

Brew

YOUR OWN TM

May 1996, Vol. 2, No. 5
Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

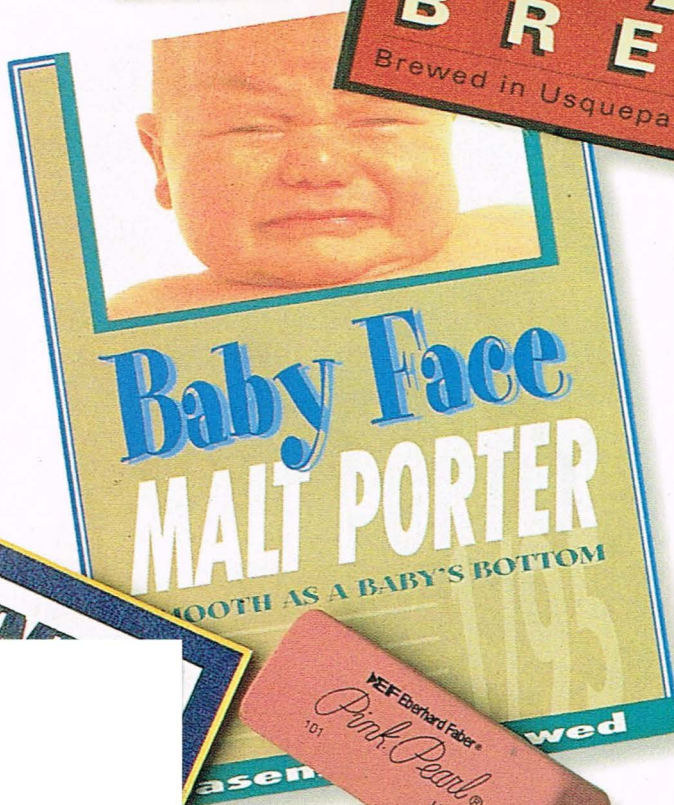
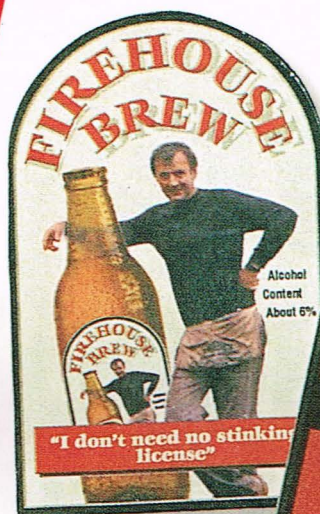
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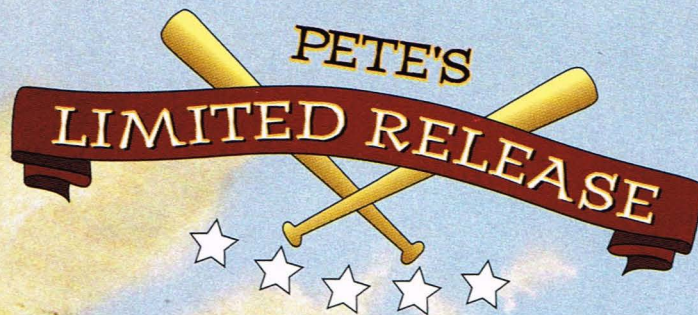


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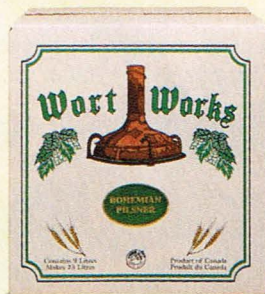
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This is Sean. He's our beer guy.

Matter of fact, around Brew King, we call him "The Beer Guy".

After all, he knows a thing or two about beer. And as you can see, he's pretty happy right now. Why? Because after months of self-imposed exile in Brew King's (windowless) brewing lab, Sean has emerged with Wort Works, an all-malt brewing kit even by Sean's standards. You see, even by Sean's standards, you see, Sean belongs to that elite group of homebrewing purists - commercial brews and the ones that scoff at most insist on choice natural ingredients masterpieces. With Wort Works, Sean would never cut corners.



all-malt brewing kit even by Sean's standards. You see, even by Sean's standards, you see, Sean belongs to that elite group of homebrewing purists - commercial brews and the ones that scoff at most insist on choice natural ingredients masterpieces. With Wort Works, Sean would never cut corners.



So what has Sean created? A totally unique, bag-in-a-box packaged product offering 9 litres (2 gallons) of concentrated wort made from 100% barley malt with naturally processed hops and filtered Canadian water, fully



boiled in our 1000 gallon brew kettle. Sean even insisted on including a special dry hop package for extra aroma and flavour. And true to form, his instructions are comprehensive, even with information on the specific ingredients used. Sean's no dummy. He made Wort Works with his fellow homebrewers in mind, but he also made sure that its user friendly, no-boil method would be perfect for beginners too. Keep Sean happy. Make his Mom proud. Try Wort Works. The results will make you (and your friends) happy too.



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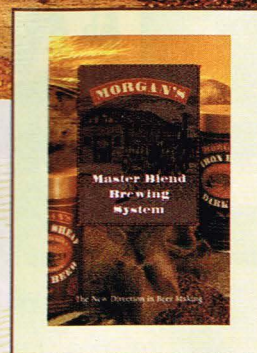
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How to Win a Label Contest

How do you choose winners in a contest when you have hundreds of interesting and creative entries?

For the First Annual BYO Gonzo Label Contest, we carefully reviewed each entry for graphic unity, energy, clarity, originality, and seven other specific attributes. Using a carefully weighted grading system, we rated each label then added up the scores. A multiplier factor was figured in for artistic value, and finally a U-shaped curve was imposed to calculate the winners.

Oh, yeah, and anyone who sent beer with their entry immediately made it to the finals.

The problem with a contest like this is there's no way you can give recognition to the many, many people who deserve it. For instance there were plenty of entries that, while not in the top flight graphically, had great names, warnings, and other notations on the label. Who's going to appreciate someone's use of words if not the editor? That's why we're introducing the first annual BYO Gonzo Label Contest Editor's Pen Awards. The prize? You guessed it.

Surgeon General Award. Paul Chapman, Endicott, N.Y., for Happy Chappy's Light Pale Pilsner Ale (pilsner ale?): "Happy Chappy's has been known to cure emphysema, hangnails, gout, rigor mortis, bad attitudes, nose bleeds, etc."

Surgeon General Award II. Tony Ernst, West St. Paul, Minn., for Deadhead Stout. "Government Warning: Consumption of this product may result in spontaneous dancing and/or the desire to tour the country in a Volkswagen Microbus."

Tell It Like It Is Award. Elizabeth "Missy" Weibert, Clovis, Calif., for Missy's Private Reserve: "Brewed for the discriminating palate — not my husband's beer-swilling friends."

Preventing Moochers Award. Ken Koch, Rosemount, Minn., for Stinky's

Lager, Musty Skunk Brewery. Honorable Mention: Richard Lyman, Wolcott, Conn., for Old Damp Mustache Lager ("This stuff probably won't harm you, much").

Political Fervor Award. Ken Hall, Trenton, N.J., for Dreadnought India Pale Ale: "Since this is an untaxed product, it cannot be sold or traded. Your federal government is populated by sycophants seeking only re-election. It is within your power to change the government: Get out and vote!"

Never Had a Chance Award. James Krupa, Bourbonnais, Ill., for Ten Year Anniversary Barleywine commemorating Super Bowl XX. Bears 46, Patriots 10. Should have checked the editor's loyalties first.

X-Rated Award. Lee Murray, Ooltewah, Tenn., for Pig Pokin' Porter. (How did he get that photo?) Honorable mention to Tom Holcomb, Corunna, Mich., for Goat Scrotum Ale. This was our first entry, briefly making us fear that the contest might have been a terrible mistake.

Hanging Out with the Wrong Crowd Award. Dave Elliott, Modesto, Calif., for noting in the letter accompanying his entry: "The second batch was brewed for the Super Bowl and was called Super Bowl Suds. After January 5 the Super Bowl Suds was gone, consumed completely by bottle-stealing friends."

Something New

This month marks the launch of our new magazine, *BrewPub*. It focuses on bottom-line issues for brewpub owners, managers, and brewers. If you work at a brewpub or are thinking of going pro, check out page 29 for more information.

Craig Bystrynski

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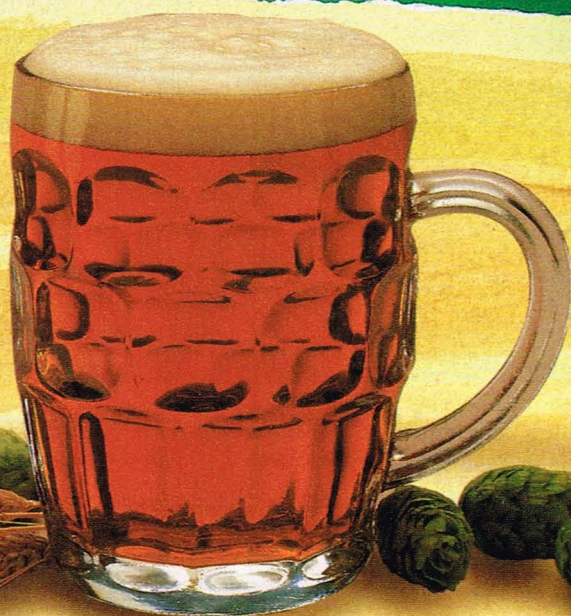
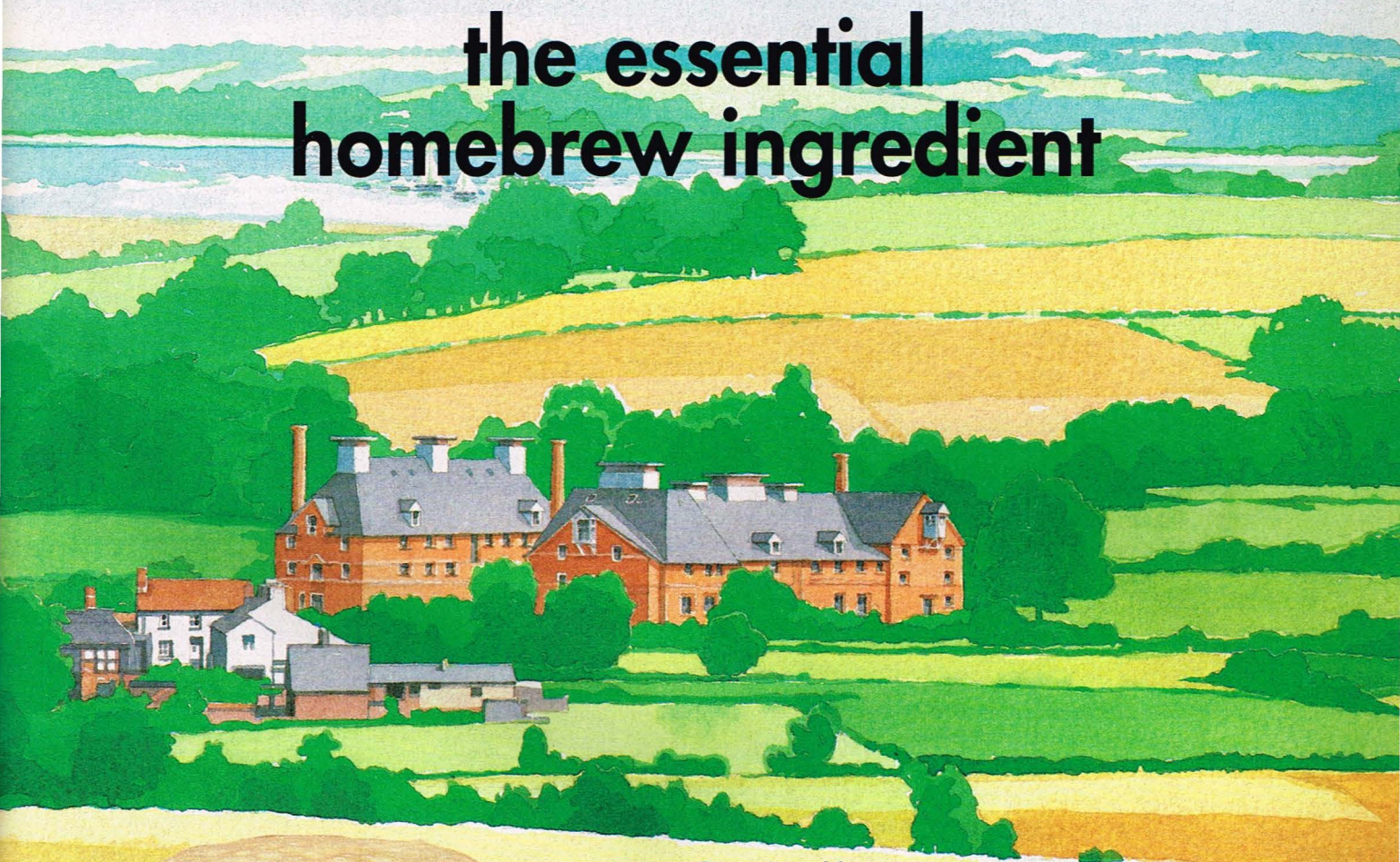
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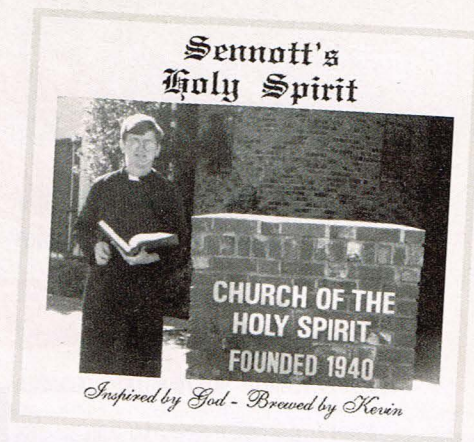
My friend Mike and I have always heard good sanitation is the key to brewing success. Last summer, when we decided to make our very first stout, we didn't want to take any chances. We made sure not only all our equipment was sanitized, we were, too. Well, we made the stout, and it was the worst beer we ever made! We didn't get discouraged, but we learned there's more to brewing than clean equipment.

Kevin Sennott Sacramento, Calif.

When I started brewing my own beer a year and a half ago, I knew — as a good Catholic — I wanted to call it "The Holy Spirit." When it came time to create my labels, I needed a good photograph. I recruited the help of a priest friend, who lent me an outfit. (Thank God for that!)

On the day my wife and I went to take the photo, we pulled up in front of the church. We were excited, but there was a hitch. To our surprise a funeral was going on, and there were still people outside.

There I was with my priest's outfit on. I realized the photo would have to wait for another day. I sure could have used The Holy Spirit then. We came back and took the photo the next day when the coast was clear!



What's the fine for impersonating a priest? Maybe a homebrew or two.

Fermenter or Fermonster?

The other day I set out to brew a cranberry wheat ale for an upcoming competition.

All was proceeding smoothly. I went to Great Fermentations and picked up my supplies, came home, popped a beer, steeped grains, and started the boil. Soon the heavenly aroma of malt and hops was wafting its way around my house. I puréed the cranberries, whistling while I worked, anticipating how good this was going to be once it was ready. After the cranberry purée was added to the boil, the aroma of cranberries joined the malt and hops in a delightful olfactory dance throughout my house.

When it was ready, I proceeded in the normal fashion to cool the wort, pitch the yeast, and rack it into my 6.5-gallon carboy. After attaching the airlock I put it away to do its stuff. A couple of hours later there was a skim coat of white krausen, and by the time I went to bed that night, there was an inch of krausen and the airlock was bubbling merrily. All was well.

I woke up at about 6 a.m. and went downstairs to get a drink of water. Coming down the stairs I could smell the distinct fruitiness of fermenting

wort. "Yummy," I thought. "This really is going to be good." The closer I got to the small downstairs bathroom that serves as my fermentation room, the stronger the smell became.

Opening the bathroom door, I was enveloped in that rich fruity aroma. When I stepped in and felt for the light switch, my foot struck something that felt suspiciously like my airlock. "Uh-oh," I thought, and flipped on the light.

What a sight. Although I had left more room than usual, the carboy was completely filled with foam. A column of foam was rising out of the carboy and cascading down the sides to gather on the floor. My airlock was lying at my feet filled with krausen. The walls, toilet, mirror, and light fixture were all splattered with crusty dried wort. Obviously there had been quite an explosion when it popped its top.

Looking around, I couldn't believe I was faced with such a mess on a Sunday morning. That's when I looked up. And there it was, dried cranberries and wort, all over the ceiling, looking like some crimson Rorschach Test from hell. What a mess. I sighed, closed the door, and went back to bed.

*Brian Wolf
Fairfax, Calif.*

MILE HIGH CLUB MEMBERS!

Tell us about the strangest place you've ever brewed ...and send us a picture of your brewing set-up! There's a cool BYO t-shirt in it for you. Send your story 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!

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From the Shadowy Depths of the Forest... "Scouting the Bluffs"

Kevin Daniel, winner of major wildlife art awards, portrays the fierce majesty of the wolf pack.

A powerful wolf in solid pewter watches the rising of a gleaming, polished pewter moon.

The relief-sculpted stoneware tankard makes the rugged, rocky world of the wolf seem real.



Kevin Daniel and Longton Crown create a wonderfully original collectible tankard that evokes America's mountain majesty in every detail. A wolf pack emerges from the shadowy depths of the forest, their eyes like glowing coals that stir our primal memories.

"Scouting the Bluffs" uses the arts of painting and sculpture to make us feel our kinship with the magnificent timber wolf. The first tankard in Kevin Daniels' *The Cry of the Wolfpack* collection is a beautifully integrated work of art in fine stoneware and pewter. Just \$39.95, "Scouting the Bluffs" is a landmark fine-art tankard; we doubt you'll find it's equal at twice the price.



Kevin Daniel's haunting portrait evokes our sense of awe and wonder.

"Scouting the Bluffs," a hand-numbered collectible tankard issued with Certificate of Authenticity, is limited to an edition of no more than 120 firing days. We expect strong collector interest; please act before the date indicated if you would like to acquire this art treasure.



Elegantly detailed sculptures of wolves in the wild make "Scouting the Bluffs" a unique tankard.

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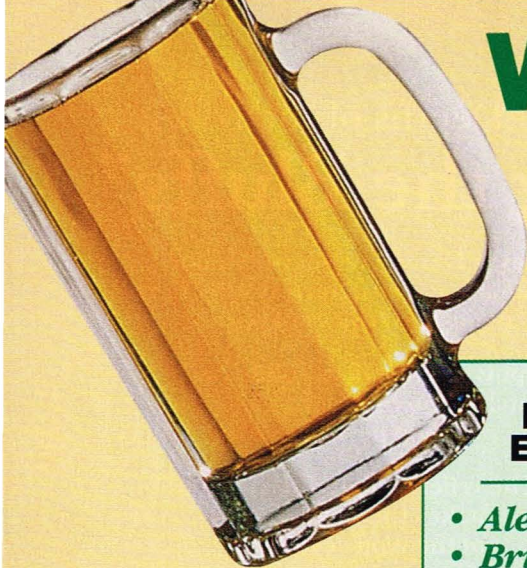
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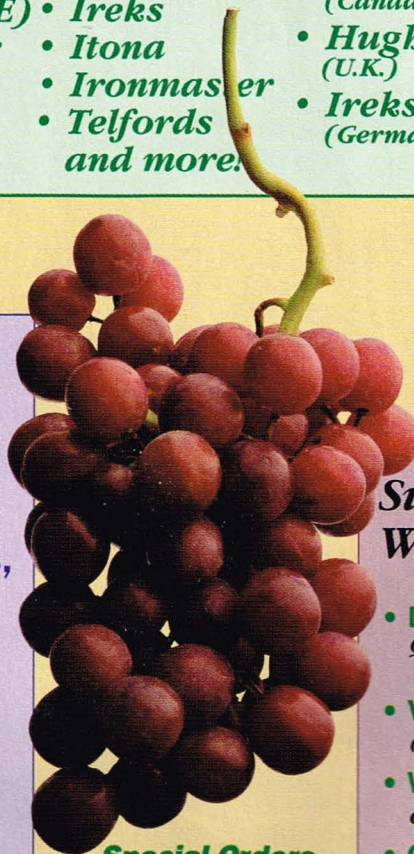
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Scotland Not Ireland

Dear Brew Your Own,

I just received my latest issue of BYO (March '96) and the first thing that caught my attention was not the wonderful story titles, nor the fine photographs, but rather the background picture. That picture shows none other than the Hunting Tartan of the Clan Maclean. As the cover story is a piece on

Ireland I thought perhaps the tartan was chosen for its predominantly green color. That would be strange because it is a Scottish tartan.

It's an attractive magazine cover, but my Scottish pride leads me to at least comment, lest our tartan become associated with the Irish!

Perhaps an issue on Scottish brew is in the works?

*Dr. Christopher McLean Jones
Bardstown, Ky.*

Fired Again?

Steve Rank, fired then rehired as BYO marketing director following a cover fiasco last fall, has been fired again.

"I'm serious this time," said Publisher Carl Landau. "He's gone."

Meanwhile, BYO's kind-hearted edi-

tors have organized a drive to save Rank's job.

Rank's latest gaffe came when he chose a Scottish tartan as the background for the March cover on Guinness Ireland. After the issue was published, Rank, who is of Scottish descent, confessed that he had purposely chosen the colors of his own clan. Ironically, the deception was pointed out by a reader from the same clan.

"What's next?" said Landau. "Bagpipers for a story on German lagers? Kilts for a feature on homebrewing in Japan? Golfers in funny hats for an article on Czech pilsners?"

Once again, BYO editors had absolutely no prior knowledge of the deception. None. Really.

Last fall, Rank was fired after he produced a cover depicting a large man washing bottles in a bathtub (September '95 BYO).

Landau fired Rank shortly after that issue appeared. The marketing director was later rehired following a reader outcry.

"That can happen again," according to BYO Editor Craig Bystrynski. "Carl's a hot-head. He'll change his mind with the right persuasion." He added, "Steve's not much of a marketing director, but he's a real humanitarian. He's nice to kids, talks with old ladies, and even let his mother-in-law live with him for six months! Who could fire a guy like that?"

The Bottle and the Law

Dear BYO,

I'd like to comment on raiding recycling bins for bottles. Like many others, I have stood looking longingly at a huge bin of perfectly 'cap-able,' free bottles. But beware! Besides defeating the recycling actions of others, removing bottles from recycling bins of *any kind* is illegal! (In California it is petty theft, a misdemeanor).

Now, you could argue that the reuse of beer bottles for homebrew is a recycling effort, and I wholeheartedly agree! But I doubt that the law would make an exception.

Ask your neighbors to set aside 'pop tops' for you. I even go to restaurants sometimes and offer 10 cents for each bottle (a bargain for me, and twice the redemption value). I have found there are plenty of legitimate ways to get all the bottles you could ever need!

*C. W. Fugate
Santa Cruz, Calif.*

A Blast from the Past

Dear BYO,

I am writing in answer to the question regarding grocery store malt extract (Mail, March '96 BYO). I suspect your reader is referring to Blue Ribbon Malt Extract. I grew up in the '50s, and it was stocked by virtually all grocery stores.

*Skip Godfrey
Billings, Mont.*

Many thanks to everyone who let us know about Blue Ribbon Malt. It was originally made by Pabst, the beer company, and is now made by Premier Malt. It's still available in five different varieties. One retailer that carries it is E.C. Kraus in Independence, Mo. For mail order information, call (816) 254-7448.

Getting Unstuck

Dear BYO,

I've read about the problems of stuck runoff and the need to keep a

Make Your Vote Count!



☐ **Steve's doing a great job! Give him a raise!**



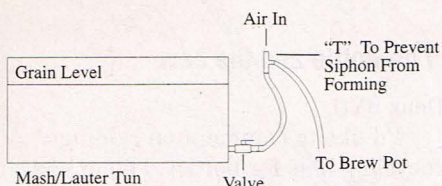
☐ **Fire him! A monkey could do a better job!**

Why I love/hate Steve: _____

Name: _____ City: _____ State: _____

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Davis, CA 95616

Or Fax: (916) 758-7477



certain liquid level in the tun to prevent the problem. My tun has a copper manifold in the bottom. Is there a risk of stuck runoff in this type of system? I thought of adding a T in the outflow

line and raising the T to a level slightly above the grain bed. This would keep liquid in the tun to a level above the grain bed and the T would stop a siphon from forming (see illustration). Is this a good idea?

Will this cause the wort to collect too much oxygen?

*Todd Paridon
East Longmeadow, Mass.*

All lauter systems are at risk of

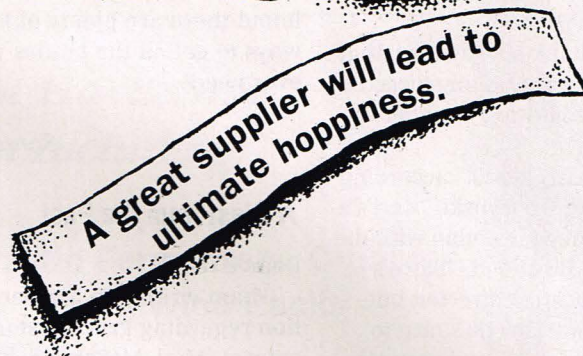
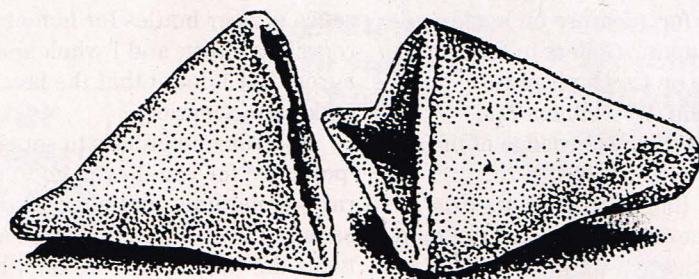
collapsed beds due to suction pulling on the bed during runoff. Your method will definitely do the trick, and you don't need to worry about oxygen pick-up. Commercial brewers use similar devices to combat the same suction problem you have encountered.

Mother's Milk

Dear BYO,

While perusing the February BYO, I saw mentioned in Mr. Wizard's column the name of my favorite of all stouts, Mackeson (Milk) Stout. I kept Mackeson in business the summer I was in England. Could Mackeson Milk Stout be that same memorable essence I imbibed in Oxford? Plus, does anyone know of an extract recipe for Mackeson Stout?

*Jonathan Nail
San Diego*



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An Inspirational Story

by Scott Russell

Inspiration comes from a variety of sources. Sometimes it is a fortuitous combination of ideas or images that supplies the best ideas. This month's recipe is a perfect example.

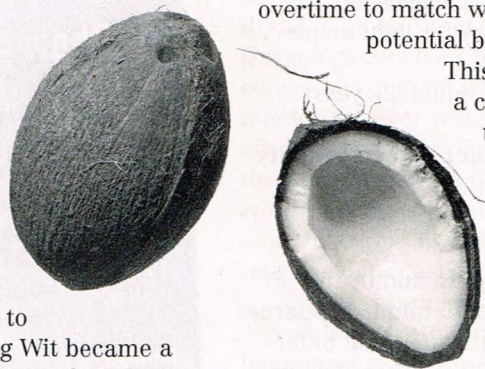
Some of my favorite brews — some of the best and most interesting — have come to me by name first, with no ingredients or recipe attached. It's just a name begging to be brewed. Sparkling Wit became a champagne-like Belgian wheat beer; Strawberry Blonde was every bit as delicious as its name, brewed with fresh New England wild strawberries (several pounds of them, arduously hand picked and stemmed). Sometimes it takes some trial and error to concoct a recipe worthy of a name.

Another common source of inspi-

ration for me is the grocery store. I cruise the spice and baking goods aisle, the ethnic and imported foods aisle, my eyes and nose seeking the unusual, the rare, the quirky, my mind working overtime to match what I find to a potential brew.

This beer arose from a combination of the two. I can't honestly remember whether I saw the coconut sugar in among the Thai and Vietnamese seasonings and sauces first, or if

in the back of my mind the sonority of "Coconut Brown Ale" was already simmering, but I do remember a sort of a flash and a slowly spreading grin as I put the two together in my mind.



Coconut Brown Ale (5 gallons)

Ingredients:

- 0.5 lb. chocolate malt
- 0.5 lb. pale malt, toasted (10 minutes on a cookie sheet at 350° F, then cracked)
- 1 lb. 50° to 60° Lovibond crystal malt
- 4 lbs. amber malt extract
- 2 lbs. gold dry malt extract
- 4 oz. coconut sugar
- 0.5 oz. Willamette hops
- 2 oz. freshly grated coconut
- 10 to 14 g. dry yeast, or a liquid culture (such as Wyeast 1098, 1028, 1968)
- 2/3 cup dry malt extract or 1/2 cup corn sugar for priming

Step by Step:

Steep malts in 2.5 gallons cold water. Gradually raise heat and

remove grains when temperature reaches 170° F. Sparge with one quart of hot water (through a colander). Add malt extracts to kettle, stirring well to avoid scorching. Add coconut sugar. Bring to a boil. Add hop pellets. Boil 45 minutes. At kettle knockout, steep coconut for 10 minutes as wort begins to cool. Add to fermenter and top off to five gallons with chilled, pre-boiled water. At 75° F pitch yeast. Ferment warm (70° to 75° F) for three to four days, rack to secondary, and condition cool (50° to 55° F) for three to five more. Prime with dry malt extract or corn sugar, bottle, and age 10 days to two weeks.

Alternatives:

An all-grain version of this brew should be based on a very pale

Coconut Brown. The name conjures up sunset over a lagoon, palm trees waving in the gentle, warm tropical breeze, distant strains of ukulele and steel drums...

Reader Recipes

David McDermott's Scout Mountain Stout (5 gallons)

"I have successfully reproduced this stout on many occasions and find it a rich, imperial-style stout. I usually have original gravity from 1.067 to 1.072."

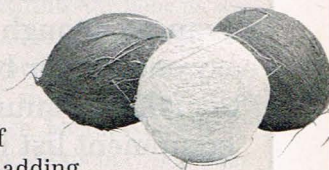
Ingredients:

- 7 lbs. Steinbart's light extract (or other light extract)
- 3.3 lbs. Coopers dark extract (or other dark extract)
- 1 lb. 60° Lovibond crystal malt
- 1/3 lb. black patent malt
- 0.5 lb. chocolate malt

mash: seven to eight pounds of pale malt, a pound of crystal malt, with some chocolate steeped in the mash run-off. Hops should really be kept to a minimum so as not to overpower the delicate flavor of the coconut.

On Finding the Coconut:

If your grocery store has a reasonable ethnic and imported foods section, you should be able to find the coconut sugar. If not, you can try adding coconut extract along with your priming sugar, or even prime with coconut liqueur (amounts will vary according to taste and sugar content of the liqueur).



- 0.5 lb. roasted malt
- 2 oz. Chinook hops (for 60 min.)
- 0.5 oz. Fuggles hops (for 2 to 5 min.)
- 2 packets dry ale yeast
- 2/3 cup priming sugar

Step by Step:

Crush the grains, add them to two gallons of water, and bring to a boil. Sparge the grains with about one gallon of hot water and add extract. Bring to a boil and add the Chinook hops for 60 minutes. Then add the Fuggles for the final two to five minutes of the 60-minute boil. Cool and transfer to primary fermenter, pitch the yeast when cooled.

Transfer to a secondary fermenter about three to five days after initial fermentation. Ferment about five to seven days. Bottle with priming sugar, and bottle condition a minimum of four weeks.

Henry Finkelstein's Rootin' Friutin' Berry Berry Beer (5 gallons)

"This recipe calls for packaged frozen fruit that has the advantage of

being de-pitted. The fruit can be pureed in a blender and squeezed through a nylon mesh bag. Be prepared for a huge blow off."

Ingredients:

- 5.5 gallons soft water
- 6 lbs. wheat dry malt
- 6 oz. crystal malt
- 1 oz. Hallertauer pellets (bittering)
- 1/2 oz. Saaz pellets (flavor)
- 1/2 oz. Saaz pellets (aroma)
- 8-10 packages of frozen fruit (cherries, raspberries, peaches, etc.)
- 2 lbs. clover honey (or light maple syrup)
- 1 packet Belgian liquid ale yeast
- 1 tsp. Irish moss
- 3/4 cup corn sugar or 1 cup light dry malt for priming.

Step by Step:

Crush crystal malt, add to 150° F water, and hold for 20 minutes. Sparge and boil. Add malt, honey, and bittering hops. Boil for 30 minutes. Add flavor hops and boil additional 15 minutes. Add aroma hops and Irish moss

and boil for additional 10 minutes. Remove from heat. Place pureed fruit in large nylon mesh bag and sterilize in hot wort for five minutes. Squeeze extract through bag into wort. Pitch yeast at about 75° F and ferment in primary for one week at room temperature. Rack into secondary and lager at 40° F for four weeks. Prime, bottle, and age four to six weeks in dark cellar or cool closet. ■

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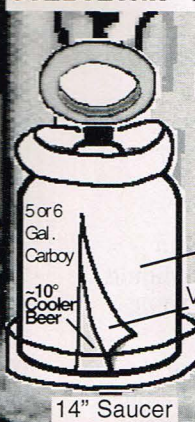
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Drink When the Drinkin' is Good



Mr. Wizard

I just started to brew my own beer. So far, so good. I would like to know the expected shelf life of my home brew. I have noticed that some companies date their bottles and cans for freshness. I guess the big boys pasteurize and add some type of preservatives to extend the life. Although I don't think my beer will be around for long, how long do you think it will stay fresh? Also, is there any difference in the freshness between bottled beer and mini kegs?

*Richard Harris
Pennsauken, NJ*

I guess it's that time of the year when all the brewers who have been happily brewing over the winter start to wonder how long that stuff will last! For most homebrewed beers the answer is not too long. Beer is a perishable commodity and will go bad over time. Beer that contains bacteria will spoil much sooner. Since homebrewers are usually faced with a few nasty bacterial critters snoopin' around, homebrew frequently goes bad (I mean sour-bad) within three to six months. Microbrewers face the

same challenge, and their beer doesn't last too long either.

If it were possible to package beer with zero bacteria, it still wouldn't last forever. The "O" word is to blame for this. Of course I am speaking of the dreaded oxygen that's in the bottle. Oxygen causes beer to oxidize if it comes into contact with beer after fermentation. Ever wonder why imports often taste a little papery? It's not from the European hops, it is from the "O" word. That's why beers like Budweiser and Miller that have been heat pasteurized don't last forever.

Oxygen is one thing homebrewers can do battle with. That's because most homebrew is bottle conditioned and the yeast in the bottle can scavenge up oxygen that gets into the bottle during packaging, minimizing the chance of oxidation. Rarely do I taste oxidized homebrew. If kegs are used instead of bottles, then the oxygen content is further reduced since kegs have less headspace per volume of beer than bottles. Kegged beer typically is less prone to oxidation, whether it's homebrewed or made by a large brewery.

If you've been clean and careful, bottled your homebrew with zero bacteria, and bottle conditioned, then you may think you have the Grim Reaper beat. Sorry, Charlie, all beer dies sooner or later. The problem now is that the yeast is a living organism and will eventually start to autolyze (that's a fancy word that translates roughly from Latin as "self destruct"). In my vocabulary, yeast rots. Rotten yeast in your homebrew is not delicious. Brewers have invented a more pleasing name for the taste: "yeast bite."

Fortunately, this takes some time as long as you don't bottle your beer with a ton of yeast. If the beer has been clarified by racking a couple of times, then bottle-conditioned beers can last for many months or several years. In general, high-alcohol beers age better than normal-strength beers.

Homebrew doesn't last forever. It's natural to want to make the claim, and it's always nice to think the way one does something is the best way. In the case of beer, my philosophy is: Drink it when the drinkin' is good! The best way to ensure your beer will be good when you feel the urge is to take note of these words: (1) A clean brewery makes better beer than a grimy one; (2) be careful not to splash your beer during bottling; (3) avoid bottling beer with excess yeast; (4) cold, dark storage will dramatically extend shelf life; and (5) periodically sample your stash so you can quickly drink it if it starts to show the signs of beer death!

Mr. Wizard

My husband cannot have gluten, and beer is about the only thing we haven't found a reasonable substitute for. Do you know if there are any recipes for a homebrew that would not contain barley malt?

*Mary Kay
Charlotte, N.C.*

Unfortunately all beer has malted barley as its base, and your husband can't have the gluten proteins in barley. Other grains have much more gluten than barley and would present the same obstacle to his diet. In fact malted wheat is the only suitable substitute for malted barley in brewing, and wheat's claim to fame is its super-high content of gluten proteins.

The only substitute for beer as we know it is sake. Sake is technically in the family of fermented beverages known as "beer," since it is made from a cereal grain, rice. Mead, which is made from honey, floats between beer and wine like pollen in the air. If the pollen lands in your beer mug, then mead is also sort of like beer, basically because brewers like to make mead. The ancient tribes of Northern Europe made beer and mead and kind of

lumped them together since they were made by the same sort of person, the town brewer. I've digressed, but he can drink mead with no worry from gluten. Some mead is even hopped, so it has similarities to beer.

Another tippie that may be of interest is cider. Although technically a wine, hard apple cider is one of those things brewers like to make and have given honorary membership in the beer family. Actually, cider was given a bad name in this country in the late 1800s, as was gin in England during the same period. According to the teetotalers, cider was the most evil thing around. It really never regained its popularity (and it was *very* popular in this country before Prohibition) until homebrewers started making it in recent years.

Lastly, there is the hard stuff: scotch, Irish whiskey, bourbon, Tennessee whiskey, or any other related spirit. These are made by distilling beer, and the distillation process leaves the gluten behind. Some of these products, especially the Highland scotches, retain a lot of malt flavor.

Mr. Wizard

I have been an extract brewer for most of my brewing years. Recently I began experimenting with the mashing process. I have been following what the books say about the starch-to-sugar conversion time and the temperature to maintain. My question is: If after the first hour of mashing you don't get starch-to-sugar conversion, how long should you continue to mash, and how often should you check for conversion using an iodine test? Is there a maximum mash time?

*Pat Schroepfer
Lafayette, Colo.*

I can only assume what your mash schedule is, but since you're a beginning masher I will guess that you are using a single-temperature infusion mash. In this method the mash temperature is very important, since you must achieve a temperature where alpha- and beta-amylase (enzymes) can both be active. A temperature of 150° to 152° F works well for an infusion mash. If you mash in

this temperature range you should have conversion within an hour. In fact if you don't have conversion within an hour at these temperatures, then something weird is happening.

If you are using cooler mash temperatures, such as 140° to 145° F, then conversion can take a very long time. This is because alpha-amylase is not very active at cooler temperatures and works slowly. Alpha-amylase is responsible for "conversion," or the change in the iodine reaction from black to colorless. Essentially, the iodine test creates this black color when large starch molecules are present, and since alpha-amylase rapidly reduces the size of starch molecules, the iodine test is a measure of alpha-amylase activity. Beta-amylase, on the other hand, produces maltose from starch and is responsible for making wort fermentable, but beta-amylase alone cannot achieve starch "conversion."

If you are using a multi-temperature mash, the rules change a little. These mash schedules often have a protein rest, a beta-amylase rest, an

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alpha-amylase rest (also known as a conversion rest), and they end at mash-off. If you're going through an elaborate schedule like that, then you may not even be at conversion temperatures (152° to 158° F) within the first hour. In breweries that use multi-temperature mash schedules, it is typical not to even worry about the iodine test until the temperature gets into the conversion rest. Even at this point, hold at this temperature at least 30 minutes before performing an iodine test. Some mashes may require a very long conversion hold if there are insufficient enzymes to cause rapid conversion. This can occur if using adjuncts, such as rice or corn, that dilute the enzyme concentration in the mash, or if part of the mash has been boiled, as is the case with decoction mashing. Once a negative iodine test is confirmed, the mash is raised to mash-off temperatures, usually about 170° F.

Hopefully this answers your question. In short, there is no real maximum mash time. On the other hand if you feel that conversion should have occurred after a given period of time, you may have some special problems with the mash. If that's the case, then a careful review of that particular mash is in order.

Mr. Wizard

I have been a homebrewer off and on for almost 30 years. I began on a shoe-string budget back in college and made a fair representation of beer. A couple years ago I became quite serious about the hobby and now have almost all the brewing toys I need to do the job right. Do you know where I can find the test procedure for obtaining the bitterness of a brew after fermentation has completed? Is there a good text for this or is it simple enough that you can print it in your column?

Dan Derrick
Irmo, S.C.

Do I know the method for determining beer bitterness? Yes. Can I print it in my column? Yes. Can you do at home? No.

Unfortunately, determining the bitterness in beer requires some pretty expensive laboratory equipment and a

nasty organic solvent. The method is actually quite simple. Beer is mixed with iso-octane, a really stinky solvent, and a small amount of hydrochloric acid and gently shaken for 15 minutes. The mixture is then centrifuged to separate the liquid part from the organic (solvent) phase, and a small sample is taken from the organic phase. The compounds responsible for bitterness reside in the organic phase. The sample is then put into a spectrophotome-

ter cuvette, and the absorbance of light is measured at 275 nanometers. International Bitterness Units (IBUs) equal this absorbance multiplied by 50. Pretty straight forward.

The problem is that a UV (ultra-violet) spectrophotometer is needed for the method, and those babies cost at least \$5,000! That's why very few, and I do mean *very* few, microbrewers really know how bitter their beer is. How do they survive without knowing this

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number? They taste their beer! If beer is tasted under controlled conditions (not at a blow-out party), much can be determined about its properties. Other breweries simply send their beers off to an analytical lab that performs these sorts of analyses for a reasonable fee.

If you still want to look up the citation, it is published in the American Society of Brewing Chemists' (ASBC) *Methods of Analysis* (a really expensive book). The ASBC is located in St.

Paul, Minn., and their telephone number is (612) 454-7250.

Mr. Wizard

Help me, oh great and powerful brew guru. I have noticed that when bottling in 12- to 22-ounce bottles, using one-half to three-quarters cup of corn sugar (depending on the type of beer) is sufficient to carbonate. However, when using

two-liter bottles, five-liter minikegs, or even a five-gallon soda keg, the same amount of priming sugar produces a wonderfully lively foam dispenser but not much of a beer dispenser. Why is this? One would think that it would produce an equal volume of CO₂ in either case. Is there a formula I can use to determine the correct amount of sugar to use when taking into consideration the size of the containers the brew is going into?

Jason Goebel
Nitro, W. Va.

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This is an easy one. There is less head space per volume of beer in a keg than the same volume of beer packaged in bottles. Therefore, bottled beer requires more priming sugar for a given volume of beer than kegged beer (assuming that you fill the keg). I'm sure I could derive some really neat equation to precisely calculate the amount of priming sugar needed for a batch that would take into account the volume of headspace that it must pressurize, but I don't feel like it! Just kidding. In practice it is most practical to determine this by trial and error. To pin down the amount of sugar required for bottle conditioning, you can make a set of bottles that have different amounts of primings and taste them to decide which carbonation level you prefer. Similarly, you can perform the same experiment using two-liter, five-liter, and five-gallon containers.

Happy experimenting!

Mr. Wizard's Address

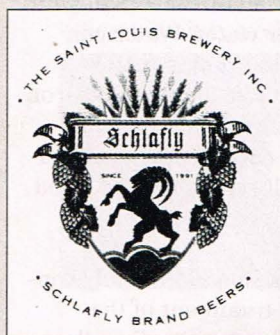
Do you have a question for Mr. Wizard? Write to him c/o Brew Your Own, 216 F St., #160, Davis, CA 95616. Or send e-mail to wiz@byo.com.

Following a freak accident during a previous career as a trapeze artist, Mr. Wizard dedicated himself to becoming well-grounded in the art of brewing. Now he thrills to unorthodox recipe calculations, but some believe local beer quality mysteriously improves when the circus comes to town.

Hints for Good Taste: Fight Off-flavors

by Gailen Jacobs

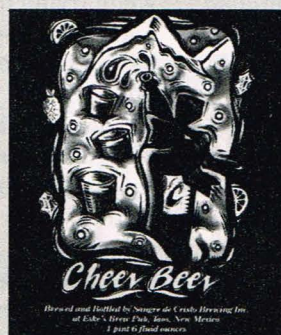
Does your beer sing the buttery blues? Dance the metallic mambo? Storm in rancid rage? There's not much hope for good beer turned bad. But there are ways you can avoid the common pitfalls that lead to beer's off-flavors.



Saint Louis Brewery

Brewer: Stephen Hale

"Using the proper yeast is critical. We absolutely recommend using a liquid...Use the purest strain you can, and keep it as fresh as possible."



Sangre de Cristo Brewery

Brewer: Bill Bockbrader

"Homebrewers should also keep fairly good control over their temperatures during the brewing processes. Fermentation temperatures should not get too high or too low."



Rock Bottom Brewery

Brewer: Rick Hammond

"Cool your wort as soon as possible and transfer into the fermentation vessel. You don't want your beer being luke warm for an extended amount of time where airborne bacteria or wild yeast can fall into it."

Brewer: Stephen Hale (with assistant brewers Sara Choler and James Ottolini)
Brewery: Saint Louis Brewery, St. Louis, Mo.

Years of experience: 4 1/2

Education: Siebel short course; on-the-job training

There are many issues involved in analyzing off-flavors: the correct mash temperature, maintaining a rapid boil, the correct boiling time. You could talk all day about different flavors and their causes. But there are three common areas where homebrewers can eliminate many off-flavors: Quickly decrease wort temperature, handle

yeast correctly, and avoid sunlight.

To avoid things such as DMS (dimethyl sulfide, which gives beer a cooked-corn flavor), lower the wort temperature quickly after the boil. The high-risk time comes between shutting off the boil and the yeast starting to do its job. That lag time can be an easy opportunity for bugs (contaminants) to get in. We have a heat exchanger, and we have a cold liquor tank that keeps our cold water at 34° to 36° F, so knock-out happens very quickly. The drop in temperature takes less than 30 minutes for 15 barrels.

For homebrewers there are a

variety of wort chillers, including the copper coil immersion chillers and the counter-flow, jacketed style.

Handling yeast incorrectly contributes a lot of off-flavors. The emphasis should be on keeping yeast fresh and avoiding autolysis in the yeast. Autolysis happens when you let the beer sit on the yeast for a long time and the yeast rots. This lends a particularly nasty flavor to the beer.

Depending on the style — lager and a few other styles will take a bit longer — rack to a secondary once primary fermentation is done. This gets the wort off the yeast as soon as possible.

Using the proper yeast is critical. We absolutely recommend using a liquid. That is not to say that there are not good dry yeast out there, but our results have greater consistency and better flavor profile when we use liquid. The viability of the yeast is higher, especially when you brew it up in a starter jar. Use the purest strain you can, and keep it as fresh as possible.

There is a range of off-flavors that will come from yeast, including sulfur flavors, the autolysis, and more (fruity) esters than you want.

Direct sunlight is a third common cause of off-flavors. If you are using a glass carboy, keep the sunlight off it. Put a sweatshirt around it and cross the arms. If you are using bottles, don't use light brown bottles. They do not have the same light resistance as dark brown bottles. The darker the bottle the better. Skunking comes from storing the finished product in clear bottles and letting sunlight hit it. That is a flavor that seems to be fairly common among some continental European lager styles.

Brewer: Bill Bockbrader
Brewery: Sangre de Cristo Brewery, Taos, N.M.
Years of experience: 4
Education: University of California, Davis short course; on-the-job training

One of the first things to consider when trying to avoid off-flavors in your homebrew is your water. Water can have chlorine in it, organic matter, mineral ions, metallic ions such as iron or copper, or too much sulfate. You have to be really careful of your water supply. Get a really clean tasting, good tasting water supply that is free of chlorine.

Homebrewers should be really conservative in their treatment of the water in terms of trying to adjust the pH or add minerals. It is very easy to overdo it. Don't just add something like gypsum to brew water; there could already be too much gypsum in it. If the water tastes good, that is a very good criteria. Good-tasting water

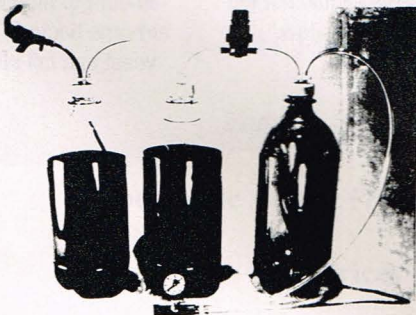
makes good-tasting beer. If homebrewers' water tastes good, they don't have to worry about testing.

Homebrewers should also keep fairly good control over their temperatures during the brewing processes. Fermentation temperatures should not get too high or too low. Too high temperatures will produce off-flavors such as diacetyl (buttery), acetaldehyde, and other harsh flavors. If fermentation temperatures get too low, there may be a delayed fermentation, which increases the chances of bacterial contamination.

Mash temperature depends on how you want your beer to turn out. If you like maltier beers, keep your mash temperatures in the higher range — say 154° to 156° F. If you like your beers to come out drier and have more of the emphasis in the beer on hops and less on malt, keep the temperatures lower. With incorrect mash temperatures, you might end up with a beer that does not have the optimum amount of sugars, and it will be thinner than what you want. If that hap-

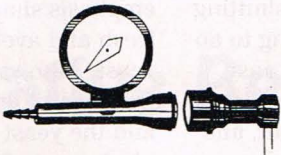
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The Tips

The Saint Louis Brewers

- Following the boil, drop the wort temperature as fast as possible.
- Use healthy, fresh liquid yeast to jump start bacteria-eating fermentation.
- Keep the light-sensitive beer out of the sun.

Bill Bockbrader

- Use good, clean tasting water.
- Carefully regulate fermentation temperatures.
- Sanitize! Particularly important before and during fermentation.

Rick Hammond

- Rack to a secondary or store your just-fermented beer cold.
- Keg, keg, keg.
- If bottling, purge with CO₂.

pens you may end up overbalanced on the hop side. Balance is the key to good beer. If you are off balance, that is basically an off-flavor, too.

A third tip to avoid off-flavors is to maintain good sanitation. Sanitation is important in all stages of the process but especially directly before and during fermentation. The two off-flavors that come up most often are the sour taste of lacto-bacillus (bacterial contamination) and the phenolic flavor that comes from wild yeast contamination. You usually get these through poor sanitation.

Brewer: Rick Hammond

Brewery: Rock Bottom Brewery, Minneapolis, Minn.

Years of experience: 3

Education: Siebel short course, on-the-job training

Starting from the beginning of the brewing process, you want a vigorous boil in a lidless pot. The boil ensures the proper volatilization (evaporation

of compounds) and the open top allows DMS to escape.

Cool your wort as quickly as possible and transfer into the fermentation vessel. You don't want your beer being luke warm for an extended amount of time where airborne bacteria or wild yeast can fall into it.

If you use a glass carboy, keep it in a dark closet to avoid off-flavors caused by direct sunlight.

When pitching, avoid all dry yeast

and stick with fresh liquid yeast.

Maintain the proper fermentation temperatures. You would want to avoid any sort of 75° F-plus environment for fermenting ales. The 65° to 70° F range is ideal. Fermentation produces heat within itself, so the fermentation vessel will be warmer than the ambient air. Lagers are much more sensitive.

Once primary fermentation is done, racking or cold storage after one

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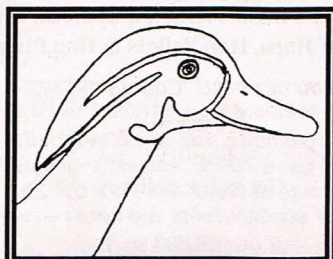
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more day (for a diacetyl rest) is important. Racking the beer off the primary into secondary gets it off the trub. The trub harbors bacteria. If you are not racking, put the beer in some sort of cold storage (below 40° F) to let everything drop out of solution. It is safe to let the beer just sit there without doing anything because most bacteria need a warmer environment. You won't have too much of a problem with overflocculation, because your yeast will remain in suspension for priming.

Ideally you want to keg your beer. With a keg you are dealing with a single environment. With bottling you are dealing with 48 single environments. Each bottle can contain something that can cause an off-flavor — some sort of bacteria.

When you keg you can force carbonate or use less priming sugar than if you are bottling. The less you have to introduce to your beer post-fermentation the better.

Bottling seems to be where most of the off-flavor problems occur. If you are going to bottle, wash the bottles as soon as they are empty, store them upside down, and sanitize them well with something like bleach water or iodophor.

Part of the problem with bottling occurs when you are filling the bottles. You are oxidizing your beer. That creates off, stale, papery flavors. When bottling, homebrewers put the beer into a bucket and add their sugar water for priming. This is all exposed to air. When they bottle they use the dip tube, and the beer splashes as it fills the bottle. Unless the bottles have been purged with CO₂, the beer has been exposed to air. You want the yeast a little exposed to air because the beer is going to have to start fermenting again, but they are getting a rather high exposure.

We use a keg for fermentation. After we've let everything drop out after fermentation, we transfer into another keg using CO₂ pressure to pump from one keg through the tap of another, which has been primed with CO₂. Basically, we are going to get a transfer without any exposure to oxygen or air. This keeps it clean. ■

Weissbier: Will That Be White or Wheat?

by Jeff Frane

I decided I wanted to move to Bavaria when I learned that a typical mid-morning snack consisted of a half-liter of weissbier, a weisswurst (veal sausage) and a big, soft pretzel. Oddly enough, this practice doesn't seem to be linked to a more Southern habit, the mid-day siesta, so I will probably have to wait until retirement — I can't imagine going back to work after that snack. But the taste of sausages and the intoxicating spiciness of a frothy weissbier tempt in my imagination.

In this country the term "weissbier" or, more commonly, "weizenbier" has gone from being largely unknown to completely misunderstood in a matter of 10 years. "Weizenbiers" (wheat beer often dosed with fruit essence) abound, but few of them bear much resemblance to Bavaria's very special drink.

Weissbiers date back to the late 1400s and early 1500s, and they developed a tremendous popularity that carried through the next couple of centuries. Because of the high percentage of wheat in the grist, the beers were considerably more pale than the "braun (brown) biers" produced throughout the region, and were dubbed "weissbiers" or "white beers." Like all the beers of the time, they were top fermented, and still are. This makes weissbier one of the few German styles that retains the old brewing methods.

During the years of Weissbier's greatest popularity, the right to brew with wheat was reserved for a ducal family, which guaranteed a fabulous income from the family monopoly. Gradually, however, by the end of the 18th century the beer's popularity began to wane, so the royal family sold the useless rights for the beer, and weissbier came perilously close to disappearing all together.

One brewer, Georg Schneider, continued to brew weissbier and kept the style alive. It managed a tenuous survival over the next century or more. In recent years weissbier has had an explosive growth in Bavaria, in other regions of Germany, and elsewhere in Europe, largely due to the Schneider Weiss produced by Georg's descendants and the now-large brewery in Munich.

Weissbier has enjoyed a revival much like the American microbrewery revolution, and doubtless for similar reasons. Weizens, especially the yeasty hefe-weizens, are considered more "natural," are more flavorful, and to some extent have become more chic than the standard helles (pale) lagers or northern pils.

Unlike many of the American beers masquerading as "weizens," true weissbier is an untamed jungle of flavors, taking the natural fruitiness of an ale yeast to the farthest reaches. There is no room for moderation here. Drinkers either hate it or love it, and many switch from the former to the most ardent enthusiast in a single glass. After a half-liter of weissbier, anything else (especially anything with hops) can taste decidedly weird.

Weissbiers are brisk and refreshing. Characteristically the carbonation level is very high and this, in conjunction with the extra proteins

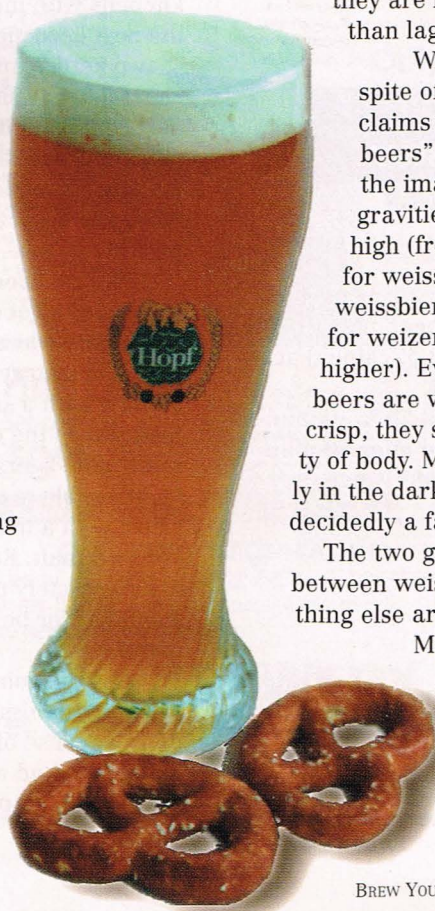
from the malted wheat, creates the tall, stiff white head that marks the honest weissbier. In Germany beer glasses are clearly marked with the correct fill level, so the drinker can be assured of getting a true liter or half liter. A weissbier glass (long, elegantly flute-shaped, narrow at the bottom, and very wide at the top to enhance carbonation) has the line drawn two inches below the lip, and still the head bursts proudly above it.

Although known as "weiss" or "white" beer, weizens have a deeper gold color than most pale lagers — certainly far more color than American pilsners. Some are even ruddier, and the confusingly named dunkles weissbier ("dark white beer") is also still brewed. Because of the wheat used and since the beers do not receive a long cold-storage period, they are far less polished than lager beers.

Weissbiers are not, in spite of their color or claims to health, "light beers" by any stretch of the imagination. Starting gravities are reasonably high (from 1.047 to 1.056) for weissbier and dunkles weissbier, and even higher for weizenbock (1.065 and higher). Even though the beers are well attenuated and crisp, they still finish with plenty of body. Malt flavor, especially in the darker versions, is decidedly a factor.

The two great distinctions between weissbiers and everything else are wheat and yeast.

Malted wheat makes up 60 to 70 percent of the typical grist, with malted barley making up the



remainder. Malted wheat, which lacks the husk found on barley, is inherently difficult to work with and requires special care in the brewhouse. But the distinctive flavor and dense head of the well-crafted weissbier are their own rewards.

A true weizenbier yeast strain is absolutely essential to the beer. A strange offshoot of *Saccharomyces cerevisiae* (standard top-fermenting or "ale" yeast) fermented at typical ale temperatures, the weizenbier strain produces an unusual melange of phenolic flavors. The clove-like is most prominent, but a good weissbier is very complex, with varying levels of vanilla, banana, and other fruity or spicy flavors swimming in and out of perception. What would be considered signs of contamination in lager are ironically signs of a well-made weizen.

Until recently true weizen strains were tough for homebrewers to find. Attempts to secure yeast from import bottles were largely disastrous. Although weissbiers are traditionally bottle conditioned, most of the larger breweries use a lager yeast at this stage rather than their primary fermentation strain. Many even pasteurize the bottles for stability. Fortunately,

a good variety of yeast is now available (such as Brewtek CL-920, Wyeast 3068, and Yeast Lab W51, among others). The best results seem to come from fermentation temperatures in the upper 60s and low 70s; at cooler temperatures, the distinctive spiciness may not develop.

For the all-grain brewer weissbier provides an opportunity to experiment with decoction mashes — removing a portion of the mash, boiling it, and returning it to the main mash. Decoction mashes allow an optimal breakdown of proteins and starches and help to develop the correct color. For pale weissbiers a single decoction is sufficient, but for the maltier richness of a dunkles weissbier or weizenbock, the extra effort of a double decoction is worth trying.

Decoction mashes require a lot of extra time, equipment, and effort — especially when weighed against a British-style single infusion. It is, frankly, an intimidating process until you've gone through it a few times — then it's merely a lot of work! Given the lack of good weissbiers in the US, however, a real fan may find it the only way to enjoy one of the great beers.

My experience has been that kitchens with multiple burners make the best decoction brewhouses. With two kettles and a good-sized ladle, it's relatively simple to separate the decoction, boil it, and hold the main mash at a constant temperature — making corrections in temperature when the decoction process isn't quite perfect.

Extract brewers have it relatively easy, with a good array of all-wheat and mixed wheat-barley extracts available. The extracts should be supplemented with a small mash of good pale malt. Given the difficulty in brewing really pale beers from extract, it might be advisable to shoot for darker versions, with a modest addition of caramel malt. Roasted, burnt flavors are completely unwanted, so color should never be sought with roasted malts.

Anyone going to all the trouble of brewing a weissbier ought to go to the extra expense of using imported wheat malts. I've had excellent results from both German and Belgian versions,

Dunkles Weissbier

(5 gallons)

Ingredients:

- 2.75 lbs. domestic 2-row malt
- 6 lbs. Belgian wheat malt
- 1.75 lbs. Belgian Munich malt
- 1 oz. Mt. Hood (3.5% alpha) at beginning of boil
- 0.25 oz. Mt. Hood after 30 min.
- 0.25 oz. Mt. Hood after 60 min.
- Wyeast 3068 at 68° F
- 1 cup corn sugar

OG = 1.055

FG = 1.017

Step by Step:

Mash in 3.5 gallons of water at 100° F. Raise to 122° F and hold for 25 minutes. Remove about 25 percent of the mash (the thickest part) and transfer to second kettle.

Slowly raise the temperature of the decoction to 160° F and hold for 15 minutes, then slowly raise to boiling. Boil for 30 minutes, then slowly return the decoction to the main mash. (I told you this got complicated!)

The mash at this point should be about 145° F; hold for 20 minutes, then slowly raise the temperature to 160° F. Hold until iodine test for starch is negative (about 10 to 15 minutes). Then raise the mash temperature to 170° F and hold for five minutes for mash-off.

Sparge to 6.5 gallons and boil for 90 minutes, adding hops as noted. Cool wort, separating the wort from the hot break. Aerate thoroughly and pitch one quart yeast starter. Follow normal fermentation processes (I prefer an open fermenter), rack to secondary when krausen falls, and follow normal procedures.

Bottle with corn sugar and condition at normal temperatures for four to six weeks. Follow standard lager beer techniques for kegging or bottling.

Weissbier

(5 gallons)

Ingredients:

- 3.5 lbs. domestic 2-row malt
- 7 lbs. Belgian wheat malt
- 1 oz. Mt. Hood (3.5% alpha) at beginning of boil
- 0.25 oz. Mt. Hood after 30 min.
- 0.25 oz. Mt. Hood after 60 min.
- Wyeast 3068 at 68° F
- 1 cup corn sugar

OG = 1.052

FG = 1.014

Step by Step:

See step-by-step instructions for Dunkles Weissbier.

Dunkles Weissbier

(5 gallons)

Ingredients:

- 7 lbs. Weizen extract (65% wheat, 35% barley)
- 2 lbs. domestic 2-row malt
- 0.5 lb. crystal malt
- 2 oz. Mt. Hood (3.5% alpha) after 15 min.
- 0.25 oz. Mt. Hood after 30 min.
- 0.25 oz. Mt. Hood after 60 min.
- Wyeast 3068 at 68° F
- 1 cup corn sugar

Step by Step:

Mash crushed malts in one gallon of water at 150° F for about one hour. Sparge with hot water and add malt extract to kettle. Boil for 90 minutes, adding hops as noted.

Cool wort, separating the wort from the hot break. Aerate thoroughly, and pitch one quart of yeast starter. Follow normal fermentation processes, rack to secondary when krausen falls, and follow normal procedures. Bottle with corn sugar and condition at normal temperatures.

OG = 1.050
FG = 1.014

and the British wheat malt I've seen was likewise excellent. Good domestic two-row malt (very pale) works well for the barley fraction. Any caramel malts used should be the best available.

Hops are almost invisible in weissbiers, entirely absent in the finish and at the threshold of perception of bitterness. Nevertheless, they should be good, low-alpha "noble aroma" hops, such as German Hallertau, Hersbrucker, or Tettnanger, or a modern clone such as Mt. Hood or Liberty.

Any good water source seems to be appropriate for weissbiers, which is unusual and good news for brewers.

Brewers who are really intrigued with weissbier owe it to themselves to buy one book, Eric Warner's *German Wheat Beer* (Brewers Publications, 1992). Warner studied weissbier brewing in Bavaria and eventually opened the Tabernash Brewery in Colorado, reason enough to visit the Rockies. His book offers a brewer everything necessary — well, everything but the

ingredients — to brew authentic weissbier. In '92 I was one of the judges to award his weissbier a blue ribbon in the American Homebrewers Association national competition. His beer and his book inspired me to spend hours in the kitchen brewing my own. The recipes here are developed from that inspiration. ■



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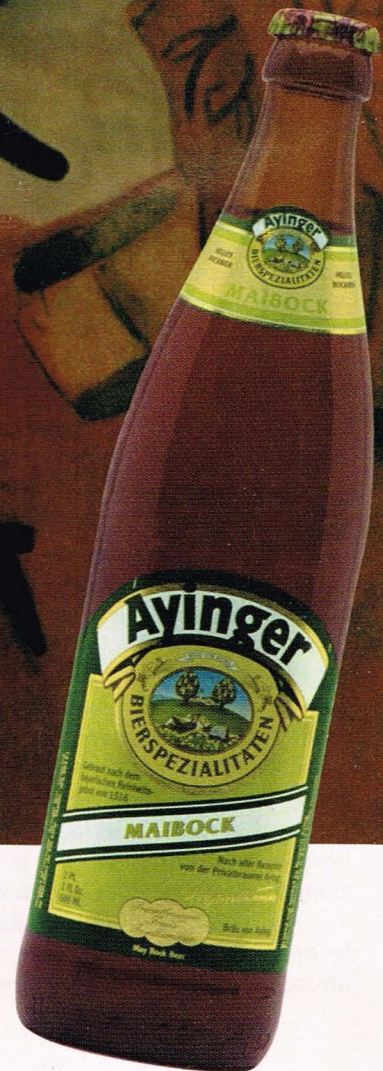
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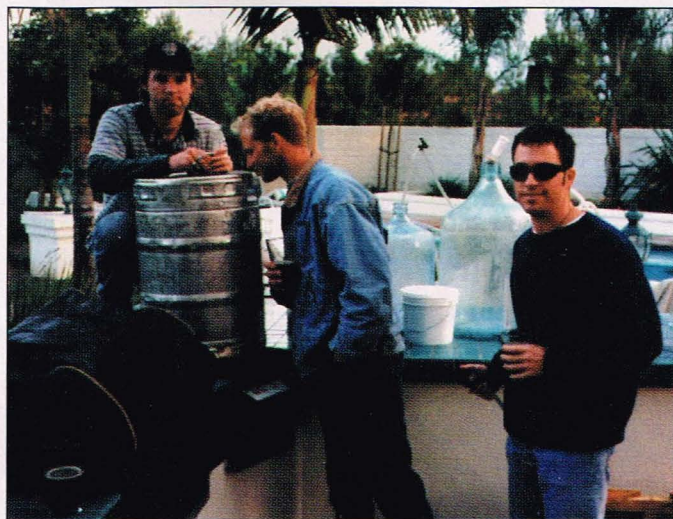
Homebrewer in Hot Water

by Susan Walton

Mark Howell's got a hit CD with his band, and his beer's so good it's being sold at a local pizza parlor.

If you were walking down Hollywood Boulevard and saw cameras, sound men, guys with guitars, and a big bus, you probably wouldn't think, "That must be a homebrewer." But in the case of Mark "Howie" Howell filming a video with his band, Water, that's just what he is.

Water is rising. The guys in the band grew up together and have been playing together for years, but lately they've found themselves on the path to fame and music recognition. Five of their songs are used in Warren Miller's latest skiing movie "Endless Winter," and they followed that up with a tour and an appearance at the movie's premiere. Howell plays guitar, and the band members write their own songs together. But between all of the touring, recording (their CD, "Nipple" on MCA Records, is available in stores across the country), filming, and songwriting, Howell brews his own beer.



Mark "Howie" Howell and George Dutton are joined by drummer John Guest (right), who is standing in front of Howell's monster carboy.



The members of Water: John Guest, Dean Bradley, Mark Cohen, and Mark Howell, taken at Joshua Tree National Monument.

"It all came from wanting to know how to do it myself," he says. "I love beer, and I wanted to know how to make it." He's been brewing for about four years.

He and John Guest (Water's drummer) brew with their financial manager, Jim Kieckhafer, and George Dutton, who is on the band's road crew. The other guys in Water like their beer enough to keep them pretty busy.

Water's Water

As a homebrewer, Howell is aware of the importance of water. Since it is also the name of his band, it has special significance for him. Did they name the band because of his interest in homebrewing? "Well, we got together to talk about names, and we wanted something simple, one word, easy to remember. I suggested Water, and everyone liked it. We decided to think about it overnight, and the next day they all said 'Yeah!' And that was it!"

Kieckhafer originally taught Howell how to brew, and mostly they brew at

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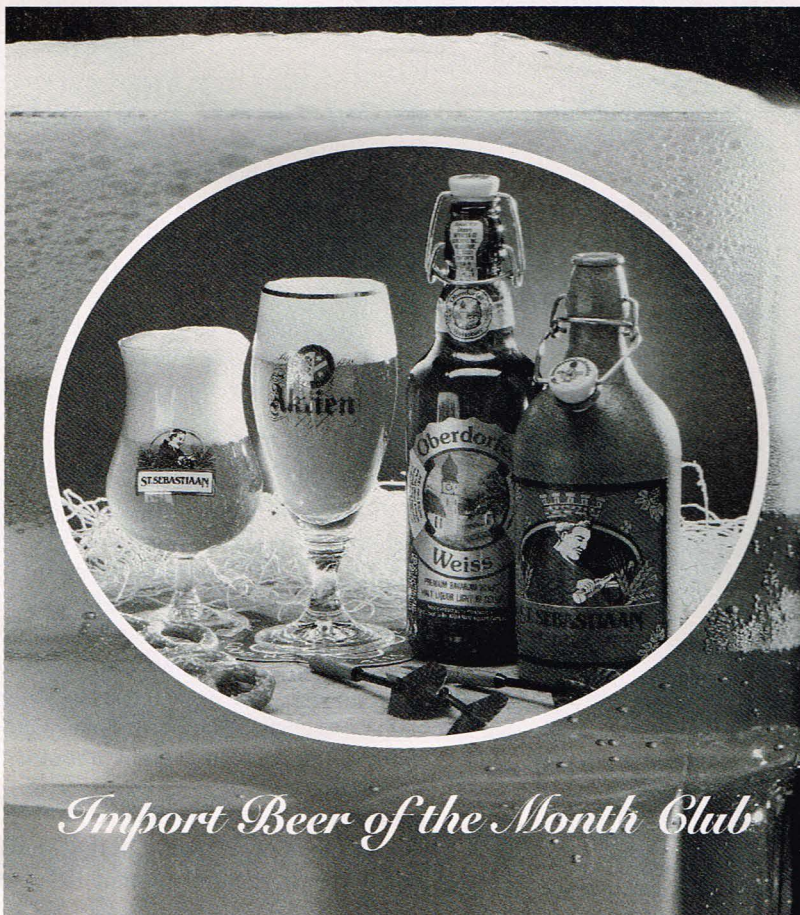
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Water's Edge Ale

(10 gallons)

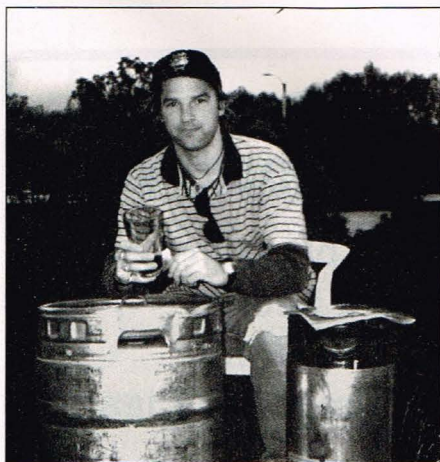
Ingredients:

- 3 oz. Perle hops for 45 min.
- 4 oz. Willamette finishing hops for 5 min.
- 12 lbs. amber extract
- English ale yeast
- 1 cup priming sugar

Step by Step:

Bring water to boil, add extract. Start timing one hour when wort returns to rolling boil. After 10 to 15 minutes add Perle hops. After 55 minutes add finishing hops. Bottle with priming sugar or keg with CO₂.

— courtesy of Mark Howell



Howell keeps a close eye on his kettle, with a beer and a BYO close at hand.

his house in Tustin Ranch, Calif. The water there is not the greatest. But Kieckhafer has an excellent reverse osmosis filtration system installed in his house, and it has a tremendous effect on the brew's outcome.

"The system makes a big difference," says Howell. "It's pretty intense." It is housed under the sink and filters out all the chlorine and impurities, so the water comes out of the tap clean.

Because of the band's busy schedule, Howell brews mostly extract. "I'd

like to have time to do more all-grain, have total control," he says, "but our ales come out really good this way, too."

So good, in fact, that he has been brewing for a local pizzeria for the past year or so. His beer is served on tap next to Sierra Nevada and Guinness, and the patrons like it just fine. He'd like to try distributing his beer locally. "But I'm a Sagittarius, so I

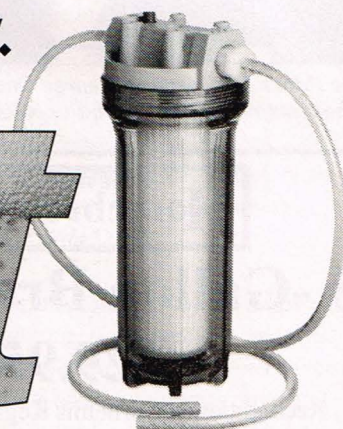
love to travel. We're on the road a lot," he acknowledges.

Water's Hardware

Between gigs Howell has managed to put together a great collection of homebrew equipment. The guys set it all up outside around a cut-off keg that they made for a brewkettle. They found the top to an old pan that fits perfectly as a lid. The kettle sits on a

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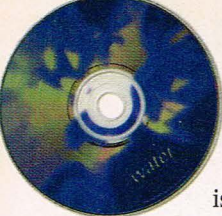
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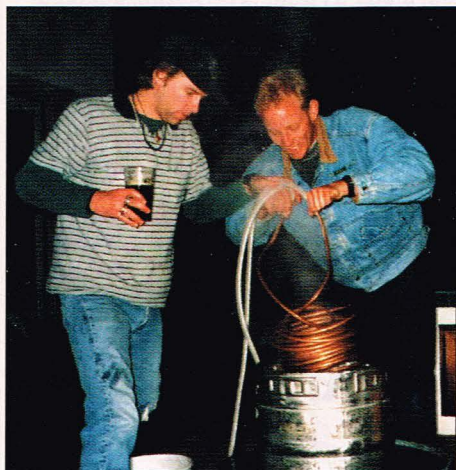
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gas burner designed for outdoor use, which is controlled with an easy-to-handle dial.

His copper chiller is a coiled, cobra-like beast that he put together with fiberglass tubing. The entire keg/kettle fits into an aluminum vat with room to spare for cold water and ice. "The tub totally kicks the heat down fast."



Howie (Mark Howell) and George Dutton get the wort moving through the chiller.

Howell has two carboys, one five gallons and the other 12 gallons. The big one looks large enough to hold half the Pacific. He bought it from an elderly woman and when he got home, he found the date on the bottom — 1912!

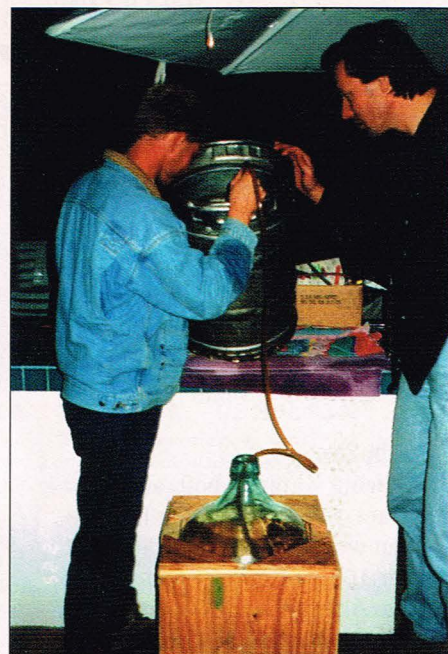
"It is perfect for making 10-gallon batches, because we can rack to it with room to spare," he says.

He used to worry about breaking it, so he built it a wooden crate lined with carpeting that keeps it snug. The crate serves a dual purpose, protecting the carboy from harm as well as keeping out the beer-damaging rays of the California sun.

"Someday, when we have a really big tour bus, I want to take my brewing equipment on the road with us," Howell says. "Then I'll brew wherever we are. I'll just set up in the parking lot."

His recipes may never be the same twice, because the water will be different in every place. 

For more information on the band, write to Water at P.O. Box 3845, Long Beach, CA 90803.



George Dutton and Jim Kieckhafer rack the wort to their primary, a monster carboy housed in its wooden crate.

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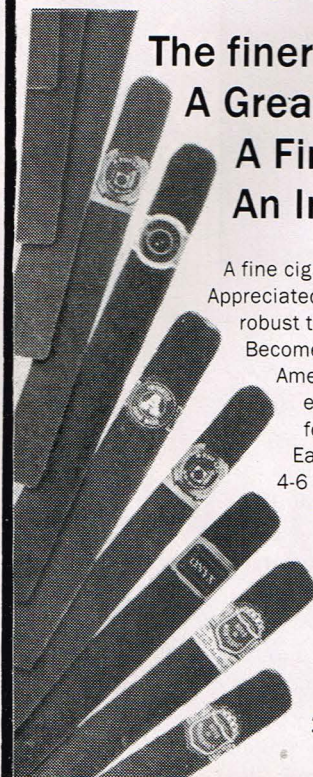
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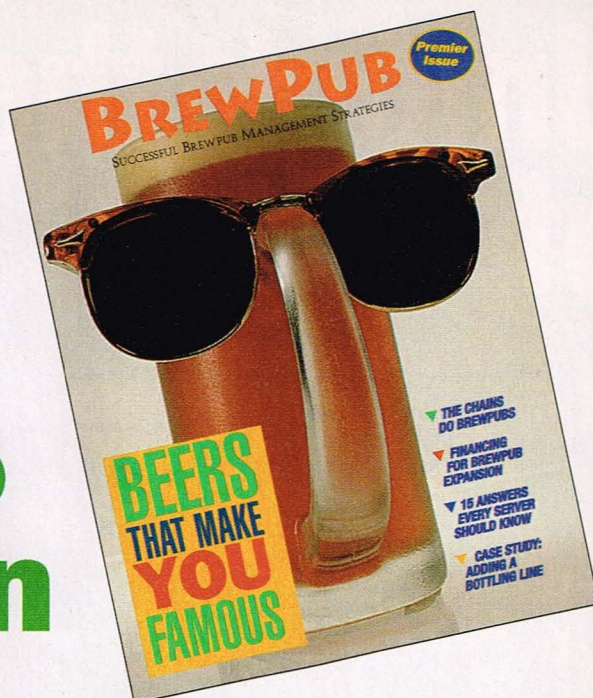
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Unlock the Secret of Water

*Discover
how mash
water affects
beer flavor.*



By Nico Freccia

Historically, great beer has always been the product of the happy circumstance of the location and the times.

Beer is an agricultural product, so traditionally it varies from growing area to growing area. Because of local political influence on trade and taxation,

each city adopted different methods of production and sale of beer. And certainly different methods of malting, kilning, and every step of the manufacture of beer gained uniqueness from the era's common practices. But perhaps the greatest influence on the styles of beer that have

become world classics is water.

Though individuality is still the hallmark of great beers worldwide, modern times have afforded a certain measure of freedom and consistency to beer production methods. If you live in Ohio and wish to brew Belgian-style beer, you can



SO! THAT'S
HOW HE DOES
IT!!!

BEWARE OF THE
DOG

readily purchase Belgian malts. If you wish to employ a German mash schedule or Czech hops, the information, technology, and products are only as far as your local homebrew shop. But neither you nor any brewer on any scale can practically import water from Munich to brew a true German lager. Water defines the character of any great brewing region, including the region around your home.

What Makes Water Unique?

Chemically, water in its most basic form is H₂O: two atoms of hydrogen per one of oxygen. But for all practical purposes your water is H₂O with lots of dissolved minerals, organic material, and gasses from everything it has come in contact with on its way to your tap.

For brewing purposes ion concentration is of the greatest concern. Ions are electrically charged particles. Positively charged ions (cations) and negatively charged ions (anions) combine to form compounds. Mineral



salts, such as gypsum or ordinary table salt, are examples of these compounds.

When the salts are dissolved in water they ionize, or dissociate, back into their original ions. The ions that most affect the brewing process are calcium carbonate and bicarbonate, magnesium, sodium, sulfate, and chloride.

Most homebrewers in this country rely on their own municipal water

supply for beer making. Most municipal water supplies in the US are derived from deep wells, reservoirs, or rivers. The water is filtered and treated (usually with chlorine or a chlorine compound) to inhibit microbial contamination. In many locations the water is pH adjusted for corrosion control.

Your tap water should be (and probably is) clean and clear, have no strong aromas or unpleasant tastes, and be generally satisfactory for drinking. The standard rule is: If your water is potable to you, then you can brew with it. You may, however, detect some aromas and flavors in your water that send you to the store in search of the bottled stuff for everyday drinking. In any case, it's time to take a closer look at what's in your water and how it can work for your beer.

Analyzing Your Water

There are a lot of basics that you should know about your water supply. Where does it come from? How is it treated? Does the source water or

Ion Table			
Ion	Ideal Concentration	Effects	Brewing Source
Calcium	50-150 ppm	Lowers mash pH. Aids enzyme activity, protein coagulation, sparge runoff, clarity. Accentuates hop bitterness. In excess it can rob wort of essential yeast nutrients.	Gypsum (calcium sulfate) Chalk (calcium carbonate) Calcium Chloride
Magnesium	10-30 ppm	Important yeast nutrient. In excess will contribute a bitter or harsh astringency.	Epsom Salts (magnesium sulfate)
Carbonate	<50 ppm*	At high levels will counteract effects of calcium, raise mash pH, extract tannins from malt, slow enzyme activity, impede flocculation (yeast clumping).	Chalk (calcium carbonate)
Bicarbonate	<50 ppm*	Formed by reaction of carbonate with CO ₂ and H ₂ O. Same effects as carbonate at high levels. Can be removed with calcium.	Sodium bicarbonate (baking soda)
Sodium	30-100 ppm	Will accentuate sweetness, especially in the presence of chloride. Levels over 200 ppm can cause harsh flavors, as can high levels paired with high levels of sulfate.	Non-iodized table salt (sodium chloride)
Chloride	up to 350 ppm	Greater than 250 ppm will accentuate sweetness, especially in the presence of sodium. At high levels can hamper yeast flocculation.	Non-iodized table salt (sodium chloride) Calcium chloride
Sulfate	up to 150 ppm	Accentuates hop bitterness, contributes dry, full flavor with slightly sharp edge. At levels above 400 ppm, or in combination with high levels of sodium, can become very palate drying.	Gypsum (calcium sulfate) Epsom salts (magnesium sulfate)
* Unless using dark malts. If using dark malts, level can be higher.			

composition vary at different times during the year, and for what reasons? In some areas rainfall may affect the amount of dissolved minerals in the water. Where rivers are the source for a local water supply, the composition may vary greatly depending on the height of the river stage. How is the water treated? And last and perhaps most important, what are the dissolved minerals?

The easiest way to find out all of this information is simply to put in a call to your local water department. Departments usually publish an annual report detailing all aspects of the water supply. In some cases they include this report with the regular bill. Don't worry about asking all kinds of questions over the phone. Simply call and ask for a copy of the water quality or water analysis report, and you should find that it contains all of the information you need.

The municipal water quality report for the city of San Francisco, for example, is a two-page report that consists of charts listing all mandatory health-related standards for clarity, microbiology, organic and inorganic chemicals, and radionuclides.

The report clearly states and defines the unit of measurement, maximum allowable contaminant level, and the range and averages for each item in treated San Francisco water. Most of these chemicals are not detected and are of minor concern to brewers.

A second page lists aesthetic standards and additional constituents such as alkalinity, hardness, pH,

chlorine, and levels of key ions such as calcium, magnesium, and sodium. In addition there is a narrative describing the origin of the water and treatment practices.

It is interesting, for instance, to know that the water originates from high Sierra snowmelt in 459 square miles of protected Yosemite National Park watershed land. It is more useful, however, to know that 15 percent of the supply is derived from local reservoirs. From that fact we can assume a range of fluctuation in the content of the water supply throughout the year. Fortunately, that range is fairly small, and averages are given that can be used for brewing calculations.

The high Sierra water, stored in Hetch Hetchy reservoir, is pH adjusted with lime for corrosion control, then chlorinated to kill bacteria that may be potentially harmful.

This is important information for the brewer, and a glance at the charts provides a valuable picture of the water supply as a whole. Calcium and total alkalinity and hardness (both expressed as CaCO_3 , calcium carbonate) are all low, but the pH is relatively high.

The report states that "the water is pH adjusted with lime for corrosion control." Lime reacts with calcium and bicarbonate to form calcium carbonate, which is insoluble and precipitates as a white, chalky residue. Because the water needs to travel 150 miles through tunnels and pipelines, this addition of lime to decalcify the water reduces chalk buildup in the supply lines, and it reduces buildup and corrosion of pipes in the home.

The water that comes out of a San Francisco tap, therefore, is very low in mineral content (soft), which makes it easily adaptable to all great beer styles, and even though it has a high pH, it is low in total alkalinity, which is good for the mash. Because

liquid chlorine bleach is used to kill bacteria in the water, boiling, filtering, or "out gassing" the brewing water will rid it of any chlorine. By having a simple, working understanding of what and why the brewing water is what it is, you can begin to understand exactly what it is best suited to brewing.

If you use water from a well, you will need to get it tested if you want to have control over styles. You may want to do a little geological research about your area as well to get a complete picture of the origins of and changes to your water that may be occurring.

Classic Beer Styles

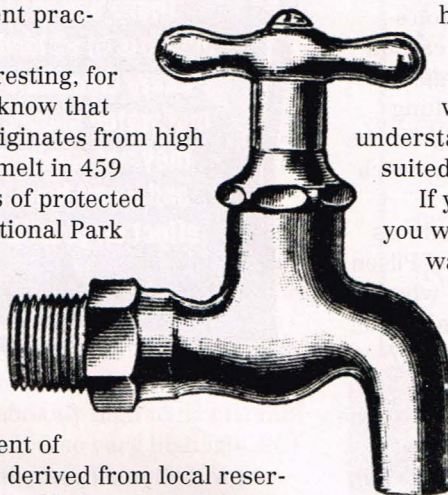
"Hard" and "soft" are the two terms that have the greatest significance in describing the character of famous brewing waters. "Hard" water is measured primarily by the amount of calcium and magnesium it contains. Because these ions inhibit the sudsing ability of soap, water containing high levels of them is "hard" to lather. "Soft" water is water with the absence of significant amounts of

these ions.

Calcium is the most important ion that affects hardness. Calcium lowers the mash pH, aids enzyme activity, helps protein coagulation and sparge runoff, aids clarity, and accentuates hop bitterness.

The carbonate and bicarbonate ions pull the mash pH up and neutralize calcium by forming a chalky precipitate when boiled (or mixed with lime). Therefore, the ratio of calcium to carbonate is a more accurate determining factor in measuring hardness.

Burton-On-Trent, home of Bass Ale, is one of the best examples of water hardness as an influence on the development of a famous style. The generally accepted optimum range for calcium in the mash is between 50 and



By having a simple, working understanding of what and why the brewing water is what it is, you can begin to understand exactly what it is best suited to brewing.

150 parts per million (ppm). Burton's water contains a whopping 270 ppm of calcium and 60 ppm magnesium. At this level, calcium can be detrimental to the mash. But because Burton's water also has a high level of carbonates (200 ppm), the negative effects are balanced out and the resulting water provides the background for the dry, hoppy, minerally flavor for which Burton's beers are known.

At the other end of the hardness spectrum is the classic water of Pilsen (Plzen) in the Czech Republic, where Pilsner Urquell is made. Pilsen's water is extremely soft, containing only 7 ppm calcium, 2 ppm magnesium, and 14 ppm carbonates. The softness of the water allows a greater intensity of malt flavor to come through while still maintaining a rich, smooth, and round palate.

By comparison Dortmund, which also produces pale lagers in the style of Pilsner Urquell, has very hard water, and the palate of its beers is accordingly minerally, lending the beer a bit more crispness.

There are trace amounts of all kinds of nasty chemicals in our water supply, but they are negligible and won't have an effect on your beer.

Making the Most of the Water You've Got

Now that you know what's in your water and how it will affect the flavor and styles of beer that you make, here are a few simple principles to help you make the most of your water.

- **Getting rid of chlorine.** Chlorine that passes from your water into your beer may lead to medicinal aromas that you don't want. Chlorine levels in

your water supply can vary greatly, so your best bet is to smell your water. If there is a noticeable chlorine odor, you might want to think about getting rid of the chlorine. If the water is chlorinated, you can drive off the chlorine simply by boiling your brewing water. You may also "out gas" the water by letting it sit uncovered for 24 hours. Your simplest option is to buy a small carbon filter and run all your brewing water through it. Carbon filtration will also work if your water department uses something other than, or in addition to, chlorine, such as chloramines.

- **Adjusting hardness.** Boiling water that contains calcium and carbonate will precipitate a residue, thus lowering the total hardness of the water. But be aware of your original calcium levels. You don't want to remove all of the calcium, as it is vital to a healthy mash. You can add calcium back, if necessary, in the form of gypsum (calcium sulfate) or calcium chloride.

If your water is very soft and you add calcium, you will raise hardness. Remember that gypsum, for example, is a salt (the calcium and sulfate ions combined) and it will also add sulfate to your water. So if there is already a high level of sulfate (more than 100 ppm), you may want to add calcium chloride (CaCl_2) instead, to avoid harsh flavors that may be associated with high levels of sulfate.

- **Using bottled water.** Just like tap water, bottled water needs to be tested for chemicals and ion concentrations. Your bottled water supplier should be able to provide you with the information.

- **Brewing water and extract.** Extracts are worts that have already been made for you. When the grains were mashed, the water was adjusted to optimum levels for the style of extract being made. You may wish to drive off chlorine from your brewing water, but you probably don't need to adjust the ion content of your water if you are using extracts.

Other Components

In addition to chlorine and the few ions previously mentioned, there are several other components of your

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water that may affect flavor.

Generally, there are trace amounts of all kinds of nasty chemicals in our water supply, but they are negligible and won't have an effect on your beer. Certain inorganic chemicals such as nitrate and nitrite can affect your beer, but these shouldn't be a problem unless you are using suspect well water. If you see levels above 5 ppm, you should find an alternate water source.

Some chemicals such as copper, lead, and iron are totally undesirable in your brewing water and should be present in amounts of less than 1 ppm. Don't worry about copper and lead pipes in the brewery; the metals will not dissolve into water from pipes. You probably don't have lead utensils lying around the house but if you do, don't use them in your mash or beer. Lead will dissolve in acid solutions.

Most municipal water supplies are fluoridated. The levels found in your water will not affect brewing.

Other Ions

A few common and important ions are sodium, chloride, and sulfate. Common table salt is sodium chloride (NaCl), which can be added to water to accentuate sweetness and smoothness. Avoid iodized table salt because iodine is toxic to yeast. You probably don't want to add sodium chloride and gypsum together, because adding gypsum (CaSO₄) is also adding sulfate. Sodium and sulfate together may make the beer unnecessarily harsh tasting. Consult your water analysis charts for levels, but the more sulfate in your water, the less sodium you want to introduce and vice versa.

Classic Brewing Water

Burton and Pilsen are just two of the classic defining waters that have led to some of the world's great styles. You know the beer, you know the water, now put the tastes together in your mind.

• **London.** London's water varies from district to district, but an exemplary London water supply is low in calcium (52 ppm) and high in carbonates (156 ppm). Though the high alkalinity of this water would

make brewing pale ales difficult (the pH of the mash would be too high), it is perfectly suited to brewing porters because dark roasted malts are naturally acidic and will overcome the buffering power of highly carbonate waters, lowering the mash pH into the correct range. High levels of sodium (100 ppm) may accentuate the chocolatey sweetness of the porters that made London famous. Example: Young's London Porter.

• **Dublin.** The name Dublin is synonymous with one beer — Guinness. Guinness' unique production process makes the world's greatest dry stout, but what about the water? Though the water is reasonably high in calcium (118 ppm), it is also very high in carbonates (319 ppm). Therefore, again, it is well suited to the use of lots of highly acidic dark roasted malts.

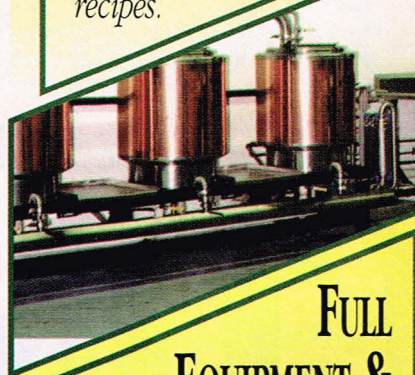
• **Munich.** Unlike the water of Dortmund to the north, Munich has a very carbonate water supply (75 ppm calcium, 150 ppm carbonates). Its lagers, therefore, tend to have a distinctively sweet, malty profile to balance the carbonate water, and they are generally fuller bodied and slightly darker than other pale lagers. Munich also perfected other lager styles employing slightly darker malts such as Märzen and dunkles. Examples: Spaten Pils, Paulaner Dunkel, Ayinger Fest-Märzen.

• **Vienna.** Vienna's water is hard (200 ppm calcium, 120 ppm carbonates), and its beers will taste minerally. Its water also has a fairly high sulfate concentration (125 ppm), which contributes to the characteristic dry finish and may accentuate the nuttiness of the high-kilned malt. Examples: Ottakringer 150 Jahr, Dos Equis Original Amber (from Mexico).

• **St. Louis.** The home of the world's largest brewer has an excellent all-around water supply for brewing except for its slightly low calcium content (25 ppm). It is generally fairly low in carbonates (50 to 120 ppm, depending on river stages) and has a good balance of the other ions relevant to brewing. Sodium (50 ppm) probably contributes a bit of sweetness and sulfate (100 ppm) for a slightly dry finish. Example: Budweiser. 

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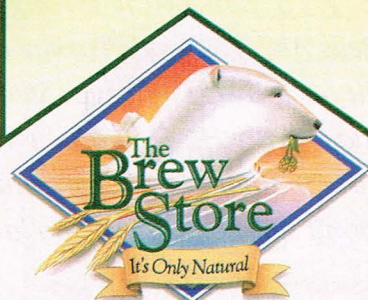
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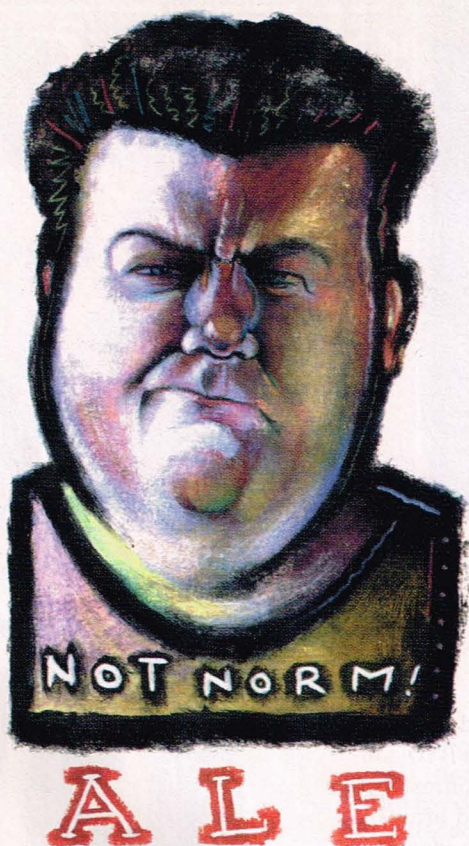
By Sal Emma

After sorting through nearly 1,000 entries, from Wedding Bells Ale to Mosey's Turkey Brew, from Ale House Bock (The Brew Fit for a King) to Anger Steam Beer, and from Kringle's Christmas Ale ("Truly Ho-Homade") to Yin and Yang Beer ("It's a Whole Sum"), the judges have made their choices. All decisions are final. Don't send bribes; it's too late. Until next year, that is.

1st Place - Funky

**Jim Roberson
Pleasanton, Ca.**



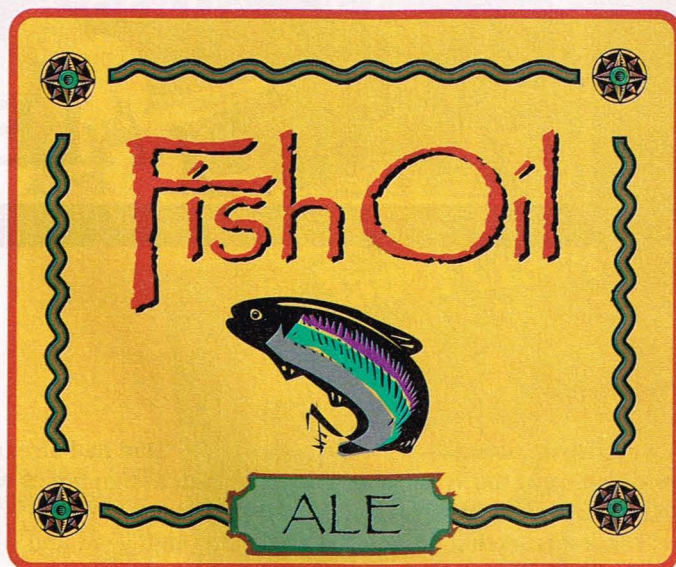


1st Place - Slick

Barry Fitzgerald
Lawrence, Kan.

1st Place - Classic

Troy Brandt
Edina, Minn.



Not Norm Ale Takes "Slick" Blue Ribbon

"Not Norm Ale," brainchild of Barry Fitzgerald of Lawrence, Kan., took the blue ribbon in the "Slick" category. "I heard about the contest late in the game, about a week before the entry deadline," Barry, a professor of illustration and graphic design at University of Kansas, explains.

"To save time, I decided to design a label using a piece of art I already had in my portfolio and started sifting through piles of stuff. The (George) Wendt portrait basically jumped out of the file. I thought, who better as a symbol for beer than our old favorite, Norm?"

Fitzgerald explains how he came up with a way to show the "Cheers" star more respect when he named the beer. "I was reading about Wendt, and he was lamenting the fact that he has a hard time breaking out of the Norm stereotype, saying that he — George Wendt — is 'not Norm.' He had a new TV show, after all. Plus, it's a great play on

words," he says. Fitzgerald's original portrait was painted in acrylics. He added the typeset name, then made a color photocopy for the final design.

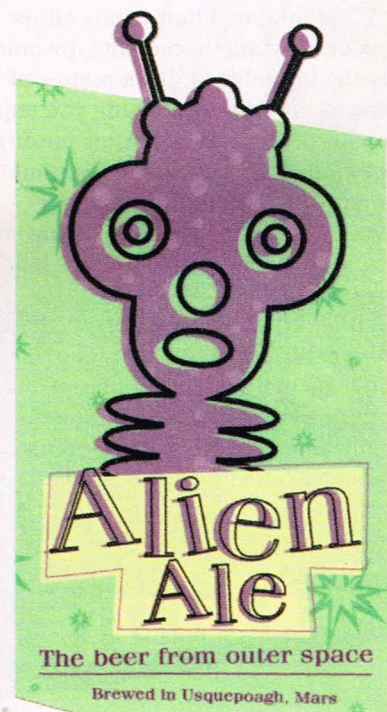
Fitzgerald is a "born-again" homebrewer. "I brewed a few times, years ago, with disastrous results. I was sort of on my own without good instruction or guidance. I gave it up — the beer was lousy. But there is so much more information available today. And the ingredients are better than ever. It seemed like a good time to take up the hobby again," he says. His last three efforts — a porter, a winter ale, and a Christmas beer — were successes.

Alien Ale: Brewed in — Usquepaugh?

Michael Cadoret has been brewing his own for about six months. The spirit moved him while he and

2nd Place - Slick

Nicole Cadoret
Providence, R.I.





2nd Place - Classic

Scott Hannah
Seattle, Wash.

his wife, Sheila, were doing some vacation shopping at the Whip and Spoon, a kitchen store near Portland, Maine.

"I saw this section of the store with homebrewing ingredients and equipment. It reminded us of how our parents and grandparents used to make their own beer, and it seemed like a great idea," Michael recalls. After brewing a batch or two and really liking the results, Michael and Sheila decided they should put some effort into labeling the fruits of their labor.

"You know, if somebody gave me \$25 and told me I had to buy either beer or brewing ingredients, I would buy the ingredients. It's a matter of pride — creating something you enjoy from basic ingredients. After putting that kind of effort into the creation of the brew, you should not leave it unnamed. It's an ego thing, doing your own labels. But it's a lot of fun, too," he says.

Once he made the decision to pursue labels, he did the next most logical thing: He got hold of a professional graphic artist. That artist happens to be his daughter, Nicole, attending Massachusetts College of Art.

"Dad had already asked me to help him design labels when the BYO contest was announced. The contest put us in high gear, and we started brainstorming names and design ideas," Nicole says. The second place winner in the "Slick" category, "Alien Ale," was the result of one of those late-night brainstorming sessions. Nicole put it together using a Macintosh computer running Adobe Illustrator.

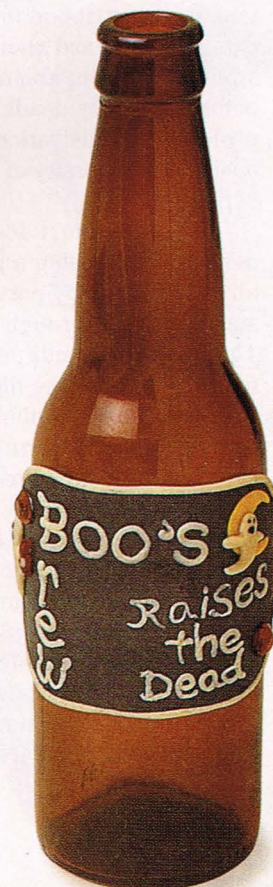
By the way, "Usquepoagh" is not a made-up name. Michael and Sheila live there. It's in Rhode Island, though. Hey, but who's to say there isn't an Usquepoagh, Mars, too?

Does B-Brite Remove Bolted-on Labels?

Jim Roberson's "Strange Brew" took first place in the "Funky" category. Strange Brew's label was made of copper with brass bolts in each corner, creating the illusion that the label was bolted to the bottle.

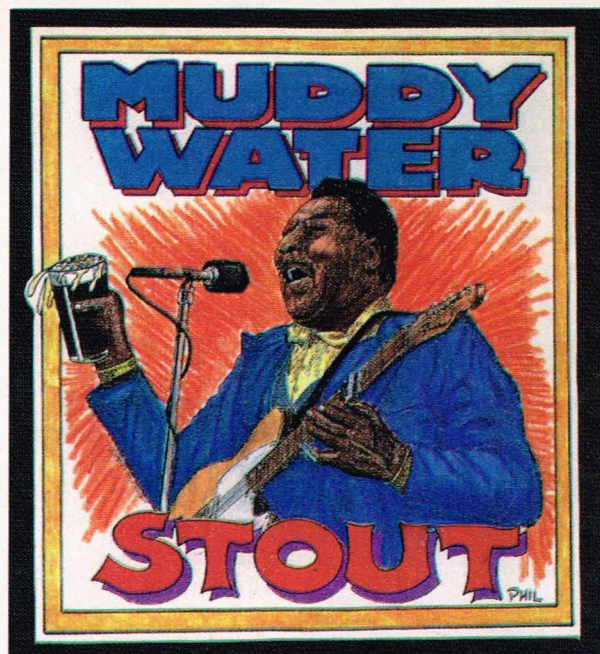
"I was trying to create that classic copper and brass brewery look," Roberson explains. "I started by polishing a sheet of copperplate. Then, the actual label design was printed on

GO ON



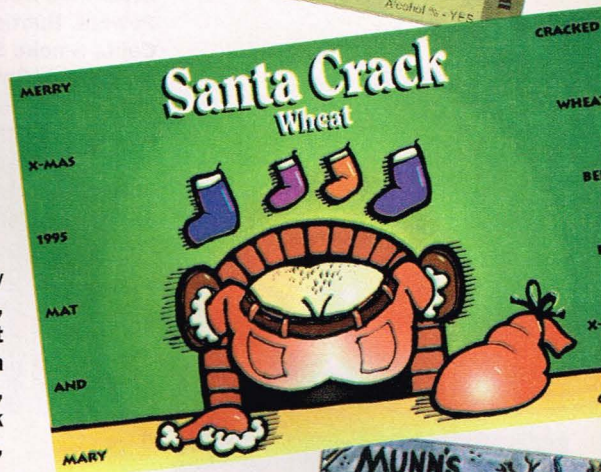
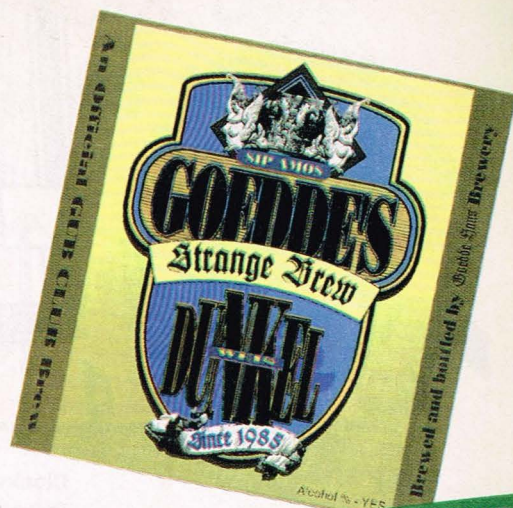
Editor's Choice

Heather Park
Natick, Mass.

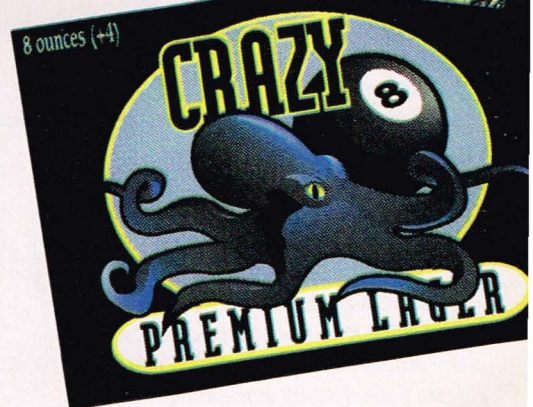
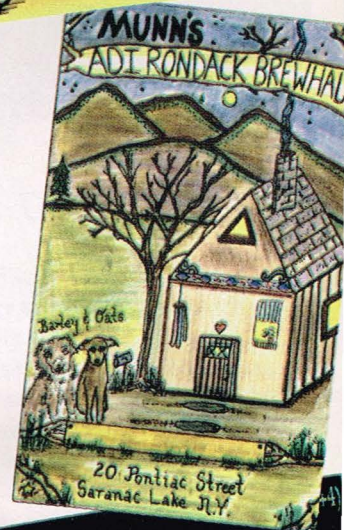


2nd Place - Funky

Phil Chestnut
Seattle, Wash.



From top to bottom: Tony Goedde, Bellevue, Wash., Strange Brew Dunkel Weis; Mat Jacobs, Chico, Calif., Santa Crack Wheat; Tony Munn, Saranac Lake, N.Y., Adirondack Brewhaus; and Brian Fowler, Toledo, Ohio, Crazy Eight Lager.



IZO

clear plastic and applied, with the bolt heads put on top to finish the illusion.

"The idea just popped into my head after I decided to enter the contest."

Roberson lives in Pleasanton, Calif. He's a sales rep for Rockshox, a firm that manufactures mountain bike suspension forks. "I like to play around with graphic design when I have time. The design for 'Strange Brew' was done by hand, cut and paste. Then I took it to an instant copy shop, where it was transferred to the clear plastic," he recalls.

Roberson has been brewing for five years and likes to try different styles. The day we caught up to him, he had

just bought ingredients for a wheat ale.

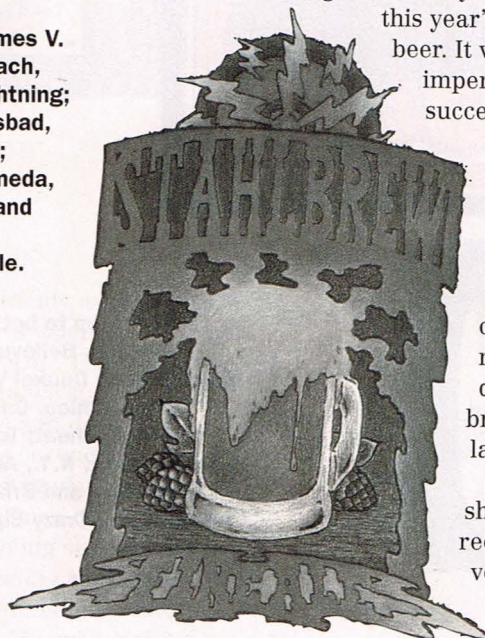
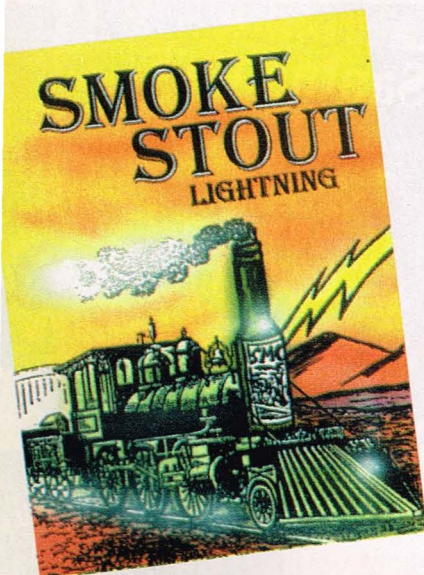
Roasty, Toasty . . . and Muddy.

Phil Chestnut is a Seattle sign painter who tinkers with graphic design in his spare time. "I was working on a blues calendar just for fun and had lots of pictures of blues musicians laying around. We had brewed a batch of stout that everybody loved — many were begging for more after we gave them some — and my brewing buddies asked me to name it. It seemed appropriate to call it 'Muddy Water.'"

Chestnut stuck a beer glass in Muddy's hand and colored the label with colored pencil. "All by hand. I



Clockwise from left: James V. Powers, Huntington Beach, Calif., Smoke Stout Lightning; Kenneth A. Smith, Carlsbad, Calif., Ken's Kosmik All; Stephen Bissinger, Alameda, Calif., Bissinger Brew; and Mike Stahlbrodt, San Francisco, Calif., Fire Ale.



don't use computers for anything, at home or in the sign shop," he says. Muddy took second place in the "Funky" category.

Chestnut has been brewing for 15 years with his two partners, but they only started labeling about a year ago. "I had seen some labels in the brew shop. They inspired me to try my hand at it," he explains.

The trio brews an average of 15 gallons every week. Muddy Water was this year's Christmas give-away beer. It was dry, almost an imperial. "It was our most successful beer so far," Chestnut says.

A Fishy Entry

Troy Brandt's "Fish Oil Ale" took first place in the "Classic" category. No surprise, really. Troy is a graphic designer who recently branched out into beer labels!

"If I might offer a shameless plug, we recently launched a new venture, Jefferson Press Beer Label

Designers," Brandt says. He put together

a display kit for homebrew shops and hopes the beer label business will augment his established graphic design firm, Heaton Brandt Communications, in Edina, Minn.

Fish Oil Ale was a bitter, brewed for a fishing party with several friends. "We hang out at a lakeside cabin, fish, and drink beer. We are pretty lousy fishermen. We don't know how or what to fish for. We just use the excuse to get together and have a good time," he says.

Brandt has been brewing for two years, mainly from kits.

Bottled with a Kiss

Scott Hannah's "Winter's Kiss Ale" took second place, "Classic." "I have been making a winter beer every year for six years, toying with the spices, nutmeg, ginger, and cinnamon. It's basically a plain amber with spices," the Seattle mechanical engineer says.

Hannah started brewing in college,

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"The Surgeon General Says: If you drink too much of this fine spirit you will become lazy in the body, silly in the head, and weak in resolve to remain chaste. So drink up! And use a condom!"

— Baltic Trade Russian Imperial Stout
Ken Hall, Trenton, N.J.

"Consumption of this product by pregnant women has been proven to enhance the physical and mental traits of an unborn fetus to a superhuman capacity. One minor side effect: Your children will most likely resemble Adam."

— Adam's Pale Ale
Adam Slater, Roswell, Ga.

"Warning: According to the Sturgeon General, humans should not consume excessive amounts of this beverage due to the probability of Going Ugly Early. There have been definite correlations shown in the number of alcoholic beverages con-

sumed and the birth rate. Please drink and copulate responsibly."

— Fall Creek Scottish Ale
John Hartline, Marysville, Wash.

"Crazy Dave's Warning: Make sure you open Quayle Ale over a sink, as opposed to a leather couch, as our admitted mistake of overcarbonation might make itself more apparent to you as a beer consumer."

— Crazy Dave's Quayle Ale
Dave Foxley, Albuquerque, N.M.

"Sturgeon General's Warning: If you do not like this beer, don't drink it. That just leaves more for those that do."

— Kemmer's Original Lager
Stevan Kemmer, Savage, Minn.

"Government Warning: Anything that tastes this good can't be good for you."

— Ray's Fuggle Juice
Jim Kandler, Lake Geneva, Wisc.

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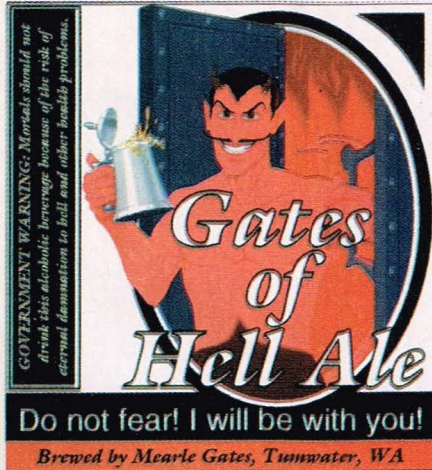
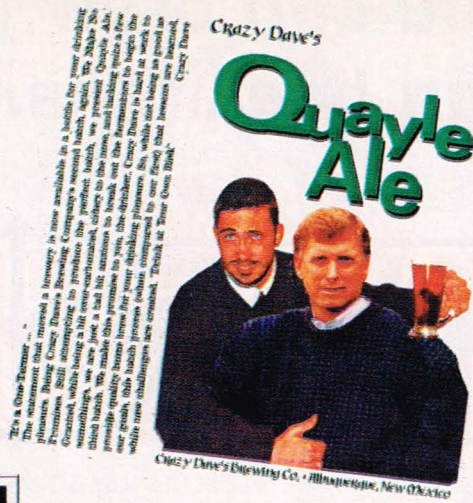
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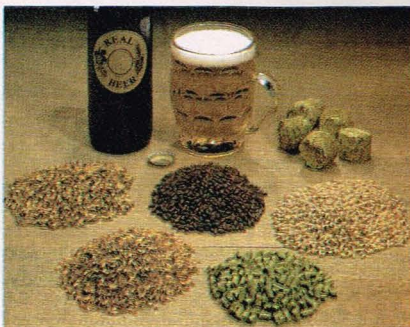
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CIRCLE 16 ON READER SERVICE CARD



Clockwise from left: Mearle Gates, Tumwater, Wash., Gates of Hell Ale; Tom Gaworski, Rancho Santa Margarita, Calif., Woolly Mammoth Lager; and Dave Foxley, Albuquerque, N.M., Quayle Ale.

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when some buddies got the homebrew bug and spread it to him.

He designed the label in black and white on a friend's Macintosh several years ago. This year, he rendered it in color for the BYO contest. "People take your beer more seriously if it's nicely labeled. It catches the eye, might make them more interested in it. Plus it's a way to show off," he says.

Hannah has tried his hand at nearly every style. Lately he's been into IPAs and also recently brewed a rye beer for the first time.

3D and Glows in the Dark!

Heather Park's label was inspired. "Boo's Brew" was dressed to kill, in baked, glow-in-the-dark polymer clay. It took the "Editor's Choice" award.

"I've been into clay lately," says the Boston University graduate student. "School is tough, and messing around with clay has been a real stress-buster," she says.

Polymer clay is a modern crafter's material. Also known as Sculpy (that's one of the brand names) it's easy to mold, bakes hard in the oven, and ends up very lightweight after baking.

"I have been making all kinds of things from it: jewelry, magnets, figurines. I figured, why not a beer label?" Park says.

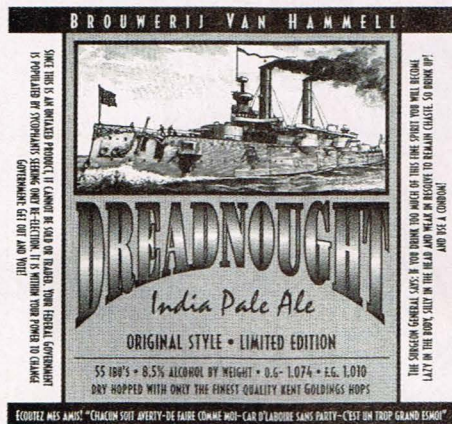
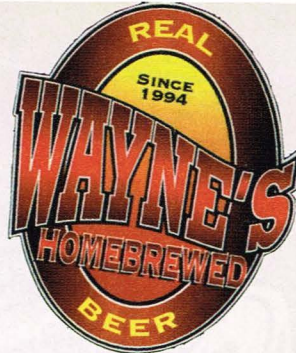
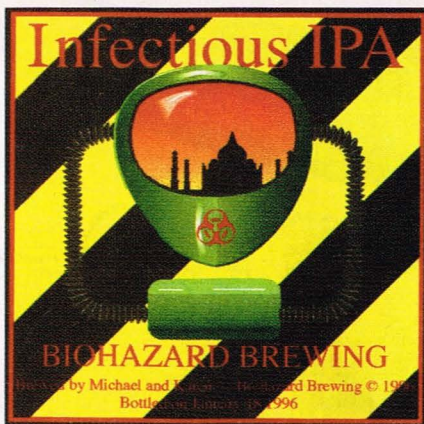
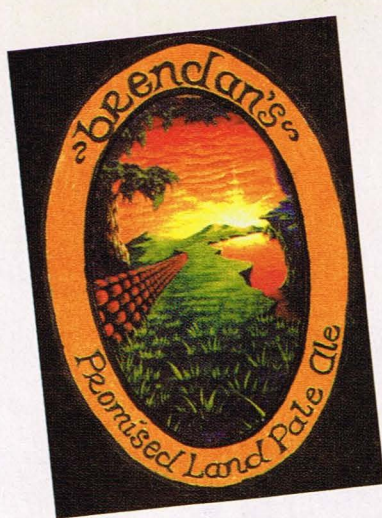
She crafted the label, molded it to fit the bottle, and baked it. She glued the finished label to the bottle for the contest.

Boo's Brew was an American brown ale, similar to Pete's Wicked. "It was called 'Boo's' because that's what John calls me," Park revealed.

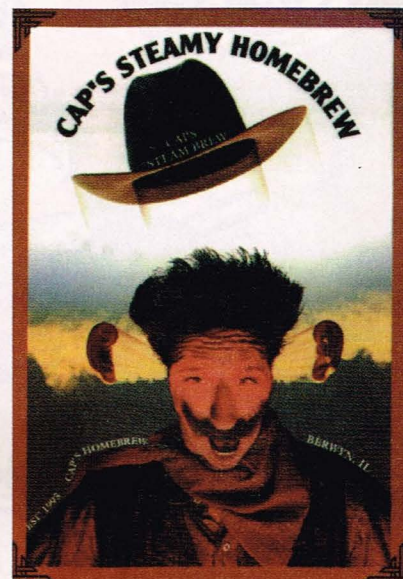
That's her fiancée and brewing partner John Letendre, who entered his own designs for the label contest. "My labels, of mere paper, didn't stand a chance against hers," Letendre says.

They have been brewing for around three years, mostly heavy ales. They recently started doing all-grain.

By the way, they have not set a date yet but recently bought a house in Natick, Mass.



Clockwise from left: Ken Hall, Trenton, N.J., Dreadnought India Pale Ale; Una M. Toibin, Richmond, Va., Promised Land Pale Ale; Michael Harvey and Karen Scheller, Blackwood, N.J., Infectious IPA; Wayne Earl, Hauppauge, N.Y., Wayne's Real Homebrewed Beer; and Michael Capitan, Broadview, Ill., Cap's Steamy Homebrew.



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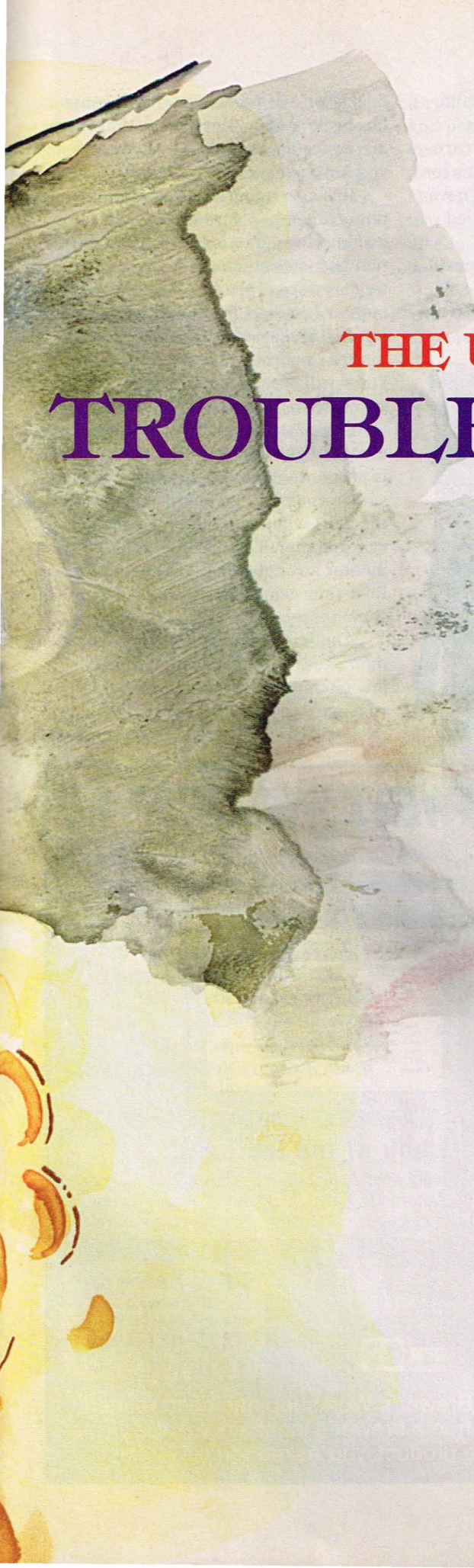
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THE ULTIMATE HOMEBREW TROUBLESHOOTER'S GUIDE

By Nico Freccia

First of Two Parts

Perfection is elusive, especially when it comes to a complex art and science such as brewing.

For any brewer, from the first-timer to the seasoned pro who has planned out every minute detail of the brew day, some unexpected glitch always seems to creep into the process. Fixing the problem usually just requires a simple adjustment or two. The best things you can do to prepare yourself are to read a lot, take good notes, and exercise common sense throughout the process.

Many strange situations may be unique to your brewing system or environment. To analyze them you need to think like your beer. If that were you in that carboy, what would you need to be most clean and comfortable? Think about every hose, valve, bucket, and airlock that you might have to pass through during your infancy and adolescence. Don't worry about your beer,

SHAWN C. TURNER ILLUSTRATION

just think about it (or think like it). The following troubleshooting tips will get you in the right frame of mind.

1

My fermentation is slow, stuck, or never started.

When an appliance isn't working, you make sure it's plugged in before you take it apart. Likewise, check a few basics first when you have a brewing problem. Your cooled wort should be in the 55° to 75° F range when you pitch the yeast, depending on the particular yeast strain. In general lager strains should be pitched into 55° to 60° F wort and ale yeast into 65° to 75° F wort. Pitching yeast into a fermenter that's too warm or too cold can shock or kill the yeast. Also, the yeast you're pitching should be roughly the same temperature as your cooled wort.

If you are using dried yeast, you may be rehydrating it first. Most

instructions recommend rehydrating the yeast in about a cup of sterile water at 100° to 105° F. Be very careful not to rehydrate in water that's too warm. Many times fermentation never begins because the yeast was killed when it was rehydrated.

Slowly cool the rehydrated yeast to room temperature and swirl the solution before pitching. Try moving to liquid yeasts in the form of "smack

packs" or test tubes. They will always be sterile, and you will know that they are active because they bulge before you have even pitched.

It is also important to maintain a uniform temperature throughout the primary fermentation. If the fermentation becomes stuck, it may be due to a temperature drop. Just warm the fermenter up to get fermentation going again. The best idea is to put your bucket or carboy in a place that you know will stay at a fairly stable temperature for several days.

One of the most important elements to quick, normal fermentation is proper aeration of the wort. After you've cooled it, go ahead and splash the wort when you fill up your primary fermenter. Then shake the full fermenter strongly for a minute or two. Rest your arms and then shake it some more.

Another basic, and the most common cause of stuck fermentation, is low pitching rate (number of viable yeast cells). A dried yeast or liquid pack will probably get your wort fer-

If the yeast is doing its business — no matter what the speed — leave it alone.



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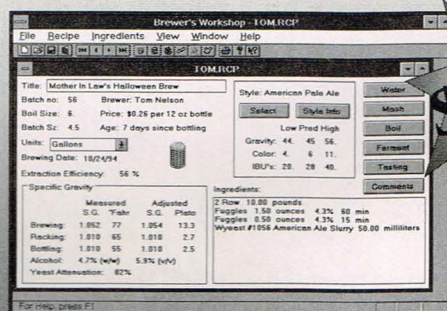
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menting within 12 to 24 hours. But if you take an extra day to culture the yeast into a one-pint starter, you'll probably see fermentation in half that time. Remember, the faster your yeast gets to work, the fewer chances any bacteria will be able to gain a foothold.

If the yeast is old and dead, like some dried yeast that's been sitting on a shelf, fermentation may never take off.

Finally, if you see fermentation activity but it seems to be taking a long time, don't worry. Different yeast strains have different characteristics, as do different worts and worts of differing gravities. If the yeast is doing its business — no matter what the speed — leave it alone.

2

My fermentation finished too quickly.

Again, check to see that the temperature hasn't undergone any large fluctuations. If it has dropped suddenly, the fermentation may actually be stuck rather than finished. If it has risen (above 72° F), the yeast will work much faster. Some yeast strains, particularly dried yeasts, can produce very active, rapid ferments at higher temperatures.

High pitching rates can also contribute to a quick ferment. If you've used a slurry, say, from your local brewpub, chances are you're pitching many times more viable cells than you normally would be, and the fermentation will start and finish quickly. Many small breweries use high pitching rates and plan on fermentations that are complete in just two to three days. Ultimately, your beer is probably fine and you can continue with secondary fermentation or check the gravity and bottle it.

3

My siphons never seem to work properly.

Siphoning is really quite simple, and the best thing you can do for yourself if you are having trouble with

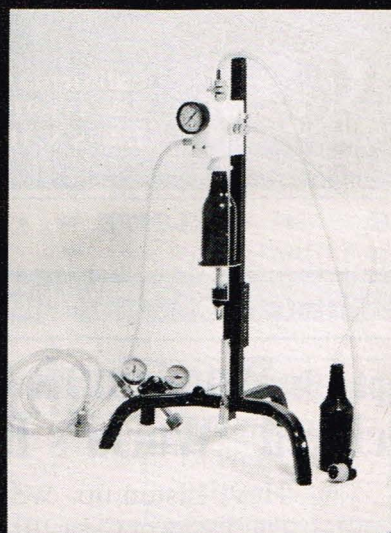
it is take a bucket of water and a hose and practice for five minutes. Check out "20 Tips For Better Beer" (December '95 BYO) for the simplest and safest way to siphon: First, take a two-inch piece of copper tubing or plastic hose that can fit like a pen cap onto the end of your siphon hose. Simply dip one end of the siphon hose into your beer. Keep the outlet end of the hose *above* the level of the beer

and suck on the hose.

When beer starts flowing pull the pen-cap starter off, leaving the outlet of the hose perfectly sterile, and dip the hose down into the receiving bucket. Draping the hose in a U-shaped loop from the top of the beer bucket and then up to your mouth will act as a sort of valve, cutting off the flow after it dips and then rises back up to reach the level of beer in the bucket.

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If your siphon still doesn't work, check for leaks. You may be working extra hard sucking in air through a hole in the tubing. Also, make sure that the siphon ultimately runs down hill. And if you're using a large-diameter siphon, you may want to switch to one with a smaller diameter. Although wort transfers more quickly through a wide siphon, large-diameter tubes are much harder to start.

Finally, if you're siphoning to or from a closed keg, make sure the vent is open. Otherwise, the vacuum (or pressure, depending on which way you're going) will stop the flow.

4

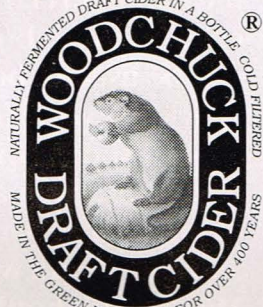
I always seem to have cidery, sour, or off-flavors in my beer.

Most likely, your beer is being contaminated somewhere along its way to your mug. There's one exception: Cidery flavors can arise if you are using a lot of cane (table) sugar or corn sugar as part of your recipe (other than priming). These sugars were sometimes recommended in older kit recipes and will almost always make your beer taste thinner, cidery, or vinegar-like.

Remember, you should be thinking like your beer. Follow the flow through every step of the operation. If your off-flavors are due to contamination, you have to be extra careful with cleaning and sanitizing.

Bacteria are on everything in the home brewery. A good cleaning with warm water, mild detergent, and a non-abrasive sponge will clean off the majority of the microorganisms. Make sure to thoroughly clean all your equipment before and after you use it! All equipment should be regularly inspected for stains, organic deposits, and scratches, all of which will harbor bacteria. Don't forget to take apart and clean and sanitize spigots, valves, airlocks, hydrometers, thermometers, and anything else that might contact your sterile wort. Don't take any chances: clean everything. Then sanitize.

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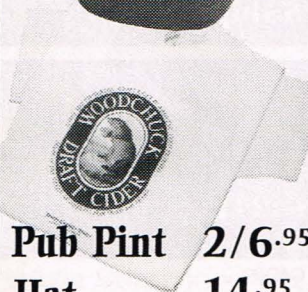
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The carbonation levels in my bottles are always different: too much, too little, or flat.

First, make sure you have established a standard priming procedure. You should always use corn sugar, not table (cane) sugar. A total of 3/4 cup per five-gallon batch is the recommended amount. Boil the sugar with about two cups of water to sterilize it, add it to your bottling bucket *first*, and then siphon the beer on top of it. Then gently stir the beer to thoroughly mix the sugar.

If different bottles within the same batch have different carbon dioxide levels, the problem may be that the priming solution isn't distributed evenly throughout the batch. Perhaps you made your solution properly and mixed it in well, but the problem persists. If so, you probably haven't properly cleaned or rinsed some of the bottles. Excessive amounts of cleaner or sanitizer can leave a residue in the bottle that can inhibit fermentation. Make sure all of the bottles are clean, with no deposits, and soak them in a diluted sterilizing solution that you don't need to rinse.

Be sure that you have stored the bottles at the proper temperature and that no large temperature fluctuations have occurred during conditioning. Give the beer enough time. A batch that tastes almost flat after a week or even two may be okay after a little more storage time.

If all the bottles are overcarbonated or gushing, you may have added too much priming sugar. It's normal to lose some volume during racking and fermentation. If the change is significant (one-quarter gallon or more), you should compensate by adjusting the amount of priming sugar you use.

If you did everything right and still have gushers, the problem may be bacterial contamination. Review your cleaning and sanitizing procedures.

The fill levels in my bottles are always different.

There is a simple way to ensure that all of your bottles will always have the correct, and the same, amount of head space. You should be using a bottle filler

or hose that reaches to the bottom of the bottle. The hose will always displace the same amount of liquid from bottle to bottle. Generally, if you allow the bottle to fill so that the level of liquid is all the way up to the lip of the bottle, when you remove the filler there will be exactly an inch and a half of head space in each bottle. Be sure to watch the level of the liquid, not the foam, if any. A little

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7

My beer has no head.

The problem may not be with your beer. A dirty or greasy glass, oily fingers, and lip balm or lipstick will kill a beer's head immediately. Then check bottles and equipment for sanitizer residue.

Next, assuming you have enough CO₂ but no head retention, you may want to think about your recipe. Proteins are the primary contributors to a good head, so beers with a proportion (around 10 percent) of a high-

er-protein malt such as wheat or rye will generally have a better, longer-lasting head. Flaked oats and flaked barley have long been employed in stouts to improve the creamy, thick texture of the head. All-malt beers have plenty of foam proteins. However, if you're using adjuncts such as sugar, honey, or rice, expect less foam.

Alternatively, many ingredients such as coffee, chocolate, and tea, and many herbs and spices such as mint are very oily and will kill a head instantly. Try using them in small proportions and with a little of the high-protein malts to boost the head's staying power.

8

I finished boiling and cooling my wort but forgot to add the hops.

Try making a "hop tea" and adding it to your fermenter. Just add one-half

pound of dry malt extract to two quarts of water and bring to a boil. Add the normal amount of bittering hops and boil them for an hour, or add double the amount and boil for 20 to 30 minutes to save time. Cover the pan, cool it for about 15 minutes in a cold-water bath, sanitize a strainer and funnel, and strain the liquid into your wort. Give the (cooled) wort a good shake to mix the hop tea in, and you should have a beer with a normal amount of bitterness.

For aroma you can try dry hopping after primary fermentation has finished or in the secondary.

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9

I bottled all my beer and forgot to add priming sugar.

Your best bet is to sanitize a bottle opener, open the bottles one by one, and add a level one-quarter teaspoon of corn sugar to each bottle. Then use a fresh, sanitized cap to reseal. Don't pour the bottles back into a bottling bucket as this will oxidize and stale your fresh brew.

If all else fails, you can always blend the flat beer with some properly carbonated beer and enjoy it anyway.

10

My beer is always cloudy.

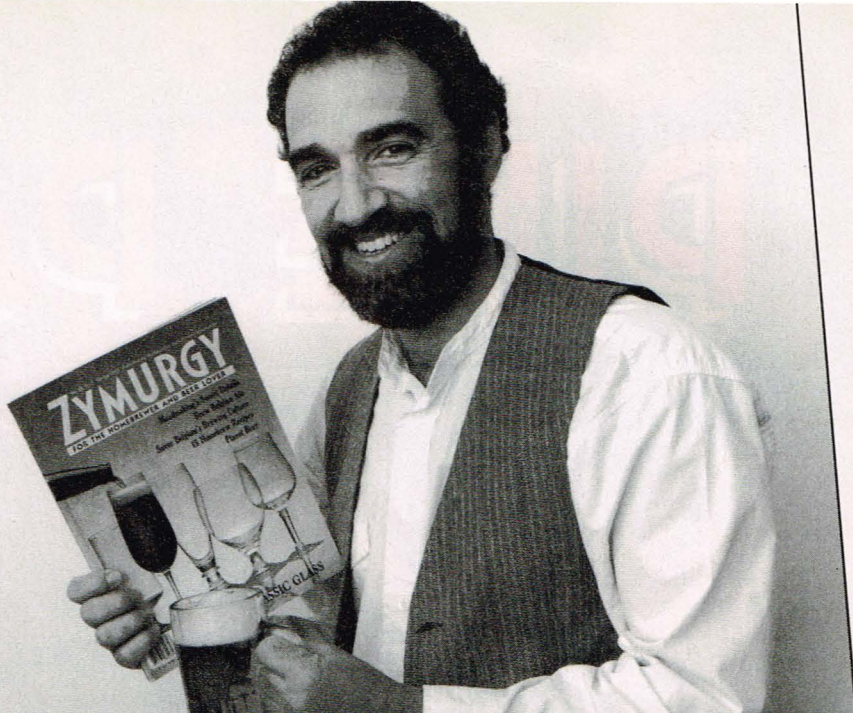
If the beer tastes fine, don't worry too much about it. There are a number of steps you can take in the brewing process itself to leave as much haze-causing material behind in the brewpot as possible (see "Three Easy Steps to Crystal Clear Beer," January '96 BYO).

Perhaps the best thing you can do for your cloudy beer is employ a secondary fermentation with cold conditioning if possible. Just transfer the beer into a sanitized glass carboy after primary fermentation has subsided, and let it sit for at least a few days at fermentation temperature. Knock the temperature down to 35° or 40° F for a few days after that. Most of the yeast and other matter will settle out, leaving clear beer at bottling time. Likewise, a month of storage in your fridge should clarify any bottled beer.

If you experience persistent cloudiness, your beer may be contaminated. You should be able to taste and smell the contamination, too. Be very particular about your cleaning regimen.



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Improve Your Lautering Technique

by Dan Listermann

A few easy methods can help you avoid stuck sparges, improve extraction, and fine-tune your equipment.

Lautering is perhaps the most daunting task of all for all-grain brewers. The word "lauter" is a German adjective meaning "clear, pure." Brewers use it to describe the portion of the process in which the sweet liquid wort, newly converted from the starchy grist in the mash, is separated from the solids (spent grains). The wort is drained away from and recirculated through the grain bed, which acts as a filter.

Lautering can be daunting because

it is somewhat delicate. If the process is allowed to go astray, annoying problems can crop up. Fortunately these problems are not critical to the brew, nor are they difficult to avoid or overcome.

The two primary problems are poor extraction and stuck mashes. Poor extraction results in lower original gravity, and that means that your brew will not reflect the recipe. A lower-than-expected original gravity can be corrected with extra malt extract, but that compromises the integrity of the brew. Also, if you want to make the same beer again, you'll have a difficult time repeating the process.

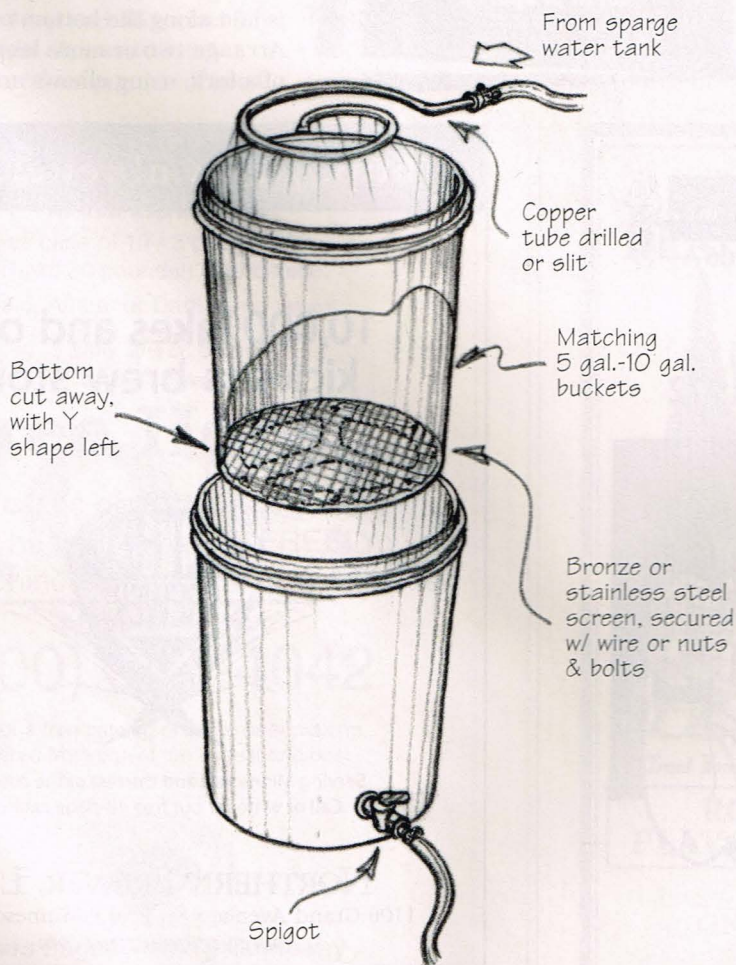
A stuck mash happens when the grain bed clogs. It is primarily a huge bother. The process of trying to correct a stuck mash can bring on other problems as well, such as oxidation and loss of temperature.

Improving Your Equipment

Essentially a lauter tun is a large strainer or colander. Commercial lauter tuns are usually large, round vessels fitted with a false bottom that rests above the actual bottom of the vessel. The false bottom is usually made of slotted metal and sits anywhere from a fraction of an inch to a few inches above the vessel floor. A screen made of triangular wire called wedge wire is also used. The wire is welded to cross pieces so that the base of the triangle faces up. Each wire is spaced so that a small gap runs the length of the wire.

Three classes of lautering equipment are usually used by homebrewers: false bottoms, the slit or drilled pipe manifold, and the screen strainer. False bottoms most closely approximate commercial practice, giving the most even flow patterns over a large area.

Charlie Papazian, founder of the American Homebrewers Association,



inspired thousands of brewers to go on to mashing with his "Zapap" lauter tun. It is made from common food-grade buckets with simple tools. The bottom of one bucket is drilled with hundreds of holes about 3/32-inch to 1/8-inch in diameter to form a false bottom. This bucket is nested into a second bucket, which has been fitted with a drain. The brewer pours water into the buckets until the false bottom is submerged, then the mash follows. After a bit of vorlaufing (recirculating), the sweet wort is drained from the mash while sparge water is sprinkled onto the top.

An improvement to the Zapap is to cut the drilled bottom away from the bucket an inch from the bottom. A groove is then cut into the remaining wall of the bottom for clearance for the drain. The bottom is placed into the drain bucket upside down. This reduces the foundation water requirements, reduces the vorlauf time, and increases the lauter tun capacity.

Homemade false bottoms built from screens and perforated sheets

of metal are limited only by one's imagination. A common example is a stainless steel screen installed in a legally acquired, used half barrel or a large restaurant-style stock pot. Most neighborhood welding shops will be happy to help cut the top of a half barrel open and install a drain valve.

Sparge bags are another option. They are made with waterproof sides and a porous bottom. There are commercial examples, or they can

be fabricated at home. Sew from watertight fabric a tube a little larger in diameter than the bucket. Then sew draw strings into one end of the tube and an open (mesh) material to the other end to form a bottom.

The bag hangs from the walls of the vessel and is held tight with the draw strings. Unless the vessel is fitted with some sort of false bottom to support the bag, the bottom of the bag will touch the bottom of the vessel, cutting off a large area of flow. Another alternative is to suspend the bag high enough so that it does not touch the bottom. The disadvantage to this is increased dead space, longer recirculating times, and decreased mash capacity. It also causes cracks in the grain bed.

The slotted/drilled manifold is another easily fabricated lautering system. It is especially well suited for rectangular coolers. Copper or plastic tubing is slotted with a saw or drilled with holes 1/8-inch in diameter. The tubing is laid along the bottom of the cooler. Arrange two or more lengths like tines of a fork, using elbows and T's for con-

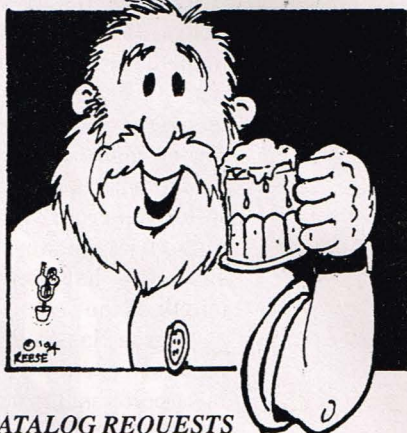
The primary cause of stuck mashes is excessive suction. If the wort is allowed to drain off too fast, the filter bed will not have enough time to form properly.

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nections. The holes or slots are usually pointed toward the bottom of the cooler. A T and tubing at the middle of the "fork" are used as the connection to the outside. The wort enters the holes or slots and travels along the tubes until it reaches the T, where it passes through the wall of the cooler.

The screen strainer is a small, single-length version of the slotted or drilled manifold. It is simply a short section of rolled fly screen that is connected to the outside of the vessel with a tube.

With all of these straining systems, the lauter tun should be sized so that the depth of the grain bed is at least five inches. If the grain bed is less than this, the filter bed does not develop well. A pound of grist in a mash will occupy about 100 cubic inches. As an example, a standard five-gallon bucket has a bottom 10 inches in diameter. The bottom has an area of 78.5 square inches. A grain bed five inches deep and 10 inches round will contain almost 400 cubic inches of mash or four pounds of grist.

It's best not try to lauter less than four pounds of grist in such a vessel.

The actual filtering of the wort does not take place on the surface of whatever is used to hold back the mash. The false bottom, manifold, or flyscreen function only to hold back the solids in the grist. It is the husk material that does the actual filtering. The amount and shape of the holes or slots of the false bottom, manifold, or screen's surface is secondary to the amount and location of the filtering surface (as long as the holes are not so large as to pass larger solids).

A true false bottom that covers the full bottom surface of the lauter tun gives the most even flow. The manifold method can approximate a true false bottom's flow if there are enough branches. The rolled flyscreen causes a tightly focused flow that generally tends to be slow running with uneven extraction.

Keep It Flowing

The method of attaching a drain to the lauter tun is often a source of

concern for aspiring all-grain brewers. The simplest way to install a drain in a bucket is to drill an undersized hole in the wall of the bucket. A 7/16-inch hole with a 1/2-inch O.D. (outer diameter) hose forced through it will seal quite well.

Creating a drain in a cooler can be as simple as using a drilled stopper with a short piece of 3/8-inch O.D. tubing stuck in the hole where the faucet or drain has been removed. Vinyl tubing is used to make the final connections.

The outflow of lauter tuns can be controlled in several ways. Some like to see a tap on their lauter tun. While this can be very nice, it is far from necessary. A hose clamp or in-line valve on a vinyl hose is a common way of controlling flow. Either generally works well, but each is subject to clogging when the occasional particle gets wedged in the constriction. This is not a big deal. It's just something to watch.

A better, more gentle way of controlling flow is to leave the drain hose

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wide open while raising or lowering its outlet to change the flow rate. There is nothing to get clogged, and the control is very fine. There is less chance of accidentally sucking the filter bed down, which can cause a stuck mash.

Start the flow by opening the hose with its outlet above the level of the mash. Slowly lower the outlet below the level of the mash until the desired flow rate is met. As the sparge progresses, the hose height will probably need to be lowered to maintain the flow.

Removing the Wort

Sweet wort can be removed from a mash by dilution, displacement, or a combination of the two. Dilution is the older method. It is known as "steeping" or more recently as "batch sparging." The idea is to simply drain the mash of the free liquid, refill the lautertun with hot water, stir, and repeat as necessary. Each time the mash is drained and refilled, more sugar is diluted into the water and removed.

It is best to refill the lautertun

from the bottom instead of from the top. This is called underletting. The mash will need to be recirculated after each refilling. Some homebrewers find simplicity in this process. Others argue it is adequate for small, low-gravity batches but can never exceed efficiencies found in displacement sparging. In fact batch sparging is used successfully by several commercial breweries,

It is probably better to keep the water level minimally above the grist. This supports the grist while reducing channeling.

ranging from Miller Brewing Co. to Anchor Brewing Co. Where homebrewers stir between sparges, commercial brewers rake the grains gently.

The more common practice of sparging removes the sugars from the mash by displacement. While the wort is drained from the bottom of the lautertun, hot water is sprayed onto the top of the mash. As this water moves down into the mash, it is moving into areas of increasing sugar concentration, absorbing more sugar as it progresses. All portions of the mash are constantly being washed with water that has less and less sugar in solution.

Whatever method you choose for sparging, the water temperature should be between 165° and 175° F.

Getting Water to the Mash

The delivery of the hot sparge water onto the mash can be as simple as hand ladling or as sophisticated as a rotating sparge arm. The difference is convenience and efficiency. Ideally the sparge water should be applied so that its level is equal to the level of

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the grist. As a practical matter there are problems with this. You can find yourself essentially chasing the level down and compacting the grain bed, risking a stuck mash.

It is probably better to keep the water level minimally above the grist. This supports the grist while reducing channeling (the tendency of the sparge water to take paths of least resistance) and does not add unnecessary weight to the filter bed. The less sophisticated the method of delivery is, the more water that should be kept above the grain bed.

Hand ladling is certainly inexpensive, but it's very labor intensive. The mash will need constant attention. Wherever the water is poured, it tends to bore channels into the grain bed. These channels form an easy path for the water to bypass much of the mash, so efficiency can suffer.

A separate vessel, fitted with a drain, for holding the sparge water is very useful. If this vessel is placed above the lauter tun, you can obtain a degree of automation. The trick is to position the bucket or its outflow tube over the mash, then control the flow somehow so that little attention is required. If the outflow is simply allowed to fall onto the mash, a deep hole will quickly develop. Some brewers place a saucer on the surface of the mash to break up the flow. Other ways of breaking up the flow are using a watering can rose or some stationary sparge manifold such as a drilled copper tube.

Commercial brewers frequently use a rotating sparge arm called a Scottish Cross. It has the advantage of containing many very tiny holes over a large area, which produces a fine, evenly distributed "rain" that cannot harm the grain bed.

Both the mash and the lautering operation can be performed in the same vessel, or the two operations can be separated. If the mash is performed in a different vessel, it will need to be transferred to the lauter tun. Most lauter tuns, to cover the false bottom, will need a little sparge water added to the vessel before the mash is added. This keeps the mash from being forced into the openings of the bottom. For the same reason it is

best to ladle the mash into the lauter tun as opposed to dumping.

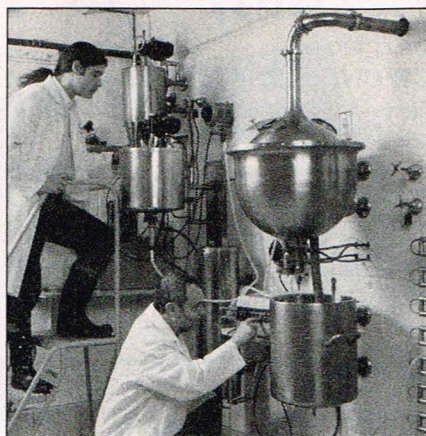
The Runnings

The Germans call the recirculation operation "vorlauf," which means "forerunnings." The lauter tun is allowed to slowly drain, with the wort periodically being returned to the top of the mash, until the wort is no longer opalescent and few solid particles are being passed. A few pans of wort are

usually adequate to achieve this condition. Perfect transparency is not absolutely necessary.

The running of the wort should be timed so that it will take at least 45 minutes. Somewhat better extractions can be realized if more time is taken. This gives the water more time to penetrate and exit the solids, although you'll soon reach a point of diminishing returns. A five-gallon batch will require about 6.5 gallons of wort. This

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is a little better than a pint per minute as a rule of thumb.

After about half an hour, start monitoring the gravity of the runnings about once every five minutes. For beers with original gravities between 1.040 and 1.052, the sparge should continue until the temperature-corrected specific gravity of the runnings goes down to 1.008 to 1.010. At this level there is still no danger of leaching astringency-causing tannins from the husk material, and there is very little sugar left in the mash anyway.

A rule of thumb is to stop the sparge when the specific gravity — *not* corrected for temperature — is 1.000. At the temperature of the runnings, usually between 140° and 160° F, the temperature-corrected specific gravity will be a little greater than 1.010. A 10-gallon batch will usually reach this point after about eight gallons of sparge water has passed through the mash.

Beating Mash Problems

The primary cause of poor extraction is a poorly crushed grist. A good grist from a good mill should produce 28 to 32 specific gravity points per gallon when measured at the fermenter. Other causes include a runoff that is too rapid or sparge water that becomes channeled. Inattention can allow the level of the sparge water to fall too far below the top of the grain bed, greatly reducing the time the water has to absorb the sugars.

Timing is the cure to excessive runoff speed, and attention to how the sparge water is applied is the cure to channeling. If channeling is suspected, stir the mash lightly to an inch or two above the false bottom to break up the channels.

A stuck mash is the bane of all mashers. The quality of the brew is only affected minimally, but the time and bother can be annoying. The primary cause of stuck mashes is excessive suction. If the wort is allowed to drain off too fast, the filter bed will not have enough time to form properly. It will be sucked down onto the false bottom so that the flow is stopped.

Other causes can be a grist that is too finely ground or a grist that contains a large amount of huskless

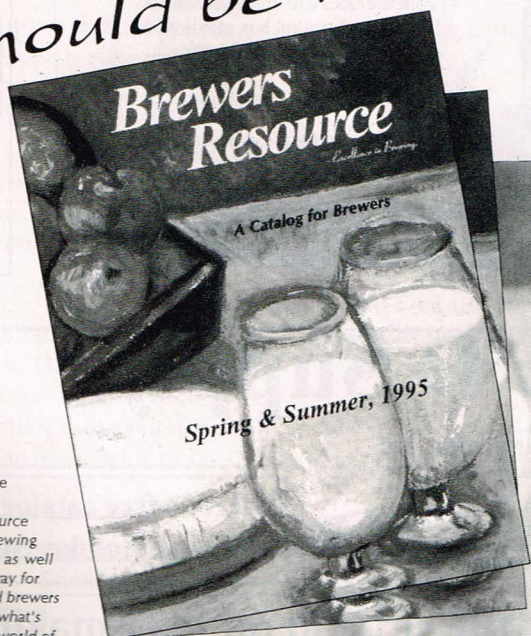
material such as wheat. When one is learning to mash, it is better to err on the coarser side of crushing. With experience you'll learn to make adjustments that will allow you to use finer grains.

Cures to a stuck mash begin with underletting the mash with sparge water to refloat the grain bed. The mash will need a good stirring and should be allowed to resettle five to 10 minutes before recirculating. In

extreme cases the mash will need to be dumped out, the lauter tun cleaned out and refilled.

Most common lautering methods work just fine. The one that is right for you will depend on the amount of money and/or time you are willing to expend. The best way to learn about all-grain brewing is to watch an experienced brewer. Being homebrewers, they are always thrilled to show anybody the ropes. 

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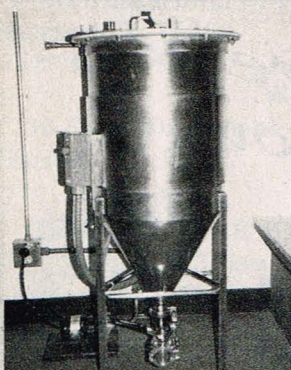
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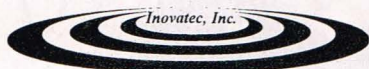
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N is for Nose

The latest installment of our continuing series on beer and brewing terms.

N

near beer - a malt beverage with low alcohol content. *I like to get near beer, as close as I can, whenever possible.*

neutralize - to make neutral (i.e. neither acidic nor base)

nickel - a toxic ion that causes foaming in beer. *If I had a nickel for every time my beer foamed, I'd be rich.*



nose - a beer or wine's total fragrance and aroma.

O

oats - a cereal grain used in brewing.

off-flavor - an unpleasant taste that can develop in beer.

original gravity - the specific gravity (density) of a wort prior to fermentation.

old ale - a strong, dark-colored draft beer with a high original gravity served in Britain.

over-hopping - putting too many hops

in a brew, resulting in an extremely bitter beer.

oxidation - the combination of oxygen with beer flavor compounds. Produces unpleasant tastes in finished beer.

P

pale ale malt - the standard British malt used in the production of traditional ales.

panache - in France, a drink composed of one part beer and one part lemonade.



pasteurization - heat treatment given to filtered beer to kill microorganisms that cause spoilage. Usually occurs after beer is bottled in a pasteurization tunnel but can be done prior to bottling in a flash pasteurizer.

pH (abbreviation for potential hydrogen) - the degree of acidity and alkalinity in a solution.

phenolic - an unpleasant, medicinal quality in beer.

phenols - volatiles found in beer that can arise from contamination when in high concentration, imparting a medicinal taste.



pitching - adding yeast to cooled wort. *Sandy Koufax has nothing on me, I'm the world's greatest yeast pitcher.*

pitching rate - the amount of yeast

needed to ferment one batch of beer.

Plato - a degree of measurement used to express specific gravity.

precipitation - a clarification process that condenses impurities and causes them to sink. *A good precipitation chases beer clouds away.*

primary fermentation - the first stage of fermentation, lasting between two and seven days and performed in open vessels.

priming - adding sugar to a finished beer to produce carbonation by a secondary fermentation.

protein - organic compounds that contains amino acids. Large quantities in beer can cause chill haze (cloudiness when beer is warm).

R

racking - transferring beer from the secondary fermenter to bottles, kegs, or other holding vessels.

racking tube - a tube with an inlet near the bottom used with a siphon to draw beer from the fermenter, leaving precipitation behind.

respiration - the absorption of oxygen and expiration of CO₂ by germinating barley. ■

For more information about brewing terms, check out the Dictionary of Beer and Brewing, published by Brewers Publications, Boulder, Colo. It was used as a reference for this article.

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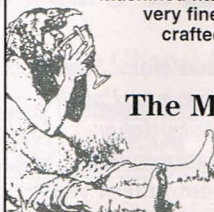
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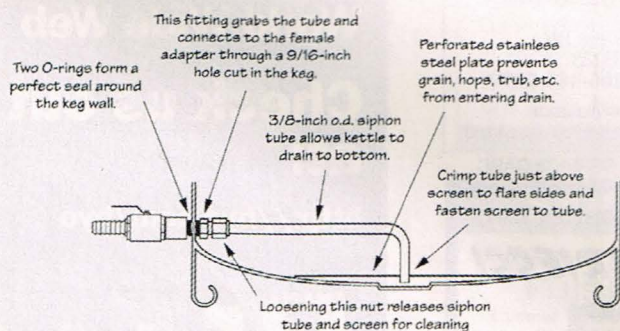
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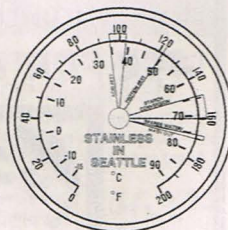


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Hint, Hint

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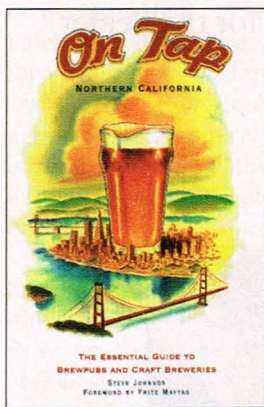
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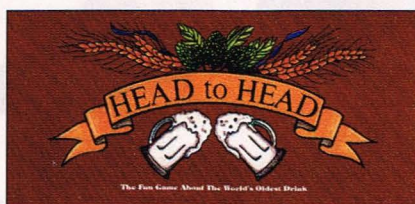
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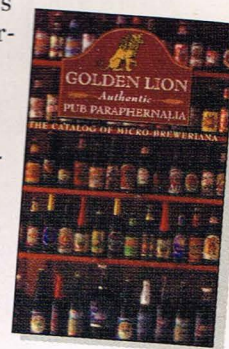
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B-r-r-r-rewing in the Far North

by Steve Johnson

Raven's Ridge Brewing, located just outside Fairbanks, Alaska, is farther north than any other brewery in North America. How far north? It is near the 65th parallel, only 120 miles south of the Arctic Circle.

When Raven's Ridge opened in 1994, it took away the title of most northerly brewery from the Arctic Brewing Co. in Yellowknife, Northwest Territories, which is about 200 miles south of the Arctic Circle.

Raven's Ridge is not the most northerly brewery in the world. That record is held by the Mack Brewery, in Tromsø, Norway, which is actually north of the Arctic Circle. Nordlands Brewing in Bodø, Norway, is also north of the circle. The Lapin Brewery in Tornio, Finland, is about 50 miles south of the circle. That puts Raven's Ridge in fourth place worldwide.

Regardless of its latitude, there is no question that it gets cold in Fairbanks. According to Hal Tippens, Raven's Ridge president, brewmaster, and Grizzly Adams look-alike, the average high temperature in January is about minus 4° F, the low around minus 20°, and 40° below zero isn't unusual.

Even to most Alaskans, that's cold. Residents of Fairbanks regard Juneau (the state capital and site of Alaskan Brewing, the state's first microbrewery) as subtropical — a place to break out your Hawaiian shirt and ukulele.

Hal recently talked about what it is like to brew in his icy corner of the world, at Raven's Ridge Brewery.

How does the cold affect the way you make beer?

First off, in the winter we don't have to run the compressor for the glycol (used to cool beer to near-freezing temperatures). Instead, we just run it (the beer) outside the building to a radiator — basically, copper tubing with aluminum fins on it. The ambient

temperature gets the glycol nice and cold.

Also, we use propane burners, and unlike breweries in the lower 48 states, we have to take precautions so that the propane stays in a gaseous state.

At 45° below zero propane turns to liquid, and we wouldn't get any pressure from the tank. To prevent this we buried the tank up to its shoulder. The temperature of the propane at the bottom of the tank stays at about 40° above zero.

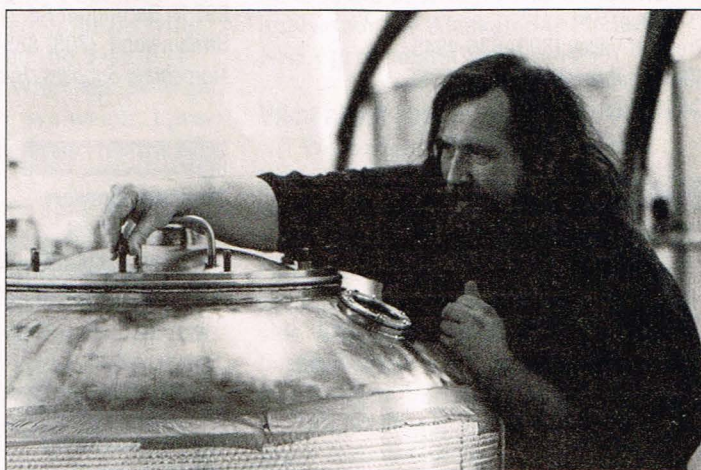
When we don't have a farmer to pick up our spent grain, we have to put it in the dumpster. They require us to let it freeze before it goes in the dumpster. Oddly, the grain, which goes out at about 150° F, takes at least a week to freeze, even when it's 20° below outside.

How did you choose the name Raven's Ridge?

We wanted to name the brewery after something with local identity. We selected the raven because it is a very common bird in Fairbanks and is one of only three or four species that stay in the area throughout the year.

Tell me about the actual brewery.

It is housed in a large warehouse of corrugated metal construction with a couple of garage doors on the side. It's an industrial area that has traditionally supported the airport. The Chena river is about 300 feet away. The brewery offers a scenic view of the jet fuel storage tanks. Inside, all of



Hal Tippens adjusts a fermenter valve at Raven's Ridge Brewing. For most of the year he doesn't need any special cooling devices for his wort — he just lets the frigid Alaskan air take its toll.

the stainless-steel brewing and fermenting equipment is housed in one room. We have a separate room with a stop in it.

What led you to open a brewery in the first place?

I grew up in Portland, Ore. That's where I became interested in beer. I began trying different brands in the early '80s. Even before the first microbrewery opened there was an interest in good beer in Portland. There were a lot of imported beers.

Blitz Weinhard had brought out Henry's in the late '70s. It was a real departure from other domestic brews. In the early days Henry's was pretty close to being a microbrew. I even tried the beers made by Cartwright Brewing, a brewery that opened briefly in '82.

What happened after that?

When I attended Oregon State, I played rugby, which meant I was drinking a lot of beer and meeting people from a lot of different countries. I got in with some New Zealanders and starting trying their beer. It was a tad pricey — we were all in college, you know.

KEMAL BOURAOLUKAROU PHOTOS

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I moved to Alaska to attend graduate school in Fairbanks, and I got to know some homebrewers. One of them showed me how to brew, and I've been brewing ever since.

I started with malt extract, then decided I wanted to learn a little more about it. I bought *The Complete Joy of Homebrewing* by Charlie Papazian. My roommates all chipped in for brewing supplies, and I brewed the beer. I brewed every week. When the beer had been in the bottle for two weeks, I pronounced it ready. The beer was usually gone that weekend.

Almost right away, I began thinking about opening my own brewery. I watched what was happening in the microbrewery movement for a long time before I did anything. Alaska has barley farms, and early on I naively thought it would be neat to malt the grain and brew a truly Alaskan beer.

Why didn't you pursue that concept?

Making beer is enough work as it is, without having to get into malting the barley.

What pushed you over the edge?

Some friends of mine got married, and I brewed some beer for the wedding reception. My beer was sitting next to a full keg of Watneys, and the wedding guests actually preferred mine. That convinced me I could brew beer that would be economically viable. Then I took a couple of years to investigate.

Early in '93 we began building the brewery. It was originally in a bar called the Crazy Loon Saloon. A friend of my partner was building the bar and wanted it to be kind of a brewpub. He didn't have the money to build us a space off to the side, so we had about 100 square feet right in the middle of the bar. It seemed like a good idea at the time, but it just didn't work out — not enough space.

We moved into a warehouse near the Chena River, just west of Fairbanks. It had floor drains, electricity, and plumbing. We didn't have to make many changes. We put up some sheet rock walls so that it would have a good, washable surface. Beside finishing the walls, we basically just hooked up the equipment.

You mentioned a partner. How many people are involved?

There are three principal partners: Larry Sontoni, Duff Dunlap, and me. Larry is a teacher at the university, and Duff does some carpentry work. Larry has helped fabricate some of the equipment and helps on brew day. Until we opened the brewery, I was a systems analyst for the Alaskan Sar Facility, a NASA ground station.

What about your equipment?

We designed the mash tun and brew kettle ourselves. They were welded for us by a local company. We purchased six fermenters from Cross Distributing. They were Grundy tanks with cooling jackets welded on the outside. They have rounded bottoms but are not conical. The batch size is seven barrels.

We made our own innovation to the mash tun. We made a cradle for the tun so that when it's full of grain we can roll it to wherever we want. We can turn the mash tun on its side (it has a hand crank that turns it 90 degrees). Then we can shovel it out. The cradle is made of two-inch steel tube stock and has casters. We designed it and built it ourselves.

What was it like to make the transition from homebrewing to commercial brewing?

It is much easier to make a five-gallon batch of beer than a 200-gallon batch of beer. Things that didn't matter much as a homebrewer do matter as a commercial brewer. For example, clarifying the beer. In a five-gallon vessel you don't have to pay any attention to it. It just does it by itself. Clarifying your beer is much harder in a large vessel. To clarify it we chill it down to encourage the yeast to drop out and use isinglass finings. Our beers are unfiltered.

What about your ingredients?

We get our two-row pale and Munich malts from Great Western Malting. Plus, we buy British crystal and black patent from Hugh Baird. For hops we use Cascade pellets. We started with leaf hops, but it made an enormous mess and was hard to get out of our pumps. We don't culture our own

yeast. Instead, we use dry, vacuum-packed yeast from Scott Labs in California. We use a fresh batch of yeast each time, and we don't repitch it. That way we don't have to worry about it.

What kind beers do you make?

We make a pale ale and a porter. For Christmas last year we made a spiced ale. Our beers are available in kegs only.

How have they been received?

In the summertime we sell everything we can make. It is much slower in the winter. Our beers are currently available in Fairbanks, Anchorage and, in the summer, in Denalai Park.

Why the summer?

Tourist season. The tourists really go for anything Alaskan. We have a neat slogan on our t-shirt: "A city is a



Six round-bottomed Grundy tanks serve as fermenters. They have cooling jackets welded to the outside.

community when it has its own brewery." That phrase came from one of our good customers at the Crazy Loon. Those were the first words out of his mouth after tasting our beer.

Your roots are in homebrewing. Are you still involved with it?

I don't homebrew anymore, but lots of homebrewers come to me for advice and to use our mill to grind

malt. I'm still active in the local homebrewers' club, which I helped found.

Your interest in beer started in Portland — do you ever go back?

I go back to Portland every Christmas. I get together with my old high school buddies, and we hit as many brewpubs as possible. If you picked any city in the world just for its beer, well, Portland wouldn't be a bad choice.

If you are ever in the Fairbanks area, be sure to stop by one of the good beer bars to try some Raven's Ridge beers. If you would like a tour, give the brewery a call at (907) 457-2739. The brewery is located at 5690 Supply Road #4 (send mail to: Raven's Ridge Brewing, P.O. Box 81395, Fairbanks, AK 99708). ■

Steve Johnson lives in Clemson, South Carolina, and is author of three brewery guidebooks: On Tap: a Field Guide to North American Brewpubs and Craft Breweries, On Tap New England, and On Tap Northern California.

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Discovering a Homebrew Heritage

by Brett Dearman

On my birthday three years ago my wife surprised me with two very special gifts.

We were living in Southern Louisiana at that time, which was about 200 miles from my extended family in Houston. This may seem like quite a distance for some folks, but it was the nearest I had been to my grandparents in more than 20 years.

The first of the two gifts were waiting for me when I came home from work. I found that my mother and my grandparents had made the trip to be with me on my birthday. This represented the first time I had that much family together for a birthday since my age was in single digits. The second present was my first homebrew beer kit.

South Texas has a large Czech-American population, with pockets of Czech culture in various small towns along the coast. Both of my grandparents are first generation Czech-Americans and grew up truly bilingual and bicultural.

One of the traditions from my Czechoslovakian roots that has stood the test of time is the appreciation of a really good glass of beer. I grew up thinking that everyone had a second refrigerator that had a beer tap sticking out of the side. When I say that my mother's side of the family enjoys beer, I mean that they *really* enjoy beer.

On my birthday my grandfather and I made a 30-mile trip to the nearest (and only) homebrew supply store to pick up my second birthday present.

That trip offered my grandfather an uninterrupted hour to tell me about my beer-making heritage. There were stories of catastrophic beer-bottle explosions and hiding empty bottles under the front porch to avoid suspicion. And stories about the makers of some of the finest beer in Central Europe and how he and I are part of

the same family tree.

My grandfather told me how he and his father made homebrew during the Prohibition era using powdered or canned malt extracts, brown sugar, molasses, and even Karo syrup at times to get the desired effect.

They fermented in big ceramic crocks that they hid behind the chicken coop to avoid discovery. When I questioned him on the choice of hiding spots, he said that it smelled so bad back there that the "revenuers" wouldn't bother to go look.

They didn't have any test equipment, so they had to guess at the starting and finishing

explained that this was just the *recent* past and that I come from a long line of brewers.

My great-grandfather had immigrated to the US in the late 1800s, leaving behind a career as a grain miller in Czechoslovakia. He worked at the place where they cracked the malted barley for use at the brewery in Plzen. My grandfather's father often mentioned that the one major benefit of working at that place was that he could get the very best ingredients in the world for making beer, which he did routinely.

Family legend has it that my great-great-grandfather actually worked as a brewmaster and was instrumental in bringing the pilsner into popularity.

After spending almost the entire trip talking about the past, we began to talk about beer recipes and what my first batch was going to be like. I opted for a cream ale as my first, simply because I had read somewhere that it was the most forgiving recipe, least likely to suffer from novice mistakes.

We discussed technical questions, such as whether or not I would lager or if I would ever try all-grain mashing. I learned a lot on this trip, but the best part came when we were pulling into my driveway on our return.

He looked at me, a little teary-eyed, and told me how happy he was that I was carrying on the family tradition. He said to make sure to pass on the art of beer making to my boys and tell them about their roots.

I could do nothing less. ■

Do you have a story for Last Call? Write to Last Call, c/o Brew Your Own, 216 F St., #160, Davis, CA 95616.



Brett Dearman is proud of his family's brewing history and plans to pass the tradition on to his sons.

gravities. The lack of sterilizing material was apparent on occasions when a batch turned out "plumb awful." There was even a patch in the middle of their garden that was for their hops plants.

Of course, the best batches that my great-grandfather produced were made from all-grain mashing and were referred to as "the good stuff." I was startled to find out that my great-grandfather had been an all-grain brewer. My grandfather

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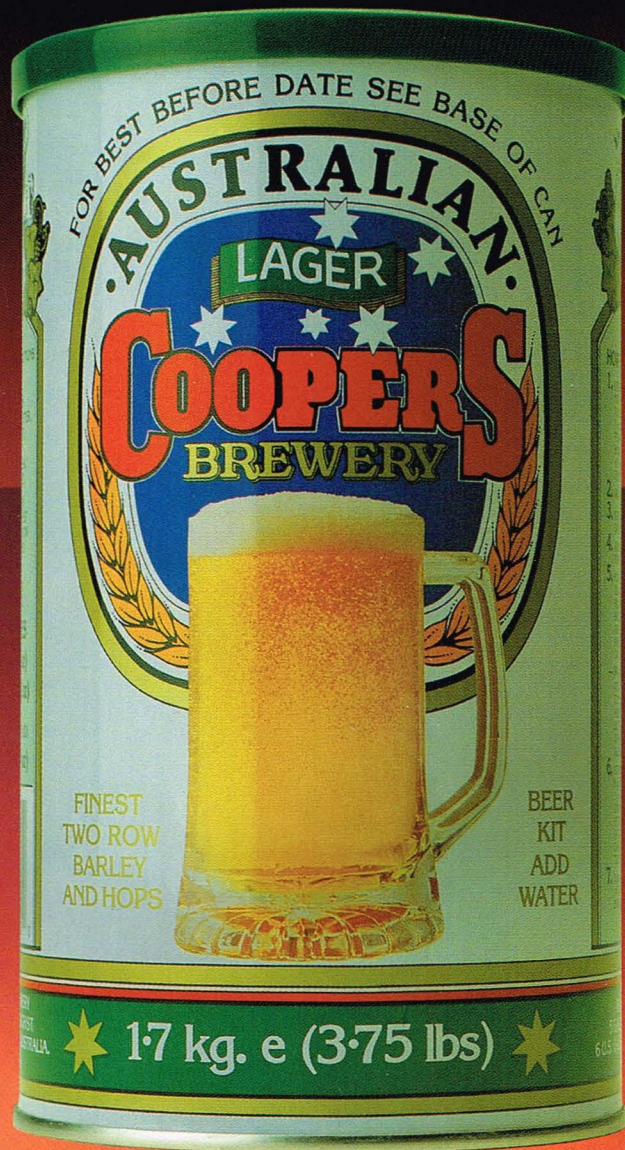
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