Brew Your Own

December 1996, Vol.2, No.12
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Special Holiday Issue

THE HOW-TO HOMEBREW BEER MAGAZINE

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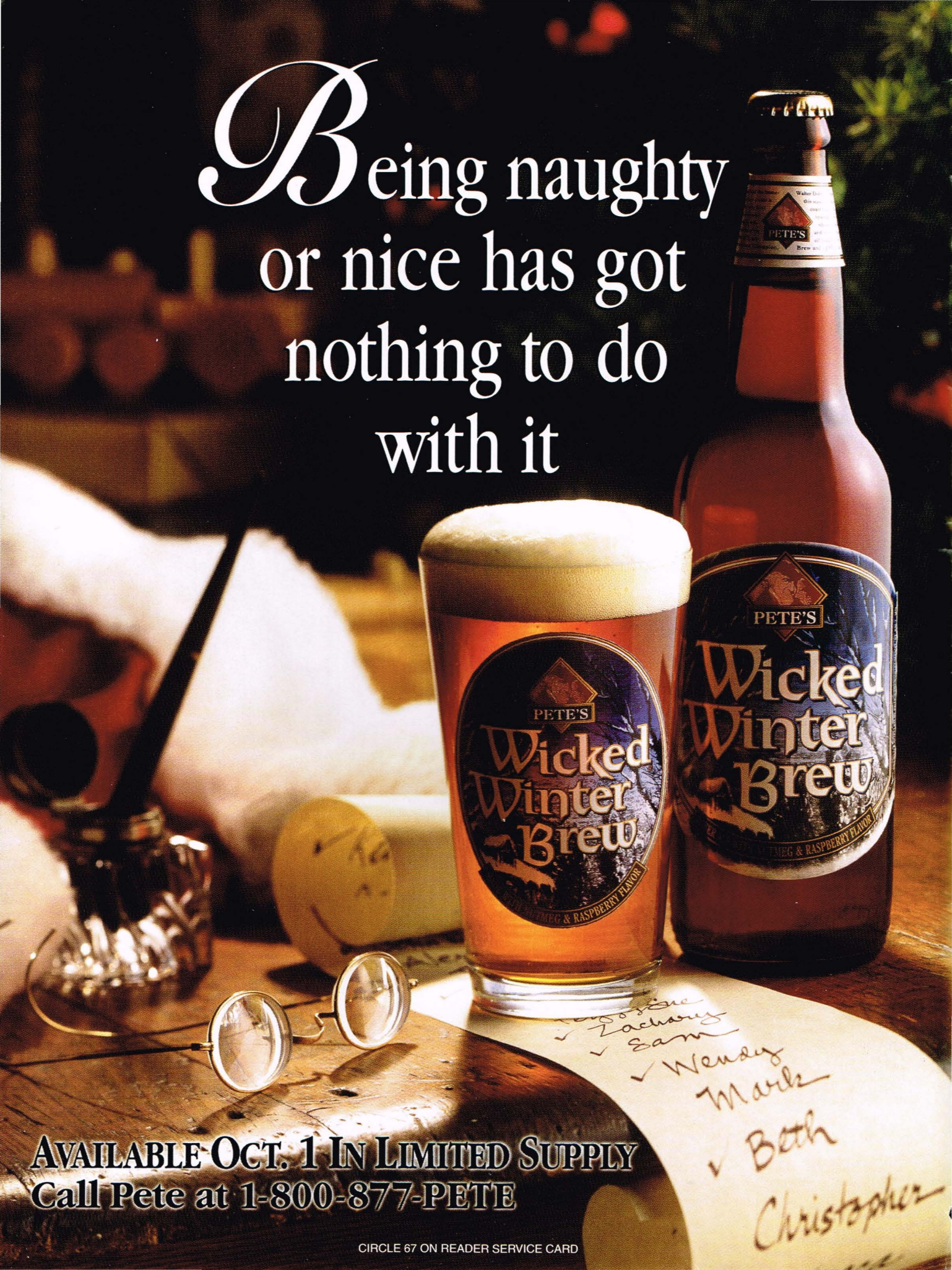
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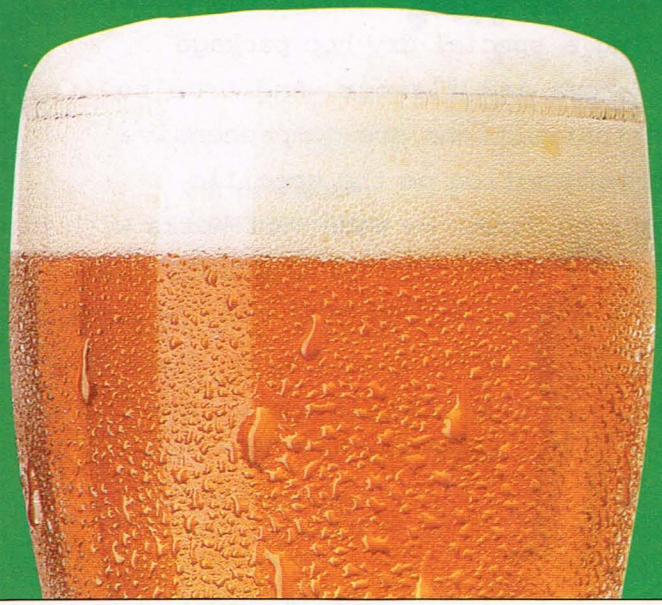


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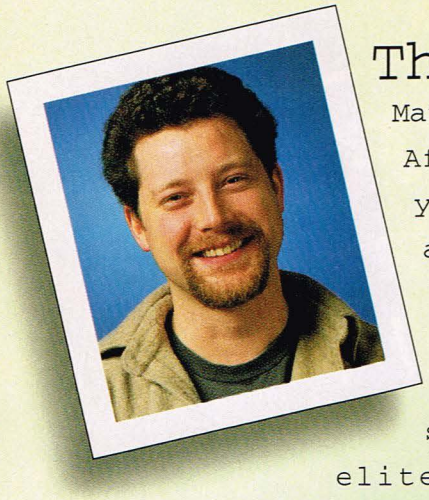
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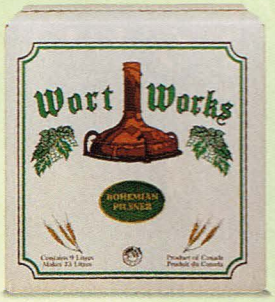
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This is Sean. He's our beer guy.

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 of pure perfection - even by Sean's standards. You see, Sean belongs to that elite group of home brewing purists - the ones that scoff at most commercial brews and insist on choice natural ingredients for their own brewing 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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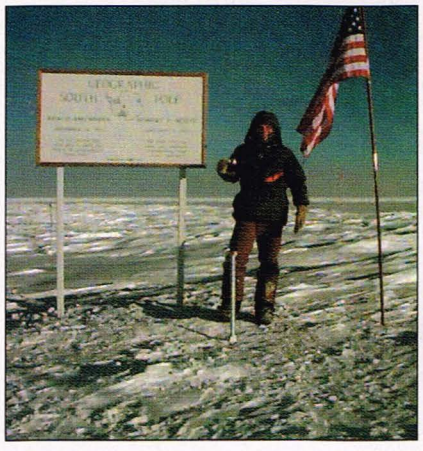
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Separation Anxiety

Question: How do you divide a hydrometer?

No, this is not a joke. I really need to know.

I figure there are a few possibilities. Method one: Cut it in half. Somebody gets the part that floats. Fine. But the other person gets the thin part that would just sink to the bottom every time you try to take a reading.

"Damn, there goes the hydrometer again."

"I can't believe it. Another beer that's off the scale!"

Method two: Split it lengthwise, so each half has part of the bulb that makes the hydrometer buoyant. Sure, it might be a little lopsided, but maybe you could get the right reading just by multiplying by two.

This has been on my mind because I've recently separated. (No, not my wife. What, do you think I'm crazy?) I've just split from my brewing partners, and I'm feeling a little anxious about it. My wife and I moved — for the purely selfish reason that I was getting sick of the 80-mile commute. Our two brewing partners, also for purely selfish reasons, refused to come with us. I figure I made the commute for almost two years; they could at least try it the other way. But no.

Now, before you go getting all teary eyed, let me mention that this doesn't signify the end of our long-time brewing partnership. We will brew again!

Just not as often, which brings me back to the hydrometer dilemma. We own all our brewing equipment jointly. How should we split it up? We could try "You get the hydrometer, I get the thermometer. You get the siphon hose, I get the straining bag." But then nobody has enough stuff with which to actually brew. Besides, it's too much like deciding who gets Grandma's antique rocker and who gets the collection of refrigerator magnets from all 48 states.

Or we could divide things on a time basis. You get the stuff Mondays, Wednesdays, and every other weekend. I'll take Tuesdays and Thursdays. Sounds like a bad divorce. And is it really right to do that to your own brewpot?

Actually, there's another reason this has been on my mind. I'm feeling a little guilty. For years our equipment has resided at my friends' house. If I wanted anything, I just went down the street and picked it up. Then I'd return it to their garage, which was bigger and didn't tend to flood every time there was a heavy dew, like mine did.

Recently, in what seemed like a brilliant gambit at the time, I took my friend out, plied him with beer, then suggested he give everything to me. For safe keeping. The proper persuasion having been employed, he readily agreed. So right now I have it all. If he wants to borrow it, it's not just a trip down the block any more.

Ringggg. Ringggg. "Hello?"

"Hi, this is David. I want to use the brewing stuff."

"Sure, come on over and get it. See you in a couple of hours. Do you need to spend the night?"

What would Judge Wapner say?

At this point I figure there's only one person who can help me; someone who specializes in just this kind of thing. This year I'm asking Santa for two of everything. In case you want to contribute, my wish list begins on page 26.



Brew Your Own
THE HOW-TO HOMEBREW BEER MAGAZINE

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Bruce (Brewski) Hegwer, Ed.D. Animas, N.M.

To commemorate the completion of my doctorate degree in educational administration and to proclaim my favorite hobby, my wife presented me with a personalized license plate. What a great gift!

She gave me a homebrewing kit for Christmas last year, and homebrewing was an excellent way for me to relieve the stress of working on my doctorate. I became so engrossed in homebrewing that I have picked up the nickname Brewski. Now that my doctorate is finished, I continue to enjoy making beer. We often have friends over on the weekends, brew a couple of batches, and then finish off the day enjoying homebrewed beer and barbecue.



Bruce Hegwer cruises the streets of New Mexico as Dr. Brew.

Explosive Brewing

For all those who have never encountered an explosive batch of over-carbonated beer, be warned. I brewed my first IPA and was looking forward to trying it. This was my seventh or eighth batch of beer since I started brewing almost two years ago, so I was aware that over-carbonation could cause problems, but I had no idea of the extent.

My mother-in-law was over babysitting our kids, and I had just returned from bringing my wife home from out-patient surgery. My wife's mom said there had been a couple of loud bangs in the basement — almost like a gunshot. She was about to call the police when we returned.

As I opened the basement door I caught that very strong beer aroma you get after a big party where beer's been spilled all over the house, and I immediately realized what had happened. Oh no, not the beer! The floor was covered in the sticky beer mess, and glass was everywhere. As I surveyed the terrible sight, another bottle exploded. It sounded like an M-80 going off, which is something quite a bit more powerful than a firecracker but not quite a stick of dynamite. I chose to wear ski goggles and leather gloves. I went back down and saw glass chunks sticking out of my textured ceiling. The bottles were exploding at the neck, and because they were on a high shelf, the glass was actually going through the cardboard box top and into the ceiling. I put on my heavy overcoat, ski mask, a baseball cap, and a hooded sweatshirt and went back down. Another went off.

My family watched me come up, add a piece of clothing, and return to the basement until in the end I was actually wearing a refrigerator box over my head with slits cut for my arms and one so I could see. I was a sight to behold. After realizing that I basically couldn't move in my makeshift protective gear, I tossed my box aside. The problem was that the now-soaked case of beer was on a high shelf with a less-than-flimsy bottom.

Finally, my brother-in-law came by, laughed at me, and then decided to help. With a board slid carefully beneath the box we were able to get the wicked brew out the back door. It was 0° F that night, but only two bottles burst from expansion. I thought of salvaging the rest, but my wife would not allow the explosive stuff back in the house. It didn't matter. I popped a couple outside to sample, and talk about a head! More than half of the bottle poured out in foam. Even worse, the beer was good. I had a few and cried as I poured the rest down the drain, but I saved most of the bottles.

Scott Keller
Kansas City, Mo.

Motorcycle Beer

A couple of years ago, I was in a motorcycle race and clipped a 30-foot aspen, which promptly fell on me and injured my neck. There was no serious damage other than a major addition to my already legendary reputation for bad luck. In honor of being cold-cocked (in front of an audience, no less) I named a batch of my beer "Murphy's Falling Aspen Ale." The black and white label featured a picture of a motorcycle rider about to get smacked by a tree. It read, "It has to be good, it's got a dirt bike on the label."

Ken Murphy
Denver, Colo.

Couples Who Brew Together!

Do you like to brew with your spouse or lover? Tell us about it and send us a picture. 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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Keep It Cold

Dear Brew Your Own,

Help Me Mr. Wizard (September '96 BYO) says fermentation "is best accomplished if the beer is kept cold, but not all homebrewers have the ability to keep five gallons of beer cold for this long." When I was stationed in Alice Springs, Australia (a desert), we kept beer cold for six months or better for little or no money — just time.

We made a cold box. We found a box big enough to hold a five-gallon fermenter and four half-gallon milk jugs (you can also use two-liter soda bottles). Line the inside of the box with plastic foam (can be found in the vegetable department at grocery stores). We secured the plastic foam with glue to the inside of the box. Make a lid for the box, and line that with foam, too.

Fill eight milk jugs almost to the top with water. Place them in the freezer. When you brew, place the five-gallon fermenter in the box with one jug in each corner. Replace the jugs at 12 hours and again at 24 hours. By now the temperature should be lower than 15° C (59° F). At this point you can alternate two jugs every 24 hours.

This method worked fine. Although I am an extract brewer, my friend is all-grain and has made a box from wood to hold close to 10 Cornelius kegs. He replaces the frozen jugs about every three days. Once the temperature is below 15° C, you have to replace the jugs less frequently.

Brian Shepherd
Parker, Colo.

Refreshing Wheat Beer

Dear BYO,

I have a preference for weizen beers and offer this suggestion for a most refreshing wheat-based brew: Add light malt to the wheat malt when boiling the wort. Then prime with a combination of clover honey and maple syrup.

The results are refreshingly superb.

Jim Carabetta
Meriden, Conn.

Amber Ale

Dear BYO,

Jeff Frane's "Amber Ale" (June '96 BYO) rang true for me. I live in an area with numerous brewpubs. The vast majority of them sell various colors of pale ale under the handles of amber, porter, stout, and such. Brewing beer with character and personality would seem to be *verboten*. Come on guys, show your stuff.

Tim Johnston
Mountain View, Calif.

Big Batch Brewing

Dear BYO,

I haven't had much luck converting five-gallon recipes to 10 gallons, so I've been looking for a good supply of 10-gallon, all-grain recipes. Do you know where I can find a good listing of recipes for large batches?

John Wendt
Cincinnati, Ohio

To convert a five-gallon recipe to 10 gallons, multiply all the ingredients by two. With this small volume there won't be significant changes in extraction rates.

Hop Help

Dear BYO,

I followed the Grow Your Own Hops article (March '96 BYO), and I now have two hop vines growing wonderfully. I'd like to be able to expand the planting horizontally along a fence by separating the vines into more plants. How do I propagate rhizomes out of them?

When you cut back the hops in November, do you continue to water them?

Kathryn Barry Stelljes
Portland, Maine

From the author, Scott Russell: In the spring, as new growth begins to appear on the vines, dig them up carefully and cut off a piece of the heaviest horizontal part of the rhizome. I always try to make sure there is a bud, shoot, or rootlet starting from each piece I plant. In the fall I cut my vines all the way back to the ground, cover them with a six-inch pile of mulch, and ignore them.

One Vote for Organization

Dear BYO,

I've been a subscriber since the first issue and I have one suggestion: How about an index of some sort, maybe published in print or even on-line and downloadable! Then it could be constantly updated. I've got quite a library of information and an index would be helpful.

Walt Swan
Birmingham, Ala.

We're always happy to oblige a loyal reader. You'll find the index beginning on page 75. You can expect an updated annual index each December. It's also now available on the World Wide Web at www.byo.com.

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Brewing a Norwegian Tradition

by Scott Russell

Ah, traditions. Nothing brings out traditions like the winter holidays. And is there a better, more appropriate tradition than the brewing of a special holiday beer?

The winter holidays need a unique brew full of character, one that guests and family will remember. Most craft brewers (and some of the bigger commercial breweries as well) brew something special at this time of the year, from spiced and fruited beers to extra-rich, trappist-style ales, winter lagers, and super-hoppy IPAs. And we can't forget Samichlaus, one of the world's strongest beers, brewed once a year by Brauerei Hürlimann in Zurich, Switzerland, on December 6, Saint Nicholas' Day. Samichlaus is lagered for a year and released as the next batch is brewed. Now that's a special tradition.

A few years back I was in a rut. I'd done the same holiday ale for three years in a row: a pale ale spiced with orange, ginger, cinnamon, and nutmeg, a little stronger and richer than usual. While it was a nice beer, I just needed to do something different. Inspiration was slow in coming until the night of the krumkake marathon. For the uninitiated, krumkake (pronounced kroom-ka-keu) is a traditional Norwegian pastry/cookie, thin-batter fried on a patterned iron press. It is one of the staples of the Norwegian-American holiday arsenal. It is rolled up sort of like an ice-cream cone (but don't ever suggest putting ice cream in it, or you may find yourself sleeping with the lutefisk), and served with whipped cream and lingonberries, or eaten plain.

My wife is of Norwegian descent, so naturally enough we make krumkake every year. Hundreds of them. It takes all of an evening and night, and we burn our fingers, smear grease all over everything, spill goopy batter on the stove and start small grease fires.



Fun, ja? You betcha.

But it tastes great. The main reason is the spice. As in many Norwegian baked products, krumkake is made with cardamom. It is the most unique and interesting spice I think I've ever used in anything, sweet and peppery at the same time, piercingly fragrant, yet somehow blending in...If you've never experienced fresh cardamom, you probably have no clue how seductive this spice can be. Do yourself a favor: Go out and buy some whole cardamom seeds. Take one seed, peel off the outer husk, and crush the black kernel inside between your fingers. Now you know what I'm talking about.

Jul Öl

(5 gallons, extract and specialty grains)

Ingredients:

- 1 lb. crystal malt, 20° Lovibond
- 1 lb. crystal malt, 90° Lovibond
- 2 oz. roasted barley
- 7 lbs. amber malt extract syrup
- 4 oz. malto-dextrin powder
- 0.5 lb. light-brown sugar
- 1 oz. Chinook hop pellets (10% to 12% alpha acid) for 45 min.
- 1 vanilla bean, chopped
- 1 tsp. crushed cardamom seed
- 0.5 oz. Cascade hop flowers
- Wyeast 1056 or 1272
- 3/4 cup of dextrose for priming

Step by Step

In 2.5 gals. of cold water, steep crystal malts and barley. Bring water gradually to 170° F and remove grains. Add to the kettle malt syrup, malto-dextrin powder, and sugar. Bring to a boil and add hops. Boil 45 minutes, then turn off the heat. As the wort cools, steep hop flowers and, in a muslin bag, vanilla and cardamom. Cool, top up to 5.25 gals., and pitch yeast. Ferment at 70° to 75° F for five to seven days. Rack to a secondary fermenter for a week. Prime and bottle.

Options

This recipe has gone through several permutations over the years, from the first version made from Mountmellick's Export Ale kit and amber DME to an all-grain formulation (8 lbs. Belgian pale malt, 0.5 lb. Munich, 0.5 lb. amber malt, with the same specialty malts steeped in the runoff after mashing). To alter the color, change extracts. Use light or extra-light extract (and drop the roasted barley) to get a dark gold to light amber ale, or use dark extract for a brown version.

I like using the neutral ale yeast to allow the malts and spices to come out, but Wyeast 1084 Irish ale will work as well, leaving it more full bodied. Edme dry ale yeast is acceptable, too. I envision this as a lager (although I have yet to do it) fermented with Wyeast 2042 Danish lager yeast, and aged cold for three months to make it really smooth.

An alternative for the spices is to steep them in 1/2 cup of vodka for two months and add them at bottling time.

Well, wouldn't you know, during the annual krumkake marathon that year, somehow some cardamom found its way into a glass of homebrew, along with a little vanilla extract, and voilà, a new holiday tradition was born: "Land of the Midnight Sun Jul Øl." My best attempt at pronouncing Jul Øl comes out "yool erl," but then, I'm not even a little bit Norwegian. It means Christmas ale.

I brewed it the next day, a little more than three weeks before Christmas, and it was ready to drink by Christmas Eve. Smooth, slightly sweet, reddish amber, and oh my, the cardamom aroma! If I dare to bring it out at a gathering of more than half a dozen people, there isn't any left by New Year's Day.

So happy holidays, whichever ones you celebrate at this time of year! Remember to drink responsibly, and don't drink and drive.

Reader Recipes

Hoppy IPA

(5 gallons, extract)

This is a very hoppy IPA that is not for the weak of heart. It gets its name from the Columbus hops, which take control of this beer from the start. Although the IBUs are up there, it should be a hophead's delight. Being a hop lover from Northern California, it is my favorite brew.

Dante Vassey
Valley Springs, Calif.

Ingredients:

- 6 lbs. pale malt extract
- 2 lbs. Aussie Lite dry malt extract
- 2 lbs. Gambrinus honey malt
- 1 lb. crystal malt, 10° Lovibond
- 1 lb. crystal malt, 20° Lovibond
- 5 oz. Columbus hops, 2 oz. for 55 min., 1 oz. for 20 min., 1 oz. at end of boil, 1 oz. in secondary
- 1 tsp. gypsum
- 1 tsp. Irish moss
- 2/3 cup corn sugar for priming
- American ale liquid yeast

Step by Step:

Heat 1 gal. water to 170° F and add grains. Hold at 155° F for 60 minutes. Sparge grain with 1 gal. of 170° F water. Add extracts and gypsum, then bring to boil. Boil five minutes and add 2 oz. of hops. Boil 35 minutes and add 1 oz. of hops and Irish moss. Boil 20 minutes and remove from heat. Total boil is 60 minutes.

Add 1 oz. of hops. Add 3 gals. of water to primary fermenter. When wort is cool, siphon to primary and top off with water to 5 gals. Pitch yeast, seal the batch, and allow to ferment until active fermentation is complete. When transferring to the secondary fermenter, place remaining 1 oz. of hops in a stainless steel steeping ball and add to secondary. Ferment another five days, prime, and bottle. Age at least two weeks.

OG = 1.065
FG = 1.018

Not-So-Pale Ale

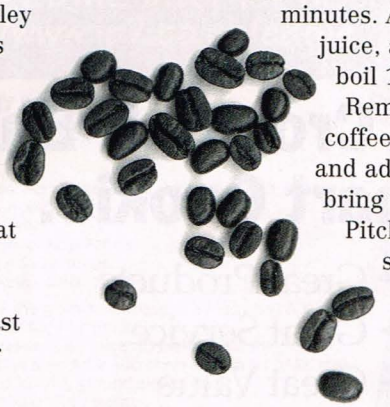
(5 gallons, partial mash)

This beer started out as somewhat of a mistake. I added roasted barley to the grain list by accident. I was going to make a stout later in the day. It turned out so good that I have made it several times since.

Tom Green
Wilton, Calif.

Ingredients:

- 6.5 lbs. pale malt extract
- 0.5 lb. crystal malt, 40° Lovibond
- 0.5 lb. roasted barley
- 2 oz. Cascade hops (4.4% alpha acid), 1 oz. for 65 min., 1 oz. for 15 min.
- 1.25 oz. Willamette hops (4.2% alpha acid) at end of boil
- 1 tsp. Irish moss
- Whitbread dry yeast
- 3/4 cup corn sugar



Step by Step:

Heat 1 gal. of water to 150° F and stir in crushed grains. Hold at 150° to 158° F for 45 minutes. Sparge with 1 gal. of water at 170° F. Add extract to water and bring to a boil. When boil begins, add 1 oz. of Cascade hops, boil 50 minutes, then add remaining Cascade hops and Irish moss. Boil 15 more minutes, turn off heat, and add Willamette hops and steep for 15 minutes. Cool wort and pitch yeast. Ferment at 70° F for about five days, then transfer to secondary for seven to 10 days. Prime with corn sugar and bottle or keg as usual.

OG = 1.048
FG = 1.012

Coco-Java Stout

(6 gallons, extract)

Vary the coffee amount. One pound is too strong, and 0.5 pounds to the gallon seems just right.

Richard Earling
Hanover, Pa.

Ingredients:

- 3 lbs. dark dry malt extract
- 3.75 lbs. Cooper's stout extract
- 4 lbs. Mellicks dark extract
- 0.5 gals. dark decaffeinated coffee (brewed)
- 1 tsp. gypsum
- 1 tsp. Irish moss
- 6 oz. unsweetened, dark chocolate
- 1 oz. Hallertauer hops (4.3% alpha acid) at end of boil
- 1/2 cup raspberry juice
- 0.5 oz. coriander
- 5 gals. bottled water
- Lager yeast

Step by Step:

Boil 1 gal. water with extracts, gypsum, and coriander. Boil for 30 minutes. Add Irish moss, raspberry juice, and dark chocolate and boil 15 minutes.

Remove from heat and add coffee and hops. Cool the wort and add enough bottled water to bring volume to 6 gals.

Pitch yeast at 68° F. Ferment single or double stage. Bottle condition for six weeks.

OG = 1.057
FG = 1.021

Mainsail Canadian Ale

(5 gallons, extract with specialty grains)

While escaping a cold Minnesota January sailing in the Virgin Islands, I fell in love with Canadian beer. I was determined to recreate this north-south paradise in my own kitchen.

The recipe is simple enough for the beginning brewer. My wife approves of the shorter boil time

because I'm spending less time cluttering and puttering in the kitchen. Best of all, you'll have a smooth, refreshing, flavorful brew with great body.

Scott Seewald
Burnsville, Minn.

Ingredients:

- 3.5 lbs. malt extract syrup (John Bull Canadian Ale Kit)
- 2 lbs. light dry malt extract
- 0.5 lb. light crystal malt grain
- 1 oz. Cascade hop pellets (4.1% alpha acid), 0.5 oz. for 25 min., 0.5 oz. at end of boil
- 1/4 tsp. Irish moss
- Wyeast 1056 (American ale liquid yeast)
- 3/4 cup dextrose priming sugar

Step by Step:

In a grain bag steep grains in 1.5 gals. of cold water as you bring water to a boil. Remove the grains at 170° F. Continue to heat until water boils, then remove from heat. Add malt extracts and half of the hops. Return to boil for 15 minutes. Add Irish moss for last 10 minutes of boil. Stir in remaining hops after completion of boil.

Strain wort into primary fermenter containing 3 gals. of cold water. Top off fermenter to 5 gals. with cold water. Pitch yeast at 75° F. Monitor primary fermentation closely until kraeusen head begins to fall. Rack into secondary fermenter before the bitter resins on the kraeusen fall back into the beer. Allow beer to ferment. Boil priming sugar in 2 cups of water for 15 minutes, mix carefully into beer, and bottle. Ferment for 10 to 14 days.

Sam Adams Clone

(5 gallons, extract and specialty grains)

This is in response to a request for a Samuel Adams Honey Porter clone.

Tom Culliton
Austin, Texas

Ingredients:

- 0.5 lb. black patent malt, crushed
- 0.5 lb. chocolate malt, crushed
- 1 lb. medium crystal malt, crushed
- 6 lbs. amber malt syrup
- 3 lbs. light honey
- 1 oz. Perle hops, for 60 min.
- 1 oz. Fuggle hops, 0.5 oz. for 30 min., 0.5 oz. for 5 min.
- Wyeast 1084 "Irish Ale"

Step by Step:

Bring water to 160° to 170° F. Steep and remove specialty grains. Bring water to boil, then turn off the heat before adding the malt extract to avoid scorching. Bring back to a boil and add Perle hops. After 30 minutes add 0.5 oz. Fuggle hops. Boil another 25 minutes and add remaining Fuggle hops. Optional: add 1 tsp. Irish moss at 45 minutes into the boil to help the break. Remove from heat, cool to 70° F, transfer to carboy, topping up to 5 gals., and pitch yeast. Ferment for four weeks.

OG = 1.062
FG = 1.016 ■

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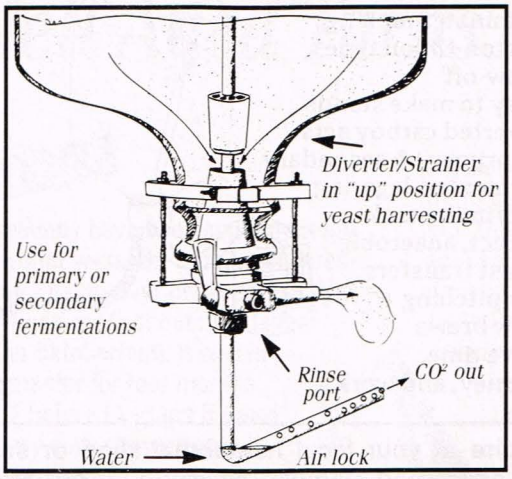
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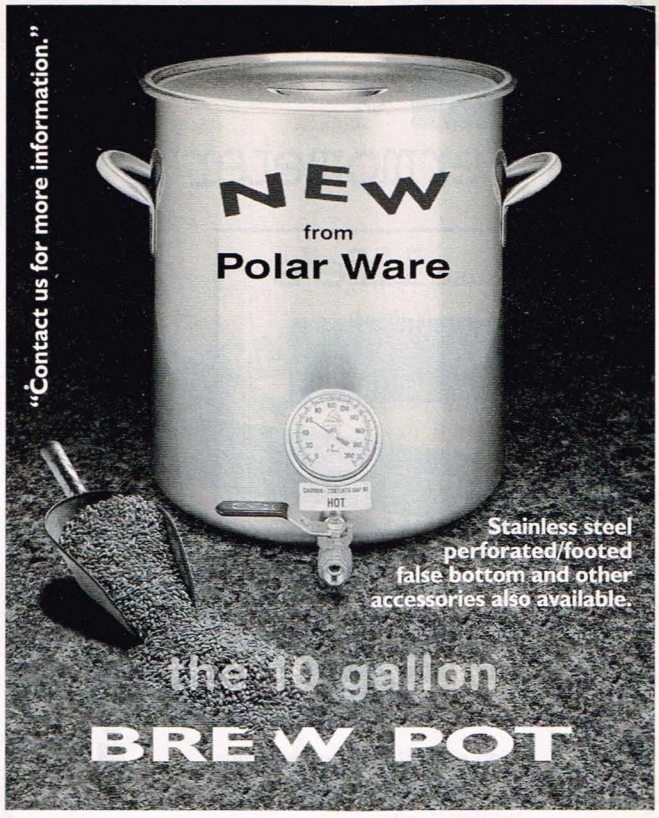
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1.3lb Light Dried Malt Extract
2 oz Chocolate Malt
4 oz Crystal Malt
8 oz Pale Malt
2 oz Northern Brewer Hop Pellets
1 packet EDME Active Dried Yeast

For 5 gallons: Crack the grain malt, place in a mesh bag & steep in 2 quarts of hot water for 20 minutes.
Remove grains & add enough water to make 2 gallons.
Bring to a boil & add the dried malt extract, the Microbrewery Series LIGHT extract & 1 oz of hop pellets.
At 30 minutes of boiling, add ½ oz of hop pellets.
At 50 minutes, add the last ½ oz of hop pellets to the boiling pot.
After 60 minutes, add the contents of the boiling pot to 3 gallons of cold water in the primary fermenter to make up to 5 gallons.
Cool to 65/75°F.
Rehydrate the EDME Active Dried Yeast in ¼ cup of boiled water cooled to 98/107°F. Wait for 15 minutes – stir & pitch the yeast.
Ferment for 5 days & rack to a carboy. Allow to rest 5 – 10 more days then prime & bottle.
Condition at 35°F for at least 2 weeks.

OG: 1.043 – 4

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Ingredients:
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2lb Clover 100% Honey
8 oz 60L Crystal Malt
2 oz Northern Brewer Hop Pellets
1 teaspoon Ground cinnamon
1 packet EDME Active Dried Yeast

For 5 gallons: Crack the grain malt, place in a mesh bag & steep in 2 quarts of hot water for 20 minutes.
Remove grains & add enough water to make 2 gallons.
Start a 60 minute boil & add the Microbrewery Series DARK malt extract, honey, 1 oz hops & ground cinnamon.
At 30 minutes add ½ oz hop pellets.
At 50 minutes add ½ oz hop pellets.
After 60 minutes, add the contents of the boiling pot to 3 gallons of cold water in the prrimary fermenter to make up to 5 gallons.
Cool to 65/75°F.
Rehydrate the EDME Active Dried Yeast in ¼ cup of boiled water cooled to 98/107°F. Wait for 15 minutes, stir & pitch the yeast.
Ferment for 5 days & rack to a carboy.
Allow to rest 5 – 10 more days then prime & bottle.
Condition at 35°F for at least 3 weeks.

OG: 1.076

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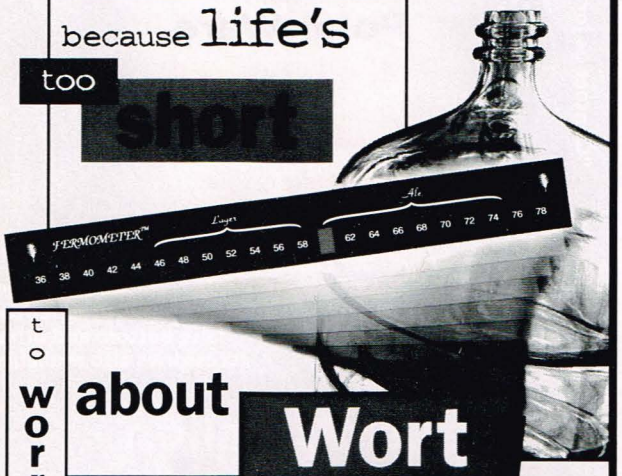
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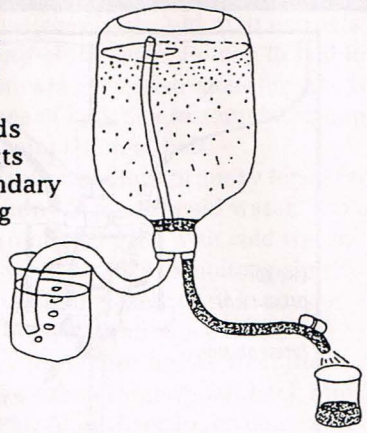
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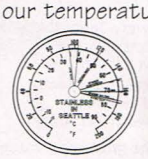
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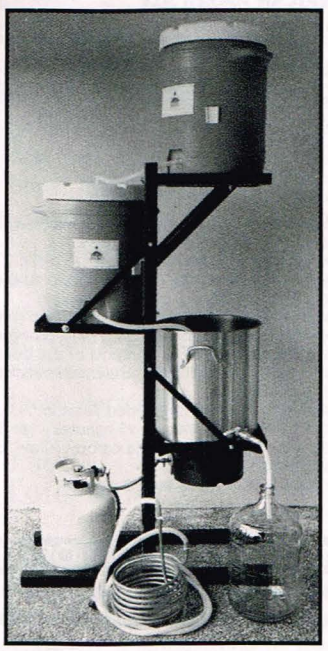
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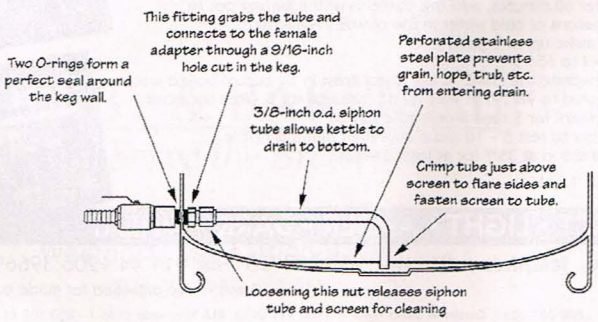
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CIRCLE 74 ON READER SERVICE CARD

Well Aged Turns to Old Age

Mr. Wizard

I recently have been contemplating what would seem like a common question, but I have never come across it. I just kegged my first batch of lager beer (an Oktoberfest). It was in the fermenter for four months at 42° F before I kegged it (used a primary and a secondary fermenter) and force carbonated it. I tasted it the next day, and it tasted like a young beer.

My question is about the age of the beer. Competitions ask you how long it has been since the beer was bottled/kegged. Didn't my beer do any mellowing in the fermenter for that length of time? Does simply carbonating it make that big a difference, or does it start some magical process? When lagering, do you age the beer in the fermenter or in the keg? Does it make a difference? Why?

I would appreciate any light that you could shine on this subject (since it *is* in a keg and protected).

Dennis Garrett
Grand Forks, N.D.



I'm not sure how to answer this question without tasting your beer, but it sounds like your four-month aging process may have done more harm than good. I suspect the young flavor you are describing is yeast autolysis or "yeast bite." This flavor appears when yeast begin to decompose and release their aromas into beer. Long aging times, even at cold temperatures, can eventually lead to autolysis if most of the yeast is not removed from the fermenter.

The conventional method of lagering involves racking the beer off the sedimented yeast following primary fermentation and into the lagering vessel. This vessel is typically a closed, pressurized vessel, but lagering in a carboy poses no great problem. During the first two to three weeks the lager begins to mature as diacetyl (buttery flavors) and acetaldehyde (green-apple flavors) are reduced by yeast. Also, sulfury compounds leave the beer during this period of cold aging.

In most commercial breweries that lager for very long periods, as you have done, the beer temperature is lowered to near freezing for the time following these initial two to three weeks. Cold maturation allows for further gravity clarification of yeast and also helps remove "chill haze" or the haze formed when beer is chilled. At near freezing temperatures, the yeast are relatively stable and autolysis is slowed. However, if the aging process goes on for too long, then beer flavor can be quickly lost. This is the potential risk of long aging. To prevent this from happening, it is important to have a goal of aging in mind before you begin. Once that goal has been met, the beer should be taken further in the process.

The goals of lagering usually include flavor maturation, removal of yeast, and chill stabilization. If these have all been achieved, most brewers would encourage you to get on with it!

Hopefully this provides some insight into your problem. As I said, it is hard to really tell without tasting your beer (this is my hint for samples). In the future, try aging for a shorter duration.

Mr. Wizard

How come when you sprinkle salt into a glass of beer, it causes it to fizz? The more salt, the more fizz. I discovered this one day while I was drinking (believe it or not) a very boring ale. I also noticed that if I poured enough salt into the beer, I could cause it to foam over the glass. I certainty do not practice this ritual on a regular basis. Perplexed.

Jim Megerson
Lenexa, Kan.

Excuses, excuses! It's obvious to all that you *like* salt in your beer, and now you wonder why it causes foaming.

Salt, like sugar and scratched beer glasses, contains rough spots that act as nucleation sites for gas breakout. This phenomenon occurs when a liquid that is super-saturated with gas, such as beer or soda, contacts a nucleation site.

On a microscopic level there are low-pressure areas around the imperfections that flash the gas out of solution in the area. Some pilsner glasses and champagne flutes are made with rough spots at the bottom to cause a fine stream of bubbles to constantly release during the consumption of the contents.

If you really want to get nerdy about this whole thing, I've got a fun experiment. Fill a glass with ice and quickly pour a soda pop into the glass; you should have a fair amount of foam in the glass. Next, fill a glass with ice and pour water over the ice. Then empty the water from the glass, keeping the ice. Now, quickly pour a second soda pop and observe the foam; there should be little if any. That's because the water melted the rough nucleation spots from the ice surface. I prefer pouring my favorite cola onto ice that has been polished in this manner (I guess I've got some pretty important concerns!).

Gas breakout is not only caused by solids such as salt but also by other gas bubbles and low atmospheric pressures. This is why bubbles in beer invariably lead to more bubbles and is also why beer has a great head on an airplane. I especially like foam and so find the airplane effect particularly amusing.

So the next time you're adding salt to your favorite beer or relaxing with a cold one on the way to wherever, you can relish the image all of the tiny bubbles emerging from the liquid in your glass, bumping into one another, and forming more tiny bubbles, finally coming to rest on the top of your brew as froth.

Mr. Wizard

I've been brewing for a couple of years now and have recently started brewing partial-mash recipes. I was wondering how important sparge-water temperature is. I raise a pot of water to about 170° F, but when I sparge for 40 minutes, the temperature drops significantly. It seems to me that it would be rather difficult to keep up the temperature. In addition, immediately following the sparge step the wort is brought to a boil anyway, passing through sparge temperature. Any help on the matter would be appreciated.

John Huber
Edmonds, Wash.

The purpose of sparging is to extract as much carbohydrate from the grain bed as possible while minimizing the extraction of husky, astringent flavors. The reason 170° F is frequently cited as an ideal sparge temperature is that good carbohydrate extraction and acceptably low husk extraction occurs.

This largely depends on your water chemistry, but in general 170° F works well. Some references mention that enzyme activity ceases with 170° F sparge water, but the fact is that stopping enzyme activity is not that important for most mash schedules.

If the sparge water cools off during the sparge period, the only negative effect is a decrease in your carbohydrate yield. This may seem trivial — after all, an extra pound of malt isn't that expensive — but sparging at variable temperatures makes it very difficult to predict how a particular ingredient's weight will affect the brew.

For example one pound of black malt in a 170° F sparge may contribute a pronounced burnt flavor to a stout. But if the sparge temperature is 150° F, the flavor from that grain will be less. My advice is to try to keep the sparge temperature between 160° and 170° F.

Mr. Wizard

Why add crystal malt? Under what circumstances should I add a lot? Under what circumstances none? Your health tip in the September '96 column says

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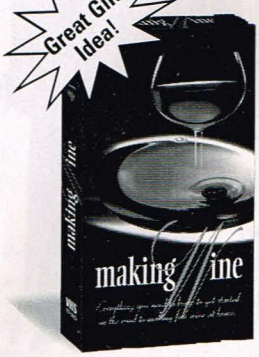
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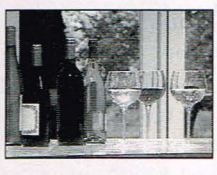


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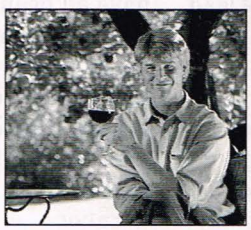
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CIRCLE 37 ON READER SERVICE CARD

that lots of crystal malt will make my beer more heart healthy, so why not add five pounds of crystal malt to every recipe?

Hal Davis
Boston

I did write that melanoidins, like those found in crystal malt, are among the natural antioxidants that many have recently touted as heart healthy. However, this must be weighed against the fact that beer is an alcoholic beverage.

In any case crystal malt adds color and flavor to beer. Light-colored crystal malts add pale orange hues and sweet, caramel flavors. Darker crystal malts add more red hues and richer, toastier toffee flavors.

In both cases too much crystal makes for a sweet, cloying beer. I would dare to guess that five pounds of crystal in a five-gallon batch would be almost undrinkable.

Crystal malt can be added to most beers with some color and low-level sweetness. These beers range from pale ales to Scotch ales, from helles lagers to Märzens, and from porters to stouts. In other words most beer styles that folks brew at home. This means that most homebrew has potentially beneficial antioxidants as one of the naturally present constituents. ■

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.

'Twas the night before brewday and all down the block, not a homebrew was cooking, not even a bock.

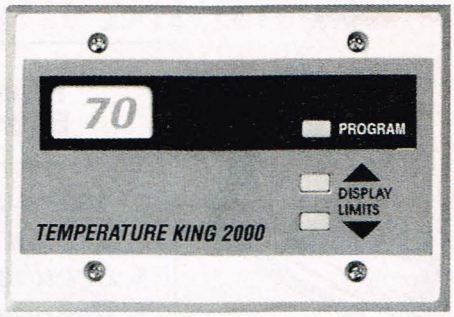
When out on the roof there arose such a clatter, I sprang from my recipe calculator to see what was the matter.

What to my wondering eyes did appear but Old Mr. Wizard with eight carboys of beer.

I heard him exclaim as he flew out of sight, "Happy brewing to all, and to all a good night."

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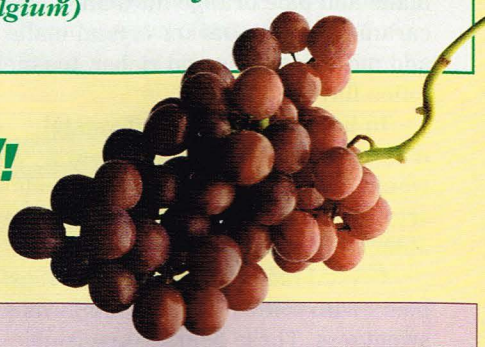
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CIRCLE 79 ON READER SERVICE CARD

Sparging: Maintain the Right Balance

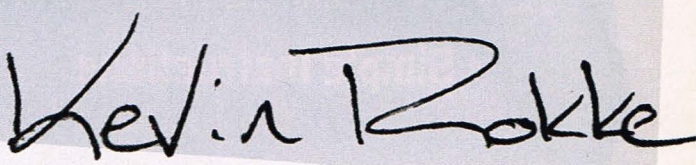
by Suzanne Berens

Put as much soluble matter into your boil as possible by attentively sparging. The keys are finding the ideal speed, water level, and temperature to get the full brewing value from the malts and adjuncts.

Crane River Brewpub & Café

"Once I have the runoff started, my goal is to keep just enough liquid on the grain bed to keep it moist. I watch to see that it doesn't dry out or doesn't have a pool of water on top."

Brewer: Kevin Rokke



Brewer: Kevin Rokke
Brewery: Crane River Brewpub & Cafe, Lincoln, Neb.
Years of experience: 10
Education: BS in biology, University of Nebraska, Lincoln
House Beers: Whooping Wheat, Sodhaus Altbier, Zlate Pivo (pilsner-style ale), Homestead Pale Ale, Platte Valley ESB, Good Life Stout

At Crane River we're careful not to sparge too hard or too fast. We try not to oxygenate the wort too much to avoid tannins and off flavors, although some is inevitable. If you see foam building on top of the grain, that's a good indication of oxygenation and means you need to slow down the rate of your sparge.

I get the flow started and adjust the speed of the water to get the runoff going at a certain rate. I want the runoff going into the kettle at a good even flow. Once I have the runoff started, my goal is to keep just enough liquid on the grain bed to keep it moist. I watch to see that it doesn't dry out or doesn't have a pool of water on top.

I can't say exactly how much water we use for sparging. I use enough to fill my kettle to 8.5 barrels (the size of our system).

I begin sparging right after I start running off, watching the temperature so it doesn't get too hot. When it gets to 168° F, that's pushing it. Sparging too hot can produce tannins and add to problems with clarity. Check the wort as it goes into the kettle to see if it is clear. We sparge around 165° F. The time it takes varies from 35 to 50 minutes, depending on the beer style. Wheat beers, stouts, and our other heavier beers take 45 to 50 minutes, and lighter beers will run 35 to 40 minutes.

Wheat beers typically run longer, because they require slower sparging to keep from getting a stuck mash. The proteins in the wheat float down a little bit and get a little more sticky.

The Tips

- Sparge right after runoff, and watch the temperature. The water should not be hotter than 168° F.
- Be careful not to sparge too hard or too fast. Slow down if foam begins to form on top of the grain.
- Keep just enough liquid on the grain bed to keep it moist. Don't let it dry out or let the water pool on top of the grain.
- Make sure the rate of your sparge keeps pace with the speed of your runoff. Keep the runoff flow as even as possible.

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When brewing our stouts and heavier beers, I have to slow down because the grains almost totally fill the mash tun. To accommodate the grain I need to turn our sparge arm upside down, so the holes are on top and not shooting directly down on the grain. With these big mashes I have to start the sparges slowly and let the grain sink down a little bit so I can turn the arm around again.

Having to turn the sparge arm over to make room for grain isn't the only problem we've run into with our equipment. That sparge arm is theoretically supposed to spin around the top of the grain bed to keep the extraction even. The arm seems like it wasn't designed really well, like there should be some ball bearings in it so that it spins with the force of the water. The force of the water is suppose to get it rotating, but it just doesn't do anything.

I spin it around by hand a couple of degrees at a time so that I get coverage over the whole grain bed while we're sparging.

Crane River has had only one stuck mash, which was right when the brewery got started, before I was here. They simply ran off too fast and didn't sparge fast enough to keep up with it. The grain bed got stuck at the bottom. They tried to alleviate the problem by underletting some water to break up that bottom grain bed, giving it another good stir, and then recirculating again. This did the trick.

Sparging is probably harder for homebrewers because they tend to tinker with different equipment each time. It's probably best to try one piece of equipment a few different times to get the feel of it before experimenting with another piece.

The best thing homebrewers can do is to start running off slowly to avoid getting a stuck grain bed. Also, make sure you don't run off faster than you are sparging in. This helps avoid problems of sticking.

Another tip homebrewers might keep in mind is to be careful that you don't slosh a lot when sparging. I ran across this when I was homebrewing, but it is easy to control. For example don't use a bucket to sparge. Use a hose instead so that you can control the rate of the sparge. ■

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CIRCLE 75 ON READER SERVICE CARD

Mild Ale: Low Alcohol Meets Full Flavor

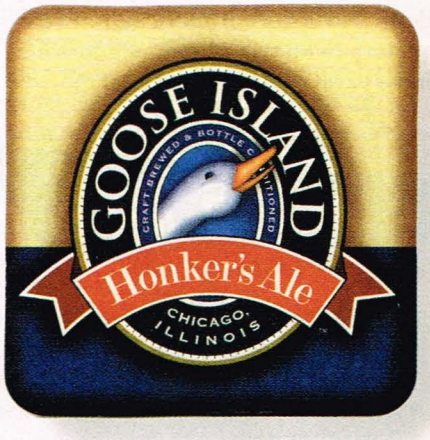
by Jeff Frane

Once almost lost as a style, mild ale has been resurrected by the British consumer movement Campaign for Real Ale.

In the Tao of British ales, mild is the yin to bitter's yang. For many beer styles, such as pilsner or weissbier, we can specify color, original gravity, and body, but for mild the only real definition is "not bitter." Or perhaps we can be a little more specific: real ale, but not bitter.

For the British real ale means beer that is naturally conditioned without filtering and extra carbon dioxide used in dispensing the beer. The beer goes into the cask (cask, not keg) while still in the final stages of fermentation, and it finishes its conditioning period in the cellar of the pub where it will be served.

This has been the traditional practice in the British Isles, but it requires extra work and special expertise on the part of the brewery and the publican. In the late 1950s the larger breweries began to push kegged beers, which were filtered and force-carbonated before kegging, then served in the pub in the manner familiar to Americans: The beer was pushed out of the cask with CO_2 (which, over time, dissolves in the beer and raises the carbonation level) rather than being pumped out of the cask from the bar.





Even more than bitter, apparently, mild performed poorly as a keg beer, and its place was taken by the lagers that the big breweries advertised heavily. While it retained some popularity regionally, the style was in danger of disappearing from view in the 1970s. Thankfully, the consumer group Campaign for Real Ale (commonly called CAMRA) assured that many of the smaller breweries survived and that real ale made a significant comeback.

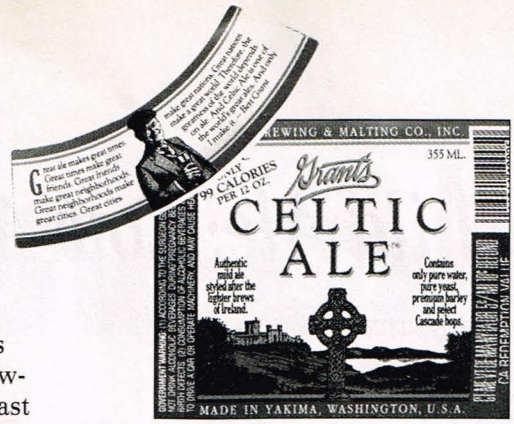
Mild is often defined (at least in the US) as draft brown ale, but in fact milds, like bitters, vary widely from region to region and brewery to brewery. What the beers have in common is a reliance on malt rather than hops for flavor.

Michael Jackson writes that mild beer was once "a harvest-time drink, a reward for farmworkers," and it has long been associated with working-class drinkers. Often, milds had a fairly low alcohol content and were popular lunchtime beverages for thirsty factory workers in the great industrial cities. As with bitter, however, low alcohol did not mean low flavor (something that American breweries have had a hard

time understanding). Pioneering British homebrewer Dave Line noted, "Mild ale is renowned for its luscious, sweet flavour and thirst-quenching properties."

North American homebrewers will have a tough time finding commercial examples of mild against which to judge their beer. More than most beers, mild is inherently a draft product, and cask-conditioned beers simply don't travel here from Britain. Even visitors to Merrie Olde England will have to be in regions such as the Midlands to taste the best examples (Banks' and Highland), but the London brewer Fuller's has reintroduced its Hock.

In the US milds were never part of the brewing scene, but the microbrewery revival has produced a few examples. Michael Jackson mentions one from Chicago's Goose Island brewpub and another from the Pacific Coast brewpub in Oakland, Calif. (an extract brewery). Grant's Celtic Ale, brewed in Yakima, Wash., lays claim to being a mild, even though it is bottled. At press time the Celtic Ale was still availble, but the brewery might stop production at any time.



Although milds can range in color from pale to very dark, they generally vary from mahogany to deep brown. And while some milds can be rich in color, they are usually low gravity (1.033 to 1.036) and light bodied. Always, of course, they are low in bitterness (otherwise, they would be bitter!). Some complexity of hop flavor is appropriate, as is a complexity from the yeast. Indeed, using fruity yeasts is a particularly good plan with milds so that the lightly hopped beer doesn't become boring.

British maltsters produce mild ale malt, which has slightly more color (3° to 4° Lovibond) than ale malt (2° to 3° Lovibond), with consequently more malt flavor. However, the mild ale malt doesn't seem to be necessary for milds. Michael Jackson lists ingredients for some classic modern milds, all of which are brewed from ale malt, with additions of crystal and chocolate or black malt. H. Lloyd Hind's British brewing text from the 1930s mentions the use of mild ale malt but suggests blends of pale malts, including but not limited to mild malts. He also notes the use of wheat, amber, and brown malts. It's interesting to note that Hind's text defines milds with original gravities ranging from 1.040 to 1.045, considerably higher than modern versions.

In traditional and modern milds, kettle sugars are common and more generally accepted than in pale ales. Naturally enough, these tend to be darker, lusher sugars with plenty of residual flavor and a contribution to color. Homebrewers have shied away from kettle sugars in the last decade or so (at least US brewers) because of the unpleasant flavors created in a lot of older recipes, but the British have known for generations that the proper use of sugar can be very useful.

In addition to providing fermentables in the wort, the impurities in sugar can provide interesting flavors in beer. Most of the sugar used in the US has been highly refined, making it less useful for brewing purposes because no impurities are available. Even brown sugar is simply refined sugar with some molasses added back in. While it is better than white sugar for beers such as milds, there are better options.

Turbinado sugar, a less refined cane sugar, is available in many health-food outlets, and some homebrew suppliers carry British sugars and syrups. Canadians have access to a version of Demarara sugar, long a favorite for British homebrewers (although the Canadian type seems darker and richer than the British from the few examples I've seen). Invert sugar is a very sweet and relatively expensive sugar. It is available in cake decoration and candy-supply stores. It's possible to make invert sugar from table sugar, with heat and a mild acid solution. It's widely used by British and Belgian brewers, both in the kettle and as primings, and available to them in a range of colors. Homebrewers can easily make do with good raw cane sugars.

Hopping rates, obviously, should be low (about 20 IBUs) and low-alpha, high-quality British hops (Fuggles, Goldings) would make the best additions. No dry hopping!

Any good British ale yeast should work beautifully, particularly one with some fruitiness or buttery-ness (diacetyl). Carbonation should be low, whether the beer is kegged

Born to Be Mild

(6 gallons, all-grain)

Ingredients:

- 6.5 lbs. British pale ale malt or equivalent*
- 8 oz. British crystal malt
- 2 oz. chocolate malt
- 1 oz. Progress hops (6% alpha acid), for 75 min.
- 0.5 oz. Fuggle hops (5% alpha acid), for 30 min.
- Wyeast 1968 London ESB yeast
- 1-qt. starter of good yeast

Step by Step:

Mash in 2 gals. of water at 152° F for 90 minutes (or until conversion). Sparge to 6 gals., and boil for 15 minutes. Add Progress hops and boil 45 minutes. Add Fuggle hops and boil 30 minutes more for a 90-minute total boil. Cool to pitching temperature, aerate thoroughly, and pitch yeast. Ferment in open fermenter at 65° to 68° F until kraeusen falls, then rack to secondary. Follow standard kegging or bottling procedures, but use about two-thirds the normal amount of priming sugar.

OG=1.037
FG = 1.012

*North American maltsters such as Great Western and Gambrinus are producing very good ale malts. Any of these would be a good starting point for a mild — or any other British ale, for that matter.

Mild Thing

(6 gallons, extract with specialty grains)

Ingredients:

- 5 lbs. Telford's amber malt extract
- 8 oz. British crystal malt
- 2 oz. chocolate malt
- 1 lb. Turbinado sugar
- 3 oz. Fuggle hops (5% alpha acid), 2.5 oz. for 75 min., 0.5 oz. for 30 min.
- 2-qt. starter of good yeast

Step by Step:

Infuse the grains in 0.5 gals. of hot water (about 150° F) for 30 minutes. Rinse the grains into the kettle with hot water, and add water and the malt extract to 3 to 3.5 gals. of wort. Bring to a boil. Boil 15 minutes and add 2.5 oz. hops. Boil 45 minutes and add 0.5 oz. hops and the sugar. Boil 30 minutes more for a total boil of 90 minutes.

Cool the wort as quickly as possible, adding enough cold, boiled water to bring the volume to 5 gals. Aerate thoroughly and pitch yeast. Keep the temperature as cool as possible, and allow the beer to ferment out, racking to a secondary when the kraeusen (foamy head) falls. Follow normal bottling procedures.

OG = 1.035
FG = 1.010

(blasphemy!) or bottled (more blasphemy!). Unfortunately, few of us have the necessary equipment and knowledge to brew true cask-conditioned ales, so we will have to be satisfied with fudged versions.

Extract brewers are at no particular disadvantage in brewing milds, although as always, care should be taken to use high-quality malts. The addition of good caramel malts and moderate additions of chocolate or black malts (enough to deepen the color without adding unwanted burnt notes) will help, whether in an all-grain or an extract-based mild.

A half-pound or so of home-toasted amber malt (350° F for 90 minutes) adds a pleasant nuttiness, and commercially produced brown and amber malts are available from various homebrew suppliers. Belgian biscuit malt, while not necessarily authentic, is a useful way to add a semblance of British nuttiness to American malts (once again, for all-grain or extract). ■

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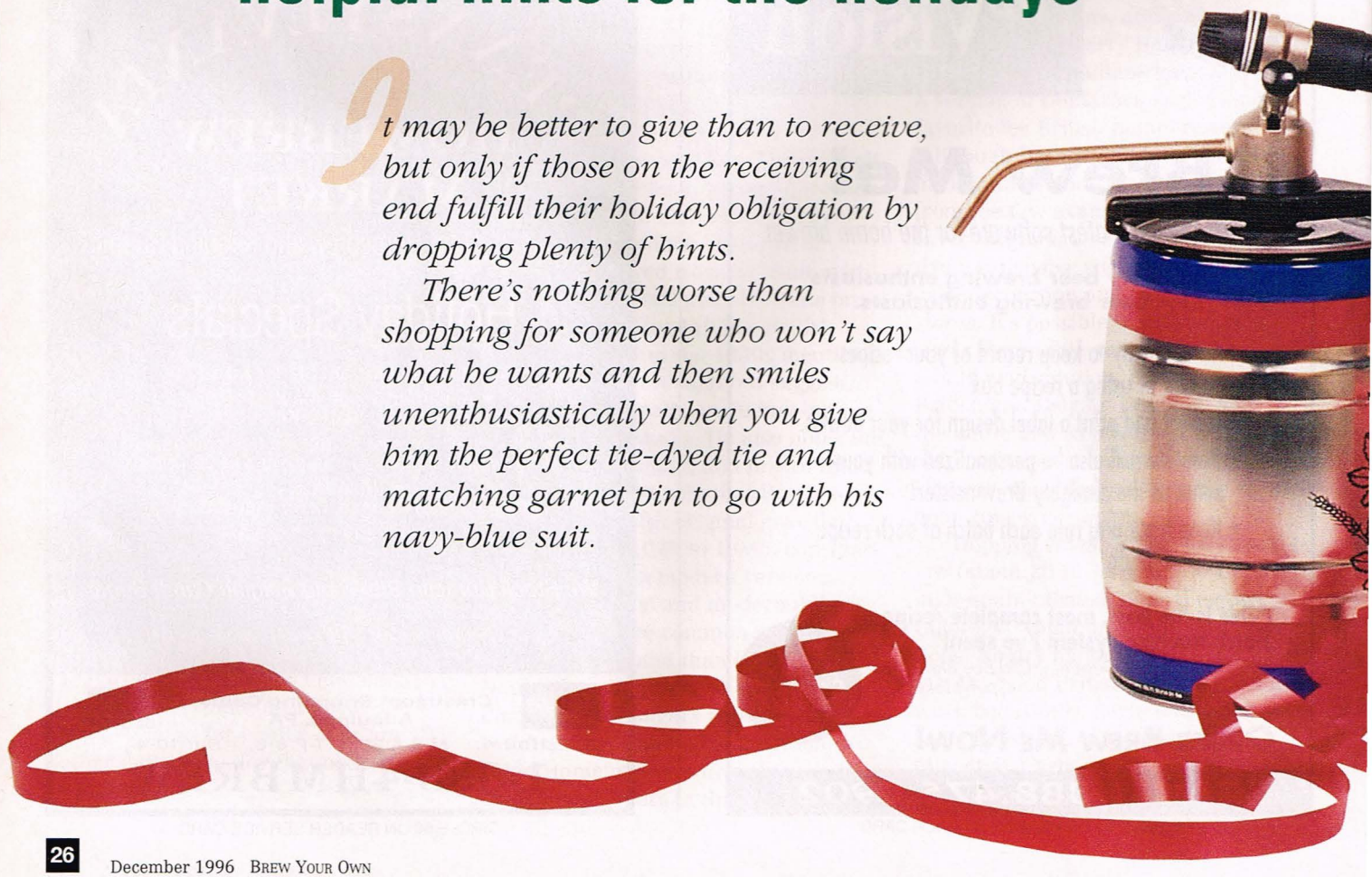
CIRCLE 66 ON READER SERVICE CARD

MAKING A LIST

Give your loved ones some helpful hints for the holidays

It may be better to give than to receive, but only if those on the receiving end fulfill their holiday obligation by dropping plenty of hints.

There's nothing worse than shopping for someone who won't say what he wants and then smiles unenthusiastically when you give him the perfect tie-dyed tie and matching garnet pin to go with his navy-blue suit.





TODD HAMMOND

"I never would have thought to pick this out myself," he says. As if you can't tell.

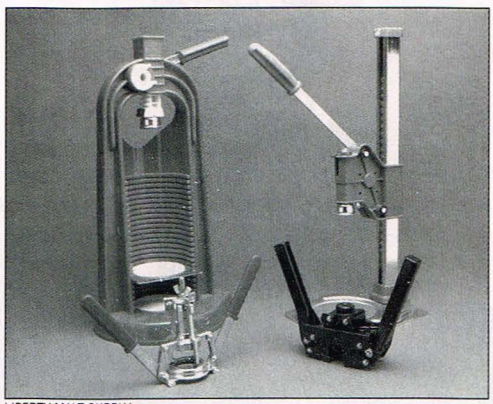
If you're the type who never hints, then hopes for the best, well, perhaps you'll enjoy that *History of the Holy Roman Empire* or the 27-speed Cuisinart or the Best of Tiny Tim CD box set.

On the other hand maybe you'd like to take it easy on your loved ones this year. Offer a few suggestions. Drop a well-placed hint or two. Make out a full-fledged list. To help you get into the spirit of the season, we asked homebrew retailers to name their most popular gift items, along with a few things they'd like someone to give to them.

Each of the items listed is readily available at most homebrew shops. So feel free to leave this magazine lying around, open to this article. A few well-placed circles, checkmarks, or the word "Yes!" or "Cool!" written in red felt-tip pen at strategic points should do the trick. After all, you want to be a good receiver, don't you?

The List

1 Bench Capper. There are two basic types of bottle cappers: wing cappers and bench cappers. Most starter kits come with a wing capper, the kind you place on top of the bottle, then pull the two handles downward at the same time to crimp the cap into place.



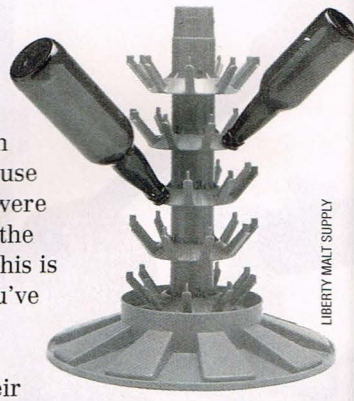
LIBERTY MALT SUPPLY

Wing cappers (foreground) are inexpensive and utilitarian. But bench cappers are more efficient and easier to use.

A bench capper has a base where the bottle sits. The capping mechanism is on a pole attached to the base. You simply pull down the single handle to squeeze the bottle cap. Bench cappers are less awkward then wing cappers and can be operated more quickly. Wing cappers require you to use an equal amount of force on each handle, and the capper must be placed squarely on the bottle. With bench cappers you just set the bottle on the base and pull the handle down. Try it, you'll like it!

Note: Unless you always use the same size bottles, be sure to get a bench capper that can be adjusted to various heights.

2 Bottle Tree. A bottle tree is a tall, plastic stand with pegs sticking out at all angles. Simply hang your bottles upside down on the pegs to dry them. If you've ever had to stack your dishes in the sink because your bottles were air-drying in the dishwasher, this is for you. If you've ever tried to lay 50 or so bottles on their sides to air- dry on the counter, only to lose a dozen over the edge, you need a bottle tree. Even fully loaded, a bottle tree takes up no more than a foot of counter space.



LIBERTY MALT SUPPLY

Nowhere to dry those clean bottles? Try hanging them on a tree.

3 Glassware and Steins. Do you serve your beer in an assortment of glasses you acquired at the last four beer festivals you attended? Does your fifth guest have to choose between a four-ounce taster and your old Cleveland Browns coffee mug?



For the very deserving, these antique steins from Glasses, Mugs & Steins run $29 to $150...each!



CIRCLE 51 ON READER SERVICE CARD



An outdoor cooker, like this Fyrbrewer from Jantac, will heat your wort in record time.

Don't limit your holiday list to equipment. You want to serve your beer in style, too. Beer styles developed around the world, and many have their own special glassware, too. The best-selling glasses tend to be pint glasses, followed by pint mugs, and pilsner glasses. How about a collection of hourglass-shaped wheat glasses for that hefe-weizen now fermenting in your carboy? And don't pass up a nice matched set of traditional beer steins.

4 Stainless Steel Brewpot/Remanufactured Keg. This is a great time to upgrade your kettle. A good brewpot prevents scorching and is large enough to help you avoid boilover. A larger brewpot, say eight gallons, allows you to do a full boil (boil all of your wort rather than boiling a portion and topping off with water before you pitch the yeast). A good stainless-steel brewpot should last as long as you brew. The advantage is it won't chip or scratch in such a way that it accumulates bacteria.



This remanufactured keg from Stainless in Seattle is fitted with a temperature gauge and false bottom for mashing.

Remanufactured kegs also make great brewing equipment. These are kegs in which the top has been cut off. In many cases valves, false bottoms, and temperature gauges have been added to facilitate mashing. You can also buy stainless steel pots with the same type of equipment so that they can be used as mash tuns.

5 Outdoor cooker. You need something that can fire up your new brewpot, right? Take your brewing outdoors with a propane burner. The advantages are many: no more kitchen mess to clean up. No more disagreements about whether you should get your brewpot off the stove just because supper time was an hour ago. A good propane burner works as well as or, in some cases, better than a standard kitchen stove.

Burners are rated by the amount of heat they generate. The minimum you need is a 35,000 BTU cooker, which runs in the neighborhood of

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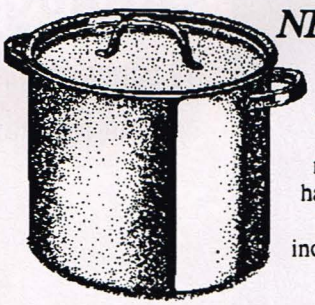
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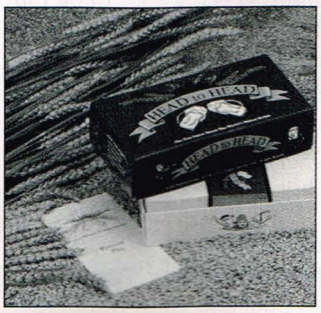
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Make sure your counterpressure filler is easily adjustable for various bottle sizes and can be easily cleaned.

8 Cool Beer Stuff. For the homebrewer who has everything or just wants to have fun away from the brewpot:

T-Shirts. Lots of homebrew stores sell great beer T-shirts. You can also get a stylish T-shirt or cap touting your favorite brewing magazine (see page 55). If that's not enough, check out the T-shirt of the Month Club from Brew Tees of Falmouth, Maine. Each member of the club receives a T-shirt with a different microbrewery logo each month. Participating microbreweries range from Kona Brewing Co. in Kona, Hawaii, to Wychwood Brewery in Oxfordshire, England.

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economics, art, gastronomy, and other areas — all related to beer. It's marketed by Food for Fun, Huntington, N.Y. If you're into jigsaw puzzles, try 99 bottles of Beer on the Wall, a 550-piece puzzle by Great American Puzzle Factory featuring — you guessed it — 99 different brands of beer.

9 Tap System. There's nothing quite like draft beer. Somehow it seems fresher, more natural. Plus, it means you don't have to bottle. A standard homebrew tap system includes a five-gallon soda keg, a carbon dioxide tank, a regulator, quick disconnects, and a tap hose. Instead of bottling you rack your beer into the keg and carbonate using the CO_2 canister.

If you're already kegging, why not dispense your beer in style? Replace that plastic cobra head with an attractive tower and tap handle. A good beer faucet reduces the amount of foam, because no air enters it between pourings. It is removable and easy to clean. The tap handle is the decorative part, and you need a tower to support it.

10 Books. There are lots of great beer and homebrewing books on the market. In addition to classics such as Byron Burch's *Brewing Classic Beers*, *Dave Miller's Homebrewing Guide*, Dave Line's *Brewing Beers Like Those You Buy*, and Charlie Papazian's *The Homebrewer's Companion* and *The New Complete Joy of Homebrewing*, check out some of these.

No reading list is complete without these any-season brewing classics.



CHRISTINE KELL

The Brewer's Companion by Randy Mosher (Alephenalia Publications) uses lots of charts and worksheets to help you understand the many facets of beer, from brewing flavors to various recipe calculations. It's easy to use but might be a bit advanced for beginners.

Brew Ware by Karl Lutzen and Mark Stevens (Storey Publishing) looks at a wide range of brewing equipment. It explains how various equipment works, what to look for when you purchase equipment, and even how to build some homebrewing equipment.

Each book in the Brewers Publications Style Series takes an in-depth look at a specific style. The latest addition is *Stout* by Michael Lewis. Also, if you're into lager *New Brewing Lager Beer* by Greg Noonan is the authoritative word on the subject.

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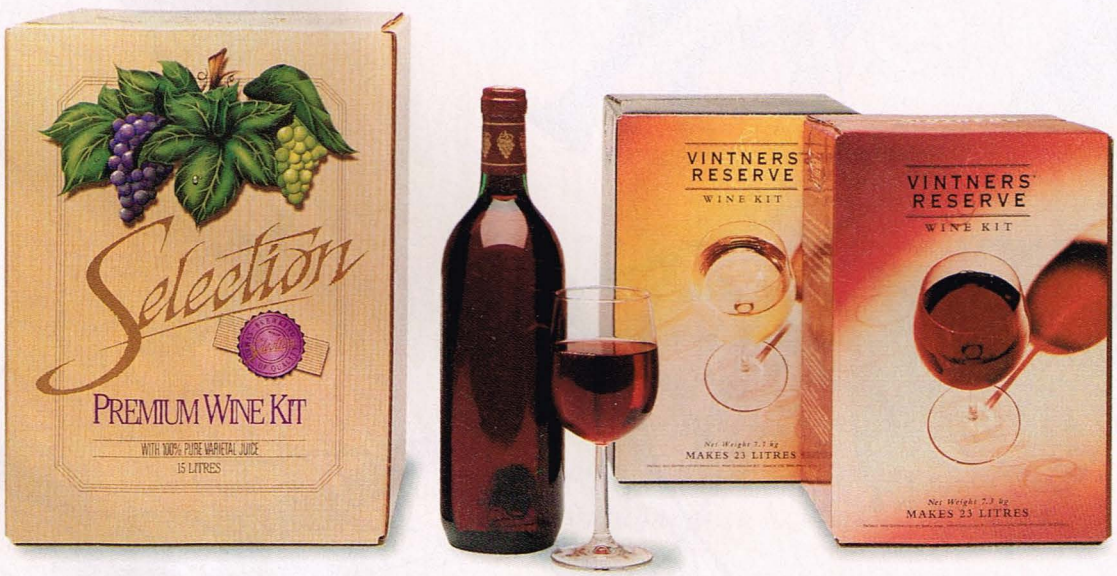
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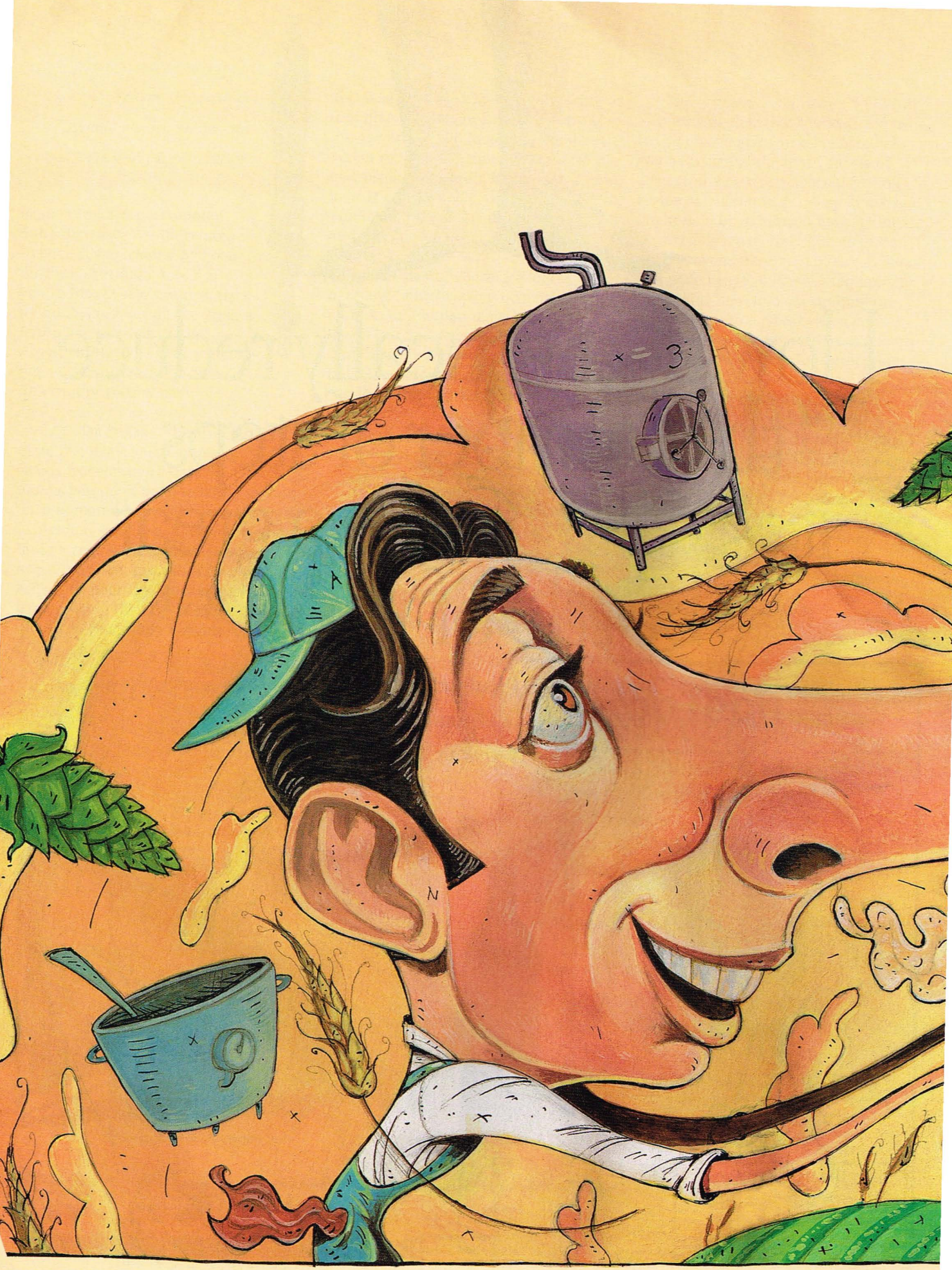
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Five Ways to Capture the Perfect Hop Nose Every Time



Remember the last time you had a fresh draft IPA or opened a bottle of pale ale and the floral, herbaceous, sometimes spicy aroma of hops smacked your olfactory nerves? The ability to create varying flavors, aromas, and characters in beer is a great aspect of brewing. And let's be honest: Most of us love hops.

Hops are the signatures on the paintings that identify our beers. We love the bitterness, but we are constantly hunting the more elusive nuances of aroma and flavor that make our beer unique from batch to batch, style to style. So how do we achieve that perfect balance, trap all that delicious aroma into a bottle, and manipulate it to just the right degree?

by Nico Freccia

What Are Hops?

The hop plant is a vine, and the hop cone, or flower, of the vine is used in brewing. The hop cones brewers use are always female because only the female cones contain significant quantities of lupulin glands. Lupulin glands are small yellow sacks at the base of the cone's petals that contain the acids and oils that give beer its bitterness and aroma.

All hops contain both acids and oils, though different varieties contain different ratios of acid to oil. Acids, specifically the alpha acids, are the compounds that lend bitterness to beer. Oils, on the other hand, lend the aroma.

Hops that contain relatively high proportions of alpha acids, therefore, are generally used as bittering hops, while hops with a lower percentage of alpha acids and more oils are used as flavoring or aroma hops.

It is the way in which hops are used in the brewing process that dictates the final bitterness and aroma of the beer. Hop acids, for example, need to be isomerized in order to impart bitterness. Isomerization is a chemical reaction that dissolves the acids into a solution (wort) and rearranges the molecules so that they stay dissolved.

In brewing this chemical change is achieved through prolonged boiling. Hop oils, on the other hand, are extremely volatile, which means that they dissipate quickly in the steam of a kettle. Therefore, hop aroma needs to be captured delicately, and there are several strategies for doing so. Before choosing a strategy, however, it's important to understand the differences between whole hops and hop pellets.

Cones versus Pellets

At harvest time hop cones are either hand picked or stripped from the vine by machine. The cones are then dried and baled together for sale. Hop pellets are made from the dried hop cones, which are ground into a powder and then pressed into pellets. The process of grinding the hops ruptures the lupulin glands, so the stickiness of the hop acids and oils naturally holds the pellets together.

There is very little physical difference, therefore, between whole hops and hop pellets, though there is a degree of practical difference. Hop pellets have the advantage of being much more compact and therefore easier to store.

They are almost always the packaging of choice for American microbreweries for this reason. Because the powder breaks apart in the boil, no straining from the kettle is necessary and this, again, is an advantage.

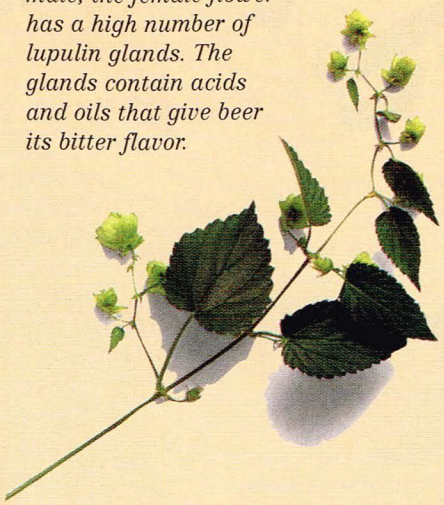
Whole hops will rely on the heat and agitation of the boil to release the acid and oil resins, but because the lupulin glands of pelletized hops have already been ruptured, the acids and oils can more quickly and easily dissolve into solution. This may be an advantage in trying to capture aroma at the end of or after the boil.

The process of grinding and pelletizing, however, does give off some heat, and some believe this may change or destroy some of the acids and oils present in the hops. So purists will stick with whole hops, although with modern methods, pellets are probably of equal quality, are easier to use, and stay fresher longer. For homebrewers the choice is one of personal preference.

Purists will stick with whole hops, although with modern methods, pellets are probably of equal quality, are easier to use, and stay fresher longer. The choice is one of personal preference.

Using Hops

Hops are a natural preservative, and that was perhaps the first consideration in the advent of their use in beer. Brewers would have quickly discovered, as well, the wonderful balancing effect that the bitter taste and aroma of the hop had on the sweet malt.



The hop flower used in brewing is always female. Unlike the male, the female flower has a high number of lupulin glands. The glands contain acids and oils that give beer its bitter flavor.

Flavor combines the experiences of sense of smell and taste together much in the same way we experience and enjoy the foods we eat as a dual taste/aroma sensation.

Aroma stands alone as an olfactory sensation divorced from the experience of taste.

Both of these characteristics can be controlled individually through specific methods in the brewhouse. These methods include: late kettle hop additions, whirlpool or steeping additions, use of the hop back, dry hopping, and use of hop oils and teas.

Late Kettle Hopping

Late kettle hopping, also called flavor hopping or finish hopping, consists of adding hops in the last few minutes of the boil so that hop oils are dissolved and very little or no isomerization of hop acids (and no bittering) occurs.

Many brewers add bittering hops at the beginning of the boil, flavoring hops about half way, and

then finishing hops. As mentioned earlier, hop oils that are responsible for aroma are extremely volatile and will be driven off in the steam of your boil almost immediately. Therefore, a hop addition in the middle of the boil will add some bitterness, probably no aroma, and be more costly for you. Calculate all your bittering hops to be added at the start of the boil. You'll use fewer hops and can reserve the fine tuning of flavor for the last five to 10 minutes.

The addition of an aroma hop during the last five to 10 minutes of the boil should contribute a significant amount of hop flavor while minimizing the addition of any bitterness. Hop pellets will dissolve more quickly into a boiling wort and the extraction of oils will therefore be more efficient than with whole hops.

Because the contact time with boiling wort is short, a greater amount of hops (1.5 to two ounces) can be used in the last few minutes to achieve maximum flavor. The heat from the boil will affect the chemical makeup of the hops, however, and the resulting character will not be the same as the aroma of the fresh, uncooked hops. In any case limit the boil time of late kettle hops to less than 10 minutes.

Whirlpool or Steep Hopping

Many of the best examples of American microbrewed beers with outstanding hop aroma have undergone no more than a whirlpool hop addition. In commercial breweries the whirlpool occurs after the boil is finished. The heat is turned off and the kettle is recirculated in a clockwise motion to centrifuge the hops into a cone that settles on the bottom of the kettle.

There are two key elements to this stage of the process: The wort is kept covered, and it is no longer agitated by boiling. Some of the beers with the greatest hop aroma made today have seen no dry hopping but rather have undergone liberal additions of whirlpool hops.

In the homebrewery the setup is the same. After the heat to the kettle has been turned off, a generous amount of hops is added to the kettle. The wort is then stirred rapidly for a minute or so, covered, and allowed to stand for about 20 minutes. The covered kettle will trap more volatiles in the wort and the lack of agitation will be more gentle to the hop oils. Again, heat will still change the chemical makeup of the hop, and a unique flavor will result.

If you use an immersion chiller, hop flavor will continue to be extracted for the duration of the 20- to 40-minute chilling time.

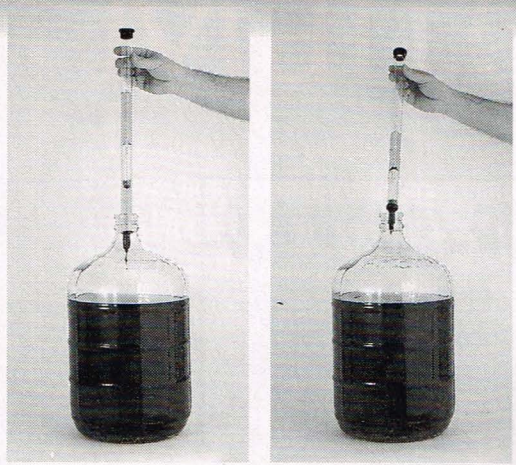
The Hop Back

A hop back is nothing more than a strainer that was used in days of old to separate the whole hops in the kettle from the sweet wort running into the fermenter. At some point brewers discovered that adding fresh whole hops to the hop back first and then

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straining boiling wort through them accomplished two things. First, it acted as a filter bed, straining out the hops and trub, and second, it imparted a fresh hop aroma.

In the homebrewery this method is effective if you are straining boiling wort into a fermenter filled with cold water or using a counterflow chiller to cool your wort. In an open straining system the hot wort flowing over the hops carries oils into the wort, though some of the volatiles will be lost to the open air.

The system is most effective when used in conjunction with a counterflow chiller and constructed so that the hop back is sealed, allowing hot wort from the kettle to flow through it on the way to the chiller without allowing any of the volatiles to escape. It has little practical use in an immersion chiller system.

In general a hop back will be a bit more time consuming, costly, and messy, but it can impart a very close-to-fresh hop aroma.

Dry Hopping

Dry hopping is perhaps the most widely used and most talked about method of adding fresh hop aroma to beer. In principle the method involves adding a quantity of whole or pelletized fresh hops in a straining bag to the secondary fermentation of the brew.

The fresh hop aroma of dry-hopped beer seems to be complemented by the flavor quality of late hopping.

Because the secondary fermentation will be taking place at room or cellar temperature, the chemistry of the hops is not altered or affected by heat. Therefore, the aromatic oils can be slowly extracted from the hops, and the delicate volatiles will not escape. Again, a liberal amount of hops should be used to achieve a full aroma (about two ounces in a five-gallon batch).

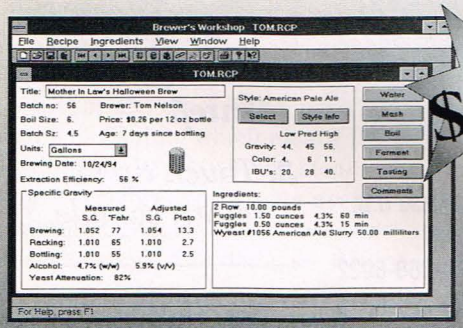
For those who employ kegging systems, add the hops at kegging time and allow them to steep for a few weeks before the beer is served. This is the most traditional way of dry hopping and will produce the best results.

If you bottle your beer, you should employ a secondary fermentation for at least a week (two is better) to fully extract the hop aroma before bottling.

Dry hopping during the primary fermentation is possible, but it should only be done when the primary

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fermentation has subsided (after three or four days) so that the volatiles will not be carried off in the escaping carbon dioxide of fermentation. In any case, secure the hops in a straining bag and weight the bag so that they are fully submerged in the beer.

Proper dry-hop aroma will take some time to develop, and the aroma should continue to improve for months in the keg. Dry hopping, as seen by the success of the first well-traveled and generously dry-hopped India pale ales, also has a great preservative effect on beer. And because fermented beer is an environment hostile to bacteria, don't worry about contamination from unsterilized hops; it is highly unlikely to occur.

While many beers are late-kettle or whirlpool hopped and not dry hopped, most dry-hopped beers have also seen late kettle and/or whirlpool hopping. The fresh hop aroma of dry-hopped beer seems to be complemented by the flavor quality of late hopping.

Hop Oils and Teas

Isolated hop oils are also available to the homebrewer. Using a carbon dioxide extraction process, manufacturers are able to provide pure, liquid hop oils that can be added directly to the secondary fermenter or keg to produce a calculated amount of hop aroma. Extracted hop oils need to be diluted into extremely small amounts and therefore are difficult for homebrewers to use.

There are also products on the market called late hop essences. Manufacturers of these products have isolated the individual compounds of the oils that give the distinctive late kettle hopping or whirlpool flavor. These are easier for homebrewers to use than the aroma oils.

Hop teas also provide some of the flavor associated with late kettle and whirlpool hopping. Bring a quart of water to a boil in a saucepan, add a generous amount of aroma hops, stir well, turn off the heat, and allow the hops to steep for about 20 minutes. You can strain this hop tea directly into the secondary fermentation, keg, or simply make the tea when you are preparing your priming sugar and add it directly to the bottling bucket.

Capturing the perfect balance of hop aroma and flavor in your beer will depend on the style and gravity of the beer you are brewing, the brewing method you use, and of course the type and variety of hop. Certain aroma hops, Cascade for example, have become the defining aroma hops in American pale ales.

There are many hop varieties to choose from, and they all have subtly different, wonderful properties. Do some controlled experimentation. You will be rewarded upon opening your next bottle of homebrew with the same tingly sensation you get when smelling freshly cut grass for the first time in the spring.

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MEAD
THE MOST NOBLE BREW

by Scott Russell

Is there a brew that conjures up more images than mead? Whether you associate it with ancient druids, pre-Roman civilizations of central Europe, Vikings, Teutonic raiders, Celts ancient or modern, it is impossible to deny the hold that mead has always had on the imagination of Western civilization.

Some believe that it was mead that Homer and others had in mind when they described "nectar," the favored beverage of the inhabitants of Olympus.

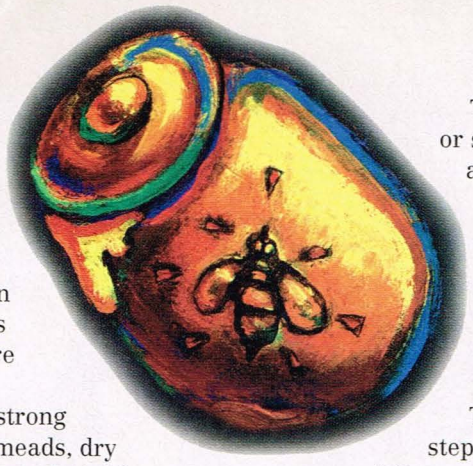
Certainly mead played a role in the Icelandic sagas, in *Beowulf*, in the writings of the ancient Irish bards.

It is mentioned in the Bible, in African tribal lore, even in the epic of Gilgamesh.

Wherever man has lived, he has made mead, even in lands where the grape or the grain grew in abundance.

But what is mead? In general terms, mead is wine made from honey. But there generality ends. Every region or people who has produced mead has given it a different

RICK HUDSON



customized spin. One need only look at the varieties of mead in the northwestern European tradition to begin to see this diversity. There are still meads and sparkling meads, strong meads and small meads, dry meads and sweet meads. Add to that spiced mead (metheglin, from which the English word "medicine" comes), fruited mead (melomel), mead mixed with grape wine (pyment) or with apple juice (cyser), even a blend of mead and beer known in Old and New England as "bracken." The peoples of the Celtic/Anglo-Saxon world knew them all.

Meadmaking follows many of the same basic rules and procedures as brewing beer from extract syrup. The major difference is time, both in the brewing and in the fermentation. Above all making mead requires a considerable amount of patience. Be warned that it will be several months (if not years) before your efforts will be rewarded, and there is really no way to speed it up.

Mead takes four steps:

1 Brewing, in which a quantity of honey is diluted in water (either just hot enough to dissolve the honey without boiling or actually boiled for up to 15 minutes or so).

2 Fermentation with a beer or wine yeast (or a specialized mead yeast, if one is available) in a fermentation vessel, preferably closed and similar to one that is used for beer.

3 Aging (the single most important influence on the flavor of the mead), which may occur in bulk or in the bottle, depending on the brewer's capacity for storage.

4 Packaging, for which the brewer must choose between cask and bottle, between priming for a sparkling product or bottling "as is" for a still beverage.

The addition of fruit or spice may occur in almost any of these steps — in the kettle, in the primary fermenter, in an aging vessel, or at bottling.

Basic Step By Step

The basic step-by-step procedure is as follows:

1 Bring water to a boil, add water treatments (usually gypsum and acid blend) and honey. Boil no more than 15 minutes, skimming the foamy albumin off the surface every two or three minutes.

2 Chill to 75° F and add yeast nutrients, stir to dissolve, and then pitch yeast. Seal and put the mead in a relatively cool (65° to 70° F) corner.

3 Ferment 10 to 14 days in primary, then rack to a glass secondary. Age in secondary for at least six weeks (check the airlocks regularly to avoid evaporation and contamination problems).

4 Bottle (when gravity has fallen below 1.020), either as is or priming with one-eighth cup of corn sugar per gallon for sparkling mead. Since you will be aging for considerably longer than most beers, oxygen-absorbing caps or wine corks are strongly recommend.

5 Leave the bottled mead undisturbed in a cool, dark place for three months before you even think about trying one. The first one will probably disappoint you. Leave it another three months and try it again. Like bottle-conditioned beer, bottled sparkling mead will cast a considerable amount of sediment, so decant carefully when serving.

Basic Ingredients

The most important ingredient, of course, is honey. The fresher and less treated the honey, the better the flavor and aroma you will get. Unpasteurized, unfiltered, and without preservatives is best. Beyond that, however, there isn't any single honey that is better than another. You can use local wildflower honey, clover honey, orange blossom honey, blueberry honey, and so forth.

Note About Glassware

The first mead I ever tasted was in Normandy. I had no idea what it was, but it sounded mysterious, intriguing, dangerous. I bought a bottle and saved it until I was alone, with no interruptions, then drank it straight from the bottle at room temperature. While I sensed the possibilities, I can't honestly say I was very impressed.

Several years went by before I ever had any more, and then it was my brother's homebrew. He served it chilled, in a champagne flute, and it was everything that first one should have been.

Since then I've been making my own and trying to match it with appropriate glassware. So far the champagne-style flute and the tall, narrow lambic glass are my favorites, but in the back of my mind I still see an old illustration from my childhood of some Norse god sipping mead from a glass horn. But I can't find the right one. I've found tacky German hunting-horn glasses with enameled crests and fancy designs, vaguely horn-shaped shot glasses (two- or three-ounce size), and other similar but unsatisfactory pieces. All I'm looking for is a 16-ounce plain glass horn, probably with a wooden stand, nothing fancy.

Would you please let me know, care of this magazine, if you come across my dream glass or a catalog that might have it? Thanks!

- Scott Russell

Each honey contributes its own unique flavor profile. Mesquite honey is supposed to produce a very unique mead. The color of the honey will have some effect on the color of the mead, but aging generally lightens even the darkest mead considerably.

Water usually needs to be treated. Many mead brewers prefer a more sulfate and more acidic water, which seem to balance the inherent sweetness of the honey and retain the aroma better than more alkaline or carbonated water. It is standard procedure to add some gypsum (calcium sulfate) and some form of winemaker's acid — either citric or a blend of citric, malic, and tartaric acids. Each brewer needs to experiment.

With the amount of fermentables involved in making mead — two to three pounds of honey per gallon sometimes — it is important to boost the yeast by adding a nutrient of some kind. Any of the commercial yeast energizers will work fine, and they are best added along with the yeast. It is important also to pitch an adequate yeast culture, at least 10 to 14 grams of dry yeast, or a pint or more of a liquid slurry, in five gallons or less. Meads can be made using ale yeast, lager yeast, wine yeast, champagne yeast, and custom-cultured mead yeast. Wyeast even sells two different liquid cultures, one with a higher alcohol tolerance (hence for drier mead) and one with a lower tolerance, leaving a sweeter finish.

Some meadmakers, in an attempt to boost the alcoholic strength of the mead, add other sugars (such as molasses, cane sugar, or corn sugar) but this is not entirely authentic. If tradition and authenticity do not play a major role in your brewing, then by all means go ahead and experiment. Any sugars other than honey may in fact speed up fermentation, but they may also contribute undesirable harsh flavors as well.

Recipes

With the exception of the cyser, the following recipes are all for three gallons each. Unless otherwise noted, follow the above step-by-step directions.

Still of the Night Mead

A light, still straight mead, similar to a sweet white wine. Perfect as an aperitif or with dessert.

Ingredients:

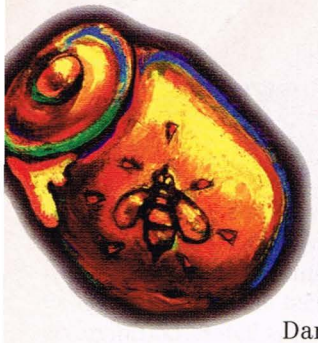
- 1/2 tsp. acid blend
- 1/2 tsp. gypsum
- 5 lbs. honey (clover or wildflower)
- 1/2 tsp. Fermax or other yeast nutrient
- Yeast (see Basic Ingredients)

Step by Step:

Follow the Basic Step by Step instructions. Treat 3 gals. water with acid blend and gypsum, then boil. Add honey, boil 15 minutes. Chill and add Fermax. Pitch yeast and ferment. Age at least three months before bottling. Do not prime. This mead should age for six to eight months before being served.



CIRCLE 83 ON READER SERVICE CARD



Sparkling Cyser

A thirst-quenching but deceptively strong sparkling brew. Darker than most, because of the cider. Serve chilled.

Ingredients:

- 1/2 tsp. acid blend
- 1/2 tsp. gypsum
- 5 lbs. honey (clover or wildflower)
- 2 gals. fresh apple cider
- 1/2 tsp. Fermax or other yeast nutrient
- Yeast (see Basic Ingredients)
- 2/3 cup corn sugar for priming
- 5 g. fresh champagne or ale yeast

Step by Step:

Follow the same procedure as Still of the Night, except stretch to 5 gals. by adding apple cider as you pitch the yeast. Age three to four months and bottle prime with corn sugar and champagne or ale yeast. Age cool for four to six months.

Kiwi-Strawberry Melomel

This is a great substitute for dry champagne.

Each honey contributes its own unique flavor. The color of the honey will have some effect on the color of the mead, but aging usually lightens even the darkest mead considerably.

Ingredients:

- 6.5 lbs. light honey (clover is best here)
- 1/2 tsp. gypsum
- 1 tsp. citric acid
- *Prise de mousse* yeast
- 2 lbs. fresh, bruised strawberries
- 5 or 6 peeled and mashed kiwis
- 3/8 cup corn sugar for priming

Step by Step

Follow Basic Step by Step. Boil honey, gypsum, and citric acid in 3 gals. water. Chill and pitch with yeast. After 10 to 14 days, rack onto strawberries and kiwis. Age on fruit three to four weeks, then rack into a third fermenter. Condition six to eight weeks, then prime with corn sugar and bottle in champagne bottles. Age cool for up to a year.

Saint-Valentine's Metheglin

Beware of the reputed aphrodisiac effects of cinnamon! Serve warm, even slightly "mulled," on a cold February night.

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CIRCLE 81 ON READER SERVICE CARD

Ingredients

- 1/2 tsp. acid blend
- 1/2 tsp. gypsum
- 5 lbs. honey (clover or wildflower)
- 1/2 tsp. Fermax or other yeast nutrient
- Yeast (see Basic Ingredients)
- 4 to 6 crushed cinnamon sticks
- 1 chopped vanilla bean
- 1/3 cup corn sugar for priming

Step by Step

Follow the Step by Step section for Still of the Night, but when you rack to your secondary, put in cinnamon sticks and vanilla bean (in a muslin hop bag, preferably). Condition with the spices four to six weeks, then re-rack. Age six more weeks then bottle, priming with corn sugar. If you wish, put a candy cinnamon heart in each bottle.

Old/New England Bracken

An old recipe, perhaps originally the result of thrifty brewers wanting to make a less-expensive mead. It calls for a lot of malt, which would certainly have cost less than honey for most people. It's malty like a Munich helles but big and powerful like a Belgian tripel.

Ingredients

- 1/2 tsp. gypsum
- 3 lbs. extra-light dry malt extract
- 4 lbs. honey
- 1/2 tsp. yeast nutrient
- A substantial yeast slurry (perhaps a blend of a neutral ale yeast and a white-wine yeast)
- 1/3 cup corn sugar for priming

Step by Step

Follow Basic Step by Step. In 3 gals. of water treated with gypsum, boil malt extract for 30 minutes. Add honey (here's a good place to experiment with honeys such as blackberry, mesquite, and starthistle) and boil 15 more minutes. Chill. Add yeast nutrient and pitch a substantial yeast slurry.

Ferment 14 days at 70° F, then 10 more at 60° F, then rack to secondary. Age 10 to 12 weeks, prime with corn sugar, and bottle. Bottle condition for at least 10 months. The best bracken I've ever had (made by my brother) was 16 months old and was still perhaps a bit young.

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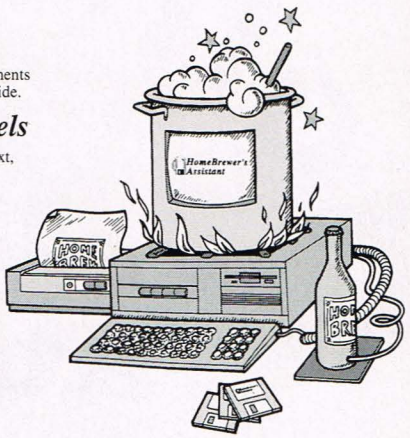
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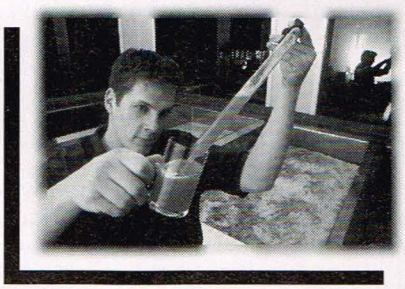
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Homebrewer at the South Pole

by Jason Dorpinghaus

Imagine being sent to the very bottom of the world to spend 12 months living and working with 25 perfect strangers. Your nearest neighbors, 800 miles away on the coast, are themselves 1,200 miles from civilization. For six months there will be no end to the blinding sunlight as the sun circles on its seemingly endless spiral around the sky. The other six months there is no end to the infernal darkness of night.

The upside down aluminum salad bowl known as "The Dome" and the steel arches protect the buildings that you live and work in from the unrelenting weather of the "Southern Continent." The yearly mean temperature at the pole is minus-60° F, with the temperature plummeting to below -100° F during the winter.

For eight months there are no flights in or out. It's just you and the other 25 people there to keep yourselves busy and entertained. There is no cable TV. No new movies to see. No going out for a night on the town. No brewpubs for thousands of miles in all



Yes, it's really the South Pole. In this digital photo, communicated by satellite, homebrewer Jason Dorpinghaus stands at the bottom of the world with a glass of his 90-Degree Smoked Abbey. No refrigeration required – the temperature was -87.5°F.

directions. What on Earth are you going to do?! That's easy — homebrew!

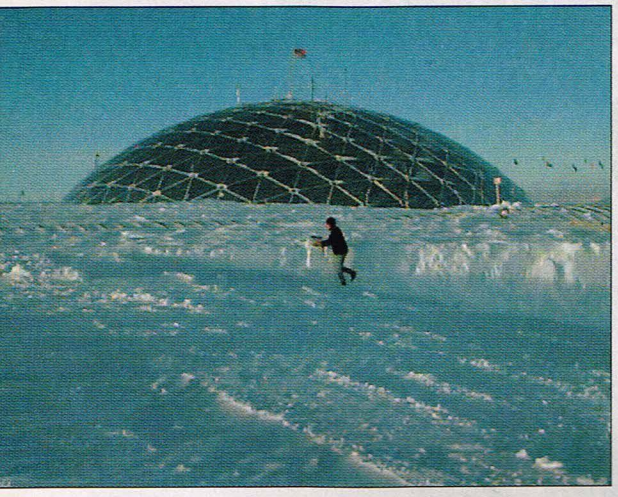
Amundsen-Scott South Pole Station

For 40 years the United States Antarctic Program (USAP) has continuously staffed a research station at the South Pole, but it wasn't until recently that homebrew (Domebrew) arrived on the scene. It's hard to say exactly when homebrewing became a popular pastime here, but it's sure to continue for years to come.

After all, can you imagine receiving one shipment of beer at the end of the summer and making it last for nine months? Not even taking into consideration how old the canned beer is by the time it gets to you or that you have a choice of only four different beers. Year-old beer at the South Pole has, until recently, been considered relatively fresh. Stories of drinking five-year-old beer during a winterover when the year's supply ran out are not uncommon.

Several years ago some homebrewer "ahead of his time" started the South Pole's Dome Brewers Association (DBA). As the most recent member of the DBA, I'm happy to be able to share my domebrewing experience with you. Everything in this article is true! Not even the names have been changed to protect the guilty.

Take a trip with me now to a place where few have been and even fewer have brewed...90 degrees south.



The dome, resembling an upside down aluminum salad bowl, is the winter home of 26 people. There are no flights in or out for eight months.

Homebrew and Me

I began my homebrewing career (oddly enough) in McMurdo, a USAP station on the Antarctic coast, after my first winterover. Upon returning to Christchurch, New Zealand, in October 1992 for a two-week holiday, I promptly gathered up brewing equipment (a plastic fermenter, thermometer, and some bottles) and as many beer kits as I thought I could brew in four months. I recall brewing about eight batches and leaving the remaining four kits with a friend to brew during his winter.

Brewing was ultra-simple then. Basically all I did was pour the kit into the fermenter and add hot tap water from the sink in my room. I stirred with a large spoon I had appropriated from the galley, let it cool over night, and pitched the yeast. Sterilization? What sterilization? I was, to say the least, a little green.

I've grown up in the world of homebrewing over the last four years and have become what I consider to be an advanced-intermediate homebrewer.

Life at the South Pole

Why on Earth would someone want to live at the South Pole? It's so desolate. White, flat, and cold in every direction you look. What is it that draws one to the ends of the Earth, to these conditions? These are questions that I could spend hours explaining, but it still would do no good. I haven't even been able to put it all together yet myself, and I have been working in Antarctica for five years.

All I can say is that I've been attracted to the polar regions since boyhood, and I was amazed that I actually made it. Most people, for lack of a better term, call me crazy. Yes, it's a crazy place to be, but it makes life a bit more interesting, and what's life without a little craziness?

Life at the Pole isn't exactly all that comfortable. Living conditions are cramped. Most rooms measure only five feet by nine feet. Each berthing area under the dome contains one bathroom for everyone, and except for your little boxy room, there is no privacy. During the summer there can be 150 men and women using the same bathroom! During the winter, however, there are only the 26 of us, 20 men and six women. It could be best described as a coed college dorm.

The station itself is pretty small. The farthest building from the dome is only three-quarters of a mile away, and there is nothing but a snow skiway in between. Every day my commute to work entails walking from my room

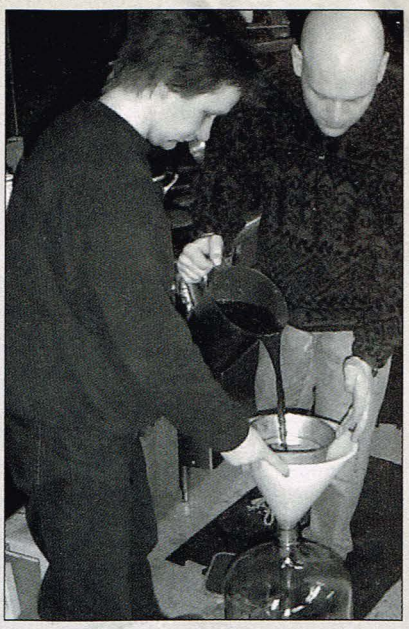


The compass tells the story. South Pole homebrewers sit atop 9,000 feet of ice and 90 percent of the world's fresh water supply.



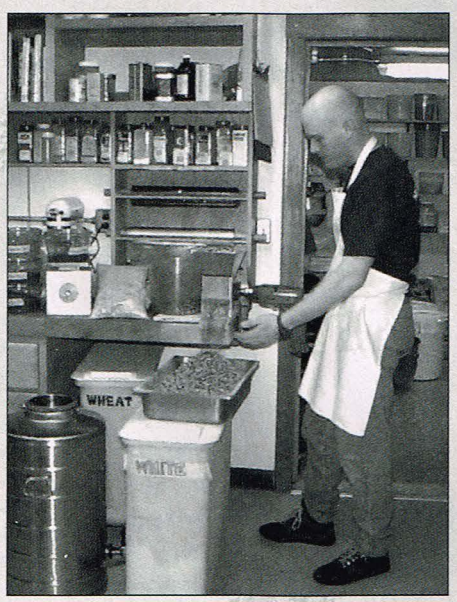
Domebrewer Jamie Lloyd (left) and author Jason Dorpinghaus .

Some equipment could be scavenged from the Dome kitchen, but the carboy had to be swiped from McMurdo, 800 miles away.



under the dome, through several non-heated arch sections, past the power plant, gym, and garage, to my office — about 300 feet in all.

My work mainly focuses on inventory and maintenance of supplies on station. This is the same type of job I did in McMurdo. It's not my chosen profession, rather only a vehicle to bring me to the ice, the place I love. Three long, cold, dark winters I have spent in Antarctica allowed me to travel around the world and across the country. It's in between contracts that I am allowed to experience my adult childhood. However, the times between contracts can be so full of activity that I have very little time to prepare for the next period on the ice.



Supplies had to be shipped through New Zealand customs. Suspicious agents cut open the grain bags, only to find...grain!

Brewing Supplies

How does one get ready for an entire year of brewing in a place where there are no homebrew shops? That's easy — overprepare!

One thing that played to my favor was e-mail. I was fortunate enough to find South Bay Homebrew Supply online so I could send in my last-minute order. They were more than helpful when filling it; it's not often you receive an order from the South Pole! Ruth and the crew happily followed all of my packing and shipping instructions for the long, rough trip, and everything made it down here without a problem.

The folks at the homebrew shop even went through the trouble of shipping my liquid yeast order out the day they received it to ensure freshness, and they packed it with insulation to keep it from arriving frozen. Thank goodness for e-mail.

During the Antarctic summer season (November through February) we receive mail by plane on a weekly basis or whenever there's room. When the mail comes in, everyone pitches in to haul it upstairs to the pool room and sort it out. As it happened, all of the supplies arrived on the same plane. A few people were disappointed when they learned that 260 of the 400 pounds of mail on the plane that day had my name on it. It was a great day.

Of course the shipment had to pass through New Zealand customs and yes, they did open the bags of grain to see what might be hiding inside. Sorry guys, just grain.

Fresh ingredients are also a must. Luckily I live on top of the world's largest block of ice, and things stay nice and fresh when stored at 60 degrees below zero.

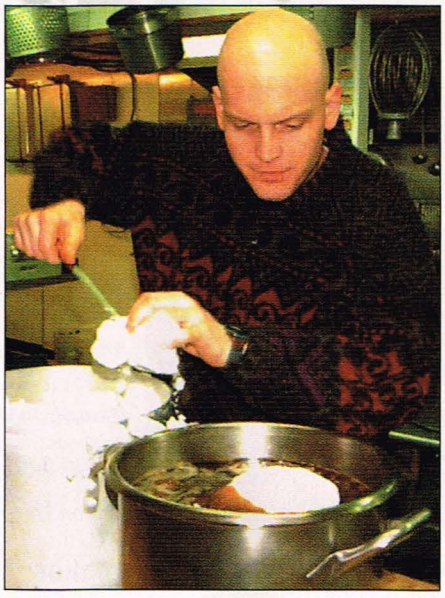
Equipment

Buying all new equipment and shipping it to the Pole can be costly, but if it's already there, why bring it? So I brought a few things such as a Glatt mill and two hydrometers with me. I waited to see just what equipment I would need to have sent to me after scoping out the growing stash. The best decision I made was to bring both of my hydrometers along, because my finishing hydrometer was broken in transit.

I was not surprised to find no glass carboys anywhere on station. Only a few roughed up plastic carboys and some buckets without sealing lids. I'm a glass man. Plastic can be hard to clean and sterilize and can retain the flavors of old batches, especially cider. I ordered one six-gallon carboy and then while on R&R in McMurdo, I located two other five-gallon carboys

Who needs a wort chiller? Cooling's no problem when you can run outside, collect a pot of fresh snow, and add it straight to the wort.





that I had used two winters before. One still had my original digital thermometer attached. I appropriated some new Tygon tubing and a couple of bottle brushes and I was in business. What a score!

I made sure to order grain in the quantities specified in the catalog to receive a few free buckets, just the thing to construct a lauter tun. A bit of scrounging produced a coffee pot spout to use on one bucket. With a trusty drill I spent two hours poking 3,500 holes in the bottom of the other. All of this I will leave as my small contribution to the DBA for future brewers.

Stainless-steel pots from the galley and a 10-gallon stainless-steel insulated water cooler provided a perfect mash tun.

What else was I missing? A digital probe-type thermometer from the power plant, a Makita drill from the carpenter shop to power my mill, and a large, plastic funnel rounded out the last bits of essential equipment.

Former Domebrewers left me with an ample supply of Grolsch-type (cage-cap) and champagne bottles, along with 1,000 caps and several soda kegs complete with a tap in the bar and a fridge cooled with outside air.

At first I was hesitant to use kegs



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here. This stemmed from my first experience with kegs in McMurdo. There we used old, discarded, and modified fire extinguishers as our primary kegging equipment. Carbon dioxide bottles were hard to come by, so natural priming was the course of the day. Here at the pole we use compressed CO_2 with a regulator, so no more cloudy or overly effervescent batches. This is better than I have at home.



Former domebrewers stocked the bar with kegs and a tap, so it's a real party when the winterover crew takes a break.

Brewing Sessions

A typical brewing session starts with me thinking: "What should I do tonight?" Before I know it I have all of my equipment out and I'm milling grain. Since the workday runs from eight a.m. to six p.m., six days a week, the brewing often runs into the wee hours of the morning. I just chill a couple bottles of Domebrew for 20 minutes outside and ease into the evening.

All of the brewing is done in the galley kitchen. The galley is one of the few gathering spaces we have to just sit and talk. I can usually count on seeing just about everyone pass through in the course of an evening either just to see what's going on or to grab a late-night snack. Most will venture back into the kitchen with their olfactory nerves engaged and say, "I thought I could smell you brewing."

I usually tell them what I'm brewing and show them the recipe. Then without fail the question comes, "When will this be ready?" It's usually the same answer, "About a month, two if I'm patient, three weeks if we're running low."

Sundays are usually my best brewing days. I can brew in the afternoon without getting in anyone's way, and I can still watch plenty of videos that night.

Problems

Brewing at the center of the world's highest, driest, and coldest continent can be interesting to say the least. There are things that I can't do here and things that I can do here that

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Haus Stout
(6 gallons, all-grain)

This is undoubtedly the favorite of this year's winterover crew.

Ingredients:

- 15th-century ice water
- 9 lbs. domestic pale ale malt
- 1 lb. roasted barley
- 0.25 lb. chocolate malt
- 0.25 lb. black patent malt
- 0.5 lb. crystal malt, 40° Lovibond
- 1-1.5 oz. Liberty hops (4.5% alpha acid), for 70 min.
- 0.5 oz. Cascade hops (3.9% alpha acid), for 20 min.
- Whitbread ale yeast

Step by Step:

I've used two different mashing techniques for this stout. First I tried overnight mashing. I was graced with a 10-gallon stainless-steel water cooler. This turned out to be the perfect overnight masher. I mashed in 3 gals. of 160° F water and the temperature dropped to 150° F. Twelve hours later the temperature had dropped to 120° F.

I've also tried infusion mashing. Mash in at 135° F for 20 minutes, raise the temperature to 145° F for 30 minutes, then raise to 155° F for 60 minutes. Mash out at 170° F for five minutes. It's a little more trouble, but I have plenty of time! Sparge with 3 gals. of 180° F water. After boiling (length differs here becuase of our altitude) I use my unconventional method of cooling the wort with fresh snow blown in from 1,000 miles from nowhere to make 6 gallons.

Because of storage problems with liquid yeast — in my case it's nearly a year old — I have had to use dried yeast. My standard for dried yeast is Whitbread ale. At the beginning of the winter, I had Wyeast German Ale 1007 liquid yeast, which gave a nice rocky head. I enjoyed it very much.

I've tried several variations on this recipe, including using 10 lbs. pale ale instead of 9 lbs. and using German Spalt hop plugs (3.4% alpha acid) instead of Cascade hops. This was a nice beer, too.

I ferment in glass for about 14 days, depending on whether I have the energy or enthusiasm to bottle it during the middle of winter. Age when consumed: 27...oh you mean the beer...uh...about three weeks after bottling. Judges' comments: "Wow," "all right," "excellent," "mmmmmm."

OG = Don't know
FG = Doesn't matter

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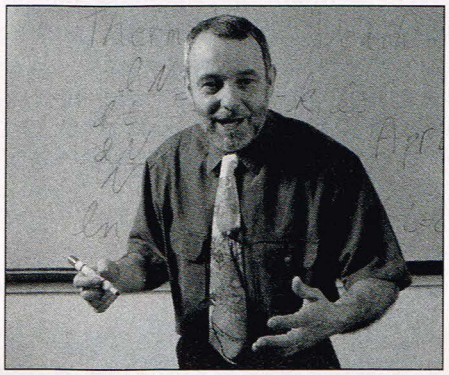
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CIRCLE 18 ON READER SERVICE CARD



After six months of darkness, the return of the sun can bring back a flagging brewing spirit.

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CIRCLE 72 ON READER SERVICE CARD

you wouldn't dream of doing at home.

Let's start with the main ingredient to every batch of beer ever made, water.

Yes, you've all heard it 1,000 times: "We use only the purest mountain spring water, blah blah blah." Well, my friends, I'm sitting on top of 90 percent of the world's fresh water supply. About 9,000 feet of ice separates me from the rock below my feet. Millions and millions of years worth of accumulated snow and ice stretching out for thousands of miles in all directions. It's a hot, thirsty man's dream.

All station water is produced by either melting surface snow or by using waste heat from the power plant generators to melt out a bulb of water 350 feet below the surface. While this water is some of the purest in the world, a tiny bit of chlorine is still added to keep the plumbing from collecting any funkies. The water I'm drinking and using for brewing has been locked in the form of ice since Columbus discovered America and maybe even longer. Having fallen as snow, it is also very soft. The closest thing back home would be using distilled water.

In McMurdo our only source of water was desalinated ocean water — highly chlorinated. Yuck. Chlorine belongs in swimming pools, not in homebrew. While I was there I also took advantage of pulling some 1,000-year-old glacial ice out of the bottom of a crevasse a few miles from town. It wasn't five gallons worth, but somehow it seemed to "make" the beer.

If there's one thing I lack, it's knowledge of water, which makes using kits or malt extract a very appealing alternative to my preferred brewing method of using all grain. I add a few things here and there to adjust the pH and the hardness, but I'm not one to even begin to explain it. Water will be the next item I try to conquer.

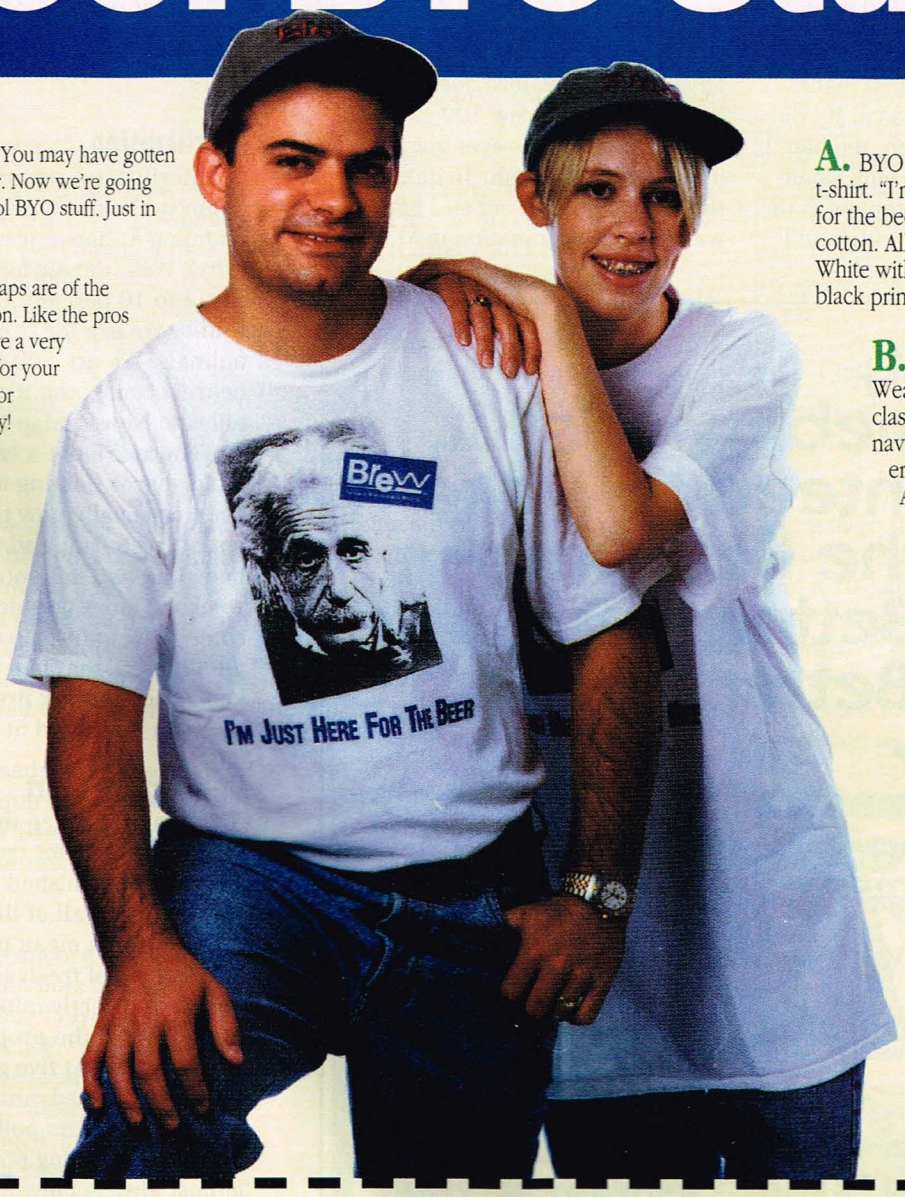
Altitude

If any of you homebrewers have gone hiking in the mountains, you will understand this point immediately. While our physical altitude is 9,300 feet above sea level, our physo altitude often reaches 11,000 feet. Not only is breathing difficult, but so is boiling water. Water boils at about 185° to 195° F here, so my wort never makes it

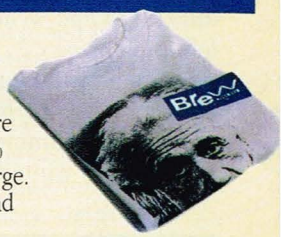
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to full temperature. While I'm not sure if this affects the actual brew, it does throw all of my decoction charts for a loop. Oh well, as they say here, "Suck up and deal, Dorp."

Supplies

As mentioned above, supplies are difficult to find. When that last plane left on February 21, that was it! If I didn't have it or if it was broken, too bad. I lost (don't ask me how) the only wooden-handled, hammer-type capper at the *beginning* of winter. I looked high and low but to no avail. It just vanished into the pit. The two lever-type cappers we had wouldn't fit the champagne bottles, so out came the hacksaw. It's not pretty, but it's functional.

Advantages

Brewing in Antarctica does have its advantages. Nowhere does it say that I can only legally brew 100 gallons a year, and nobody is ever going to know if I make a bad batch. To date I can say that I have poured out two batches. One was from contamination in McMurdo when I didn't know what sterilization was, and one was at home when I tried to make cider but in my enthusiasm to get started didn't boil the fresh apple juice purchased directly from the orchard. Some wild yeast took over, and I had five gallons of the most dreadfully sour cider ever. Those were tough times.

Sterilization

Sterilizing equipment here is not taken to the extreme to which it must be taken at home or even in McMurdo. Why? Well, the air here is extremely dry, 2 to 10 percent humidity year round. We are far from any plants or animals. We are 800 miles from the nearest coast, and it's another 1,200 miles to New Zealand.

There are not a lot of wild yeast or mold spores floating around to ruin my beer, especially now that we have run out of fresh fruit and vegetables. I've been bad and left bottles sitting for weeks without washing them and come back to find no mold growing at all. I'm sure that bad habit will be broken as soon as my first moldy bottle rears its ugly head at home.

Chilling the Wort

This is one step that I definitely suggest you *do not try at home*! After the wort has finished boiling and I have strained all of the hops out, I run outside with a clean pot and bring back a load of fresh snow. I then dump the snow directly into the wort until I've achieved the proper temperature or topped out at five gallons.

That's one advantage to living where there is no pollution. The dense, cold winds coming off the glaciers almost always blow from the same direction, so I go upwind of the power plant and skip the yellow snow. Like I said, I wouldn't recommend this at all. Unless of course you would like to winter at the South Pole.

Lagering

Recently I decided to attempt my first doppelbock. The advantage here is not only the amount of time I have to wait (I'm not going anywhere) but also the fact that we have a walk-in cooler to use for lagering. One difference is that we heat our cooler to keep it at

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CIRCLE 40 ON READER SERVICE CARD

90 Degree Smoked Abbey a.k.a. "Dorp's Surprise"
(6 gallons, all-grain)

This is for 6 gallons (I figure I have a 6-gallon carboy, so why not fill it up?)

Ingredients:
- 15th-century ice water
- 11 lbs. German Vienna malt
- 0.5 lb. Crystal malt, 40° Lovibond
- 0.5 lb. British peat smoked malt
- 2 oz. chocolate malt
- 1 oz. roasted barley
- 1-1.5 oz. Oregon Perle hops (8.2% alpha acid), for 1 hour
- 1 oz. Liberty hops (4.5% alpha acid), for 1 hour
- 1 oz. Oregon Fuggle hops (3.2% alpha acid), for 10 min.
- Wyeast Belgium Abbey liquid yeast

Step by Step:

I used the overnight mashing method for this one as well. Come to think of it, that could be dangerous when the night lasts six months.

Comments: Maybe a little too bitter. Could use less Perle and more aromatic hops at the end of the boil. Could be a bit more smoky, too. I'll just have to keep trying this recipe to get it right. Other than that I quite enjoyed it.

You might be able to tell that I'm limited to what I can use for grain, hops, and yeast. I could only bring the basics, so feel free to add your favorite aromatic hops or other ingredients. Experimentation is still my game. Fermentation: about 16 days.

OG = 1.043
FG = er...um...I can't remember.

temperature.

Because of low supplies and impatience I decided after only one month of lagering to go ahead and keg this brew. This turned out to be a good decision. It wasn't long after tapping this particular batch one Saturday night that it seemed to vanish right before my eyes.

This is one disadvantage to brewing for a large group of people. Maybe I need a couple of 10-gallon systems sent down here for next time.

Assistance

While I do the majority of the brewing here at the pole this year, I don't do it all. Jamie Lloyd, an Australian researcher working for the Center for Astrophysical Research in Antarctica (CARA), also does a small amount of brewing. This is Jamie's second winter in a row at the Pole. And you thought I was crazy.

As much as I like to brew alone, I do have a few eager volunteers here willing to help with the occasional brew. Mostly they help by washing equipment and bottling. It's funny how much more helpful they become the lower our beer supply gets.

Nearing the end of our winter, along with the sun, our enthusiasm returns. There are times, especially during the middle of the five months of total darkness, that you just don't want to be bothered with anything but passing time. Production during these slow periods drops off dramatically.

Station supplies ran out about six weeks before the end of winter and enthusiasm was waxing, so production went into high gear. I wanted to be ready; the first flight in would triple the population. What would a station opening party be without Domebrew? When the beer supplies ran out, I spent all weekend brewing batch after batch and using everything I had as fermentation vessels, including two plastic carboys and a 10-gallon stainless-steel water cooler. The new containers allowed me to brew 70 gallons to get us through the last few weeks. Oh, I think that'll do! All that is left for station opening is Domebrew and when that's gone...so am I.

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CIRCLE 63 ON READER SERVICE CARD



CIRCLE 9 ON READER SERVICE CARD

Keep Your Brew House in Peak Form

by Tom Fuller

Spend a little time taking care of your equipment and you will brew cleaner, better beer and avoid costly equipment replacements.

Your home brewery is much the same as many small craft- and microbreweries. You share the same goal with commercial breweries: to make good-tasting, clean beer. You are also using much of the same equipment. You might not have stainless-steel conical fermenters, bright tanks, or a real heat exchanger, but you make do with glass carboys, copper tubing, and Cornelius kegs.

One of the biggest differences between your home brewery and a microbrewery is how the equipment is maintained. Commercial breweries follow very strict maintenance regimens. The use of stainless steel is a big bonus for both the professional brewery and the home brewery. It lasts forever, resists staining, and is easily visually inspected. There is no reason you cannot maintain and sanitize equipment relatively the same way the big dogs do.

One of the most heinous crimes of homebrewing is the lack of post-brewing and post-fermentation cleaning.



TODD HAMMOND

Quite often the brewing or bottling session goes on into the wee hours of the morning. Equipment gets pushed aside to be dealt with in the morning. Morning turns into after work, and before you know it you are faced with dirty equipment by the time your next brewing session rolls around. After you brew, look at your equipment and ask, "Would I eat out of that?" If the answer is "no," keep on cleaning.

What, Why, and How

Hot Liquor Tank

The "hot liquor tank" refers to your mash and sparge water bucket. Chances are that this also doubles as the bottling bucket.

If you use gypsum or other water treatments in your mash water, you will notice calcium deposits left on the walls and bottom of the tank. There is no need to be concerned about this causing contamination or serious off-flavors, although you do want to work with a controlled pH and mineral content. If your tank doubles as a bottling bucket, that is even more reason to keep it clean. Occassionally cleaning with a mild acid, such as vinegar, will remove this buildup. It's the same solution many people use to clean their coffee pots.

Mash Tun

Be this a cooler, kettle, or bucket, it should also be free of calcium and other mineral deposits. All sugar residue should be cleaned out, and then the vessel should be dried to prevent any mold growth (unless you are trying to make a Guinness sour mash, but that is a different subject altogether). Any sparging mechanisms and valves should also be disassembled and cleaned. A gentle soap, such as liquid dish soap, will facilitate cleaning the mash tun.

Be sure to clean your kettle immediately after use so deposits don't have time to set. Sugars, minerals, and hop residues can be as tough as a six year old to get out of your kettle once they've settled in.



PAUL CURRERI

Kettle

During the boil, proteins and hop acids adhere to the top of the kettle to form a tenacious buildup. Also, mineral deposits accumulate over several boils. To prolong the life of your kettle and decrease the risk of off-flavors, the kettle should be kept free of these sugars, minerals, and hop residues.

This is of special importance with enamel kettles. Clean these right away to avoid sticky or stuck-on residue; you want to do a minimum of scrubbing and scraping to avoid chipping the enamel and exposing the underlying steel, which can rust. A stong cleaner, such as trisodium phosphate, should be used on the buildup, and an occasional vinegar wash will control mineral deposits.

Kettles with valves need special attention. Make sure you are using a valve with a large enough orifice to allow cleaning. Stainless-steel ball valves are best. The outside of the ball valve does not need to be stainless, yet the ball itself should be.

Racking Canes and Hoses

If you are siphoning out of your kettle you should be using a metal racking cane. Copper is best, although it gets quite hot. These can be easily cleaned and inexpensively replaced. Plastic is the best choice for racking and bottling use, because you can visibly inspect it for cleanliness. Plastic hoses are cheap. When they are dirty or cloudy, for God's sake throw them away! Plastic hoses are great for pre-boiling.

Fermenters

Fermenters should always be kept clean. They should be sanitized after the fermentation cycle and stored clean.

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Cleaning Solutions and Procedures

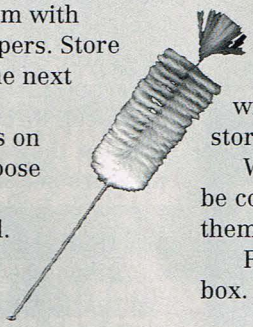
The most common cleaning and sanitizing solutions and equipment for the homebrewer are:

- Common household bleach (unscented)
- Iodophor
- TSP
- Water
- Plastic scouring pads
- White vinegar

And Don't Forget
Cleaning Tips to Keep in Mind

Clean the carboys after fermentation. Use your solution of choice to clean and fill them with bleach or iodophor and seal them with undrilled rubber stoppers. Store them this way until the next use.

When using valves on vessels, be sure to choose valves that are easily inspected and cleaned. Restaurant-supply stores usually carry very small bottle-type brushes that are useful in cleaning valves. When using plastic valves make sure you can see into them or are able to disassemble them for cleaning.



Rinse bottles and cover with cellophane or foil before storing.

When not in use, buckets should be covered in cellophane to keep them free of bugs and dust.

Ferment far away from the litter box.

Bleach

Bleach kills upon contact and is very effective at removing most grime. Use it at a ratio of one ounce per gallon. Always use it in cold water; hot water will evaporate the chlorine. Hot water, however, is a very effective way to rinse bleach. Bleach is corrosive to copper, brass, and stainless steel, so limit exposure. This is a good all-purpose cleaner. Rinse very well.

Iodophor

Iodophor is an iodine solution used for sanitizing. This is a good solution for filling fermenters and kegs for storage. Mix with cold water to get an amber color. Iodophor has a five-minute contact limit. It will stain plastic. Contrary to popular belief, iodophor should be rinsed when used on a small scale such as home use.

TSP

Trisodium phosphate is mixed at a ratio of one ounce per gallon of water.

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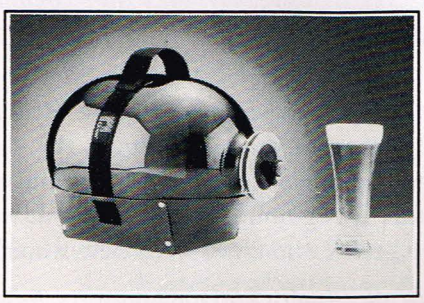
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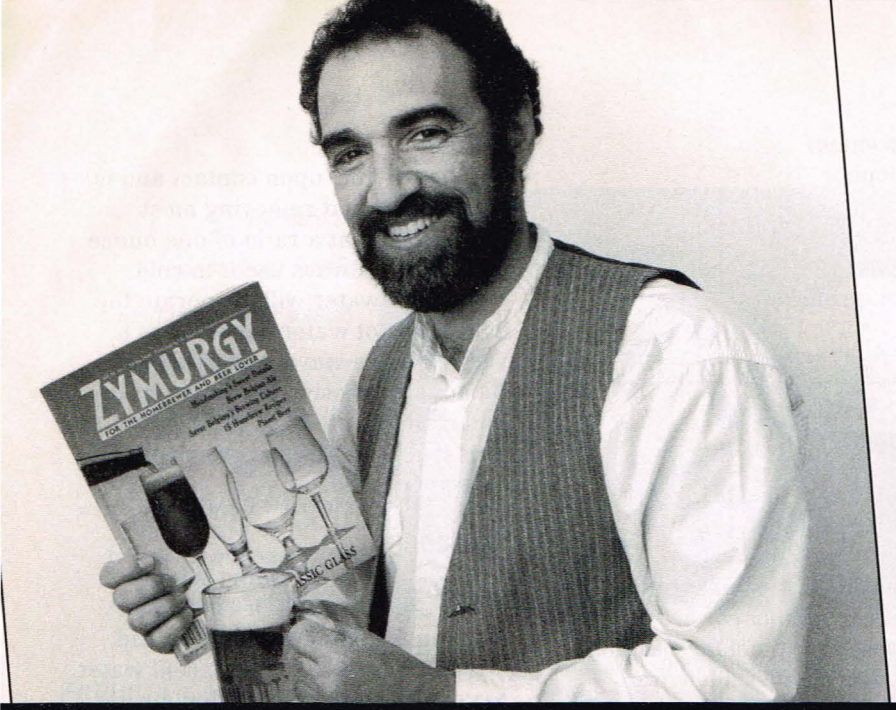
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CIRCLE 5 ON READER SERVICE CARD

This is a very effective and safe cleaner. TSP is non-corrosive and effectively removes scale. Rinse very well.

Water

Water is a little-used cleaning solution. But with a scouring pad and some water you can do a lot. Most brewers think that they need some kind of chemical to clean anything. Boiling water takes care of anything you need killed in the beer-making process. The best part is you don't have to rinse water after cleaning with it.

3M-type scouring pads

These are the plastic type, not the steel SOS-type pads. They remove scale and such from enamel and stainless steel. Be careful with these on plastics; they can scratch. The finer pads are better.

Vinegar

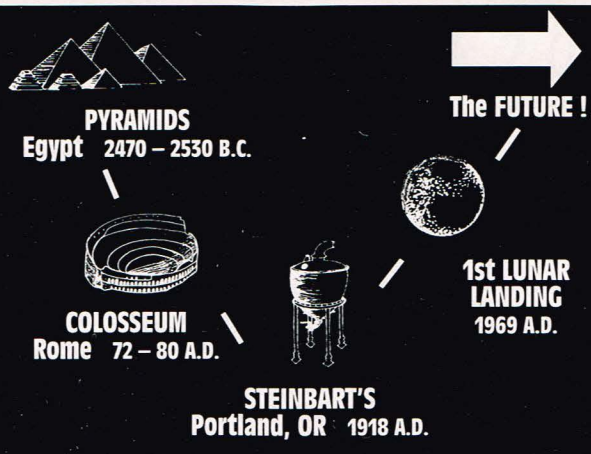
Dilute one part vinegar with two to four parts water and use the solution to remove mineral deposits from equipment.

Cleaning Regimen

When you are ready to brew, if you follow good post-brewing practices, all of your equipment should already be relatively clean. Visually inspect your hot liquor tank and mash tun. If necessary, clean them with a scouring pad

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and water, a light bleach solution, and TSP. If you use a manifold-type false bottom, rinse all of its parts and assemble it.

After the sparge and filling the kettle, rinse all the parts you just used and clean them with the solution of your choice. By the time everything is spotless again, your wort should be up to a boil.

Before chilling your wort, soak your transfer hoses in bleach or iodophor until ready for use. If you are using a counter-flow-type heat exchanger (chiller) fill your hot-liquor tank with iodophor or bleach and run about two gallons through the heat exchanger. Stop the flow of the sanitizer and let it sit one minute for bleach, five minutes for iodophor. If you use a metal racking cane to siphon the wort through the heat exchanger, rinse it off and toss it in your boil to sanitize it.

Displace the sanitizer with boiling or boiled water. Then start the transfer through the heat exchanger and allow the hot wort to push the water out of the coil. Stop the wort flow and then proceed with the transfer into the fermenter. After this transfer run about two gallons of boiling water through the heat exchanger followed by bleach or iodophor. If you use bleach, you will want to rinse the heat exchanger again. If you use iodophor, stop the flow and cap off the other end, allowing the iodophor to sit in the coil until the next time you use it.

You can find plastic caps called screw caps at home-improvement stores. These are the little caps used for nuts on children's swing sets to prevent scratching (or as mom always put it "poking your eye out"). These caps make excellent hose caps.

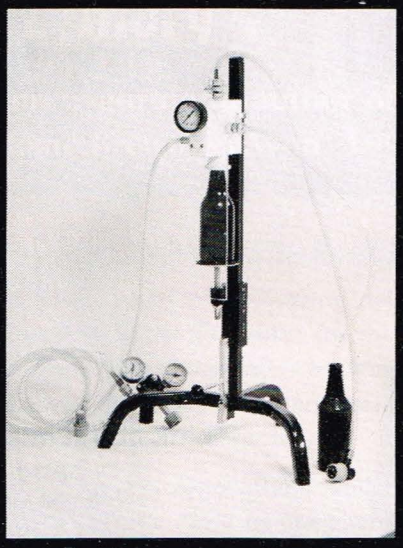
Clean the rest of your equipment with a mild cleaning solution of your choice. Be sure to dry everything.

Commercial breweries use caustic solutions daily on hoses and other equipment, particularly the heat exchanger. The caustic is generally a high-alkaline solution of sodium hydroxide. This is not recommended for home use because it is dangerous if mishandled. A good practice would be to clean your heat exchanger every two to three brews with an acid solution to remove calcium and lime buildup. ■

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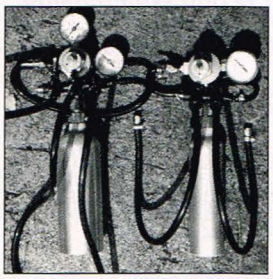
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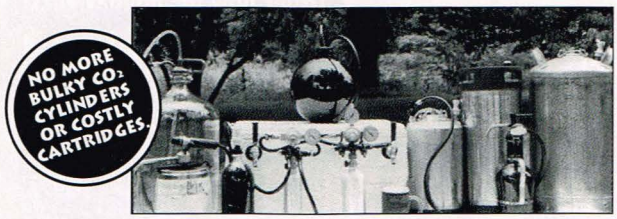
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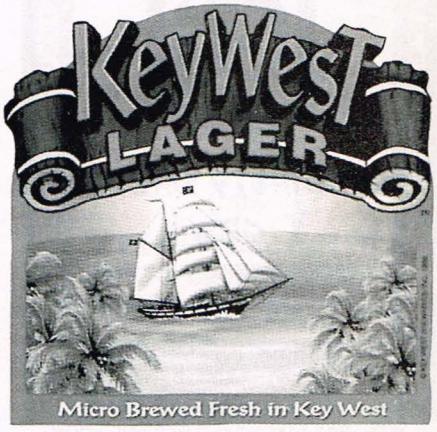
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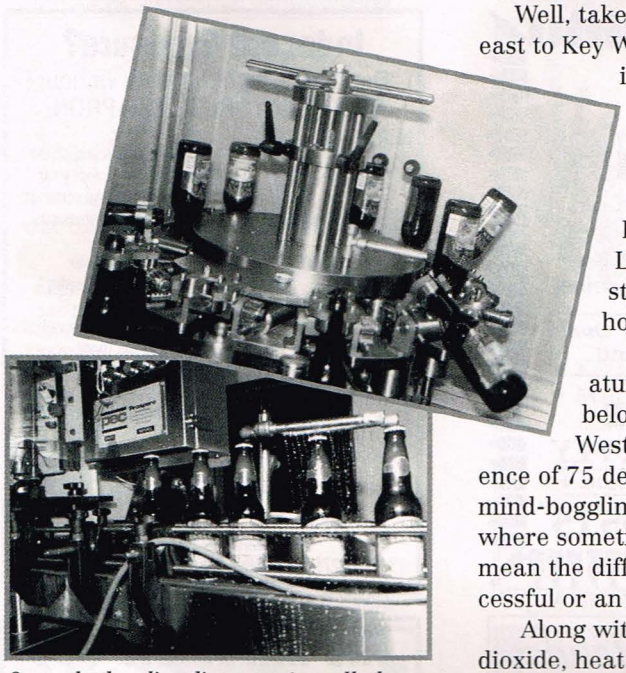
Brewing on a Tropical Island

by Steve Johnson



Remember Raven's Ridge Brewing, the microbrewery in Fairbanks, Alaska, featured in the May '96 BYO? Further north than any other brewery in America, Raven's Ridge brews beer even when the temperature outside dips to 40° below zero. Lagering is never a problem, but keeping the beer warm enough for a vigorous fermentation is.

Well, take a trip 4,300 miles southeast to Key West Overseas Brewing Co. in Key West, Fla. Here, on a small island less than 100 miles from the Tropic of Cancer, company president Bill Bohmfalk, brewer John Lambert, and their staff struggle to keep beer sales hotter than the beer itself.



Once the bottling line was installed, Key West Overseas Brewing Co. increased production by 150 barrels a month.

The average high temperature in Fairbanks is 4° below zero in January. In Key West it is 71° F. That's a difference of 75 degrees, which represents a mind-boggling effect on fermentation, where sometimes a degree or two can mean the difference between a successful or an unsuccessful brew.

Along with alcohol and carbon dioxide, heat is an important by-product of fermentation. Although insignificant in a five-gallon batch, the heat generated when you ferment hundreds of gallons at a time can be enough to ruin beer.

So Key West Overseas, surrounded by the Atlantic Ocean and the Gulf of Mexico and housed in what might be the island's only industrial building, is an unlikely site for a brewery. And that's exactly why its founders sought the location.

"Micros hadn't really taken off in the South, and (the owners) thought it would be the perfect opportunity to tap into an uncrowded market," says Bohmfalk.

But the folks at Key West Overseas learned firsthand the importance of climate. Brewer Lambert says the basic problem when they opened in January 1995 was insufficient cooling capacity. The strike-out temperature (the tem-



Bob Lakin, bottling operations manager, oversees the new bottling line.

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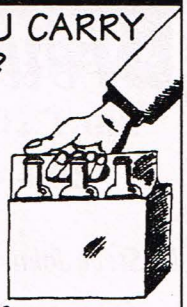
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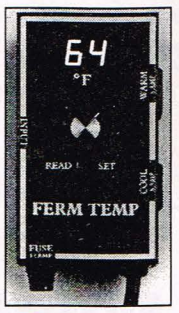
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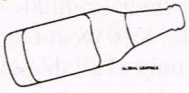
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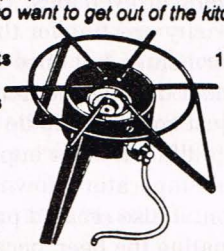
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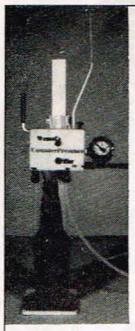
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perature at which the wort goes into the fermenter) was 81° to 82° F, which was far too warm for a brewery trying to make lagers, or even ales. The chilling capacity was fine for their 50-barrel fermenter, but once they got a second and a third fermenter going, the chiller just couldn't handle the load. This made it difficult if not impossible to bring the temperature down to stop fermentation. It also created problems with carbonating the beer, because they could not bring the temperature of the beer low enough in the bright tank to absorb the carbon dioxide.

At first, they weren't sure what the problem was. A consultant from California was brought in. They asked him to be brutally honest about the beer and the process. His suggested solutions were not inexpensive. They needed to increase cooling capacity, on which they were able to save money by using a home-built system. With the help of a welder, Lambert rigged up three 500-gallon propane tanks for additional glycol solution. Other changes included getting rid of used kegs in favor of new ones that were designed to make cleaning and handling easier.

◆

"At the end of the day, I can sit back and say, 'Damn it, this is a good beer.'"

John Lambert, Brewer

◆

Brewing seems to be back on track now and Lambert says, "At the end of the day, I can sit back and say, 'Damn it, this is good beer.'"

Improved quality also means that Bohmfalk is beginning to push distribution. "I didn't try to expand sales until we got everything completely under control on the brewing side," he says. Until the fall of 1996 their original brand, Key West Lager, was only available in kegs in the Keys and at one account in South Beach (Dade County).



During the first year the brewery produced 600 barrels. Recently the brewery introduced Key West Sunset Ale, increased its exposure in the Miami area, and began bottling its beers. With its new bottling line it has increased production an additional 150 barrels a month and is expected to brew at capacity, 300 barrels a month, by next year.

Plans are also in motion to move to a larger building during 1997. The current location is a few miles from a populated tourist center, but Bohmfalk says a larger building will facilitate more equipment, tours, and tasting.

The lager is light and highly carbonated, clean and crisp. The new ale is full-bodied and nicely hopped.

Key West Overseas uses a combination of domestic and imported hops to make its beers. The water, which accounts for about 94 percent of beer by volume, is also imported. People wonder why anyone would build a brewery on a small island with a limited supply of fresh water. Bohmfalk says the water in Key West is piped from Florida City on the mainland, 100 miles away. It is expensive, as is everything on an island, but not outrageous. And with 4 million tourists visiting the island each year, Key West Overseas' target audience is obvious.

Bohmfalk says he wasn't part of the business from the very beginning but became involved in April 1995, soon after founders Joseph Lambert and Ken Sandham installed the brewing equipment. By June Bohmfalk had become company president.

Bohmfalk says he moved to Key West in 1990 and has worked as a stockbroker. He began following the

progress of Abita Brewing of Louisiana in the 1980s and found that he really liked the fresh taste of microbrewed beer. Bohmfalk believes the microbrewery revolution is a tremendous economic opportunity, similar to what happened in the wine industry in the 1960s and '70s. He thinks people will become aware of the new and fresh flavors that beer has to offer.

John Lambert became involved because his brother was a co-founder of the brewery. John Lambert was a very successful property manager in Sydney, Australia, where he homebrewed on the side. He initially invested in the brewery, one thing led to another, and he ended up as the brewer.

He says the most important principle he learned in the real estate business, location, location, location, became sanitation, sanitation, sanitation in the brewing business. As far as applying homebrewing experience to commercial brewing, Lambert says, "The process is the same, and the principles of sanitation and chemistry are the same, also. There are important differences, though. Besides the greater volume, the commercial equipment is more sophisticated, the skill level of the brewer is greater, and commercial brewing is more a science than an art."

He thinks the biggest hindrance to homebrewers opening their own commercial breweries is the capital investment required. To date the investment in Key West Overseas Brewing is about $600,000.

Despite the constant worry of getting a new enterprise off the ground and the substantial reduction in income he has experienced as a brewer versus being in real estate, Lambert says this is the most enjoyable work he has had in his life. He finds creating a well-made beer to be very satisfying and has developed a great sense of pride in his work.

Another thing he likes very much is the free exchange of information among the brewers on the island (there are also two brewpubs in downtown Key West). He also received a lot of help and advice on the new bottling operation from Nat Collins of Woodstock Brewing in upstate New York. Lambert says the sense of fraternity among brewers is very refreshing.

Lambert is brewing on a system made by Criveller of Lewiston, N.Y., which features a 25-barrel brewhouse, three 50-barrel fermenters, a bright beer tank, a cold liquor tank, and a hot liquor tank.

On your next vacation to the Florida Keys, look for Key West Lager and Key West Sunset Ale. They are available in most good restaurants, bars, and package stores in kegs and bottles. ■

Steve Johnson lives in Clemson, S.C., and is the 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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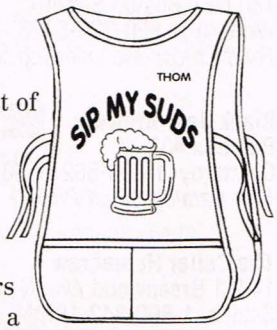
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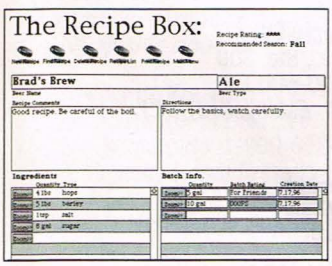
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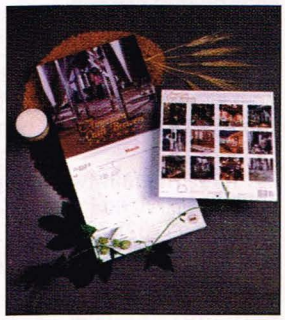
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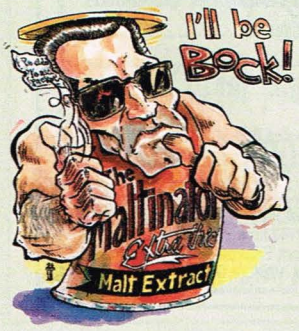
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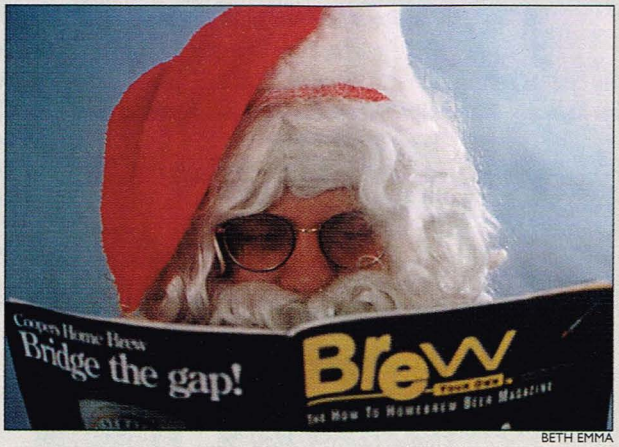
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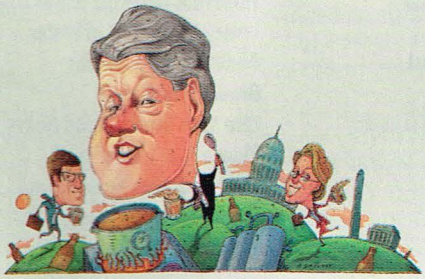
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Put to the Test

by Jeff Boogren

The saying goes, "You're your own worst critic," and in the world of homebrewing that's definitely the case. It's not often that the same friends you used to drink nickel taps with are going to be honest about your creation. In fact, with the raves you've gotten, you might even wonder if just about any brew wouldn't taste good to them. So how do you know if your beer really matches up?

After nearly two years of homebrewing tasty batches, I decided to put my beer (and ego) to the test. I held a beer-tasting party.

Set for mid-October when my partial-grain, Vienna-style brew would be in its prime, this was to be a Battle of the Oktoberfests. I wanted variety, so I chose as my contenders the season's offerings from Hacker-Pschorr, Spaten, Schell, Samuel Adams, and Paulaner. I was going to see how my beer compared with some of the biggies.

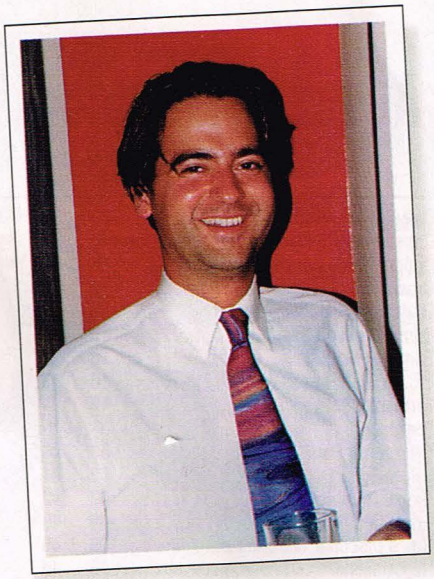
The party itself wasn't hard to pull together; it is easy to get friends to come over for free beer. There were 10 coed participants. Nearly all were from "Middleton School of Garten Brau," a reference to Capitol Brewing in Middleton, Wis., where my University of Wisconsin fellow alumni used to hang out. The brewery's flagship beer was Garten Brau.

At the party I gave my friends a crash course in judging beers, being sure to cover appearance, color, head retention, aroma, taste, hop/malt balance, aftertaste, and mouth feel. After I fielded a few questions, the group was ready. I couldn't tell if they were truly enjoying their role as connoisseurs for a day or just thirsty.

Next, I handed out their scoring cards, which I made using the 20-point scale in Charlie Papazian's *The New Complete Joy of Home Brewing*.

So that no detail would be left out, I placed pretzels and soda crackers on the table. Then, with each judge armed with a scoring card, a pen, and an understanding of the finer characteristics of beer, we began.

I disappeared into the other room to pour the first round, returning with a tray of glasses an inch full of beer. Proud of my presentation, I passed the glasses around and watched as everyone examined the reddish-orange liquid, holding the glass to the light, turning it slightly one way and then the other, murmuring a little, sniffing and sipping it and swirling the liquid across their tongues. They were nodding and scribbling numbers on their cards. I was pleased. They were actually judging!



Trying to get an honest hombrew review from friends drives Jeff Boogren to extreme measures.

"Next," one of them said. So I collected all the glasses and delivered round two. Of course, I was the only one who knew which beer they were drinking. To them each beer was a number. And soon enough, it was time for beer number three.

I poured this one with great care and marched it out to my friends. Without missing a beat, the entire group shouted and pointed "ah haaa! That one's yours!" It turns out the batch I had entered had so much sediment in it that what I was carrying on my tray were 10 little glasses of foam-topped sludge. It doesn't get any more obvious than that. I was so confident from the success of my previous brews I hadn't even opened a bottle of this one yet. So much for anonymity. And honesty. The fruits of my labor were reduced to the likes of a septic tank.

Brave as they were, my friends continued to judge, putting my beer to the same test as all the others. There were even some "oohs" and "mmmms," as well as a "not bad once you get past the floaties," and "Look out for the Loch Ness Monster!" I didn't expect to get high marks on appearance, but not a single glass came back unfinished.

We kept going, from beer four through beer six, until all had been critiqued. It was now time to tally up the scores. I won't tell you which beer won (oh, okay, it was Samuel Adams), but I will tell you that once all the scores were added, mine averaged a 12.1, which placed it in the "good" category with all but the winning entry, which was a 14.5, just approaching the "very good" mark. Not a bad score, I thought, not bad at all. And I was proud to be in the ranks of some of the world's most renowned Oktoberfests.

I may never know if my friends were being nice or if my Oktoberfest really was good. Maybe for this group, any beer is good. I do know that the raves keep coming, and the next beer-tasting party is coming up soon. This time, I'll leave out the sludge factor. ■

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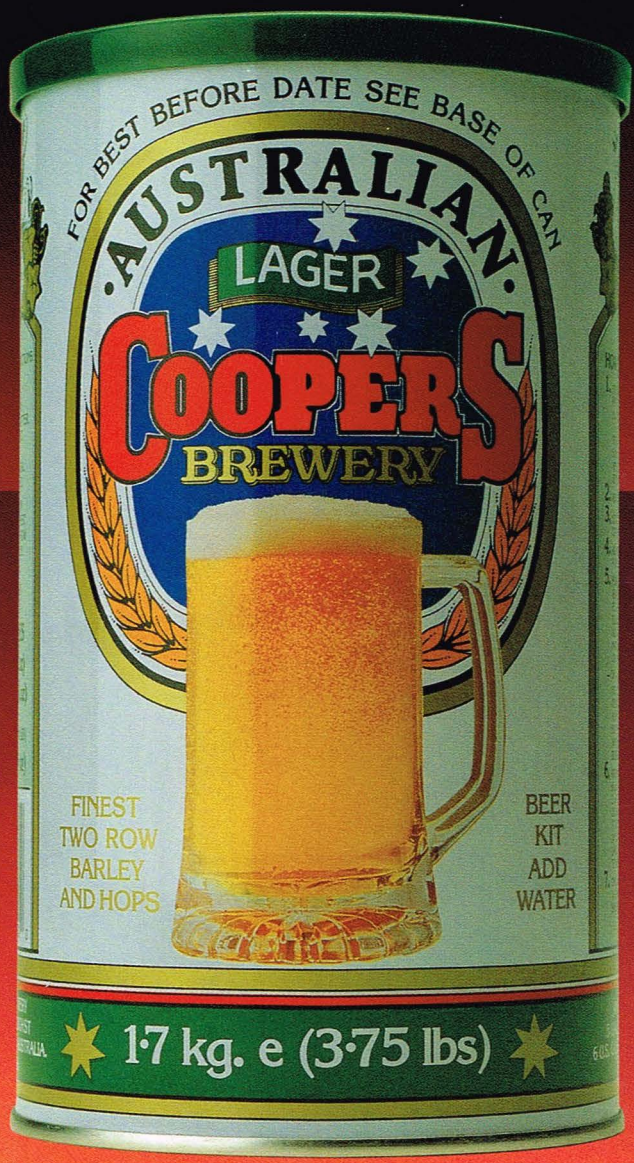
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