatics? These are easy and fun to adjust. If you think the beer is too bitter or not bitter enough, adjust the amount of the first hop addition in the recipe. That first addition is where most of the bitterness is coming from, so adjust it in such a way that the total bitterness (ounces times alpha acid) will increase or decrease from the recipe level.

Hop varieties used for bittering (the first addition in the recipe) are basically interchangeable. It doesn't matter what hop variety you use, because it goes in at the start of the boil, so most of the flavor and aromatics will be boiled out and only the bitterness will remain. It takes a very experienced taster to discern the difference between two well-boiled bittering hops. This means that there are two ways to adjust bitterness from a recipe's level. Let's say you want to reduce the beer's bitterness by 25 percent, and your

original recipe calls for a bittering addition of one ounce of a hop with 10 percent alpha acid. To adjust, you can either use three-fourths ounce of that same hop or you can use one ounce of another hop with only three-fourths of the bitterness (alpha acid of about 7.5 percent). Easy.

Hop flavor and aromatics give the brewer a lot of scope for recipe design. These are the hop additions that go in the brewpot from the middle of the boil to the end. Flavor and aromatics boil away, so the less time a hop addition is boiled, the more flavor and aromatics are retained in the brew. Don't be afraid to interchange hops. Each hop variety has a distinctly different flavor and aroma, and combinations of different hops yield still different qualities. This is where the brewer has an opportunity to brew a beer that is truly unique.

The important thing to remember about hops is that they belong in groups. Following are lists of several hop varieties, because it's important to keep these groups in mind when interchanging hops in a recipe. This is not a complete listing of hop varieties, but all these are readily available to homebrewers right now, and this list will cover most varieties you may run into.

Great for bittering but mostly useless for flavor and aromatics are the bittering hops Brewer's Gold, Bullion, Cluster, Galena, Nugget, Magnum, and Columbus (sometimes called Tomahawk). Some of these actually have unpleasant aromatics, so don't add them late in the boil in any beer.

There are some hop varieties that can be considered general-purpose hops. They can be used for bittering, flavoring, and aromatics, and they are not specifically identified with any beer style. There are some great hops here, and the possible combinations when you interchange them are almost endless. This class of hops includes: Northern Brewer, Pride of Ringwood, Cascade, Centennial, Chinook, Eroica, Ahtanum, and Ultra. The Northern Brewer/Cascade combination in particular is a classic, used in many great beers.

There is a group of hop varieties mostly identified with ales. They can be used in any combination for bittering, flavoring, and aromatics. They are Northdown, Fuggle, Goldings, Willamette, and Target.

The hop varieties usually associated with lagers are Crystal, Mt. Hood, Perle, Liberty, Hallertauer, Hersbrucker, Saaz, Tettnanger, and Spalt. German-type lagers usually have no aromatic hops added at the end of the boil, but these hop varieties can be used interchangeably for bittering and flavoring — and aromatics in beer styles where appropriate.

That's more than 20 hop varieties, each of which has a unique flavor and aroma. If you keep these groups in mind and watch the total

alpha acid content that's going into your beer (so you don't throw the bitterness level off), there's a lot of room to be creative. Never be afraid to switch hops.

Specialty grains are another great field for playing. Crystal, black patent, roasted barley, and chocolate malt are used to adjust the color and flavor of beer. These specialty grains are usually included in the grist of an all-grain beer or simply steeped to 170° F in a malt extract beer. The effects of combining specialty grains are enormous. Roasted barley changes a porter into a stout; dark crystal malt makes a weizen a dunkelweizen. A couple of ounces of uncrushed chocolate malt even puts a great nutty flavor in a light lager.

Do some reading on specialty grains, look at the descriptions of the various grades in supply catalogs, and talk to your homebrew supplier about them. Like hops, each specialty grain has a distinct flavor and adds a different characteristic to beer. Don't be afraid to experiment with these. If you use these in reasonable quantities, usually no more than one-half pound of a specialty grain variety in five gallons of beer, you won't hurt anything and you will add interesting characteristics to your beer.

Yeast is still another area in which to adjust recipe designs. The variety of yeast used has a profound effect on the finished beer. Choose a yeast strain that is appropriate for the beer style you are brewing, but be aware that this is not the only strain that is appropriate.

If you are using liquid yeast and your recipe calls for an American Ale (Wyeast 1056), try the same batch next time with Special London Ale (Wyeast 1968). You will see a big difference, and this is true of the dry yeasts, also. A beer made with Nottingham dry yeast will be very different from the same beer brewed with Edme, Doric, or Muntons. Stay within general guidelines of course, lager yeast for lagers and ale yeast for ales. But don't be afraid to experiment. You can certainly change the beer in a published recipe, and you may very well make a significant improvement.

There's a lot more to homebrewing than just being able to accurately follow a recipe. Designing a recipe from scratch or improving upon a printed recipe adds to the pleasure of the hobby (and it produces some great beer, too). To do that a brewer needs to become like a good cook, knowing what each beer ingredient does, the flavor, color, and aroma it will produce, and how to use it.

The science of brewing is vital, but once the basics are mastered it takes the art of brewing to produce fine beer. Let's learn our hobby and keep the balance between science and art. We'll brew a lot better beer if we do!

SETTING THE RECORD STRAIGHT

Knowing what you've done in the past can improve the beers you make in the future.

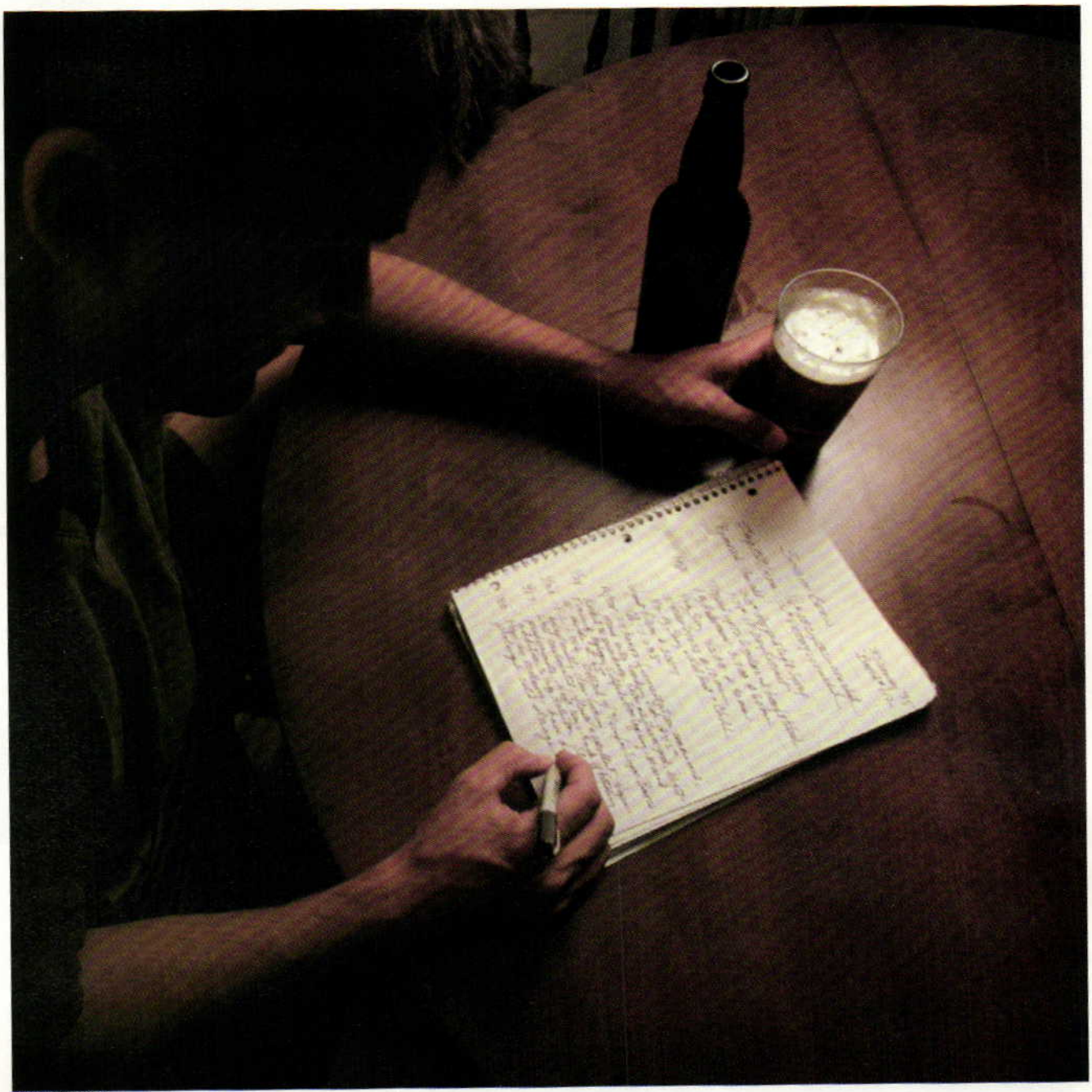
Joe came into the homebrew shop with a bottle of his latest creation. "Tell me what I did wrong," he said, while pouring two small samples. The sharp, mouth-puckering astringency suggested some sort of oversparge or possibly boiled specialty grains. With his lips still tingling the shopkeeper began trying to analyze his procedures.

"Was this an all-grain batch?" he asked, trying to narrow the possibilities.

"Well, lessee, I have been brewing an awful lot lately, and I think it was...no wait a minute, it might have been...doggone it, when did I make this?" replied Joe, staring at the bottle, struggling to recall the details of this batch of beer brewed many weeks before.

Whether you brew with malt extract, partial mash, or all-grain, good record keeping is one of the most important tools available to help improve your brewing. It can help any brewer avoid the mistakes of the past while at the same time allowing him to repeat and improve on previous successes. By recording

by John Oliver



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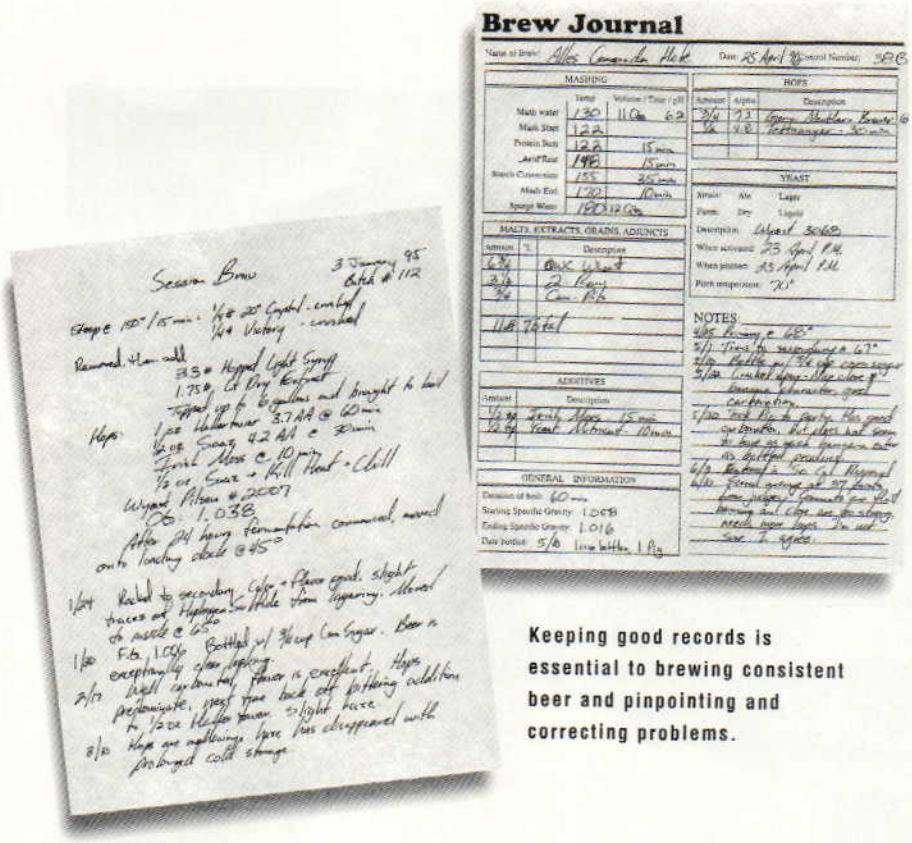

Keeping good records is essential to brewing consistent beer and pinpointing and correcting problems.

the variables associated with brewing a batch of homebrew, you can look back while tasting the finished beer and decide what to change and modify to help improve the profile of future brews.

To accomplish this effectively you need to measure and record the important variables in a manner that allows you to easily and quickly refer back to the information you need. The two most important decisions to make when putting together a record-keeping system are what pieces of information you need to record and the form in which you will record this information.

The Structure of Record Keeping

Brewing is a fun hobby, and if you overburden yourself with paperwork or long forms to fill out, it can put a damper on the activity. In addition, if the system of keeping records is not easy, the tendency of most people is to skip it or do a poor

job. These incomplete records turn out to be of little value or even useless when they're needed for a future brew.

When deciding on a method of record keeping, choose one that is easy and suits your personality. As a rule, most brewers fall into two distinct categories with record keeping: The Technician and The Artist. Each of these methods records the same basic information but in a different way. Each method has its own advantages and disadvantages.

The Technician relies on a fill-in-the-blanks method of record keeping, usually centered on some type of form. One of the advantages of this method is that the blanks are always there, waiting to be filled in. During a frantic brew the brewer is less likely to forget to record some piece of information than he would be with a more free-form system. By referring to the blank brewing record, it is easy to see at a glance what information has been recorded and what still needs to be.

Many brewing texts and periodicals have examples of these kinds of brewing logs. The information recorded tends to be numerical and quantifiable data. The disadvantage is that many brewers find that filling in the blanks on a brewing record, no matter how accurate, has all of the romance and fun of filling out an IRS form. This quickly throws a damper on an otherwise fun brewing session. Also, while numerical data can draw a clear picture of what takes place with a particular brew, some brewers have a hard time quickly and easily interpreting numbers as opposed to understanding a narrative description.

The Artist, on the other hand, tends to record information in more of a narrative style, jotting down notes during the brew. The big danger with this method is that during the course of a brewing session a valuable piece of information can be overlooked and not recorded. The information recorded tends to be more descriptive in nature, for example "light gold in color" as opposed to "SRM = 6." While this type of information is more subjective in nature, it is usually easier and quicker for most people to understand.

Which method is best? Truthfully, it depends entirely upon the individual brewer. The easier and more comfortable a system is to use, the more likely that all of the data will be recorded accurately and will be useful for future reference. Many homebrewing records are actually a personalized blend of the two styles, with much of the information recorded in a format or table accompanied by some descriptive narrative. The important thing is to find a system that works for you.

What Should You Record?

Your brewing records should

include three basic types of information: the materials used in the recipe, the brewing methods and procedures, and the results. Keep in mind your own brewing situation; if you are primarily brewing with kits or malt extract, much of the data that is important to an all-grain brewer is useless to you. The simpler the process of record keeping is, the more likely it will be done accurately every time.

The materials used in a recipe are fairly straightforward. Regardless of the type of beer you are making, you need to know the batch size as well as the amount and source of the water used to brew. For a malt extract batch, you need to know the type and amount of each of the malt extracts used. If you used any specialty grains, record the type and amount used as well.

For all-grain brews record the types and amounts of the various pale malts and specialty grains used, along with any adjuncts. Water volumes and temperatures for mash-in and sparge need to be noted, along with any acids or minerals used for water treatment.

Whether you're brewing extract or all-grain, record the amount of hops used, their variety, the type (leaf or pellet), and the alpha-acid value. With yeast you should know the type or culture, the amount pitched, and the age or number of times the culture has been reused. Any other ingredients that are used should be recorded as well, for example yeast nutrients; clarifiers such as Irish moss or gelatin; and flavoring agents such as fruit, spices, or flavoring extracts. Don't forget to list any priming sugar or malt extract used at bottling time.

The greatest care must be taken in recording brewing methods. The single biggest variable in the brewing process is the brewer, which becomes evident when several different homebrewers try to brew an identical beer while using their own equipment and procedures. The result of these types of experiments is usually a wide variety of beers that all share several

common characteristics but differ significantly as well.

Individual brewers tend to do things just a little bit differently, which is why some of the most valuable information you can record centers not on the materials you use to brew a batch of beer but the methods you use when brewing it.

The malt extract brewer should record such variables as amount of water boiled, top-up water used, and boil times. If specialty grains were incorporated, were they crushed or left whole? What were the time and temperature of the steeping?

For all-grain and partial-mash brewers the amount of information needed becomes more substantial. Amount of water and temperature used in the mash, strike temperature, and the period of time and temperature for each of the mash rests should be noted. Decoction times and amounts must be listed for decoction mashes. Advanced brewers may also want to record the pH of the strike water, mash, and sparge water as well.

Regardless of brewing style, the amounts and times of the various hop additions need to be recorded, preferably incorporating any of the many formulas available for calculating hop bitterness. Simply recording the variety and amount of hops used does not take into account the seasonal variations in a given hop variety. If this year's crop of Northern Brewer is averaging 5.8 percent alpha acid and next year's crop comes in at 7.8 percent, you will end up with two dramatically different beers if only quantity is taken into consideration with no thought given to bitterness.

Specific gravity, regardless of brewing style, provides the yardstick to measure brewing efficiency. By recording hydrometer readings not only do you know if you have matched your previous efficiency, you also know what to expect in terms of the finished beer, including if it's done and if your yeast has performed to expectations.

Fermentation times and temperatures have a strong bearing on the flavor of the finished product. By recording the length of time and temperature of the fermentation, along with any transfers, you can chart the performance of your yeast to know if it has performed as expected. Is there an unusual fruity character in your Munich helles? If your records indicate that the yeast was pitched at 75° F and the fermentation was at 71° F, you may have found the reason.

Without a record of the results, looking back on your previous recipes lacks the single most important piece of information from the most valuable test instrument that every brewer has — your own taste buds. Does the beer taste good? Why? What do you like about the beer, and what would you change

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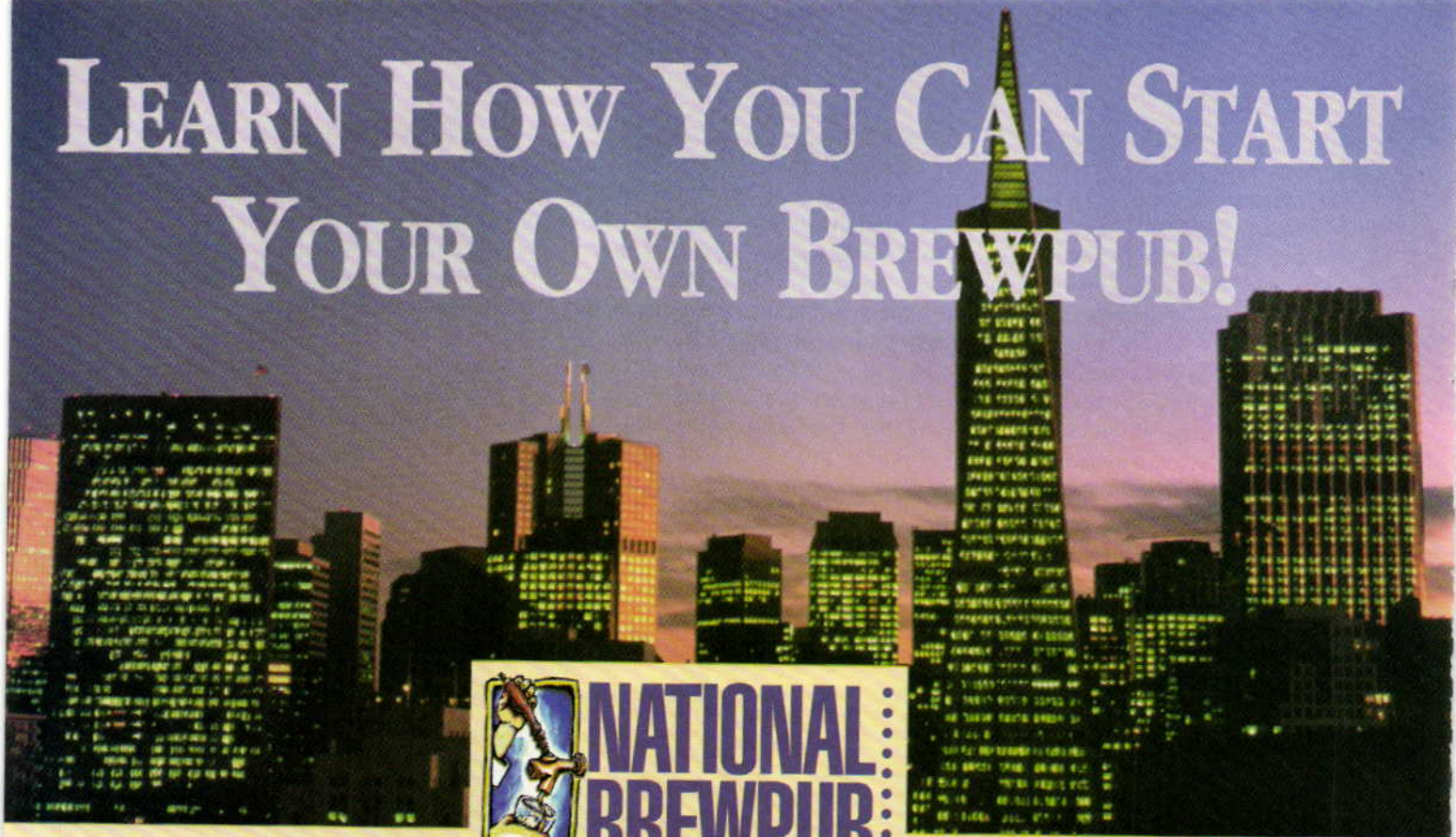

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next time? How old was the beer at the time of tasting? Did you enter the beer in any competitions, and what did the judges say about it?

Every recipe should contain tasting notes, written down at various stages in the life of the beer. Homebrew is a living environment, and even while the finished beer is in the bottle it will continue to change in flavor and character over time. Don't forget to identify your finished bottles of homebrew with some type of mark, such as a label or a designation on the cap, so that you can identify what beer it is and relate it back to your records.

The Computerized Record

Many computer programs tailored specifically to homebrewing are available for both IBM-based and Macintosh computers. Most of these programs provide an easy, consistent method for recording data. The advantage of these programs is that not only do they provide a convenient way to record a batch of homebrew, many times they are set up to perform the routine and laborious calculations such as hop bitterness and potential specific gravity automatically, eliminating a source of human error in recipe formulations.

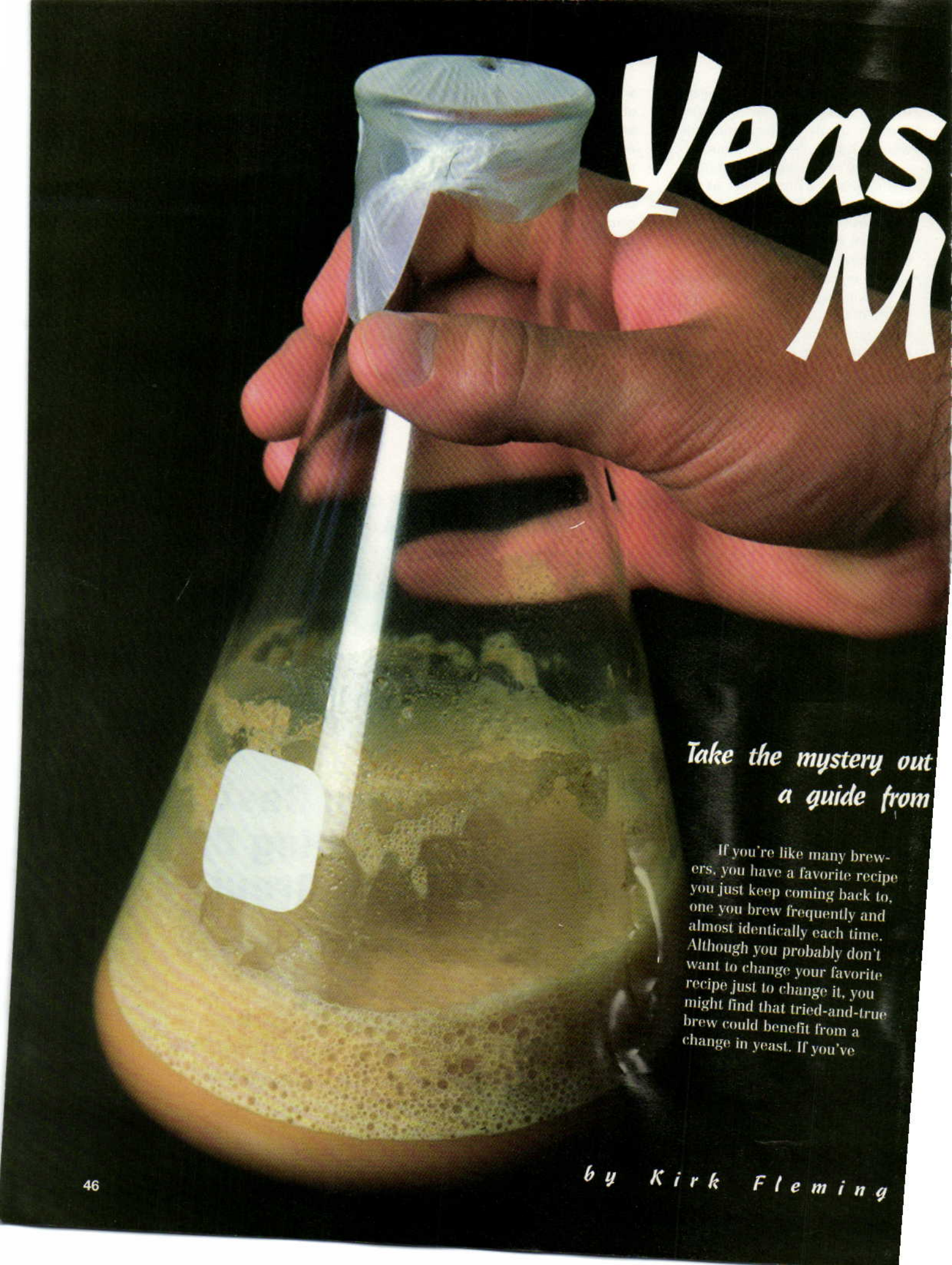
Some programs use the information you provide about ingredients to create an approximate profile of the finished brew, including variables such as gravity, alcohol content, color, and bitterness, without ever dirtying a brewpot or fermenter. Advanced programs automatically provide suggestions on modifications to the ingredients to match the style of beer being brewed.

Setting the Record Straight

Much like homebrewing itself, when it comes to keeping good records there is no single right way to do it. As long as all of the pertinent information is being recorded in an accurate, straightforward manner that can be read and understood later, then improvements to your homebrewing are sure to follow. Typically, the types of information a homebrewer considers important or necessary change as he develops and grows within the hobby, so do not be afraid to experiment or modify.

The log sheets from your first dozen batches may be rudimentary compared with the notes that you keep later on, yet they will allow you to grow and advance. Most important, don't let record keeping get in the way of having fun. Brewing shouldn't be work; good records should be a reflection of the fun you had brewing that batch of homebrew.

John Oliver is an award-winning homebrewer and BJCP Certified Judge. He is keeping records as the assistant brewer at BJ's Brewery in Brea, Calif.



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Take the mystery out a guide from

If you're like many brewers, you have a favorite recipe you just keep coming back to, one you brew frequently and almost identically each time. Although you probably don't want to change your favorite recipe just to change it, you might find that tried-and-true brew could benefit from a change in yeast. If you've

by Kirk Fleming

t agic

of liquid yeast: starter to finish

always used dry yeast, one of the several dozen liquid yeast strains available at your local homebrew supply shop might provide the extra something you're looking for in that favorite recipe.

Until a few years ago, the amateur brewer had only a few choices in selecting brewing yeast, all of them

TODD HAMMOND

dehydrated, packaged, and primarily ale yeasts. Besides the drawback of the fairly small selection, the handling in manufacturing and preparation subjected the yeast to the risk of contamination. Dry yeast packets are never entirely pure; they always contain at least some wild yeast.

Over the years, the variety of dry yeast has expanded a bit and the strains are more pure than they once were. Dry yeast is still readily available and very inexpensive.

Liquid yeast begins from a culture grown from a single cell under controlled conditions, and contaminants are controlled to far lower levels than with dried yeast. Manufacturers package the yeast in a liquid nutrient sealed in foil pouches or plastic vials. The most widely available liquid yeast is sealed in a breakable plastic bag surrounding a smaller foil pouch containing sterile wort — sometimes called a "smack-pack." Liquid yeast packaged in vials is loaded directly into the container with a small amount of liquid nutrient cover.

A new product on the market is "pitchable" yeast. The term pitchable doesn't refer to a property of the yeast but simply means it's packaged in enough quantity that you can pitch it directly into your wort without first making a starter. Some pitchable yeast packages provide 10 or 20 times the volume found in smack packs. Pitchable yeast starts much faster than a standard packet or vial of liquid yeast pitched without a starter. Still, pitchable yeast packets provide roughly a fifth of the yeast needed for a five-gallon batch, according to typical commercial pitching rates.

Dozens of yeast varieties are now available, cultured from yeast sources around the world. Because the strain of yeast selected for your beer has such a big influence on the final product, it's very satisfying to know you made a choice that is perfectly matched to your beer style. Homebrew suppliers have complete information about what varieties of yeast are on the market.

Get Started With Starters

A true story: One pair of brewers had a typical surprise when they first used liquid yeast — the long time it took for fermentation to begin after pitching directly from the foil bag. The odds couldn't have been more stacked. First, they were brewing a Scottish ale, and they had cooled both the yeast package and the wort to just under 60° F. Second, the starting gravity was nearly 1.070, a hearty brew to say the least. And third, they didn't know about starters. With all this going against the yeast, it took three days for any noticeable fermentation.

This experience has been repeated many times by brewers unfamiliar with the volume of yeast recommended per unit volume of wort (called the yeast pitching rate).

Although recommendations vary, pitching rates based on accepted commercial brewing practice are far larger than those used by many amateur brewers and come close to one-half fluid ounce of yeast solids per gallon of wort. It's impossible to know how close this rate is to ideal; the difference in the number of yeast cells in two half-ounce measures of yeast starter could differ by a factor of 100 or more. A rule of thumb: for five gallons of wort of average gravity (say 1.050), use at least one-quarter cup of settled yeast.

By contrast, the volume of yeast in a typical liquid yeast foil pouch is about one-half teaspoon or less, and even the pitchable yeast packages contain only an ounce or so of settled yeast. This means that the yeast you buy in these packages must be bulked up in a starter to get close to the recommended pitching rates for even a five-gallon batch. Increase the volume by 30 to 50 times for the smack-packs, and by three to five times for a vial of pitchable yeast.

Starters are easy to make using a clean saucepan with a clean lid. First, bring just more than two quarts of water to a boil, adding about 1 cup of extract as the water gets hot. Boil for at least 15 minutes, then cover the pan with the lid and cool in the kitchen sink in an ice bath. Using a sterile thermometer, cool the wort until it reaches 70° F and pour it into a sanitized half-gallon glass jug. Seal the jug with a sanitized screw-on cap or rubber stopper and shake vigorously to aerate the wort. Remove the stopper or cap, and pitch the yeast from the smack-pack or vial and fit a sanitized air lock and stopper assembly into the mouth of the jug.

Let the fermentation finish; the yeast froth should rise and fall. The bubbles in the air lock should be at least a minute apart. Wait for the yeast to settle out, then pour off the spent wort and replace it with a fresh batch of wort. This process can be repeated as often as needed to ensure that a large, well-fed population of yeast is ready on brew day. If you have a week or more before brew day, you'll have plenty of yeast to pitch and even some left over. What remains in the jug can be fed and maintained until the next brew session.

Some brewers prefer to pitch the starter when it is at the peak of activity instead of waiting for the yeast to settle. There are probably hundreds of arguments for both methods, but if you're like many brewers, the choice is seldom yours; you brew when you can. That means you pitch the yeast in whatever condition it happens to be. As a rule, the best fermentations happen when the starter has been nurtured for at least one week. The single most influential factor seems to be sheer volume, and very little else matters.

Handling Liquid Yeast

Keep liquid yeast refrigerated

until you're ready to use it. To start the foil smack-pack, lay the package across the palm of one hand or on a hard, solid surface, and with your other hand in a fist, press down on the package or hit it gently to break the inner wort pouch. With the foil pouch held between the palms of your hands, force the liquid inside the package from end to end to mix the yeast with the nutrient. Finally, leave the package in a 65° to 75° F location until it appears to be almost fully swollen. Sanitize the outside of the foil package, trim one upper corner off with the scissors, and pour the solution into your prepared starter wort.

For liquid yeast sold in plastic vials, let the yeast come to room temperature prior to pitching. Shake the vial occasionally to keep the yeast in suspension, and when your starter wort is prepared and in your starter jug, sanitize the top of the vial and pitch the yeast.

After the yeast has been pitched into the starter jug and you've put an air lock on the jug, swirl the contents around to agitate the yeast, being careful not to lose the air lock to rough handling. It's okay to repeat the agitation frequently (several times a day, if you want) until you can see fermentation begin.

Liquid Yeast Strains

Because there are so many strains of liquid yeast available now, with more appearing in store refrigerators each year, you can match yeasts to almost any style of beer or mead you choose. Manufacturers publish specification sheets on their yeast strains, and generally your brewing supply shop will have a copy. These spec sheets contain general information such as beer style recommendations, preferred fermentation temperatures, flocculation behavior, and flavor characteristics. These data sheets, along with the experiences of your fellow brewers, will help you select the yeast to try next.

Although your shop may not carry dozens of strains, many shops now carry the most popular ones that work well for brewing a wide variety of adult beverages. Some strains are considered much cleaner than others, leaving very little behind in the way of flavor-producing by-products in your beer. Others are well known for rapid settling in the secondary fermentation, producing an almost crystal-clear beer without the need for filtration. Ask your homebrew retailer for suggestions.

By choosing good general-purpose yeasts, using a starter, and practicing sanitary brewing, you can use a single package of liquid yeast to make several batches of beer continuing for several months or more. This can make the use of liquid yeast very economical, in spite of the higher cost per package when compared with dry yeast. Why not make your next batch a liquid yeast brew?

Making the Most of Your Hop Back

by Mark Garetz

This simple device adds unique hop flavor to your wort and strains it at the same time.

As a brewer it is always exciting to find out that a process you are already practicing can be expanded and voilá, better beer. Such is the case with a hop back.

A hop back (also known as a hop jack) in its simplest form is nothing more than a strainer, originally intended to remove the whole hops from the wort before cooling. It could be in the form of a false bottom consisting of a screen or perforated plate built into the kettle, or an external device through which the wort is run. In either case the screen or plate catches the whole hop cones, which then act as a filter bed to catch more hops and the trub from the boil. You can see where the name comes from; the idea was to hold the hops back. At some point along the way, brewers discovered that adding a charge of fresh hops to the hop back gave the beer a distinct hoppy character. One theory is that this was discovered by accident; the brewer was probably just trying to make sure there were enough hops on the screen to form a filter bed before the wort was run through.

The hoppy flavor or character imparted by the hop back is quite different from either late kettle additions or dry hopping. The wort is no longer boiling, and the typical hop back is a somewhat closed system, so fewer of the volatile oils (responsible for the hops' aroma and flavor) are lost. This is also the case with dry hopping, but the heat of the wort in the hop back causes many chemical changes to the oils that affect their flavor and aroma. These changes do not occur during dry hopping.

If you want to make a hop back at home, you have many options. If you are using whole hops and are currently using a strainer, the simplest method is to add some fresh whole hops to the strainer and run the wort through. You may have to upgrade the size of your strainer to handle the extra hops. Don't forget to run the wort through prior to chilling.

If your kettle has a false bottom, simply toss the extra hops in the kettle after the boil, cover, and start your runoff. You can also use any "strainer equivalent" such as your lauter tun.

The more closed you can keep

the system the more volatile oils you will retain. If you have a spigot on your kettle, you can build a totally enclosed hop back from a commercial water-filter housing.

First you'll have to find one made of polypropylene to handle the high temperatures of the wort. It may take a bit of searching, but they do exist. Next you'll have to replace the standard filter element with a tube made of stainless steel screen with mesh the size of a strainer or window screen. Cut the screen to the same length and inner diameter of the paper filter so it fits snugly between the top and bottom of the filter housing. If you can find a filter element with a perforated polypropylene core with holes of a proper size, you can try removing the filter material, leaving just the inner core, and then use that in place of the screen.

A little ingenuity will go a long way here. Adapt the input and output connections on the filter housing to fit your system's tubing. Now just fill the housing (outside the screen) with fresh whole hops and run the wort through on the way to your chiller. You may want to "pre-filter" the wort as you normally do now to keep the hop back from clogging or reducing flow too much.

All of these solutions are fine if you are using whole hops. But what if you want to use pellets? Luckily there is a simple solution that will give you the same effect as a hop back. Simply toss an extra charge of pellets into the kettle after you turn off the heat and before you chill the wort. Cover the kettle, and let the hops steep for 20 to 30 minutes. It's amazingly easy, and the effect will be indistinguishable from using a hop back.

How much hops should be used? That depends on the hop variety and its oil content. Because some hops have a more pronounced aroma than others, the variety makes a difference. Hops with a subtle aroma have less effect.

Keep in mind that hops used in a hop back or steeped after the boil (assuming it's a gentle steep and you're not whirlpooling or otherwise agitating the wort while it's hot) will not contribute any significant amount of bitterness to the beer.

The oil content plays a role as well. Hops with a high oil content contribute more than hops with a lower oil content. A very common hop to use is Cascade. Taking Cascade as our baseline, start with about 1.5 ounces and see how you like it. You can adjust the quantity up or down depending on the variety, oil content, beer style, and your personal preferences.

A hop back allows you to experiment with different types and quantities of hops while it serves a practical purpose. And bragging about the great results from your hop back seems a lot more exciting than straining your wort. ■

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Wine Myths Debunked

by Alison Crowe

A lot of homebrewers are also great home winemakers. And it's no wonder; the hobbies have a lot in common. The skills and techniques involved in brewing and winemaking are just about the same: using quality ingredients, practicing good sanitation techniques, monitoring fermentations, fining, stabilizing, and bottling. But certain people out there just won't have it so. They would rather we believe that wine is mysterious and complicated, an exclusive accouterment of the elegant elite and simply too far beyond our realm of understanding.

Centuries of this exact kind of wine snobbism have bred countless wine myths in our society that have, unfortunately, made wine appear a beverage reserved solely for special social occasions, romantic dinners, and boat launchings.

No wonder many potential home winemakers are turned off by all of the mumbo jumbo that has surrounded winemaking and wine consumption over the years. Here are some wine myths that are sorely in need of a good debunking. This may not make your hardcore brew buddies turn in their mash tuns for crusher-destemmers, but it might go a long way in relieving some of our collective wine anxiety.

Myth: Barrel fermentation produces more complex wines.

A wine consumer issue and a heavily debated winemaking controversy as well, this wine myth is one of the classics. We've all seen the ads in the glossy magazines and on the prime-time news that claim that Winery X's Chardonnay is more complex and aromatic because it's fermented in French oak barrels. Many wineries set aside the bulk of their production budget for roomfuls of $600-a-pop toasted oak from the Limousin forests in France, and the price of their Chardonnay reflects this costly investment.

But is all of the trouble — and all of the hype — warranted? No, according to studies conducted at the Department of Viticulture and Enology at Universtiy of California, Davis. No perceptible difference in smell or taste could be found between wines fermented and aged in new oak barrels and wines fermented in stainless steel tanks and aged in the same new oak barrels. The take-home message is: don't waste your time and money on barrel fermentation if you're just going to store it in oak anyway. To the commercial wineries that hope to cash in on the chicness associated with barrel fermentation, the cat's out of the bag.

Myth: Wine causes headaches.

Ah, the infamous "wine headache." This choice topic of conversation among wine snobs and wine wannabes alike has grown and festered in the corporate headquarters and fashionable watering holes of America into an urban legend of almost epic proportions. Knowingly citing anything from histamines to tannins, the weekend wine warriors of the world (and perhaps a few innocently speculative home winemakers?) have created a wine myth juggernaut that just won't die.

It's easy to see why. There are a number of things that seem to be likely culprits. First and foremost to be blamed are always sulfites, the sulfur-containing compounds used in winemaking (usually in the form of sulfur dioxide powder) as an antioxidant and antimicrobial agent. We've all seen the sulfite statement

on the bottles. It's not an unlikely leap of logic that links the wooziness one might feel after ingesting a glass of wine or two with something that's clearly advertised as being harmful.

The truth of the matter is, however, that the level of sulfites used in winemaking (on average, around 40 parts per million) is not harmful, and the sulfite warning labels don't even concern the majority of the population anyway. The warning labels are there to protect the 0.001 percent of the population that is both asthmatic and that lacks the enzyme sulfite dehydrogenase. These rare individuals cannot properly digest sulfites like the rest of us can and know to stay away from other sulfite-containing food and drinks like dried fruit, cured meats, and bottled fruit juice. Even if a wine is "organically" made without the addition of sulfites, it's still going to contain some sulfites because yeast produce them naturally during the fermentation process. But we don't have to worry anyway because sulfites in wine have not been shown to be detrimental to the health of most people.

So what about other things such as histamines or tannin that might cause the dreaded "wine headache"? No worries there, because none of these components have been shown to be the culprit, either. Current academic opinion holds that what probably makes your Aunt Edna feel a little out of sorts after a glass or two of red wine is most likely what's been there all along — the alcohol.

Myth: The older, the better.

We've all heard the story on the 6 p.m. news: Some wine collector with obviously way too much money has just paid $45,000 for a bottle of 150-year-old Bordeaux at Sotheby's in London. And so is perpetuated the myth that the older a wine is, the better it must be, and yet another potential home winemaker is turned off by the thought that he must wait years or even decades to enjoy the fruits of his labor. Well, wake up and smell the bottle bouquet, because you're not going to be retired before you can sample your first vintage nor do you need to take out a second mortgage to buy a drinkable wine. The truth is that all wines have a life cycle and when any given wine is "ready" to drink depends on a number of factors, not just its age.

First and foremost, all wines do have an expiration date — of sorts. A premium Grand Crus may be just hitting its stride after 25 years, whereas an American White Zinfandel will be oxidized and undrinkable if left alone that long. This is because the White Zin, lovely and fruity though it might be, is not built to age. The slow but inevitable breakdown and chemical oxidation of wine components that happens

over time can only improve a wine if the proper reactants are in place to start with. Red wines are just swimming with all sorts of these things. Tannins, anthocyanins, aromatic compounds, and other red-wine components all have their place in the complex chain of chemical reactions that occur under the correct storage conditions.

Comparatively, our White Zin is lacking in many of these reactants, and the ravages of time are more immediately felt as the components it does contain are attacked and degraded.

Most white wines produced in this country are ready to drink when they hit the shelf, and most red wines will benefit from aging to a point. If your homemade wine is really tannic, colored, and acidic (pH of say 3.3 or below), it's more than likely built for the long haul and might improve over the next 10 or 20 years. If it's light, fruity, and less acidic than usual (above pH 3.6 or so) and especially if it's a white wine, you can drink it as soon as it's done fermenting, but it will continue to improve in the bottle for the next year or maybe two. The case of the century-old Bordeaux is the exception, not the rule, and I'd be hard pressed to recommend that anyone risk that much cash on a bottle of wine that is more than likely over the hill.

Myth: You can't make serious wine from kits.

I'm a homebrewer as well as a winemaker. I think it's great that you can buy a kit at your local homebrewing store, pop open a can, heat up some extract, and enjoy your own great homebrew in a matter of weeks. What could be easier or more fun? For some reason a lot of home winemakers (or potential home winemakers) believe that you can't make great, or even good, wines from kits. They staunchly stand by their grape-only (sorry to all you country wine fans out there, too) winemaking dogma that states that if you didn't crush it and press it, it just isn't real wine.

This mindset isn't surprising considering the kinds of kits that have been available to the winemaking public in the past. Obscure varietals, sugar-sweet recipes, and oxidized or heat-damaged kits have all taken their toll on the reputation of winemaking from concentrate. Lucky for those of us who want great wine without all the work, kit winemaking is easier, more affordable, and more quality conscious than ever. Grape-juice concentrate companies have upped the quality and variety of their products, and it's a snap to find kits that correspond to the varietals, styles, and volumes that you want to make. ■

Alison Crowe is a graduate of the University of California, Davis, winemaking program and works in the university's Department of Viticulture and Enology.

A Lesson in Pop History

by Mark Spiezio

My first-born child just arrived. A son. As he grows older he is sure to be exposed to the world of brewing, because his father has a brewery in the basement complete with a tap system. My wife is concerned that I may be setting a bad example and our child may be more prone to drink than he would be in another setting. I say he either has the beer gene or he doesn't. In any case he should know his history, and when the time comes he can make his own decisions about homebrewing.

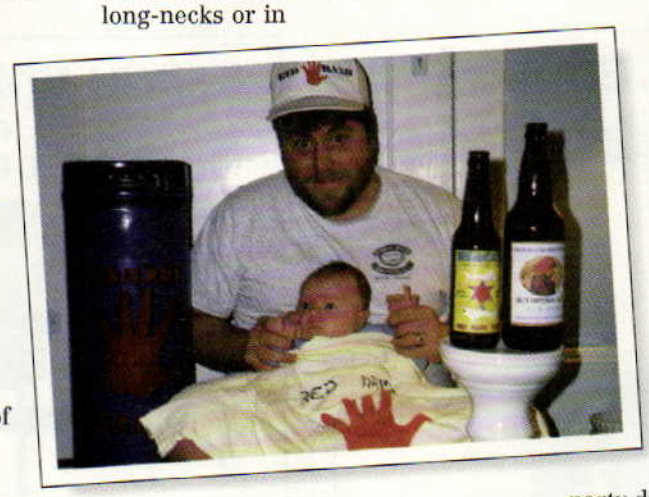
My grandfather, Vincent to his family, "Pop" to his children and grandchildren, grew up in a different world. He was born during war, the Great Depression, and Prohibition. His home town was Bayonne, N.J., a stone's throw from New York City. Some neighbors brought the art of home winemaking from Italy. This was lost on our family. Instead, during Prohibition Pop's exploits included the now-famous bathtub gin and other interesting varieties of spirits. When I gave him my first homebrew worthy of general consumption, he told me of his run-in with brewing.

Back then the drug store supplied most of the ingredients required for making your own drink. Pop and a couple of friends grew tired of life without beer and went there for the materials for a batch. The typical fare was canned malt with a pack of baker's yeast. They rushed home to my great grandmother's kitchen and began.

Out came the spaghetti pot. More of a cauldron because our family was a large one. In went the malt and water. It's impossible to tell how large this batch was because no recipe existed then or now. As the boiling commenced, the feeling of happiness grew (just like today!) and many fingers with wooden spoons went in and out of the bubbling concoction. I figure the yeast was added directly to the pot after a cooling-down period, and the pot was left covered on the stove. After a brief encounter with a broom-wielding grandma, the pot was taken to the basement.

When the next Sunday came the partially fermented beer was bottled. You see Sunday is the traditional spaghetti day in our family. Just for good measure another pack of yeast was added prior to bottling.

It was Prohibition, and Pop didn't have access to returnable long-necks or in fact any "real" beer bottles. He used every bottle he could get.



My son will choose whether to pursue the family homebrewing tradition.

A few days later, as the family lay asleep, noises began to sneak from the basement. Okay, more like explode from the basement. The bottles were ejecting their caps with such velocity they were hitting the basement ceiling, throwing the family into a frenzy. Once again there was a brief but tenuous period of broom dodging and some beer made its way into the ice box and others outside in the alley. It was promised that all would be gone by the end of the coming weekend. In the meantime more explosions erupted, shaking the icebox like a badger had been locked inside.

When the door was opened on Saturday, out flowed the malted treat. The inside was pock marked like the face of the moon. Out came the broom. Pop yelled down the street for his friends. They grabbed the spaghetti pot and went to the back courtyard. What was left of the beer was opened and dumped into the pot. As each bottle was opened the top flew up and a geyser of beer jumped two feet into the air. What landed in the pot was chilled with chipped ice and, after settling, consumed.

The excitement of this occasion was catching. Each opening was like a small New Year's Eve celebration, with beer instead of champagne popping into an otherwise dry world. The neighbors drifted into the courtyard until a block party developed. The party didn't end until the beer was gone and the broom was back out — chasing away the rowdies and a beer-soaked, laughing Pop.

Today I brew many great beers. Every time I tap a keg or pop the top of an aged stout, excitement overwhelms me just as it did my grandfather and his friends. I hope my son will share this feeling. ■

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