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THE HOW-TO HOMEBREW BEER MAGAZINE

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Magazine



# 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

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even by Sean's

Sean belongs to that

brewing purists -

commercial brews and

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Sean would never cut

corners. So what has Sean created? A totally unique, bag-in-a-box packaged

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boiled in our 1000 gallon

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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

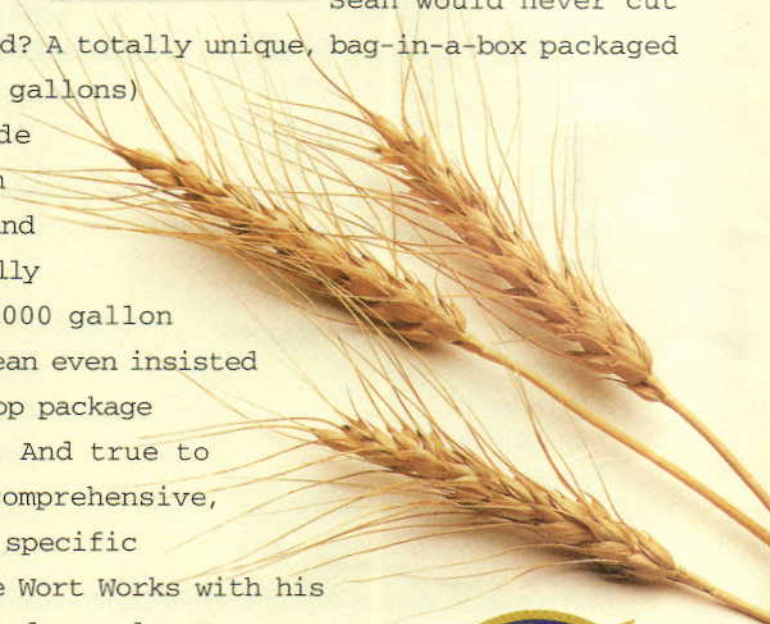
fellow homebrewers in mind, but he also made sure

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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CIRCLE 9 ON READER SERVICE CARD

## FEATURES

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From choosing the right glass for the style to creating a distinctive label, there are many tricks you can use to present your beer so that people will appreciate it even before they taste it.
- 32 Label Contest Winners**  
Magnifying glasses, pirate ships, Gen X, and sitting chickens. Check out the best from among 1,204 entries in the second annual label contest.
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If you are a dyed-in-the-wool English ale fanatic, you can naturally condition your beer in the keg and drink a pretty darn reasonable facsimile of the real deal.
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For less than \$50 you can build a hand pump to pull your own homemade real ale.
- 53 Troubleshooting a Stuck Sparge** *Alex Fodor*  
When the flow of the sweet wort slows to a trickle and the boil is pushed later and later into the day, you are left high and dry with a stuck sparge and an empty keg. Fortunately, steps can be taken to avoid this fate.



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Brewing beer in a horse stable at Weyerbacher Brewing Co.



## Label Winners, Too

Sometimes pictures don't do a label justice. Thomas Holcomb of Corunna, Mich., sent a bright orange label that read, "Police Dept. Warning: This beer is considered abandoned and may be consumed if it is not removed within 48 hours." Stan Singer of Simi, Calif., created a label with a letter to Dear Abby about a husband who "when he is not washing bottles or sterilizing equipment, is either talking about homebrew or reading about it,

Frohrip, Moose Lake, Minn. "If you think these are bad, you should have seen last year's!"

Sure Winner Award: Jerry Rossman, Cincinnati. "Should any particular label (of mine) win, I would be more than happy...to send you a sample or two for your evaluation." Congratulations, Jerry. We'll take two Friendly Fraulein Oktoberfests.

Clear Mountain Spring Award: Kirk Ramsay, Bradley, Maine, for the advisory "This product was brewed using only the finest swamp water and dirty pots." From him we don't need beer.

Best First-Brew Story: Will Morgan and Wayne Butts, Jackson, Miss., for Golden Kangaroo Ale. "It was bitter, had too much of a hops taste, and cost way too much. In short...we loved it!"

Wish We Didn't Know Award: Todd Williams, Seattle, describing the photo on his label, "Yes, that's a real pig head on the snowman."

Modern Technology Award: Chris Brosco, East Providence, R.I. "The secret is well guarded within the walls of the brewery's basement. There, between the Maytag washer and dryer lies the plastic pail..."

Favorite Brewery Name Award: Mark Hair, Pennellville, N.Y., for "Dog of the Hair Homebrew."

Our Best Friends Award: Tom and Jerry Sadowski, Crete, Ill. who sent six bottles of delicious beer, all different. They arrived after the judging ended. Otherwise you'd likely be reading about them on page 32. Hey, did you notice that this year's winner and last year's winner both sent their labels attached to full bottles? Just a coincidence...

not to mention drinking a few..." Signed "All Bottled Up in Simi."

Here are a few other Editor's Pen winners, chosen among 1,204 entries for reasons other than aesthetic value.

Contract Beer Award: Ken Futterlieb, Sussex, Wis., for "The manufacturer is not responsible for pregnancy, divorce, civil commotion, adultery, or other personal stress caused by the use of this product. No other warranties expressed or implied."

Stop the Wedding Award: David Rosenthal, Lawrenceville, N.J., for depicting his betrothed as a witch behind a kettle. "Needless to say, I had a not so happy fiancé but one great beer!"

Thanks for the Warning Award: Duane Bavlnka, Waukesha, Wis., for "Any floating objects are just your imagination."

Return to Sender Award: John Marioni, Bothell, Wash., for his "Manufacturer's Warning" that consumption of alcoholic beverages may cause "re-acquaintance with previous meals."

Tell It Like It Is Award: Curt



# Brew

YOUR OWN

THE HOW-TO HOMEBREW BEER MAGAZINE

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*Craig Bystrynski*

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CIRCLE 23 ON READER SERVICE CARD

RD BYO

## More Couples Who Brew

### Ron and Sharon Montefusco Dothan, Ala.

Since we began brewing together, we've gone as far as changing our retirement plans to include becoming certified beer judges and traveling to breweries. Our shared goals include meeting Michael Jackson and having him evaluate one of our brews.

Sharon doesn't care for adjuncts, but I have been using rice for some time now, and Sharon works on various fruit beers. We still, however, brew everything together. When one of us is working on a more personal taste, the other usually tries to be as insulting as possible in a vain attempt to dissuade the other. This doesn't work, but it makes brewing a little more interesting.

We have developed specific tasks that make the process smooth and predictable. We formulate the recipes together and set up the equipment. Sharon weighs the grain while I scoop. She feeds the mill while I operate the

power drill. The division of labor continues into the mash in which Sharon adjusts water temperature and I mash in. I usually take on the more scientific aspects, such as temperature adjustment and sanitation, because my background is as a pharmacist. Sharon has a better head for procedures and task sequence and keeps us straight. I determine end of the mash and Sharon keeps track of the steps and time.

To aerate the wort we lay a carboy on its side and roll it back and forth to each other across the kitchen. One can tell how we're getting along that day by observing the force with which the carboy is passed between us.

We have certain habits that, though unspoken, are very much a part of the beer-making process. Tom Petty's compact disc "Wildflowers" must be playing during the boil; it's 62 minutes long and times the process for us. We know when certain songs are playing what hop additions to make.



Ron and Sharon Montefusco plan to become certified beer judges.

Pink Floyd is usually played during the mash to set the proper atmosphere for the enzymes and the brewers. The brewing process and our beers truly reflect the sum of our 22 years of loving each other. Nothing else in our lives is as much a joint effort, except possibly our children.

### Barbara and Robin Noble Tukwila, Wash.

We've been a couple for 24 years, married and everything! We've been extract homebrewing since February 1994. We are on the verge of bottling our 18th batch of yummy homebrew, Maritime Nightwatch dark ale, or as the pubs call it, porter.

In the Noble Brewing Kitchen it's very much a team project. We brew at the stove, of course (we live in an apartment). I stir the brew while Robin adds the malt extract and hops. It's a joint effort watching, stirring, and keeping an eye out for boilovers. Come bottling day I sterilize the equipment and bottles, we both fill the bottles, and Robin caps them.

We log recipes and comments in a book. Then we name the beers. We have an Accidental Stout (we were trying for a porter), A Lotta Amber, Robin's Red Best Red Ale, Honey Bee Lemon Ale, and this newest

batch will be named Birthday Bash Porter in honor of us both turning 50 years old.

What's unusual about our brewing together is that I don't even drink beer.

I just love the smell of boiling wort. I think it smells (don't laugh like Robin does) like green beans cooking. I don't really care much for the taste. However, I have sampled every beer Robin has consumed all over the world in the last 24 years. I've probably drunk more from these samples than some people have consumed in a lifetime. I can tell hoppy beers from malty ones and can handle my own when we talk to brewers.



The Nobles brewed their most recent batch, Birthday Bash, in honor of their 50th birthdays.



**Nancy Kietrich and Russell Rybicki Danville, Ill.**

We made our first batch in August 1995. It turned out great. Since then we have made several batches that were excellent; others were okay, and still others were dumped upon opening.

I am a caseworker/educator and help parents with low incomes to raise

toddlers. Russ works as a licensed clinical professional counselor serving the mental health needs of our community.

In the picture we are working on our "wedding brew." We plan on bottling this beer in larger wine bottles, designing our own labels, and distributing it for the toast at our wedding reception in August of this year, in lieu of champagne. We are hoping that "the couple who brews together stays together."

**Jason and Jennifer Peacock Lebanon, Conn.**

My wife and I are *not* superstitious. We simply believe in bringing all the gargoyles in our house to the kitchen during brewing to help scare off the wort demons that lurk in every homebrewers domain. There is no way that our beer will be cheesy or chlorophenolic, metallic or musty, soapy or sour



*Jason and Jennifer use gargoyles to keep the brewing demons away.*

with our stone guardians watching closely.

This proven method has helped Gray Dog Brewing (our family) achieve near perfection with such recipes as Gargoyle Stout (shown boiling) and Jenn's Magical Elixir (in the racking bucket).

We have been brewing for four years and used to have an occasional spoiled batch or what we call "not quite ready for company brew," but not anymore. Did I just jinx us? ■



*Nancy and Russell plan to offer homebrew at their wedding.*

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- 3/8 tsp Chalk
- 1/8 tsp Calcium Chloride
- 3/4 oz Northern Brewer Hop Pellets (60 min) 20.7 IBU
- 3/4 oz Northern Brewer Hop Pellets (30 min) 7.3 IBU
- 1/2 oz Northern Brewer Hop Pellets (5 min) 1.2 IBU
- 3/4 oz Northern Brewer Hops (in fermentor) 3.9 IBU
- 1 pint Wyeast #1968 Ale Yeast Starter
- OG: 1051, IBU: 33.1

Recipes created by:

*Byron Burch*

Byron Burch is a respected authority on beer, wine & meadmaking & author of 'Brewing Quality Beers' available from all good Homebrew retailers.

**'ST. SERAPHIM'S' PORTER (5 GALLONS)**

A rich, strong Porter with a complex flavor profile & satisfying mouth feel

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- 3/4lb Dark Crystal Malt (Caramel 40)
- 3/4lb Black Roast Barley
- 4oz 100% Dextrin Powder
- 1/2 tsp Gypsum (omit if using hard water)
- 3/4 tsp Calcium Carbonate
- 1/4 tsp Calcium Chloride
- 1/2 oz Columbus Hop Pellets (60 min) 26 IBU
- 1/4 oz Northern Brewer Hop Pellets (60 min) 7.4 IBU
- 1/2 oz Williamette or Fuggles Hop Pellets (5 min) 0.7 IBU
- 1 pint Wyeast #1056 Ale Yeast Starter
- OG: 1052, IBU: 34.1

Gravities are provided for guide only.



**RECIPES #5**

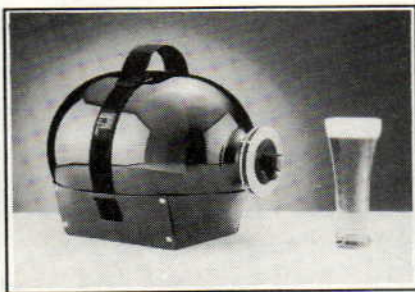
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## More Microwave

Dear Brew Your Own,  
I came up with what I thought was the greatest idea since the invention of the wheel. Then my bubble was burst when I read Sal Emma's story, "Radar Range Beer" (February '97). Who would have thought that two people would come up with basically the same goofy idea?

My gadget has a slightly different twist. Our Amana Radar Range gave out on us awhile back (stopped heating), but because I can't stand to throw things away I stashed it in the basement. After all, it cost about \$600 (back in 1982).

Then one day it struck me that even though it didn't heat, the display unit might still be usable. I took it apart and after disconnecting the high-voltage parts and bypassing a couple of safety switches, I plugged it in and lo and behold, the clock lit up and worked.

The temperature probe also still worked. After adjusting the cabinet and extending the probe to fit into my brewpot a couple of feet away, I now have a nice temperature control and timer. No more scalding my hands trying to stick a thermometer in the brewpot or trying to keep the steam off the dial until I get a reading. I thought about adding a relay and hooking it up to an electric range unit and controlling the heat, but because I heat with natural gas I've decided to pass on that. With this unit I can set the temperature I want to reach and the beeper tells me when I've reached it. It also tells me when I have reached the end of the boil.

*George Smith  
Yankton, S.D.*

## Keg Tip

Dear BYO,  
I was reading about someone whose keg had gone bad because it wasn't sealed properly. I have a tip on how to get a keg to seal. Turn it upside down. The weight of the wort will put enough pressure on the keg to seal it.

*William Woodward  
Alton, Ill.*



## Dear Carl

Dear BYO,  
I am a two-year subscriber to BYO, but I do not know a thing about brewing beer, nor do I ever intend to homebrew. If you are wondering why I am a subscriber, it is because my son Carl is the publisher of this magazine.

I would like to make my contribution to BYO. In my opinion an appetizer would be a good accompaniment to homebrewed beer. My favorite recipe is as follows.

## Hot Clam Dip

### Ingredients:

- 2 6.5-oz. cans chopped clams and juice
- 2 tbsp. lemon juice
- 1 tbsp. oregano
- 3 cloves of chopped garlic
- 1 tbsp. minced onion
- 2 tbsp. of parsley flakes
- 0.25 lb. melted butter or margarine
- 3/4 cup flavored bread crumbs
- Shredded mozzarella cheese (enough to cover top)



*Thanks, Mom.*

## Step by Step:

Simmer clams and lemon juice for 10 minutes. In a pie-shaped pan combine ingredients. Top with cheese. Bake at 350° F for 15 minutes. Serve with crackers or toasted pita bread. No sparging, carbonating, or conditioning required.

*Mom  
Boca Raton, Fla.*

## Correction

If your spent-grain bread came out a bit chewy (or as hard as last year's fruit cake), we take the blame. The recipe for Basic Spent-Grain Bread ("Great Bread from Spent Grains," April BYO) should have included six to seven cups of flour.

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CIRCLE 43 ON READER SERVICE CARD

## Brevity and the Soul of Wit

by Scott R. Russell

**M**y fascination with Belgian beer styles takes me to some interesting places and into some interesting situations. A recent beer tasting I attended even led to a challenge. The conversation went something like this:

"What's this supposed to be?"

"The label says White Beer."

"Oh, so it's a wit."

"Is that always the same thing?"

"Good question. Hmm, very pale in color, medium body, high carbonation level, cloudy and yeasty aroma, spicy nose. Seems to be a wit. You got the recipe?"

"Yup. Here. Hmm, no wheat in it. No spices either. Looks more like it's

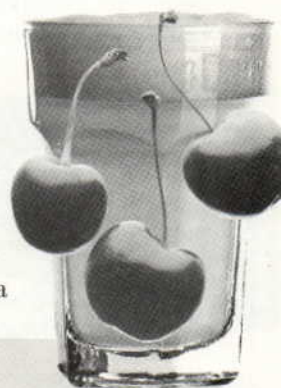
an infected California common beer."

We dug out a couple of reference books to check out some classic witbier recipes. Malted barley, malted and unmalted wheat, sometimes oats, often spiced with coriander and orange peel. Someone (might have been me, I suppose) wondered aloud what you'd have to call it if you used other spices but kept the basic recipe intact. Someone else pointed out that several of the recipes we were looking at had ginger, black pepper, sweet gale, and other spices in them, so the spices didn't seem to matter. So someone (me again, probably) had the brilliant idea: change

the orange peel to some other fruit flavor. Hmm, what would go with the acidity and yeastiness and spiced nose? There were four of us at the table, and in true musketeer fashion we pledged to try something different. We'd meet again in six months with variations on a witbier to compare.

The challenge was set.

Six months later, at that same table, we set about to compare our results. The first was a banana-flavored witbier. Wondrous banana



### Cherry Witbier (5 gallons, extract and specialty grain)

Ferment at 65° F for seven to 10 days, then rack onto cherries in your secondary fermenter. Condition on fruit 10 to 14 days, rack to another fermenter to clarify a little (three or four days), then bottle, priming with corn sugar. Age four to six weeks in a cool corner (50° to 55° F).

OG = 1.043

#### Alternatives and Notes:

All-grain brewers should mash 3.5 lbs. pale malt, 3.5 lbs. wheat malt, 0.5 lb. cara-pils, and 4 oz. each flaked wheat and flaked oats, in 11 qts. of water at 151° to 153° F for 90 minutes. Sparge with 17 qts. at 169° F. Follow the recipe, except boil long enough to reduce to 5.25 gals.

**Yeast:** This is a brew that requires a special yeast. The Wyeast culture 3944 is ideal, and I also like to try to use recultured "classic" yeasts, such as Hoegaarden and Blanche de Bruges, whenever possible. I don't recommend using dry yeast.

**Fruit:** Naturally, the whole idea

here is that you can tailor any recipe to your own tastes, so please don't feel limited to cherries. Raspberries, strawberries, mangos, peaches, anything you like might work well.

The method I've outlined here and elsewhere for using fresh fruit is the best for my brewing system. Other possibilities include steeping the fruit in the cooling wort for 15 minutes or so and then putting the fruit (in a mesh bag) into the primary; adding fruit juice or flavoring essence to the secondary; and adding fruit essence with priming sugar, or a fruit-flavored liqueur instead of priming sugar, when you bottle.

**Spices:** The "original" witbiers have a combination of fruit (bitter orange) and spices, usually coriander. My recipe above does not call for spices, but it could. What spices go well with cherries? They'd probably need to be of the pungent/peppery variety, such as cardamom, black pepper, or grains of paradise. Try what you like.

#### Ingredients:

- 1/3 lb. flaked wheat
- 1/3 lb. flaked barley
- 1/3 lb. flaked oats
- 0.5 lb. cara-pils
- 3 lbs. unhopped weizen extract syrup (about half wheat, half barley)
- 2 lbs. unhopped extra-light dry malt extract
- 1 oz. Saaz hop pellets (4% alpha acid), 0.5 oz. for 45 min., 0.5 oz. for 15 min.
- Belgian witbier yeast culture (such as Wyeast 3944)
- 2 lbs. sweet cherries
- 7/8 cup corn sugar for priming

#### Step by Step:

In 3 gals. cold water, steep wheat, barley, oats, and cara-pils. Raise gradually to about 170° F and remove grains. Add extracts to kettle. Bring to a boil, add 0.5 oz. hops. Boil 30 minutes, add 0.5 oz. hops, boil 15 more minutes. Remove from heat and cool. Top off in primary fermenter to 5.25 gals. and, when cooled to 70° F or so, pitch yeast.

esters, like a Bavarian weizen, but with some noble-hop aroma and a little diacetyl, and a rich banana-fruity smooth flavor. A bit too full bodied for the style, but a well-made beer.

Bottle number two yielded a hazy, hyper-carbonated amber-to-reddish beer from which cinnamon and cider aromas jumped out like Tiggers on springs. Too dark, too carbonated, and too sweet for the category, but wow, what a nice apple-pie aroma.

Entry number three was a bit of a cheat. The brewer, pleading a brain freeze, had merely used lemon peel instead of orange. It was different enough but disappointing because it wasn't radical. The same bitter citrusy

nose and astringency in the flavor were there as in the classics (we prepared for this tasting by sampling Celis, Hoegaarden, and Blanche de Chambly) but nothing new enough to make us bow to the brewer. Bottle number four, mine, was all that was left.

I passed the bottle to the guy to my right to open and pour. He murmured an "oh my" as he got the first hint of my aromatic surprise and poured out four samples of a relatively foamy and opalescent pink brew. Medium bodied and tart, slightly bitter and faintly buttery, shimmery, and estery...and a perfect balance between the grainy wheat flavors, yeast profile, and cherries. Sweet cherries, pounds of them, had gone into the secondary. And oh how they had changed the aroma and flavor of the beer without hiding the fact that this was a Belgian witbier. My companions stood and applauded, raising their glasses and acknowledging my brewing superiority.

And then I woke up. Fortunately, the taste and aroma of that beer

stayed with me long enough to come up with this recipe, which really did (in my humble opinion) come out as well as it had in the dream.

## Reader Recipes

### Smash-o-Rama (Munich Dunkel) (5.25 gallons, extract and grain)

This is a recipe I brewed for the fourth time because of its rave reviews, including one from myself. When served on tap it has a wonderful creamy looking and tasting head. Named in honor of a great annual party thrown by a friend, this is a dark but very smooth Dunkel style best done as a lager.

David J. Rotert  
Minneapolis, Minn.

#### Ingredients:

- 1/3 lb. black patent malt
- 1/3 lb. cara-Vienne malt
- 1/3 lb. caramel malt, 30° Lovibond
- 3.3 lbs. amber light malt extract (Briess)
- 3.3 lbs. gold light malt extract

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CIRCLE 7 ON READER SERVICE CARD

- 1 oz. Hallertauer hops, for 60 min.
- 1 oz. Tettnanger hops, 0.5 oz. for 30 min., 0.5 oz. for 5 min.
- 1 tsp. Irish moss, for 5 min.
- 14 g. dry lager yeast (Amsterdam)

#### Step by Step:

Prepare yeast at least 24 hours ahead by boiling 2 cups water and 0.5 cup DME. Cool to room temperature, put in sanitized 22-oz. bottle, add yeast, and stopper with an airlock.

Steep grains in 2-plus gals. water for 30 min. to 170° F. Sparge and bring water to boil. Remove from heat and add malt syrup. Return to boil, adding Hallertauer hops. After 30 minutes add 0.5 oz. Tettnanger hops. Continue boil for 30 minutes, adding Irish moss and remainder of hops for last 5 minutes. Cool rapidly and add water to make 5.25 gals. Pitch yeast slurry when below 75° F.

Ferment at cool temperatures (58° F) for first few days, then in yet cooler temperatures (50° F or cooler) in secondary for at least two to three weeks.

#### Ancient Chinese Secret Ale (5 gallons, extract)

The ginseng extract in this recipe should be available at any health-food store. I recommend using only American ginseng extract because it is not as bitter and is more potent. Use 150 ml. for less ginseng flavor or 300 ml. for more.

*Kevin TenBrink  
Salt Lake City, Utah*

#### Ingredients:

- 3.75 lbs. Morgan's rice extract
- 2.2 lbs. Morgan's beer enhancer
- 2 lbs. raspberry honey
- 250 ml. American ginseng extract, for 5 min.
- 4 oz. raspberry extract: 2 oz. in secondary, 2 oz. at priming
- 1 oz. Cascade hops, for 30 min.
- 2 packets Morgan's ale yeast
- Corn sugar for priming

#### Step by Step:

Start 1 gal. water and 0.25 gal. water boiling in separate pots. Add

beer enhancer to 1-gal. pot and boil 10 minutes. Add honey to 0.25-gal. pot. As mixture boils, skim off white proteins that collect on top. Add hops to 1-gal. pot and boil 30 minutes. With five minutes left in boil, add ginseng extract. After white proteins stop collecting, remove 0.25-gal. pot from heat.

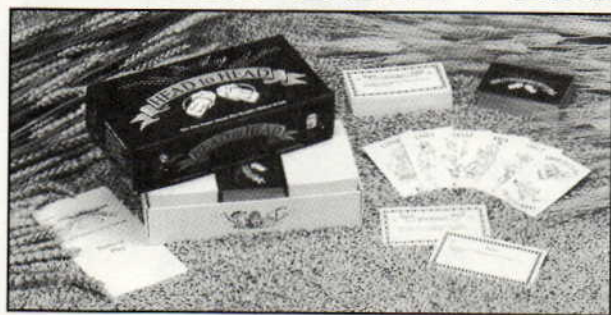
Add two mixtures together and add the rice extract. After boil remove from heat and cool. Add to carboy and top off with cold water. Pitch both yeast sachets after they have been rehydrated in warm water.

After vigorous fermentation has slowed down, rack to secondary with half the raspberry extract. Secondary ferment at cooler temperatures (about 50° F). Bottle after three weeks of secondary fermentation with the rest of the raspberry extract and your usual amount of corn sugar.

OG = 1.062 at 60° F

FG = 1.014 at 60° F ■

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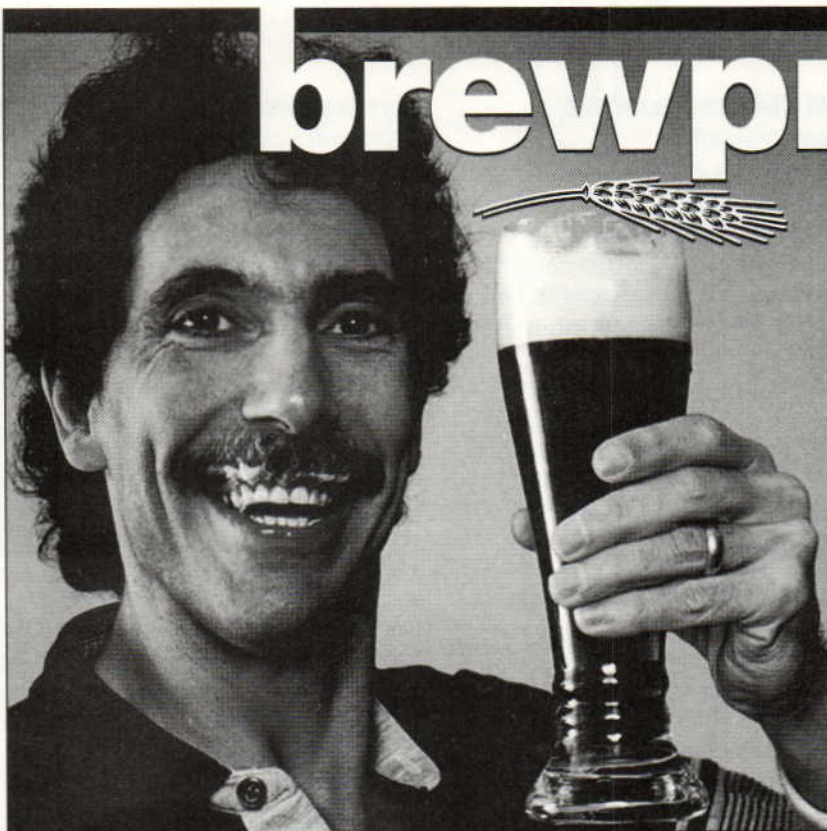
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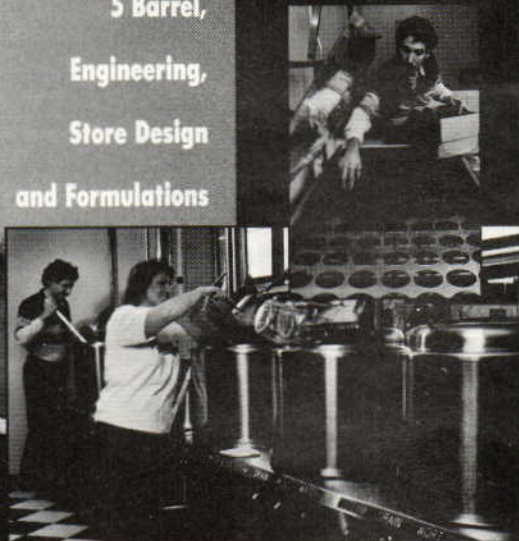
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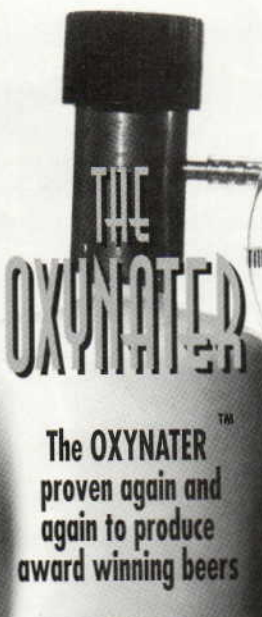
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CIRCLE 31 ON READER SERVICE CARD



## Carbonating With Dry Ice

Mr. Wizard

Recently I was sitting at home enjoying a cold Swill H<sub>2</sub>O with a great man, my dad. He was telling me about the "good old days of homebrewing" when he was young. He said that a long time ago dry ice from the ice box was used to carbonate the beer in the bottle. He wasn't sure how much to use, but he said about the size of a pencil eraser (olden-day measurement!). No one has had any real information on this or known if it would be safe to use. Please enlighten me.

Neil Selzer  
Madison, Wis.

I must be missing something here: enjoying a cold swill water? Is that one of those Wisconsin colloquialisms that doesn't make sense to non-cheese heads, or is your beer palate misaligned?

However, your question about carbonating with dry ice is interesting. Dry ice, or solid carbon dioxide, can be added to beer in a bottle. The beer is immediately capped to hold in the carbon dioxide before it quickly transforms into a gas and escapes from the bottle. Stick with me for a little math.

Gases such as carbon dioxide that obey the ideal gas laws, so-called ideal gases, occupy 22.4 liters of volume at 0° C per mole of gas. A mole of any chemical substance is a given number of molecules,  $6.02 \times 10^{23}$  to be exact. The term molecular weight expresses the weight in grams of a mole of a particular compound. One mole of carbon dioxide weighs 44 grams and will occupy 22.4 liters when expanded at atmospheric pressure and 0° C. If 1 liter of beer is carbonated to 2.6 volumes of carbon dioxide (2.6 times the beer volume), a common value for most beers, the beer contains enough gas to fill a 2.6-liter container if all of the dissolved gas is forced from the beer at

atmospheric pressure and 0° C.

The ideal gas law indicates that 0.116 moles of carbon dioxide, or 2.6 liters divided by 22.4 liters per mole of CO<sub>2</sub>, would be required for this level of carbonation. However, to accurately add dry ice for carbonation purposes, the initial level of carbon dioxide in the beer must be known. Most beers contain between one and 1.5 volumes of carbon dioxide after fermentation. This means that 1.6 to 1.1 volumes of carbon dioxide or 0.07 to 0.05 moles per liter of beer must come from the dry ice to give a total of 2.6 volumes. This translates to 3.08 to 2.2 grams of carbon dioxide (dry ice) per liter of beer (e.g. 0.07 moles x 44 grams per mole = 3.08 grams). This is probably about the size of a large pencil eraser.

The risk in practicing the method is explosive. Add too much dry ice and kaboom! In a previous life I worked at a tomato research lab. As part of my job I operated a small can seamer to can samples of experimental tomato products. Occasionally, we would can some dry ice, chuck the can into a ditch, and run for cover, sort of like a soldier heaving a hand grenade. Just like a grenade, the can in the ditch would explode, we got a chuckle, and everything proceeded as normal. The key to this story is that the idea was to blow the soup can to bits.

If you add too much dry ice to a beer bottle, it is unlikely that you will be doing it intentionally to cause an explosion. This means when the glass bottle blows up, which I

guarantee it will if too much dry ice is added, heavy-weight glass shrapnel will be propelled through the air and most likely will injure someone.

Being the conservative, cantankerous grouch that I am, I cannot recommend this practice. On the other hand a trash can full of tropical punch with a block of dry ice looks exceptionally cool if illuminated with a black light. The effect is a big, purple cloud of smoke rolling from the container of punch like a San Francisco fog bank, a much safer way to enjoy sublimation!

Mr. Wizard

I tried to brew some apple cider, following (mostly) the recipe for Cidre Normande in the article "Make Your Own Cider" (October '96 BYO). The problem is I can't seem to get the stuff to ferment. I've tried shaking the you-know-what out of the carboy to get some O<sub>2</sub> dissolved in it, and after that didn't work I tried pitching some more yeast, with no success either. It still smells like fresh cider, so I don't think it has soured yet. I noticed on the label of the jug of cider that it contains potassium sorbate and sodium benzoate (as preservatives, I presume). Would either of these adversely affect my yeast?

Tom Schuerman  
Hallam, Neb.

This is an easy one. Potassium sorbate and sodium benzoate are two of the most effective antimycotic agents used in food. Antimycotics inhibit the growth of fungi (molds and yeasts) as opposed to antibacterial agents that inhibit the growth of bacteria. Fruits naturally contain many fungal organisms from the environment that can cause fruit juices to spoil, mainly through



fermentation. In your case the very additives present to ensure apple juice stability have prevented your hard cider from becoming hard. In other words the sodium benzoate and potassium sorbate are working very well!

The next time you attempt to make hard cider, which I strongly recommend doing because hard ciders are absolutely delicious beverages, make sure to purchase fresh apple juice, which contains no preservatives. It is important to use high-quality juice from good apples because mushy fruit often has a high fungal load. This will increase the risk of a wild yeast problem.

Better luck next time!

**Mr. Wizard**

After the protein break is it okay to turn down the flame and put a lid on the brew kettle? I'm getting sticky malt on things in the kitchen. Also, it seems like a waste of liquid as I usually lose about one gallon during the boil. This is really a

waste in the summer time when I've already paid to get humid air out and then during the boil I'm putting more into my house. Nothing I've read has ever mentioned a lid. What about breweries? They have huge closed kettles, correct?

Hank Ellis  
Dallas

The truth comes out. Wort boiling wastes energy! If you are losing about a gallon during a five-gallon boil, 20 percent evaporation, you're about on track with most other homebrewers. The reason for your high evaporation rate is the large surface-to-volume ratio of a five-gallon brew kettle. In commercial breweries the targeted evaporation rate is about 8 percent. You can reduce your evaporative losses by either using a lid, as you suggest, or simply turning down the intensity of the boil. I would recommend the latter and not a lid.

The problem with lids is that they trap many volatiles, especially dimethyl sulfide (DMS), which smells like cooked

corn, in the wort. Most of the volatiles lost during the boil are lost by design, so that they don't contribute undesirable flavors to beer. Hop oils, on the other hand, contribute hoppy aroma to beer. Although volatile, hop oils survive into the finished beer if the aroma additions are made late in the boil and if the evaporation rate is reduced after the aroma addition.

In commercial breweries the kettles usually have large onion-dome tops that feed into large chimneys designed to carry the steam out of the brewery. The equipment is also designed to collect any condensate formed in the chimney and send it to a drain. The condensate drain prevents undesirable aromas such as DMS from dripping back into the wort. During most of the boil the large doors on the kettle top are left open to create a draft up the chimney to greatly aid evaporation. After the aroma hops are added, the doors are usually shut to minimize the loss of hop oils by decreasing the draft up the chimney.



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CIRCLE 28 ON READER SERVICE CARD

At home I would recommend boiling without a lid and controlling the evaporation rate by adjusting the flame on the stove. After the last hops are added, placing a lid on the pot will help keep the valuable oils in the wort. At this stage, almost all of the DMS will have been driven off and closing the kettle should have few negative effects provided that the wort is rapidly cooled (within 45 minutes) after the boil.

### Mr. Wizard

I received a filtration kit for Christmas that included three filters. Each cartridge was a different size: five microns, one micron, and one-half micron. What would be filtered out by each of these cartridges? Would any flavor be lost by using any of these filters? If so, how much?

*Terrence Holden  
Yreka, Calif.*

This is a difficult question because filters can remove particles based upon two properties: size exclusion and adsorption (sticking). Size exclusion is the mode of filtration that most filters are designed to use. This method essentially removes particles that get trapped in the filter or on the filter depending on the filter type.

Cotton filters, paper pulp filters (e.g. sheet filters), and diatomaceous earth filters (e.g. swimming pool filters and commercial beverage filters) remove particles based upon size and are known as depth filters. The flow of liquid through a depth filter is said to follow a "torturous path" that is responsible for the removal of solids. The key feature of depth filters is that they are rated in nominal sizes. Your five-micron filter and perhaps the one-micron filter are depth filters but are rated on a nominal rating system. This means that they effectively remove particles of five and one microns respectively, but the size of the openings in the filter are much larger than the filter ratings. This means these filters can remove relatively high solids loads but will also let through some particles the same size as and smaller than the filter rating. Depth filters are extensively used for beverage clarification.

The second category of size-

exclusion filters is the membrane filter. Your one-half micron is probably a membrane filter and is referred to as an absolute filter. This means that the pore sizes in the membrane absolutely will not allow particles larger than one-half micron, the size of the membrane pore, through the filter.

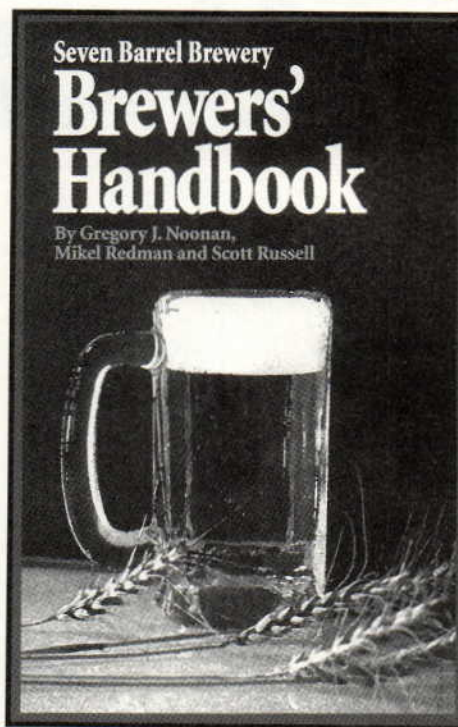
Technically, most filters referred to as absolute are not because they have not been challenged with a known load

of particles that are the same size as the rating. In a challenge test the absolute rating is confirmed by demonstrating the filter removes what is claimed.

In any case absolute filters are terrible at handling high solids loads, like cloudy beer, because the surface quickly becomes blinded.



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Membrane filters are only used after beer clarification, and the absolute filter is useful primarily to remove spoilage organisms. This operation is referred to as "sterile filtration" even though the beer is not really sterile (i.e. devoid of life).

Some filters, especially membrane filters, can adsorb compounds from the beer that otherwise would pass through the filter because of their

small size. Compounds easily adsorbed from beer are those that are hydrophobic ("water fearing") such as hop acids and some proteins, polyphenols, and color constituents. Membranes that have adsorptive qualities are called "sticky" by filter jockeys but are not viewed favorably because they can strip more from the beer than just solids. Loss of bitterness, mouthfeel, foam stability, and color can all result

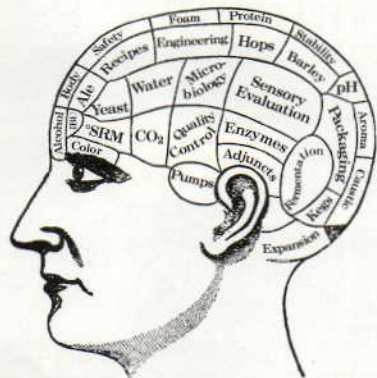
from using sticky membranes to filter beer.

Somehow I have managed not to answer your question! Your five-microns filter is a good size to remove yeast. Most yeast cells are between five and 10 microns in diameter and will remove most chill haze caused by protein/polyphenol interaction. The key to filtration is to filter as cold as possible without freezing the beer. If you want a really clear beer, then you may want to filter twice. Yes, twice, starting with five microns and then again with one micron, which removes more of the non-yeast beer haze. Double filtration is not necessary, but it will make your one-micron filter last longer. Finally, if you want to remove bacteria and extend your beer's shelf life, then pull out the one-half micron filter. Make sure the beer is brilliantly clear before using the one-half micron because if it is not, the membrane will quickly blind.

If I were the recipient of such a wonderful Christmas gift (I think filtration is pretty neat stuff!), I would filter most of my beers with the five-micron filter. I cannot quantify flavor loss, but it is safe to figure that the tighter your filter, the more flavor you will lose. Only experimentation will give you the answer. Five-micron filtration will give pretty clear beer, especially if it is filtered very cold. It should not strip out much flavor.

After filtration you can back flush the filter with hot water to remove much of the trapped solids and store it in a sanitizer such as cold iodophor (preferably in a sealable bag in the refrigerator) until the next use. Whatever you do, make sure not to store the filter in chlorine bleach.

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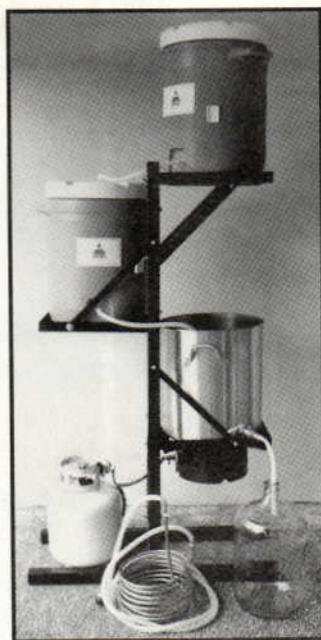
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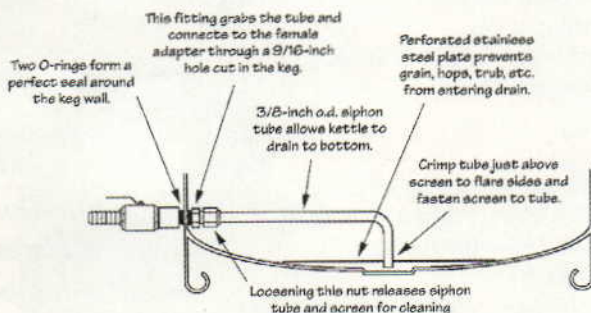
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CIRCLE 2 ON READER SERVICE CARD

# Brewing a Pale Beer With Extract

by Suzanne Berens

**Brewer:** Don Gortemiller

**Brewery:** Pacific Coast Brewing Co.,  
Oakland, Calif.

**Years of experience:** Nine

**Education:** BS in physiology from  
University of California, Berkeley

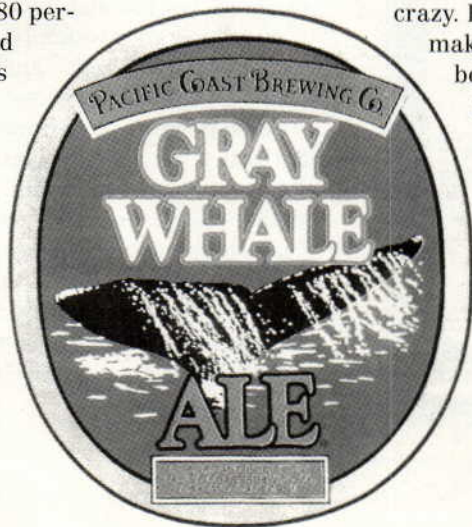
**House Beers:** Gray Whale (pale ale),  
Blue Whale (strong, hoppy amber ale),  
a rotating dark, usually Imperial Stout

As a rule of thumb, when you want to make a pale beer from extract make sure the extract is as locally produced and as fresh as possible. As extract ages, it has a chemical reaction similar to non-enzymatic browning (called Maillard reaction); it gets darker with age and above-normal (65° F) storage temperatures. Briess Malting Co. says extract can be stored up to six months with minimal browning at the right temperature and in a dark place.

Another concern is the level of concentration. About 80 percent of the water is taken out in the process of extraction. Still, there's a small percent of water that brewers want to get rid of. To do so you must add heat. If you add heat to a sugar solution, you caramelize it and it gets darker. So you want to get an extract that's thinner

— 80° Brix (80 percent dissolved solids) or less — as

opposed to 82° or 84° Brix. (Brix measurements are some-



times listed on the can.) It will tend to give you a paler beer. It affects the color more than the flavor or anything else.

Something else you want to do is watch your boil times. Don't get too crazy. Briess suggests that in making pale beers you try to boil no more than 20 minutes. One of the risks of such a short boil is lack of hop extraction, so you'll need to adjust your hopping rates upward.

It's not going to be

a huge adjustment. But if you're a homebrewer, it will be a little harder. You have to bring it up by 2 percent. If you were using an ounce before and you need 2 percent more, there's no way you're going to have a scale that will be finely tuned and accurate enough. The changes can be very subtle.

Once you've adjusted your hopping rates to compensate for the change in extraction, you need to adjust for a shortened boil time.

Say you have hops with a bitterness of 20 IBU and the boil is 45 minutes. If

Pacific Coast Brewing Co.



PACIFIC COAST BREWING CO.

"The most important thing to keep in mind when making a pale extract beer is use the freshest extract possible."

Brewer: Don Gortemiller

*Donald D. Gortemiller*

The Tips

- Use the freshest possible extract. It gets darker with age.
- Stick with thinner extracts. More concentrated extracts caramelize more easily when heated, causing them to brown.
- Shorten boil time but compensate by adjusting your hopping rate upward.
- A wort pH less than 5.6 minimizes darkening during the kettle boil. Adjust your water accordingly.

you change it to 20 minutes, the IBU goes down to eight. In that case you need to add double or more hops to stay where you were.

For homebrewers a general rule for a pale extract beer is to double the hopping rate, and that should put you in the ballpark. You also need to factor in whether you are doing a concentrated boil to begin with. A lot of homebrewers do a three-gallon boil for a five-gallon batch, which gives you a less efficient extraction rate than boiling the full five gallons. The more concentrated the wort, the more severe your error is going to be and the more you will have to adjust the hopping rate.

The pH of the wort will affect the paleness. But that depends on your water. Know your water. Hard water tends to give you hoppy and dark beers. Soft water gives you more delicate beers.

The beginner might want to start out with a pale ale, which is a lot easier than a pilsner because of the process. With a pilsner you need temperature control and you need to ferment at cooler temperatures. So unless you have a refrigerator with an adjustment thermostat to adjust fermentation temperature, you won't be brewing the correct style. ■



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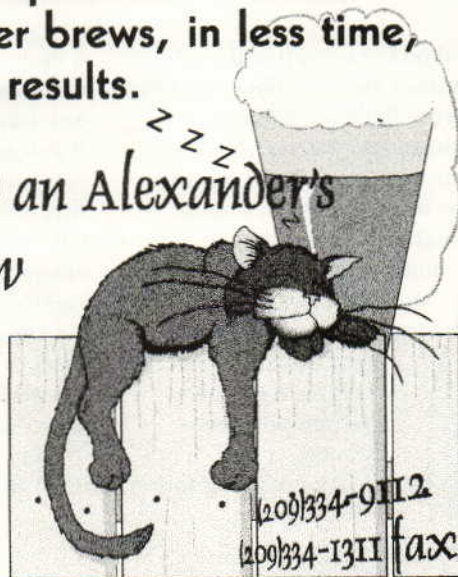
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# Oud Bruin, the Beer of Flanders

by Jeff Frane

At one time “sour brown ale” probably described most of what was being served in the local tavern. Beers were brown because the malting of barley was as yet an inexact science, temperature controls were shaky at best, and really “pale” malts were undreamed of. No sparkly, clear pilsners here.

Beers were sour because fermentation science was not only inexact, it was essentially nonexistent. It's hard to use single-cell yeast cultures when you've never seen a cell (no microscopes) and the very notion of “yeast” as the source of fermentation is foggy and vague. There are a lot of nice micro-organisms more than happy to take up residence in a good wort of beer (or even a bad one), and if you don't even know they exist, well, it's tough to keep them out.

No refrigeration (except in winter), no concept of microbiology, and no particular basis for sanitation. It's true that hops, to some extent, provide a natural bacterial inhibitor, but what if you aren't using hops?

Beers were ale because, well, because that's what they were. Most brewers relied on the (unseen and unknown) properties of top-fermenting yeasts. Yeasts and other goodies.

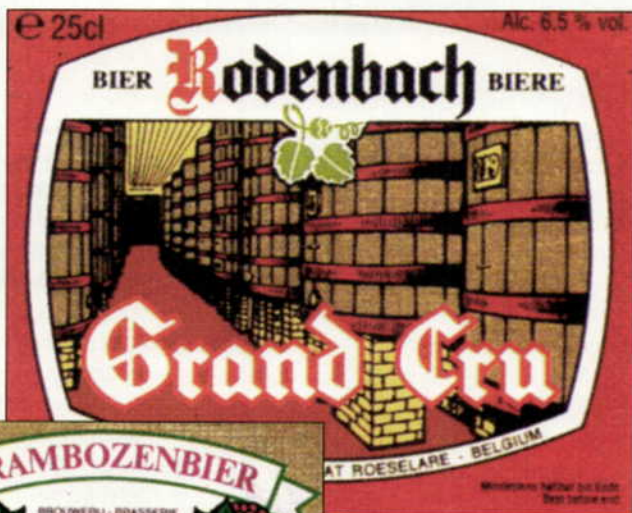
So “sour brown ales” were pretty much the same as “beer.” The notion lacks a certain appeal to most modern drinkers. Hard to imagine putting that in an advertisement: “Pucker up with Augie's Best Sour Brown Ale!” Over the years malting science has become worthy of the name, and barley malt comes out of the kiln looking more like Rice Krispies than Cocoa Pebbles.

Most breweries do their utmost to assure that nothing “bad” ever wanders into the fermenter. Yeast strains are monitored closely to assure their purity, not allowed to mutate or to consort with wild brethren or, shudder, bacteria. Roughly 75 percent of a brewery's day can be taken up with sanitation.

But somewhere in the world the notion of “sour brown ale” has retained a certain panache. One little country — uh oh, you can see where this one's going, can't you? It's a safe bet that if an ancient, funky-sounding beer has survived anywhere, it's in Belgium that we find them: “oud bruins,” which means “old browns” in the regional language of Flemish.

Oud bruins are very much a product of Flanders in Northwest Belgium. Although sour brown ale sounds unpleasant, oud bruins are actually wonderful beers in which a mild to moderate acidity is balanced by a lush sweetness and fruitiness. For the most part they really are brown, but a subgroup is distinctively red.

Relatively few breweries produce oud bruins; these beers offer a special challenge to the brewer and require



difficult techniques and, in some cases, specialized equipment to brew.

Certainly the most difficult aspect of brewing oud bruins is controlling the level of sourness. Typically, it is achieved through blending, much as control is achieved in winemaking. One batch of beer is brewed, perhaps to an original gravity in the mid-50s. The beer is allowed to age for many months, perhaps in wood, where it may acquire a winy taste or an acidity from lactic or acetic acid bacteria. Then the beer is blended with a fresher batch of a similar beer brewed to a slightly lower original gravity (about 1.045). The resulting blend is usually bottled and naturally carbonated. It may get a few more months in the bottle before release.

Perhaps the classic example of the brown oud bruin is Liefmans Goudenband (golden band), a beer so special that the bottle is hand wrapped in tissue (and can even be bought in 1.5-liter magnums — yum!). When new, the beer is very lush and round, but over time the sourness seems to become more pronounced. The beer is also used as the base for some of the most extraordinary fruit beers on the planet: an intense kriel (black forest cake in a glass!) and a frambozen (raspberry). Both are good dessert beers.

Another oud bruin I've found in the United States is Roman Dobbelen Bruinen, which seemed somewhat less sour than the Liefmans. It was also considerably cheaper, for some reason, and thus a bottle ended up flavoring a dish of beef carbonade, a classic (delicious) Flemish entree.

We tread now on shaky ground, for Michael Jackson deems the "red" beers of Flanders (primarily brewed by Rodenbach) as a distinct style. Others, however, consider them simply a variation on oud bruins, and I've read at least one report of a Rodenbach brewer who made the same assertion. Rodenbach's beers are certainly red rather than brown but otherwise are very much in the same tradition.

Rodenbach beer is brewed from a proprietary blend of pale and Vienna malts and, curiously, corn grits. It is then fermented with the house yeast blend, containing as many as 20 strains, and conditioned for about five

to six weeks. This is the "young" beer. It accounts for about 75 percent of the volume for blending in the standard Rodenbach Bier. The "old" beer goes through the normal fermentation and then is further aged for 18 to 24 months in tremendous oak casks, which are home to a mixed culture of *Lactobacilli* and other bacteria, gaining in color and acidity. Most of the aged beer is blended with the young beer to make the standard beverage, but some is bottled "straight" as Rodenbach Grand Cru, the brewery's equivalent of a single-barrel bourbon. Both beers are sweetened with caramelized sugar at bottling and then flash pasteurized. A third beer, Alexander Rodenbach (named after the founder) has cherry essence added, again to balance the tartness of the base beers.

If oud bruins present a challenge to the commercial brewer, they offer nightmares to the homebrewer. The

materials and techniques used in Flemish breweries have been developed and handed down over centuries and may not work for homebrewers. Certainly, few of us have access to oak casks rich in the proper microflora, nor do many of us have the patience to wait two years for a beer to emerge that can then be blended with yet another beer. Control of errant microorganisms is particularly difficult at home, and once started, *Lactobacilli* are difficult to stop. The homebrewers on the cutting edge of experimentation (members of the Lambic Digest group, for example), consider oud bruin to be one of the toughest Belgian styles to reproduce.

There are some alternatives for adding sourness that are worth trying. A "sour mash" technique calls for letting the mash (or a portion of the mash) sit overnight at warm temperatures, thus encouraging the growth of

## Experimental Oud Bruin

(5 gallons, all-grain)

These recipes should be considered as starting points for personal research rather than guaranteed, fail-safe oud bruins.

### Ingredients:

- 8 lbs. Belgian pilsner malt
- 1 lb. Belgian aromatic malt
- 1 lb. flaked wheat
- 0.5 lb. cara-Munich malt
- 0.5 lb. cara-Vienne malt
- 2 oz. Belgian Special B malt
- 1.5 oz. Hallertauer hops (3.5% alpha acid), for 90 min.
- 1 oz. Saaz hops (3.2% alpha acid), for 60 min.
- 0.5 gal. active yeast culture
- Food-grade lactic acid

### Step by Step:

In 3.5 gals. 125° F water mash in grains and hold for 30 minutes. Raise temperature to 152° F and hold for about 60 minutes or until iodine test is negative. Sparge to 7 gals. and boil for two to 2.5 hours, adding Hallertauer hops for 90

minutes and Saaz hops for 60 minutes. Cool, aerate thoroughly, and pitch active yeast culture.

Ferment normally and, at bottling time, add food-grade lactic acid to the finished beer. Do this experimentally by pulling a sample of known volume (e.g. 4 oz.) and add lactic acid drop by drop (while counting the drops!). When a sample of the beer tastes right, the brewer can extrapolate the number of drops necessary to create the same flavor in the total volume of beer.

Allow the beer to mature for several weeks in the bottle so that the lactic acid can blend with the other flavors. The beer can be used as the base for fruit beers by adding crushed raspberries or sour cherries during secondary fermentation. The fruit will, of course, raise the total alcohol content of the beer when it ferments out.

OG = 1.052  
FG = 1.014

souring bacteria. After the initial acidification, mashing is carried on as usual and the sourness created by the bacteria passes on to the finished beer. Although this is not, apparently, a technique used by Belgian oud bruin breweries, it does have the potential to add the necessary acidity.

Another method is to add food-grade lactic acid (available from pharmacies and some homebrew suppliers) to the finished beer. The truly experimental brewer, of course, will pitch *Lactobacillus* cultures into the nearly finished beer after fermenting with one of the mixed-culture Belgian strains available today.

Oud bruin grists ought to be built from Belgian malts, primarily pilsner malt, with some aromatic malt, cara-

Munich or cara-Vienne, and perhaps a dash of Special B caramel malt. Wheat malt or flaked wheat would also be appropriate. Dark roasted malts, with their characteristic bitterness and burnt flavors, are not welcome. Much of the color in the darker oud bruins apparently derives from caramelization of the wort in very long boils (which would also intensify the richness of the flavor), so roasted malts are completely unnecessary.

This is not a beer in which the use of malt extract for the base should be any sort of handicap, provided that good specialty malts are added. Many extracts have a sort of caramelized flavor that can interfere with certain beer styles, but for oud bruins the flavor may even be an asset.

There are hops in oud bruins, but you would never know it to taste them. Hopping rates should be very low, as bitterness and sourness make poor companions. Any good British or Continental hops, particularly varieties with low alpha-acid content, should



work, and they should only be used early in the boil, never where they would add flavor to the beer.

Brewing oud bruins at home is strictly experimental. Much of the available "research" is hypothetical, especially given the long lag times between brewing and verifying results. The other aspect of research is simpler: Go to your local well-stocked beer store and pick up bottles of Liefmans Goudenband, Kriek, and Frambozen, as well as Rodenbach's three variations on the "red" theme. Drink them carefully and thoughtfully, and consider whether they aren't worth a few centuries of work to produce. ■

## Experimental Oud Bruin

(5 gallons, extract and grains)

### Ingredients:

- 6.6 lbs. pale or amber liquid malt extract
- 1 lb. Belgian pilsner malt
- 1 lb. Belgian aromatic malt
- 1 lb. flaked wheat
- 0.5 lb. cara-Munich malt
- 0.5 lb. cara-Vienne malt
- 2 oz. Belgian Special B malt
- 2.5 oz. Hallertauer hops (3.5% alpha acid), for 90 min.
- 1.5 oz. Saaz hops (3.2% alpha acid), for 60 min.
- 0.5 gal. active yeast culture
- Food-grade lactic acid

### Step by Step:

Soak the crushed grains in 1 gal. of 150° F water for about one hour. Rinse the grains with 170° F water into kettle and add malt extract to bring total volume to 2.5 to 3 gals., depending on kettle size. Boil for 2 hours, adding water occasionally to bring up volume of wort, and add hops as noted. Cool wort, add to volume of pre-boiled, chilled water so that total is 5 gals. Aerate thoroughly, and follow the fermentation procedures in the all-grain recipe.

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# The Art of Presentation

by John Naleszkiewicz

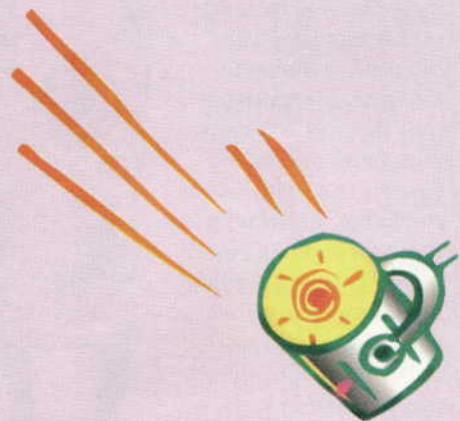
Did you ever wonder why there's no blue food?

Think about it. Green pasta, red tomato sauce, brown cookies, orange cheese, yellow margarine. Manufacturers can make processed food just about any color they want. But other than one-sixth of the world's M&Ms, you won't find much that's blue.

The reason? Marketers have spent countless bazillions of dollars researching every aspect of why we consume what we do. They've found that blue food ranks somewhere south of Barry Manilow and plastic flowers

on our cultural popularity scale. If someone served you an electric blue potato chip, would you eat it? Looks matter.

One reason the uninitiated have trouble appreciating a cloudy homebrew is that even though the beer may taste great, it doesn't look the way they expect beer to look. Besides the technical cures, there are many simple steps you can take to present your beer so that people will appreciate it even before they taste it. Sure, it's part marketing, but it's also fun to serve your own beer in a way that is appropriate





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to its hand-crafted quality. Here are some ways to make your special beer even more memorable.

### Beer Is Served from a Bottle

Think about how your brew is bottled and how that bottle will affect the presentation. Consider everything about the bottle: size, color, shape, even whether it's scratched up or brand new. You may purposely want to use a particularly scratched and worn bottle to emphasize an alt beer. Or maybe one of those cage-cap bottles with the resealable ceramic stopper.

Some believe bigger is better. If you agree, you might try using larger bottles for your beer. Try 22-ounce bottles instead of the standard 12-ouncers. A bonus to using bigger bottles is that there is less capping to do at bottling time. If you want to get really big, did you know that you can cap champagne bottles? Think how interesting it would be to serve your next batch of beer from bottles that size! (Just make sure they fit

your capper before you go out and buy a case of champagne bottles.)

On the other hand smaller bottles can be cute. Some beer styles, such as barleywine (which has a high alcohol content), are more appropriately served from smaller bottles. Just like their larger cousins, the small bottles come in a variety of shapes, from short and stubby to tall and slender. You can take the bottle-size topic a step further and serve your beer from bottles of all different shapes and sizes.

Classic dark brown bottles are the best for storing beer, but this is probably the most boring color. That's why some manufacturers will sacrifice the shelf life (and some of the taste) to present their beer in attractive clear, green, or other non-brown bottles. For the homebrewer as long as you protect the bottles from light, the color of the bottle won't affect the taste, but it will affect how others view your beer.

These lighter-colored bottles let you see what you'll be getting before the beer is poured, in a sense



Set the mood with a stylish presentation. Have fun, and make your beer look great, too.

giving you a preview of what's to come. This is especially true of clear bottles, since you will get an almost unobstructed view of the beer. Plus, beer poured from lighter-colored bottles gives the impression that it is fresher, especially when the beer has good clarity.

### Top It Off

The bottle cap can also be a source of decoration. You can buy bottle caps that have a variety of generic beer logos stamped on them as well as plain bottle caps.

Many brewers use the plain caps to market the batch or the date. Now think about expanding this concept to include some type of decoration or symbol identifying you as the brewer. It could be your initials or your name, for instance. Decorate the caps with colored permanent markers or even stamp them using a quick-drying ink designed for non-porous surfaces. This is the type used by grocery stores many years ago (it doesn't smear when it dries). This type of ink is available at (or can be ordered through) most office-supply shops.



### Decorating the Bottle

A nicely decorated bottle gives your guests another opportunity to compliment you and your beer. There are quite a few ways to decorate a bottle to make it unique and worthy of flattery.

The most obvious is to use an interesting label design. Commercial beer companies have been doing this for many years. Take a tip from their lead and try your hand at designing your own beer label. Think about how the label should look. Should it be round, square, rectangular, oval, or some unusual mixture of shapes? Remember, the trickier the label shape, the more work it will be to cut it out.

The next step is to design the basic format for the label. What the title should be, where it is located, any graphics, and the colors that will be



used for the whole thing. Remember, you don't necessarily have to make everything exactly straight. At least one beverage brand, Cutty Sark scotch, purposely makes its label look as if it were hand written.

You can use computer software, such as drawing programs and even programs designed specifically to create homebrew labels, to help you make that perfect label with a minimum of effort. This approach lets you take advantage of any graphics you have available or that you can create. This can help you produce interesting labels quickly, but that is not the only way to make beer labels. You can create some exceptional beer label designs by drawing them and using a photocopier.

What about color? That wasn't a problem when you were young, so why should it be a problem now? Be creative and use whatever you have: crayons, markers, colored pencils, highlighters. Highlighters are especially good because they allow the underlying drawings to come through clearly while giving nice color emphasis.

Regardless of how you make your labels, you still have to attach them to the bottle somehow. Glue stick is very handy. The labels stick well and come off easily in warm water. Rubber cement also sticks well but doesn't come off the empty bottles quite as easily and is a bit messier to apply. The standard white glue or paste isn't recommended. The labels have a tendency to fall off the bottle once the glue has dried.

Another way to attach your paper label is to dip the label in milk and stick it to the bottle. This holds the bottle well and peels off easily when soaked in water. The down side to using this technique is that any water-soluble ink used on the label may run.

So let's say you are more artistic than most, and you decide that you

want to have a limited set of truly unique bottles. Now is the time to consider hand-painted bottles. You can use acrylic paints to decorate the bottles with any design you can think of. Just treat the bottles as your canvas. However, you can't expect your masterpiece to make it through too many cleanings and reuses. So these hand-painted treasures would probably become single-use bottles.

### Pour Your Brew

Be sure that whatever vessel you serve your beer in is clean and free of soap film. Soap residue in a glass will kill your beer's head. Residue from other beverages will sometimes do the same. Many brewers have glasses that they only use for beer.



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You could use all matching glasses and mugs, or you could go for the "each is different" approach. The drinking vessel definitely contributes to the pleasure of the entire beer-drinking experience.

Glasses come in a wide variety of different shapes and sizes. You could go with the traditional glasses for the particular beer style you will be serving or with one of the traditional pub serving glasses. Remember, the size and shape of the glass affect the perceived aroma and thus the taste.

The traditional glass shapes emphasize the desirable characteristics while downplaying the less desirable ones for the particular beer style. For example the traditional pilsner glass is shaped rather like an ice cream cone.



This shape tends to concentrate the flavor and carbonation right to the spot you are sipping. On the other hand a weizen glass allows a foamy head to rise, which is captured and held for as long as possible. Using a snifter-like Duvel glass would place heavy emphasis on the hoppy aromas of the beer while downplaying the malty flavors.

Or you could go with something less traditional, such as serving your homebrew from a wine glass.



TODD HAMMOND

Wine glasses also come in a variety of shapes, sizes, and colors.

The use of wine glasses could give the whole beer-drinking experience a high-class flair. Also, since wine glasses are usually made to emphasize the wine's aroma or "nose," you would get more of the beer's nose when it is served in a wine glass. Another choice is to use a ceramic beer mug or even a beer stein. Some say the difference between a mug and a stein is the same as the difference between a vase and a

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CIRCLE 47 ON READER SERVICE CARD



vaahz — how much you paid for it. Beer steins can be plain or hand painted with intricate designs or nature scenes. Beer steins are most appropriate for German-style beers.

One of the advantages of serving beer in a ceramic mug or stein is that the beer will stay cold longer. A stein also creates more of a European or even a medieval attitude while you are drinking your beer, like the Knights of the Round Table toasting King Arthur. The beer steins with the lids you open with your thumb can be particularly fun.

### Other Things To Consider

When serving your beer, consider the entire atmosphere of the get-together. Will it take place in the kitchen, around a poker table, or in the living room? Is the beer sampling going to be the main attraction or just another one of the scheduled events for the gathering? The answers to these questions can be used to help set the mood by suggesting the

appropriate lighting and decoration of the place.

This should include the way you display the bottles, glasses, mugs, steins, and everything else. Do you have it all sitting out on the table or stashed back in the fridge? You could put the first round out so that the rest can be kept cold in the fridge, but the choice is yours.

Let's say you want to go for a medieval setting. Try serving your homebrew from the largest bottles you can find. Then use brown paper handwritten labels with torn edges



and all the writing in uppercase (with the occasional backward character or an extra final "e"). The beer would be poured into decorated steins or ceramic mugs. Use of candles for lighting would also be nice to keep the mood medieval.

Or if you want to simulate a more formal atmosphere, try clear bottles and wine or even champagne glasses to serve the beer. The labels should be colorful, maybe with a touch of gold or silver paint around the edges. It could become a complete high-class affair with bright lights and tablecloths, coasters, and little sandwiches.

Be creative and have fun. After all, you're serving it to your friends. You know how to impress them the best. ■



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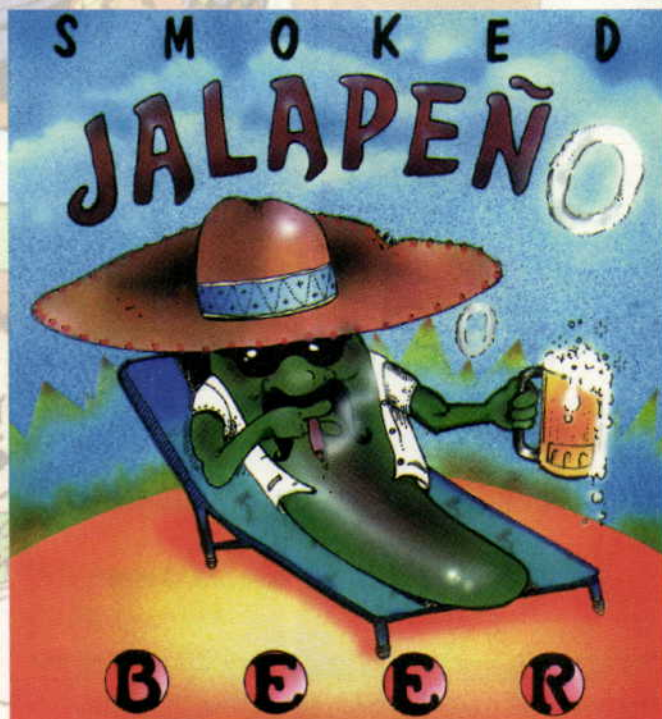
CIRCLE 36 ON READER SERVICE CARD


# PRIOR MAIL LABEL WINN

1st place professional  
Brian Wetcher  
York, Pa.



1st place amateur  
William Sinnen  
Chaska, Minn.



GONZO LABEL  
CONTEST   
EDITORS AT:  
BREW YOUR OWN  
216 F Street, #160  
DAVIS, CA 95616

PLEASE  
HAND  
CANCEL



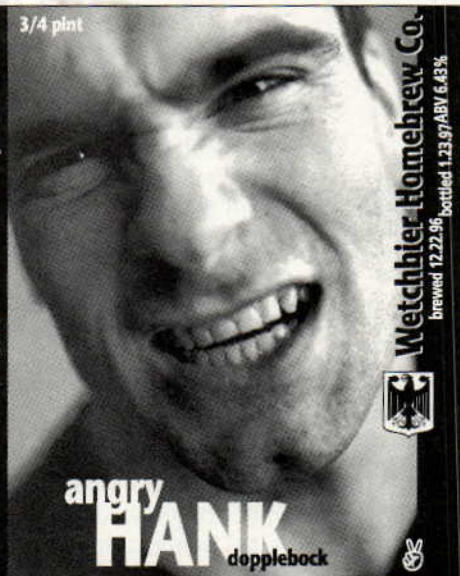
EXCO  
STAINLESS STEEL  
ANTHONY'S CAN MEASURER

# CONTEST WINNERS

angry HANK is the latest venture of the WETCHBIER HOME BREW Co. in its never ending pursuit for SUPERIOR beverage. This heavy, black potion is sure to FIRE UP some great conversation. With over TEN pounds of malts, two strains of hops, BAVARIAN yeast and just a touch of PURE maple syrup, angry HANK is bound to GRAB you by the BALLS and make you scream UNCLE! So, be CAREFUL, always watch your back, and wear a freaking CUP!

Have a NICE day.

3/4 pint



angry  
**HANK**  
dopplebock

Wetchbier Homebrew Co.  
brewed 12.22.96 bottled 1.23.97 ABV 6.43%



Grand prize  
Jim Scheibel  
O'Fallon, Ill.

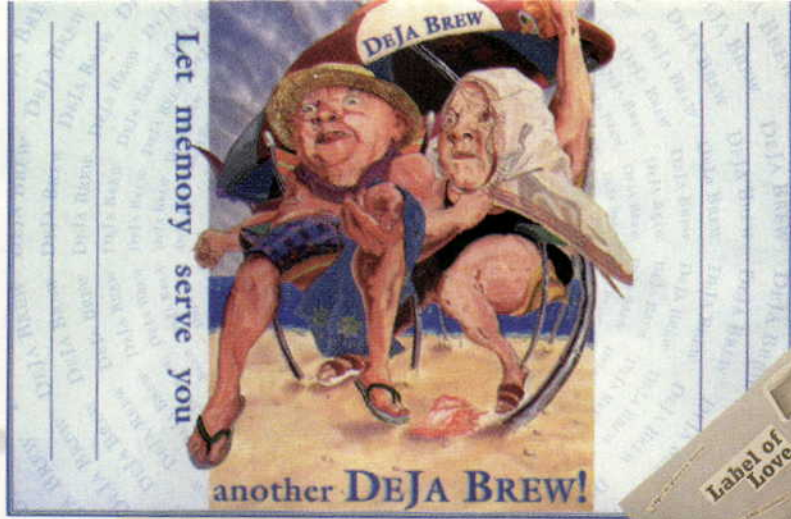


## Little Pig Pale Ale: Microbrewed and Micro Labeled

The inspiration for Jim Scheibel's grand-prize-winning label goes back to the days of Prohibition. When legal saloons served bootlegged booze, beer came in unmarked mason jars called blind pigs. Scheibel liked the name, but apparently so did Blind Pig Brewing in Temecula, Calif. So Scheibel came up with his own idea: a "wee little pig" to grace his micro label for his microbrew. It even comes with a magnifying glass that hangs from the bottle's neck.

With a little imagination and a hint of genetic engineering, Scheibel created his own pig on a Macintosh. "I beheaded a pig from a picture and got the sunglasses off a photograph of a rabbit. It's not anatomically correct, but I was trying to get a distorted look," he says. "The magnifying glass was an afterthought."





**2nd place professional**  
 David and Jenifer Hughes  
 New York, N.Y.



**3rd place professional**  
 John O'Fiel  
 Houston, Texas



Scheibel, who lives in O'Fallen, Ill., works as a designer and illustrator for a national department store chain. He has been homebrewing for two years and has never brewed the same beer twice.

### Smoked Jalapeños

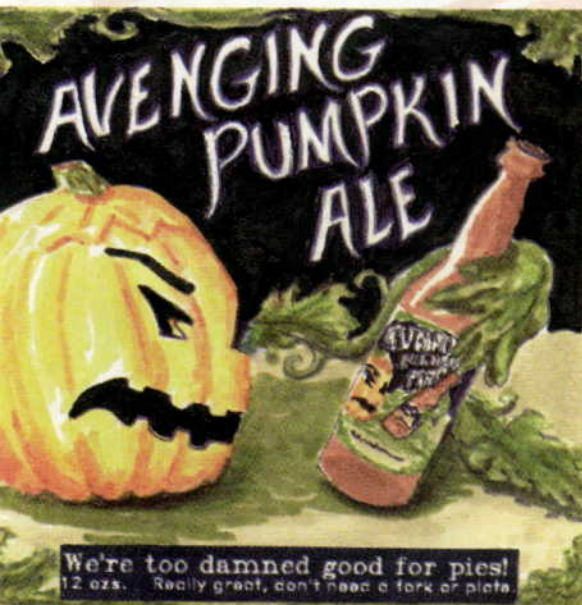
William Sinnen, from Chaska, Minn., prefers jalapeños in Mexican food, not in beer, although you would never guess judging from his label. He's not even a homebrewer. But his brother, Gary Sinnen, brews his own and prodded Sinnen into creating a label to match his Smoking Jalapeño. The label depicts a sombrero-clad pepper smoking a cigar.

Sinnen hand drew and airbrushed his label, which placed first in the amateur category. He is a printer and creates labels on the side for friends. Some of his creations have included labels for homemade maple syrup and one for One-Eyed Nick, a homebrew named after his brother's son. No, Sinnen's nephew does not have one eye. The label just shows a boy with one eye closed.

### Angry Hank Doppelbock

When Brian Wetcher was seeking a way to create an aggressive, high-alcohol doppelbock, his thoughts automatically turned to entertainer Henry Rollins, formerly with the music group Black Flag and known for spewing out the spoken word.

Browsing the internet one day Wetcher stumbled upon Rolling Stone's web page. He found an image of Rollins and downloaded it. The image came in



**Editor's Choice amateur**  
 Jan Donley  
 Elkhart, Ind.

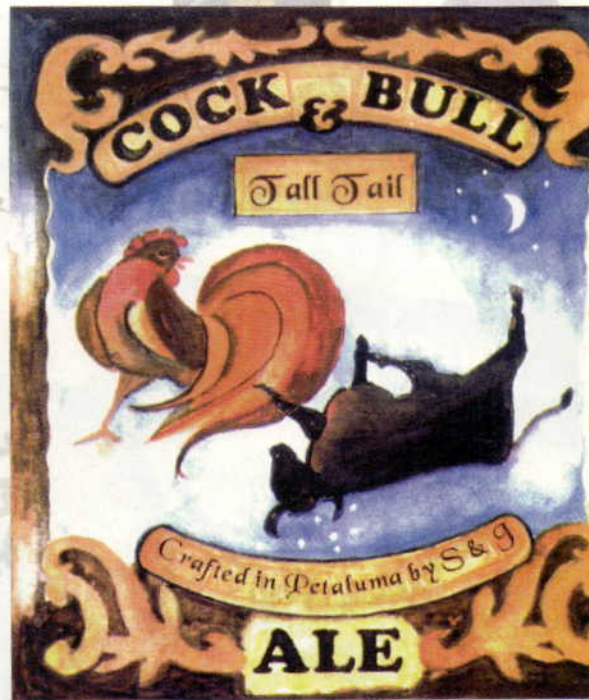
on yes x



3rd place amateur  
Ray Crokrey  
Kallispel, Mont.



2nd place amateur  
Jerry Lutticken  
Petaluma, Calif.



handy at work. Wetcher frequently works with SyQuest disks at a label company. He has a hard time getting people to return his disks, so he decided to add something to his reminder: "Keep Hank happy." The image of angry Hank naturally matched the profile for his doublebock, Wetcher says. The label earns top professional honors.

The York, Pa., resident has been homebrewing for two years and is on his 11th "angry batch." He creates designs for Mr. Steve's Homebrew Supplies in Manchester, Pa., and in exchange the shop sponsors his bike racing team.

### Tall Tails

Jerry Lutticken's Cock & Bull Ale gets its name from an expression his fiancée uses to tell him he's "full of it." She picked up the saying while living in London. "Sometimes she told me I was telling her a cock-and-bull story, which meant I was full of BS," he says.

While riding a bus to his Petaluma, Calif., home from his job as a civil engineer he was struck with the idea of a label based on the expression. He went to the library, looked at sketches, and roughly drew a cock and bull. He transferred the image to heavy-grade paper. His fiancée, Soosila Judd, added the

finishing touches with watercolors and an Old World-style border. Judd's other contributions include bottling and tasting Lutticken's creations. The label wins second place amateur entry.

### The Good Old Days

The name DeJa Brew, second place winner in the professional category, comes from combining the names David and Jenifer, says David Hughs. "Let memory serve you," the tag line,

was Jenifer's idea.

The image depicts the New York City couple many years from now lounging in beach chairs as they reminisce about the good ol' days of homebrewing.

David requested help from a friend and colleague, Gary Stanton, who coordinates the web site for a financial company. "He does mostly animations for the web and also paints on the side. I asked him to come up with a little



Best Label That  
Came in Too Late  
to Judge professional  
Barry Fitzgerald  
Lawrence, Kansas

When  
it's this good,

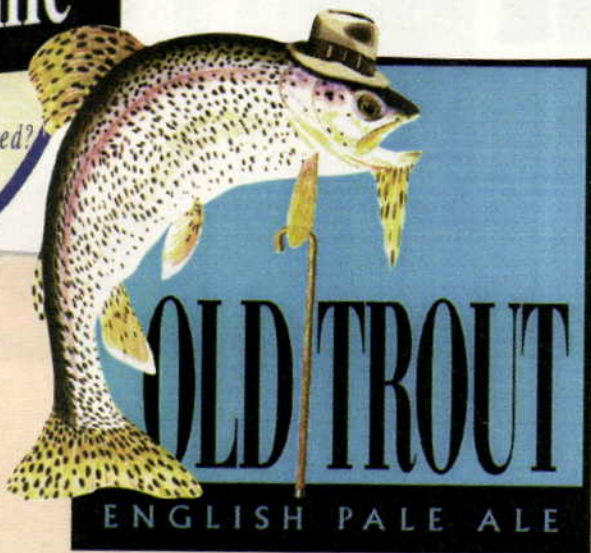


**teenie wienie**  
CREAM ALE

who could be embarrassed?

**As Risky as  
We Get Award** amateur

Chris Pillas  
Richmond, Va.



**Honorable  
Mention** professional  
Michael Kristof  
Ridgeland, Miss.

sketch," says Hughs. "Well, he comes in Monday morning with a portfolio, pulls out this 18-by-24-inch poster that he spent 25 hours making. I had told him nothing other than the name (of the beer). The rest was his. He really has an eye for detail. You should see the original — all these fine little brush strokes. I said, 'You've got to be kidding.' We framed it and put one of the labels under it."

The Hughses were married on Valentine's Day and celebrated with homebrew. They are working on a hard cider, inspired by an article that appeared in BYO.

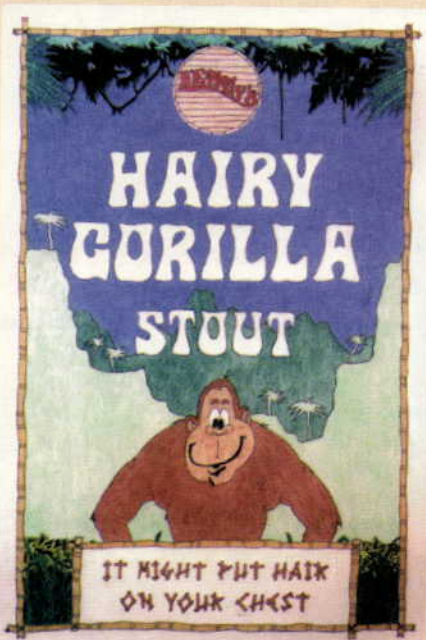
### The Bottle-Legged Pirate

Ray Croskrey's pirate tale begins humbly enough. He saw a picture of a pirate and drew a copy of it. On his computer he formed the letters, which he cut and glued to fit. He separated strings from a rope to create a textured look. The project took six hours, but the concept for the story that appears on the label came to him in a flash.

A brewer tries to make a batch of

**Macho Award** amateur

Bryan "Benny" Livingood  
Postville, Iowa.



### Grand Prize

Polar Ware 10-gallon stainless steel brew pot with cover and brass ball valve from Canada Homebrew Supply.  
Six-gallon plastic fermenter with screwtop, airlock, and spigot, from E.C. Kraus Wine & Beermaking Supplies.  
Copper wort chiller from Beer, Beer & More Beer.  
Counter-pressure bottle filler from HopTech.  
144 12-ounce or 22-ounce amber beer bottles imprinted with the winning logo from Grandstand Sportswear & Glassware.

A beer kit a month for a year from Brewcrafters.

### First Prize, Amateur and Professional

Polar Ware 10-gallon stainless steel brewpot with cover and brass ball valve from Polar Ware.  
Cornellus keg outfitted for homebrewers from RCB Equipment.  
Selection wine kit and Wort Works beer kit from Brew King.

### Second Prize, Amateur

Plastic conical-bottom fermenter with stand, valve, and hose fittings from Affordable Conical.  
Two cases of Microbrewery Series beer kits from EDME.  
American Homebrewers Association Membership from the AHA.

### Second Prize, Professional

The Interactive Complete Joy of Home Brewing CD-ROM from MediaRight Technology.  
Two cases of Microbrewery Series beer kits from EDME.  
Five-gallon and 6.5-gallon carboy harnesses from R&R Specialty Products.

### Third Prize, Amateur

Brewing library: *Designing Great Beers*, *New Brewing*

### The Prizes

Lager Beer, and *Great American Beer Cookbook* from Brewers Publications.

One case of Microbrewery Series beer kits from EDME.

### Third Prize, Professional

*Beer Taster's Log*, *Brew Chem 101*, and *Brew Ware* from Storey Publishing.

One case of Microbrewery Series beer kits from EDME.

### Honorable Mention, Professional

Hop Sampler: 8 oz. Hallertau, 8 oz. Cascade, 8 oz. Eroica, 8 oz. Cluster, 8 oz. Fuggle, and 8 oz. Willamette from The Market Basket.

Yeast selection and T-shirt from Wyeast.

### Editor's Choice

Gift set of four Rogue XS Ales plus two bottles each of Rogue Dead Guy Ale and Mogul Ale with matching T-shirts from Rogue Ales.

### More Great Prizes

Sweatshirt, baseball cap, and coffee mug with malted milk balls from Briess Malting Co.

Fermentap Valve Kit and Siphontap from Fermentap Head to Head beer trivia game and weizen T-shirt from Food For Fun Inc.

Two homebrew-related T-shirts from Global Graphics.  
*50 Great Homebrewing Tips* from Lampman Publications.

Two John Bull Premium beer kits from The Frothy Shoppe.

Five-gallon carboy harness and 6.5-gallon carboy harness from R&R Specialty Products.

Brewer's Notebook 2.0 computer software from Saranac Software.

beer during a drought but cannot because grain must be reserved for food. He raids a grain ship and loses part of his leg. Instead of a wooden leg, he wears a beer bottle.

Winner of third place in the amateur category, Croskrey enjoys brewing so much he plans to open a homebrew shop in his hometown, Kallispel, Mont. He just brewed a coffee beer and makes a nice Belgian white, red ale, and hazelnut brown ale.

### When Poultry is Pensive

Ex-zookeeper John O'Fiel didn't have to look far for inspiration when he came up with Chicken Sit Ale. He now works as a graphic artist in the exhibits department for the Houston Parks and Recreation Department, which is housed in a zoo.

His label, which won third place in the professional category, was hand-drawn. "It's just a play on words. I didn't want to make a hard, mean chicken," he says. "I wanted a soft, pensive chicken."

Chicken Sit Ale is an IPA made from extract.

### Greetings:

There we were, preparing to make a batch of Charlie Papazian's legendary prickly pear cactus mead, complimented with 20 pounds of Michigan pumpkin flower honey. Lo and behold, as we crushed and strained the cooked prickly pear fruit, Gary commented that it was "pulp friction." From that moment on, our minds danced with ideas pertaining to the Gonzo Label Contest. It did not take long to decide whose face should adorn the label in place of the lovely Uma Thurman! We trust that Charlie will take this all in good humor as it is intended...

Gary Bauer and Barb Hurd  
Mt. Pleasant, Mich.

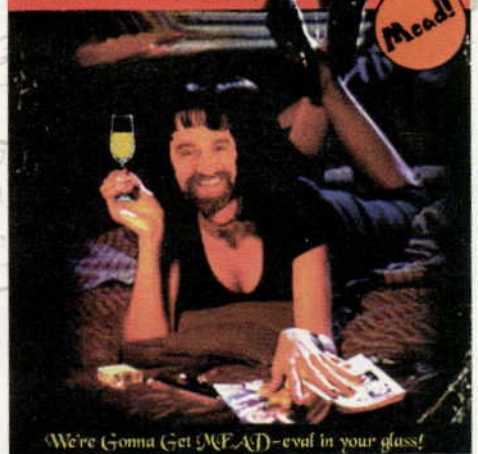
### The French Call It, "A Royale With Bees!"

Gary Bauer Barb Hurd Pittsley's Apiaries

Inspired by Charlie Papazian & Quentin Tarantino...

## PULP FRICTION

Cactus Fruit & Pumpkin Honey



We're Gonna Get (M)E(A)D-evil in your glass!

### Dear Editors:

To really make beer from scratch, I grew and harvested several bushels of barley this past summer with the intention to make my own malt (drying it in a pillowcase in a clothes dryer set on "lingerie" a la Papazian's direction in *The Home Brewer's Companion*). Unmentioned in the directions is the fact when the clothes dryer revolves, 25

lbs. of wet malted barley in a pillowcase tumbles with a "thud" like a bag of wet sand.

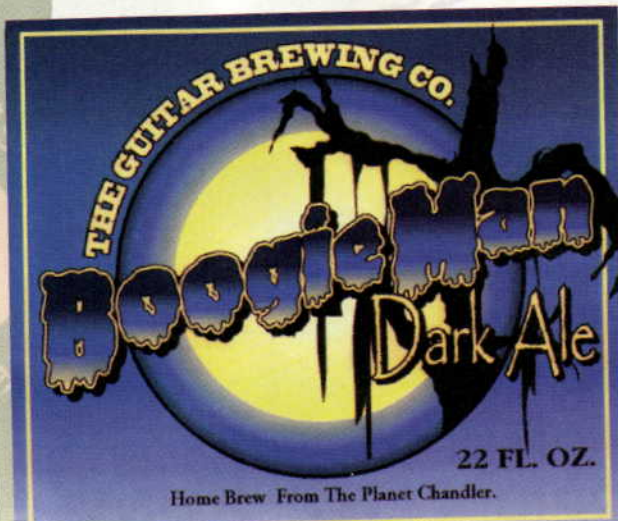
Once started the dryer thudded and my wife groaned. "No problem," I said. And sure enough the thudding stopped. Thinking this was good, I checked on the progress of the drying, but when I opened the dryer door, I found the pillowcase had split and I had a dryer full of loose grains of green malt. My wife was apprehensive, but I assured her all would be well. It took me about three hours to disassemble the dryer and clean the malt grains from the blower, vents, and ducts. Needless to say I salvaged as much of the barley as I could, even what I found in the dryer guts, and this is why the label reads as it does. The label was made by my sister-in-law, Susan Bonzi, after she heard the story from my wife.

Bob Conboy  
Rockford, Ill.



Youngest  
Entrant  
Award amateur  
Kylee Munson, age 8

Creepy  
Award professional  
Greg & Suzie Traver  
Chandler, Ariz.



*Enjoy the Real Thing:*

# Cask Cond



SAMUEL SMITH

In Great Britain, where serving real ale conditioned in wood casks is traditional, cask building was considered an art. Today's casks are made with stainless steel.



# ditioned Ale

by Sal Emma

Homebrewers are the luckiest people. They get to make their own beer however they want it — and store it and serve it however they want it, too. If you are a dyed-in-the-wool English ale fanatic, you can naturally condition your beer in the keg and drink a pretty darn reasonable facsimile of the real deal: cask-conditioned ale.

Some of us are content to force-carbonate beer, saving time and reducing sediment. Others are a bit more obsessive about the real-ale experience and choose to start a secondary fermentation in the keg to stay truer to the English-ale style.

Then there are the real die-hards, those who cask condition their beer and build beer engines to pull it from the keg by hand. Now that's taking homebrew to the next level. (For step-

by-step instructions on building your own beer engine, see the feature on page 47.)

## Real Ale History

Just what is “real ale,” anyway? Back before the days of mass-produced beer and when breweries would not dream of filtering and force-carbonating their product, all the ale sold in the great pubs of England was “real.” Meaning cask conditioned. “Real ale” is a relatively new term, brought to the forefront by the efforts of the English grassroots political group to whom every beer lover owes a great debt, the Campaign for Real Ale (CAMRA).

Not so very long ago in England, the big brewers were swallowing up all the little cottage breweries and converting their productions to “modern”



standards. That meant filtration, pasteurization, and carbonating prior to kegging. It was a simple way to speed things up, get a handle on the process, and ensure consistency and control. CAMRA members would substitute the words "dead" and "boring" in the last sentence. But more on that later.

To understand British real ale you have to understand the way beer is made and sold in Britain. Unlike the United States, with its post-Prohibition "three-tier" distribution system, England still uses the tied-house system. That is, most of the pubs are owned by the breweries, and the people who work in the pubs are, in effect, brewery employees.

This is key to the real-ale system, because real ale depends on the "cellarman," the person who manages beer in the cellar of the pub and makes it ready for drinking.

In a real-ale system the beer is delivered to the pub while it is still working. It's not ready to drink and needs some maturation. Put simply, on the brewery end this means racking the beer to casks with a priming of

the age of the beer and level of conditioning desired.

It's a complex job and not for someone who couldn't care less. The cellarman has to understand his beer and be willing to dote over it, keeping the barrels in the correct position and at the right temperature, adding fining agents when necessary, dry hopping if the customers demand. The cellarman applies liberal doses of tender loving care until the beer comes into proper condition. Sounds like a dream job, doesn't it?

Again, the brewery plays a key role here. Most real-ale houses in England can call on the team of conditioning experts at the brewery if trouble arises or when advice is needed. If the beer won't "drop bright" for instance and remains cloudy in the keg. If off-flavors develop. If the beer is flat. When you need them, this team of specialists will make way to your establishment to see what the matter is.

Come to think of it, that sounds like a dream job, too. But the point here is that a lot of care and attention is needed to keep cask-conditioned beer

CAMRA has gone on to publish newsletters, pub guides, and other materials. And CAMRA gets credit for starting the Great British Beer Festival. Its efforts have resulted in a resurgence of real ale production and consumption in England. England is enjoying its own beer renaissance with demand for real ale at its highest in decades.

## Defining Real Ale

CAMRA has created standards for real ale and is having an effect on the beer industry — not too unlike what's happening with homebrewing in America. With homebrewers defining styles so specifically for the sake of judging and competition, it helps to set standards for styles within the professional community as well.

Briefly, real ale is defined as ale that has undergone a secondary ferment in the barrel. It is served at proper temperature — not too cold — and is dispensed without the use of gas under pressure. Real ale is tapped either by beer engine or by gravity. The ale is not filtered or pasteurized.



In 1972 CAMRA began holding public demonstrations against the demise of real ale. Their first mock funeral was in response to Bass's closure of a pub in Staffordshire, England that served real ale.

sugar and sometimes new yeast, or simply racking it to barrels before the primary fermentation has finished.

Either way, the beer undergoes a secondary ferment in the barrel, a lot like homebrew in the bottle. The kegs are stopped airtight until they reach the pub. There, the cellarman takes over the process and will either keep the keg sealed or vent it, depending on

going. And that's the reason the practice all but died out in England by the 1970s. That was until a few enterprising souls founded CAMRA and began putting pressure on the breweries to keep the real ale flowing. A favorite trick of the group is holding a public funeral whenever a real ale brewery is slated for closure or takeover.

The English cask is designed to handle this set of circumstances elegantly. Real wood casks have gone by the wayside in much of England, although a few brewers and pubs still employ them. Today's cask is made of stainless steel. But it is nothing like an American stainless beer keg.

For starters the cask is barrel-shaped, similar in shape to a Golden

Gate keg; it is fatter in the middle than on the ends. Because the cask spends its days lying on its side, the sediment resulting from the secondary ferment ends up settling into the fat part around the middle.

When the cask is sitting in its cradle, known as the stillage, at the top is the shive hole. That's the hole through which beer, finings, or hops are added to the barrel, either in the brewery or the pub.

The shive hole is designed to accommodate a wooden or plastic plug called a shive. The shive is drilled with a smaller hole to accommodate the spile, a smaller plug made of hard or soft wood, depending on the needs of the cellarman. The soft spile is porous and allows the cask to breathe. The hard spile tightly stops the opening.

The cask is tapped through the head end, which is on the side when the cask is sitting in the stillage. The other major difference between English casks and American kegs is that British casks have no internal plumbing. All American beer kegs and soda tanks have internal dip tubes that allow the liquid to be dispensed from the bottom. The English cask is designed to allow the yeast and hop sediment, called "lees," to sit undisturbed as the beer is pulled. Passing the beer over the lees on the way to the glass contributes to the character of cask-conditioned ale.

Cask-conditioned ale is unique. Particularly when hand pulled by a beer engine, it is smooth, creamy, and often more complex than its contemporary, fully carbonated counterparts. Because the beer is alive with yeast and is fermenting, many unique flavor and aroma compounds are produced in cask ale that are absent in anything pasteurized or filtered.

Homebrewers employ a version of the process every time they bottle. Bottle-conditioned beer exhibits some of the same characteristics as cask-conditioned beer. That's one reason well made homebrew is often more interesting than even microbrewed beer from the supermarket. The yeast is still viable in the bottle.

Most homebrewers have made a batch or two that tasted a little off after two weeks in the bottle. But after

a month or six weeks, sometimes that "strange brew" can take on a new personality and become a premium beer. The cask-ale brewer and cellarman use the nature of fermentation to their advantage — sealing this keg, venting that one, letting it mature just to the point of perfection.

### A Superior Process?

Is cask conditioning better than other ways of handling beer after it is brewed? There's a question that, like religion and politics, might be best avoided in mixed company. It is clearly a matter of opinion. Those who would walk over hot coals for real ale will say nothing else can compare to cask-conditioned ale. Other folks think differently.

Garrett Oliver, brewmaster at Brooklyn Brewery, New York, says you can't say one method is better than another, because it's a matter of style and taste.

"Cask ale is not necessarily better, but it is definitely different," Oliver

says. "Cask-conditioned ale is a style in and of itself. It's entirely different from ale served any other way. It's unique. Cask conditioning produces a fragile subtlety that cannot be achieved any other way."

When Oliver was with the Manhattan Brewing Co., he supplied authentic cask-conditioned ale to a few clients who had the facilities and expertise to handle it. Brooklyn started out strictly as a contract brewer. However, it recently built its own brewhouse (in Brooklyn, of course). From the new facility Oliver plans to once again add cask-conditioned ales to his portfolio.

A common perception in the homebrew community is that bottle or cask-conditioned beer is better simply because it's naturally carbonated. That's only half the story.

Oliver reminds homebrewers that "conditioning" and "carbonation" do not mean the same thing. "Conditioning involves a lot more than just carbonation," he says. "That's only one

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element of the cask-conditioning process. What's as important is the fact that secondary fermentation takes place. That produces a whole new set of flavors, aromas, and other characteristics in the beer that are absent in beer conditioned by other means. For example many esters that would



Cornelius keg, chill, and shake, just like homebrewers do," Bovit says.

According to Bovit the differences are particularly apparent when the ale is hand pulled using a beer engine. "Hand-pumped ale has a fuller, creamier mouthfeel that makes the ale much smoother than beer dispensed

on the way to your pint glass.

Hence, you should remove an inch or two of dip tube to allow a deeper level of yeast sediment to remain at the bottom of your keg while you drink it.

If you want to take it one step further, you could remove the dip tube completely, then build a rack for the soda keg allowing it to lay on its side during conditioning. You could then dispense with gravity and come pretty close to authentic cask ale. However, maintaining serving temperature will be tricky under these circumstances, because you will not be able to stand the keg up in the fridge.

A compromise is to condition the keg on its side, then gently stand it up to chill to serving temperature. Much of the sediment created will stick to the wall of the keg and stay put, even after the keg is left upright.

Because most American bars are not equipped to handle English casks, brewers who make real ale are faced with similar packaging challenges. At Yards as at most other micros producing real ale, the Hoff-Stevens keg is the compromise vessel. In a Hoff-Stevens keg the dip tube does not go to the very bottom of the vessel, hence yeast sediment is left to continue to work its magic as the beer is consumed.

"We started selling our beer as 'cask conditioned,' but a number of customers called us to the mat, noticing the beer was kegged, not casked. Now we refer to it as 'keg' conditioned and that seems to be more technically correct, especially for our clients who are not using beer engines," Bovit says.

normally be vented out during fermentation are trapped in the cask and dissolved into the beer, affecting overall flavor and aroma."

## The Ale Sublime

Those who love real ale will argue that it's the best beer on god's green earth. But again, many factors come into play.

John Bovit, president of Yards Brewing Co. in Philadelphia, says real ale is so wonderful because it's served at its absolute peak. "Freshness is key," Bovit says. "Especially when you allow the primary fermentation to finish in the cask, the freshness really comes through and contributes to better flavor. You drink the beer when it's at its best. Even a stronger style, like IPA or barleywine, that requires more aging will taste better cask conditioned."

Bovit produces only naturally conditioned beer from his three-barrel brewery in the Manayunk section of Philadelphia. "We don't even own any force-carbonation equipment. When we want to force carbonate something, usually for testing, we put it in a

the usual way. The difference is night and day between hand-pulled and CO<sub>2</sub> dispensed," he says.

Bovit says another reason he loves real ale is the fact that it is not always the same. "I tell brewers real ale should always be great but it does not have to be the same every time. I think that's an important aspect of the style, and it makes the style more approachable for the average homebrewer." Real ale is a living, organic beverage, and it is reasonable to expect variations from batch to batch.

## Getting Down to Brass Tacks

If you want to brew up a batch of cask ale, start with a good recipe. Any English style will fit the bill. Bitter and IPA are especially tasty when cask-conditioned and hand pulled.

While you are waiting for the primary fermentation to finish, you should modify your soda keg. The dip tube normally goes to about one-quarter inch from the bottom of the keg. If you leave it this way, all the yeast will be drawn out of the keg with the first few pints and you will lose the effect of the beer passing over the lees

## Get Rid of That Yeast

Yards' brewer Brandon Greenwood says that an important step in the brewing process is often skipped by homebrewers: skimming the yeast. "Every English brewer removes yeast from the top of the fermenting beer. In fact the Burton Union and Yorkshire Square systems were devised to automatically remove yeast, to keep the beer from being handled," he says.

Greenwood knows of what he speaks. He earned his brewing credentials in the United Kingdom at

Heriot-Watt University in Scotland. "You should remove yeast at high kraeusen, before it starts falling back into the primary. This usually occurs two to three days into the ferment. You do this to slow things down and prevent the beer from fermenting out too quickly. It also prevents off-flavors coming from too many dead yeast cells in the primary," he says.

Greenwood suggests using a stainless spoon or perhaps a Pyrex measuring cup. "Scrub it well with lots of elbow grease and strong detergent — something like TSP — and sanitize completely before dipping it in your beer," he says.

### Priming

Once primary is complete, the goal, as previously stated, is to start a secondary ferment in the keg. You have two choices here, one a bit more manageable than the other.

At Yards Greenwood likes to catch the primary ferment at just the right point, racking when the gravity is about two points higher than terminal. To use this traditional method you have to know your recipe and know your yeast. If you don't have a good idea what your terminal gravity will be, you could miss the mark in the carbonation level.

"For the sake of argument, say you know your terminal will be 1.010. You should keg at around 1.012," Greenwood explains. "You can count on roughly 0.6 volumes of CO<sub>2</sub> for each point of specific gravity above terminal at kegging time," he says.

In this case kegging at 1.012 would condition the beer to around 1.2 volumes. That's nice and low for an English ale meant to be hand pulled. The action of the beer engine injects room air into the beer as it hits the glass through a tiny showerhead, known as a sparkler. This puts a nice, creamy head on top of the softly carbonated ale.

If you are going to use CO<sub>2</sub> to dispense your beer, you will not be able to take advantage of the sparkler and should condition to a higher carbonation level so the beer will not taste flat. Yards conditions to around 2.5 volumes for its regular draft accounts.

"That's still lower than the average micro, around 2.75," says Bovit.

"Catching" the beer at the right gravity is tricky, particularly if it hits the mark in the middle of the night or on a day when no one is around. For this reason it's usually easier to let the beer ferment out, then prime with added sugar.

Priming sugar can be corn sugar, dry malt extract, or fresh wort. Corn

sugar is the easiest to deal with and also a traditional priming agent in England. That's the method outlined here.

Beer carbonates more readily in a keg than in a bottle because the keg has less headspace volume compared to five gallons of beer packaged in bottles, so you use significantly less priming sugar in the keg, nowhere near the three-quarters cup standard

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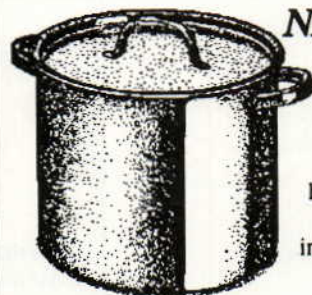
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for bottling. For low-level carbonation, use one-quarter cup of corn sugar. For medium carbonation, use one-third cup. You can go as high as one-half cup but at this level, you might be approaching carbonation too high for true English style.

The proper level of priming in your brewery will be learned through trial and error. As with primary fermentation, it will be affected greatly by the nature of your yeast and temperature at which you hold the keg during the conditioning phase.

Generally speaking you want to keep the keg near the same temperature you used for primary fermentation; 55° to 65° F is perfect. Again, it depends on the yeast. You also need to guard against the kegs getting too cold, or fermentation will shut down and you will end up with "dead" beer.

You might be thinking, wouldn't an automatic relief valve make this step a little more foolproof? Right you are. You can buy a pressure gauge ready

to clip onto your keg to monitor the pressure. Braukunst in Carlton, Minn., sells an automatic valve. "Our V-7 adjustable valve adjusts over a range of three to 50 pounds per square inch," says Cliff Tanner, Braukunst's principal. "We use it on the outlet of

our F-36, which is a stainless disconnect attached to a 30-psi pressure gauge and a manual valve. That alone works for cask conditioning, but the addition of the relief valve automates the process."

## Fining

Fining agents are protein based. When you add finings to the keg, proteins in your beer that cause cloudiness will tend to latch on to the fining agent protein and, hopefully, settle out.

The traditional English fining agent is isinglass, a protein derived from the air bladders of fish. Prepared isinglass is available from any good homebrew supplier. It's very easy to use. Simply add it at priming time. You can also use gelatin to fine naturally conditioned beer. Simply mix one envelope of Knox unflavored gelatin in a cup of cool water or beer. Stir well until dissolved, then heat to a gentle simmer to sanitize. Mix this in along with your priming sugar.

## Further Reading

For more information about cask-conditioned ale, check out these sources. They were used as references for this story.

Jim Anderson, "Let's Get Real," *Barleycorn*, Nov. 1996. 6.7.

Terry Foster, *Pale Ale*, 1990, Brewers Publications.

Michael Jackson, *New World Guide to Beer*, 1988, Running Press.

Charlie Papazian, *The New Complete Joy of Homebrewing*, 1991 Avon.

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## Leave Beer at Fermenting Temperature

How long you leave the keg alone for conditioning will also vary from brewery to brewery, ale to ale. Your taste buds are your best guide. You have to take off your homebrewer hat and put on your cellarman hat. Generally, you should start tasting the beer after five to seven days in the keg. If the carbonation and flavor is to your liking, start pulling pints. If not, let it work a little longer.

True cask ale is vented to the outside air to allow the beer engine to work — or when tapping by gravity. To vent your keg, simply attach a gas-in connector by itself, without any hose or regulator. If you are going to pull the ale by engine, it's a good idea to let the keg vent for a day or so before you start pulling pints. This allows the beer to settle down and will help to prevent excess foaming in the glass.

If you are worried about bringing in dust and contaminants, attach a short piece of gas hose to the connector and stuff the end with cotton. This will have a similar effect of a soft spile, letting CO<sub>2</sub> out and filtering the room air that enters the keg when you pump it.

## Oh No, Oxidation!

Speaking of air, what about the dreaded oxidation? You are right to be worried about that.

Oxidation is a reality of true cask ale. That's a good part of the reason English brewers tried to abandon the style back in the 1960s. It's a significant reason real ale is so difficult to handle in the pub setting. Real ale is meant to be consumed quickly. Real-ale heads are so excited about real ale because it changes over time, even as it's being consumed. The first stages of oxidation will contribute to the overall character of the brew. But in time the quality of the beer will decrease as air is left to sit on top of the beer.

There's hope. Homebrewers can take a cue from real-ale pub managers who use a device called a "bleeder." It is set to replace the beer in the keg with a blanket of inert CO<sub>2</sub>, but not under pressure. The bleeder simply squirts CO<sub>2</sub> into the cask as the beer is drawn. Since CO<sub>2</sub> is heavier than air, it

sits atop the beer without escaping through the vent.

Although CAMRA frowns on this practice, it is a reasonable way to preserve real ale that is not being consumed fast enough.

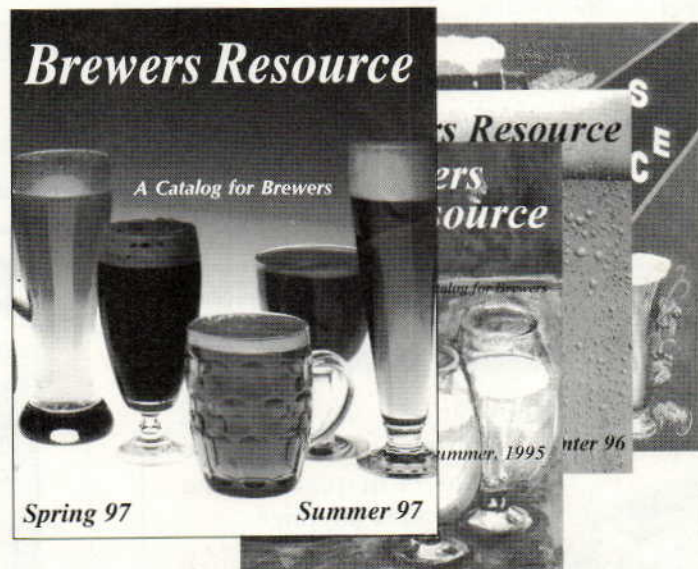
At home you should purge the keg of air at the end of the night. Open the top a crack, then let some CO<sub>2</sub> flow in for a minute or so. It will sink to the beer and push the air out of the open

top. Seal the top again and your beer will stay fresh until your next engine session.

This leads to an important point about homebrew and beer engines. Hand pulling beer is inconvenient for one or two glasses of beer. It's best to use a beer engine when you have a decent number of beer lovers around, to make the effort worthwhile.

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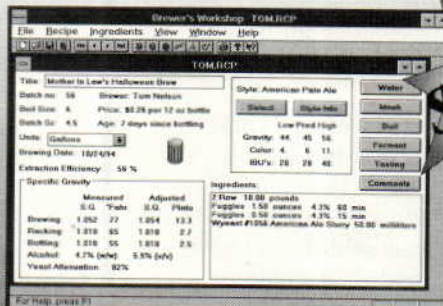
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# Build a Beer Engine

by Sal Emma

*For less than \$50 you can build a hand pump to pull your own homemade real ale.*

A group of beer aficionados and their significant others gathered recently to test drive the sleek design of the newly released Fogarty Homebrew Home-Built Beer Engine for the 1997 model year. Only one prototype has been built, but the design is so elegant and oh so sexy that predictions are flying that a fleet of these babies

will soon be taking to the homebrew highways of America en masse.

Well, that might be overstating it a bit. Except the part about sleek, elegant, and sexy. It was all those things and more, pulling pint after perfect pint, each softly bubbly with a thick creamy head, smooth as silk and tasting like more.

Even the test drivers who normally avoid the barley brew were going back for seconds, thirds...sixths. Admittedly, part of the draw was the pump itself, it worked so well and so effortlessly. But part of the attraction, we are convinced, was the excellent character of the naturally conditioned beer.

If you love authentic, hand-pulled English ale, read on. For less than \$50, you will be able to build an engine to accent your homebrew shack and make a real difference the next time you tap a keg.

If you are still bottling your homebrew, well, you should seriously consider getting into kegging just so you can experience the joy of the Fogarty Engine.



SAL EMMA PHOTOS

*Inside this wood and aluminum housing rests the secret element of the portable beer engine: a galley pump purchased from a marine-supply store.*

*The hand-drilled sparkler head on the homemade beer engine pours a softly bubbly pint.*



## The Players

It started with a simple assignment. Build a beer engine. Why not? We had the technology. We had the Yankee ingenuity. And we had John Fogarty.

Fogarty owns What's Brewing, a homebrew supply shop near Atlantic City, N.J. He is known to be able to build anything, for any purpose, with his bare hands. He's one of those guys we all envy. He can bend stainless in perfect creases. He knows how to countersink. He knows about pipes and wires. He can weld.

Plus he's an accomplished brewer who understands beer. He possesses the beer passion of Charlie Papazian crossed with the dexterity and mechanical skill of Norm Abrams, with a hint of Tim Allen thrown in for enthusiasm. He's a marvel of modern science.

With this guy on our team, we were on our way to a beer engine that worked. This was never in doubt.

Of course, as is his wont, Fogarty outdid himself. The thing worked like a charm. Like it was born to pump English Ale. Well, come to think of it, it was.



*Press down on the pump with some force to pour a pint with a creamier head.*

*Attaching a sparkler head to the outflow of a galley pump generates a creamy English head.*

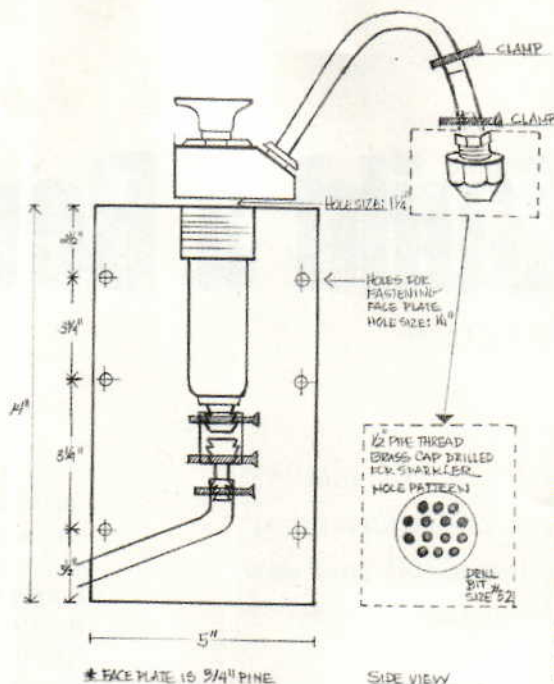
## The Pump

Fogarty's first inspiration was the paint stick. The paint stick is one of those infomercial products that has now burst the seams of the As-Seen-On-TV warehouse and spilled onto the shelves of most big paint and hardware stores. It is a big pump that looks like a broomstick, with a paint roller stuck on one end. You fill the handle with paint, then pump it into the roller and — theoretically — apply it to your ceiling and walls.

Fogarty tinkered with turning the paint stick into a beer engine and apparently got it to the prototype stage. But he killed the idea after building it and went on to bigger and better schemes.

"I was worried about the plastic components and joint material in the paint stick. I'm sure it's not food rated. Plus the thing's kind of big and ungainly. I wanted something smaller and more compact," he says.

Putting his Tim Allen hardware



KRISTINE BYBEE ILLUSTRATIONS

sixth sense into high gear, he started stalking retail outlets, looking in camping and boating accessory aisles. "I had a hunch I would find some kind of suitable pump in accessories for the great outdoors," he says. The trail got hottest when he looked at boating parts and he ended up in a marine-supply specialty shop.

He recalls the moment of success, which was preceded by several minutes of confusion.

"I asked the young lady behind the counter if she had pumps. She took me to electric pumps, the kind you use to pump out the bilge water. 'No, I was looking for a hand pump,' I said. She took me to the hand-actuated bilge pumps. 'No, I'm looking for something to pump clean water,' I said.

"That's when I struck pay dirt and she took me to the galley pumps. 'Is this for your boat?' she asked. 'No, for my bar,' I replied. 'For water?' she asked. 'No, for beer,' I replied. The conversation pretty much ended there. She was in way over her head," Fogarty says.

Fogarty had found the object of his search. A Whitestar Products Fynspray Galley Pump made in New Zealand.

"I checked it out pretty well. It was all food-grade plastic, stainless, and brass," Fogarty says. "I made sure it contained no copper. Water and

copper you can get away with. But copper and beer don't mix." Copper can oxidize beer flavors.

The pump passed muster. The rest of his task was to fit it so it would connect to a Cornelius soda keg and to build a housing that could be mounted so the pump could be worked with one hand.

Soon, the Fogarty Engine took shape.

Fogarty added a sparkler head on the outflow to generate that classic creamy English beer head and made a few trial runs with plain water. There seemed no reason to expect the thing wouldn't pull ale.

## The Beer

And pull ale it did.

The ale used to put it through its paces was a keg-conditioned extra special bitter/India pale ale with about two weeks of cellar time on the meter.

The engine was sublime, and so was the ale. It pumped effortlessly. A feather-light touch was all that was needed to work its smooth, stainless-clad action. An unexpected bonus was the fact that the Whitestar pump works in both directions. Whether you push or pull the pump handle, beer keeps flowing into the pint.

This made things go very quickly, too. In true English fashion the beer was not overly carbonated. It had been primed with one-third cup corn sugar, and the keg was left vented for 12 hours before the pump test. This, combined with the engine's super-efficiency, made pulling a pint a simple, quick task. It literally took no more time than pouring a pint from the CO<sub>2</sub>-dispensed keg, sitting alongside for taste test and dispensing comparison.

The pump dripped slightly immediately after pulling pints but stopped in short order. To avoid a mess you need to consider this when installing the engine in your home brewery.

If you're a true real-ale home-brewer, spend your next day off building yourself a Fogarty engine.

But be careful. The world will beat a path to your door if word gets out.

## Fogarty Beer Engine Parts

The beer engine is actually a pump braced inside a box. The box has a

## The Side-by-Side Test Drive

To test the performance of the Fogarty Beer Engine and to compare the differences in flavor between naturally conditioned and force-carbonated beer, we brewed a double batch (10 gallons) of ESB/IPA, cask conditioning one half and chill-and-shake carbonating the other.

### "Engine" Special Bitter, aka India "Pump" Ale Recipe (10 gallons, extract and grains)

#### Ingredients:

- 6 lbs. pale malt
- 1 lb. British Crystal, 60° Lovibond
- 10 lbs. light extract syrup
- 1 lb. demerara sugar
- 3 oz. Northern brewer hop pellets (7% alpha acid), for 90 min.
- 2 oz. Fuggle hop pellets (4.5% alpha acid), for 30 min.
- 1 oz. Kent Goldings pellets (4% alpha acid), for 15 min.
- 1 tbsp. Irish moss, for 15 minutes
- 1 pint starter of Wyeast London Ale Yeast

#### Step by Step:

Mash grains in 2 1/2 gals. water at 155° F for one hour. Sparge to 11 gals., bring to a boil, remove from heat, and add extract and demerara sugar. When boil resumes, add Northern brewer hops. Boil 60 minutes and add Fuggle hops. Boil 15 more minutes and add Kent Goldings and Irish moss. Boil 15 more minutes. Cool, and pitch yeast. Ferment in primary for 10 days at 60° F.

OG = 1.050

FG = 1.010

#### Special Instructions:

Both kegs were fined with gelatin.

We tried to treat both kegs the same in terms of temperature. The cask-conditioned keg was primed using 1/3 cup corn sugar, boiled in 1 cup water. Then both kegs were laid on their sides and kept at 55° F for

five days.

Three days before tasting, we stood the kegs up and refrigerated them. The CO<sub>2</sub> keg was carbonated to 2.2 volumes of CO<sub>2</sub>.

#### Tasting Notes:

On tasting night we fixed the Fogarty engine to the cask-conditioned keg. The other keg was tapped traditionally, with CO<sub>2</sub>.

The beer was very hoppy. In fact we overshot our bitterness level slightly. Utilization was greater than usual because of the greater volume of boiling wort — the recipe was for 10 gallons.

This mistake, however, benefited the experiment. The extra bitterness made the differences between the kegs readily apparent.

The hand-pulled ale was creamier and smoother than the CO<sub>2</sub>-dispensed version. The sparkler on the engine created a very pleasant, dense head that contributed to the very distinct creaminess of the overall beer.

The main difference between the two was the sharpness of the hops. In the force-carbonated beer, the hop bitterness was very assertive, not only at the first sip but throughout the entire glass. This is due in part, we suspect, to the fact that the flavor of dissolved CO<sub>2</sub> is bitter on its own. Similar to the flavor of plain seltzer water.

The hop sharpness was significantly subdued in the naturally conditioned version.

Bottom line, they were very different.

Some of our tasters preferred the CO<sub>2</sub> version. Predictably, these were the hopheads among us. However, the hand-pulled ale was preferred by most of the tasters, including a few who professed to "not like beer!"

#### Brewing Notes:

The level of bittering hops should be reduced in future batches.

wooden front, back, and base. The sides and top are made from a single, thin sheet of aluminum, bent 90 degrees at four points to resemble an upside down U with wings or dog ears.

#### Frame Parts:

- Aluminum sheet 40 1/2 inches by 5 inches
- Two pieces 3/4-inch pine, 4 1/2 by 14 inches for front and rear plate
- Wood for base plate. The size varies, depending on your needs. A base plate is made to be mounted or clamped to a steady surface or made heavy enough to keep the engine immobile during use.
- Wood screws

#### Pump Parts

- Whitestar Fynspray marine galley pump
- 1/2-inch inner-diameter (ID) plastic tubing, 2 1/2 inches long
- 1/2-inch barb by 1/4-inch barb reducer, stainless steel

- Soda connection
- One 1/4-inch male flare
- 3/8-inch tubing, 2-inch length
- 3/8-inch barb by 1/2-inch male pipe thread in brass
- 1/2-inch male-pipe-thread cap with blunt end (drilled, as sparkler)
- Two #145 crimp clamps or stainless steel hose clamps
- Teflon tape

### Putting it Together

#### The Aluminum U-Bracket:

The aluminum bracket is created by bending a straight sheet of aluminum into a U-shape with dog ears. The front and back wood pieces are screwed to the bracket through holes that you drill before bending the sheet. The dog ears are screwed to the base. Note: The aluminum bracket is not an absolute necessity. You could build the entire pump cabinet of wood alone. Use your best judgment.

1. First put a cloth or some type of rubber material down to prevent

2 1/4 inches out and mark or score a line across the material. Remember to mark the back side of the material. Do this again in the opposite direction. These are two of the places where you will bend the material. Also mark the strip four inches in from the ends.

3. Now that you have marked your lines, you need to mark for drill holes. The first hole is on the centerpoint line 2 1/4 inches up from the front edge. This hole size is 1 1/4 inches. Through this hole you will fit the shaft of the pumping mechanism.

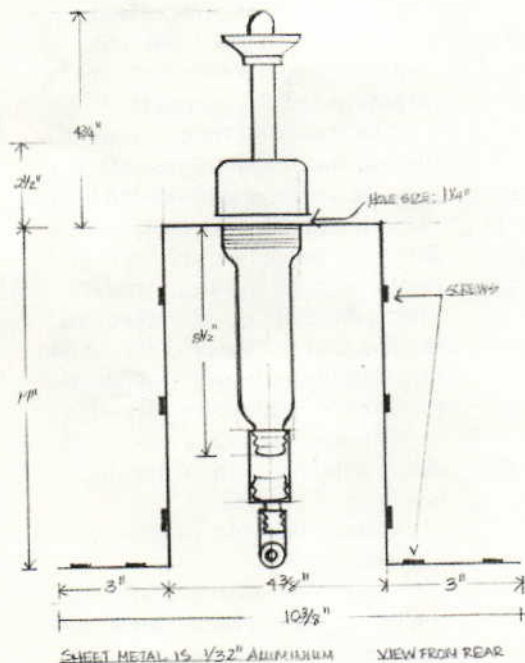
4. The rest of the holes are one-quarter inch in diameter and are for mounting and assembling the face, rear, and bottom panel. Along the lengths of the two sides (the 40 1/4-inch length), the holes should be drilled three-eighths of an inch from each edge. For the hole placement, the distances from the center point line working out to the end of the strip would be 5 1/4 inches, 8 1/4 inches, 11 1/4 inches, 14 1/4 inches, 17 1/2 inches, and one-half inch from the end. Repeat this in the other direction. You now should have holes down both sides from end to end.

5. At this point you will need to bend the aluminum material. Clamp the material with a C-clamp and a flat piece of steel or wood. A metal brake or bending tool would be a great asset for this type of work.

Clamp the steel or wood down with the edge of the material being clamped on the line marked or scored on the metal 2 1/4 inches away from center. Make sure to clamp the steel or wood on the center-side of the mark.

6. Bend the material to the 90-degree position, which would be back toward the center mark, exposing the finished side. Repeat this step on the other side of the strip. The finished product should now look like a U.

7. Now at the lines four inches from the ends, you need to bend the metal away from the center point. Make sure you clamp the steel or wood on the center-side of the lines four inches from the ends on the finished side of the material. You will now bend the metal toward the outside of the U. This will look like a tee when both sides are complete or like dog ears.



*The Fogarty Beer Engine is housed in a simple construction of wood panels and an upside down U-shaped bracket made of aluminium.*

- 1/4-inch beverage tubing, 5 feet or as much as needed
- Two 7/8-inch stainless steel hose clamps
- One 1/2-inch stainless steel hose clamp
- One 1/4-inch barb by 1/4-inch female flare in stainless

scratches and marks on your finished material. Lay the 40 1/2-inches-long-by-five-inches-wide aluminum strip finished side (the side you want visible on the finished product) down. Find and mark the center point of the length of the aluminum strip.

2. From the center point measure

### The Wood Stock:

You can now cut your wood. The pieces are 4 1/4 inches wide by 14 inches long. The rear piece for the engine should have a three-quarter-inch notch taken from it at the bottom and in the center. This will be needed to allow the beverage tubing to exit the case and attach to the keg.

Finish the wood prior to assembly. Stain, paint, or hand rub with oil.

A quick test for fit is a good idea. The base plate can be as large as needed. This will truly depend on how you will mount and dispense your product and the portability you desire from your engine.

### Holes for the Sparkler Head:

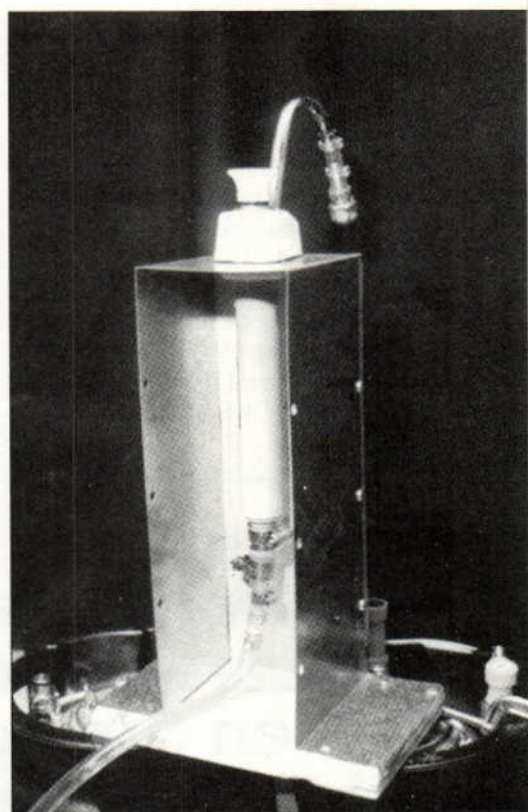
The half-inch male-pipe-thread cap should have a half-inch blunt end in the shape of a circle. Within this circle you need to drill holes so the beer will come out.

We used a number 52 drill bit, a very small diameter. The pattern for the 14 holes is in four rows. The top

and bottom rows have three holes each, the center two rows have four holes each. The rows of three holes are staggered from the holes in the two rows of four. This seems to allow a nice spray pattern.

The metal cap is brass and does not need much pressure from the drill bit to penetrate and pierce through the cap. Use caution, as it is easy to break a drill bit of this diameter. Some finesse is needed if you are going to do this with a hand-held drill. A drill press makes this step a little easier.

*The upside down U of the aluminum supports the galley pump, while the dog ears are connected to a wooden base for stability. Choose a heavy base or clamp it down for one-handed pumping.*



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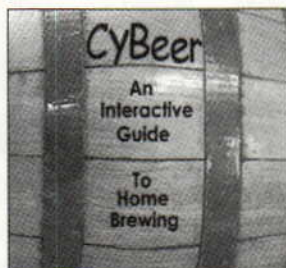
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## Assembling Your Engine

Now that all the manufacturing is done, it's time to assemble the engine.

1. Insert the galley pump through the 1 1/4-inch hole in the metal housing. This will be a tight fit, so be careful not to damage the threads when passing the pump through the hole. The pump may have to be screwed through in order to fit.

2. Use the plastic nut that comes with the pump assembly and tighten the unit to the metal U-frame. You want the front of the pump to face the

side closest to the front edge of the housing. On the top of the unit, the pump should be about a half-inch from the metal frame.

3. Connect your 2 1/2 inches long by one-half inch ID tubing to the barb at the bottom of the galley pump. Use the seven-eighths-inch stainless steel hose clamp to secure it.

4. Now place another clamp on the hose and insert your half-inch barbed by quarter-inch barbed stainless steel reducing coupler. Again use the clamp to secure the hose to the coupler. Now

get your length of quarter-inch beverage tubing. Attach the hose to the coupler and secure with the half-inch hose clamp.

The other end of the tubing will be connected to your keg. Put on a crimp clamp or hose clamp on the end and insert the stainless steel quarter-inch barb by quarter-inch female flare nut and secure. Attach your soda-keg connector.

Note: You do not need the stainless steel quarter-inch barb by quarter-inch female flare if the soda-type connector you are using is barbed. However, the ease of maintenance and flexibility of quarter-inch male-flare-type soda connectors is highly desirable.

The hose assembly is now complete.

5. Next, connect the brass three-eighths-inch barb by one-half-inch male pipe thread to the half-inch male-pipe-thread cap. The cap needs to be drilled prior to assembly. We recommend using Teflon tape on the threads when the pieces are screwed together.

6. Attach the three-eighths-inch tubing onto the goose neck of the pump faucet. Secure with crimp clamp or hose clamp. Place the other clamp on the other end of the tubing and insert the brass hose barb into the tubing. Secure with crimp clamp and/or hose clamp. The crimp clamp gives a cleaner finish. Functionally, either type of clamp is the same.

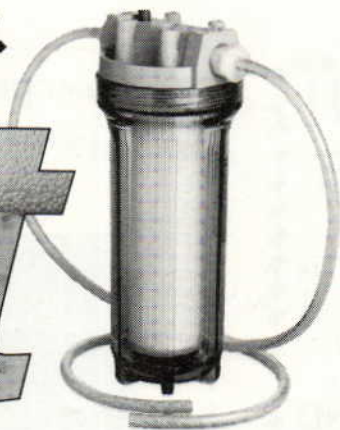
With the pump secure inside the aluminum U-frame, you can now attach the front, back, and base of the assembly with wood screws.

When it comes to using your hand-pump, attach it to the keg.

These are the basic instructions for assembly. Adjustments, adaptability, and creative modification are all within the realm of the builder. The builder's needs and style of display and dispense should be considered prior to start of construction.

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# Troubleshooting a Stuck Sparge

by Alex Fodor

The flow of the sweet wort slows to a trickle and the start of the boil is pushed later and later into the day. When night falls, all your friends leave you high and dry with a stuck sparge and an empty soda keg. Such is the sad tale of the brewer whose run-off has mysteriously stopped. Fortunately, steps can be taken to avoid this fate.

Sparging is the step in all-grain or partial-mash brewing following starch conversion. The hot sweet wort sits in the lauter tun, intermingled with the

grain particles. The purpose of running off the wort and then sparging what's left in the lauter tun with hot water is to remove the sweet liquid and leave behind the spent grains. Often this relatively peaceful event, involving the flowing of sweet nectar from hearty grains, is disrupted by subversive equipment or ingredients.

## Mash Tuns and Malts

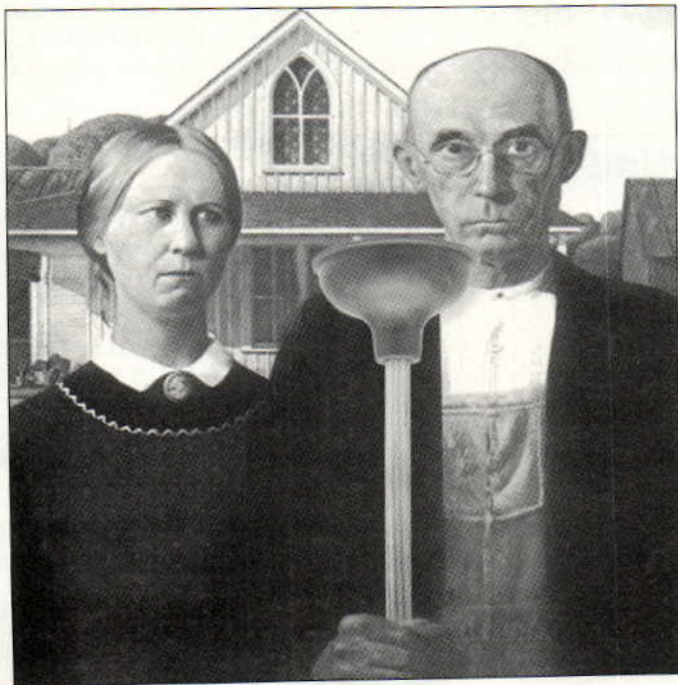
There are several different models of lauter tuns on the market. They range from a mesh bag in a plastic bucket to a converted keg with a stainless steel false bottom. Most designs will not directly be responsible for any stuck run-offs.

However, the speed of the run-off will vary between models largely depending on the surface area of the false bottom. A larger surface area means a shallower grain bed. The sparge water will run through a shallow grain bed faster because it has to travel a shorter distance to reach the bottom.

If a homemade lauter tun is used, the holes of the false bottom should be about one-eighth inch in diameter. Anything smaller will slow down the flow; anything larger will allow too much solid material through, potentially clogging the spigot.

Insulated lauter tuns, such as picnic coolers, have the advantage of keeping the liquid hot. This will keep the sparge moving along more swiftly and efficiently, because the sugars will dissolve better and the wort will flow more easily at a higher temperature.

Even the best lauter tun will not perform without properly crushed malt. To avoid a stuck sparge, the bed of grain must be permeable to water.



The husk of the malted barley is the structural component of the grain bed that allows the bed to stay permeable. Without the husk the grain bed can be likened to a pile of mud. Having no use for mud, most brewers try to preserve the husk during the milling process.

The standard corona flour mill tends to shatter the husk of the grain, often leading to stuck run-offs down the road. Roller mills keep the husk more intact while still crushing the grain effectively. A roller gap setting of 0.05 to 0.055 inch usually gives a good crush. If a roller mill is too expensive, a good homebrew shop will usually have one on hand for customers to use.

Brewers should also avoid over-crushing for fear of fines. After milling, crushed grains should contain intact husk pieces and small chunks of meal. Fines are the smallest particles produced from malt crushing and have the consistency of flour. Fines can form impermeable layers within the grain bed and impede flow.

Sometimes an all-barley-malt beer just doesn't suit your favorite style. So you try other mash ingredients, such as flaked wheat in a cloudy Belgian wit beer, raw barley in an Irish stout, or malted wheat in a German weizen. Professional brewers call these

adjuncts. When using adjuncts or malted wheat, which has no husk, the brewer must use caution to avoid a stuck sparge.

In traditional weizens, up to 70 percent of the grains might be wheat malt, but don't think these brewers have an easy time of it. Lowering the quantity of wheat malt to 50 percent or less can relieve a sparging headache. Unmalted adjuncts, such as flaked wheat or oats, may be used cautiously at proportions up to 50 percent with a highly enzymatic malt such as six-row.

Unmalted adjuncts, such as barley or wheat flour, are typically problematic. Flaked or rolled grain is easier to handle than flour and is just as effective. Of all the adjunct grains brewers use, raw barley is infamous for causing the stuck run-off blues. One or two pounds of flaked barley in a five-gallon batch of Irish stout is more than enough to keep the leprechauns out of the lauter tun (and the wort stuck in it, with the run-off at a standstill).

◆  
**Mixing the  
 crushed malt and the  
 adjunct while they  
 are dry ensures that  
 no clumps of adjunct  
 will block flow.**  
 ◆

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CIRCLE 6 ON READER SERVICE CARD



## Filter Aids

In the past brewers mixed chopped hay and oat husks into the mash to help filtration — often at the expense of beer flavor. Although this is no longer practiced, homebrewers have recently rediscovered mash filter aids in the form of barley husks and rice hulls. Rice hulls are the husk portion of the grain removed during processing.

Homebrewers can add one-half cup rice hulls or unmalted barley husks per pound of grain at mash-in when using wheat malt or a large portion of adjunct. The hulls or unmalted husks will play a similar roll in the filter bed as the malted barley husks, allowing for a smooth run-off. Whenever adjunct grains, wheat malt, or rice hulls are used, they should be mixed thoroughly with the malt. Mixing the crushed malt and the adjunct while they are dry ensures that no clumps of adjunct will block flow.

## Water's Role

While conducting the sparge it is important to make sure the water is at 168° F and stays at least that hot throughout the run-off.

The sparge water should not be alkaline, because this can cause proteins to coagulate and block drainage. Adjusting the pH of the sparge water to 5 to 5.5 will avoid this problem and decrease the extraction of harsh tannins from the grains.

The sparge water should be applied as needed to maintain an inch or so of water over the top of the entire bed. Don't let the bed run dry. When all liquid is drawn off, the grains are pulled by gravity against the false bottom and the grain bed collapses. When the sparge water is poured over the collapsed grain bed, it will have a much harder time filtering through the densely packed grains. Besides causing the mash to stick, rehydrating the collapsed bed may result in the channeling of water within the bed. When the water flows through distinct channels, it fails to extract the sugars throughout the bed and decreases the original gravity of the beer.

## Clogged Spigots

When it seems like everything was

done right but the open lauter-tun spigot is still just dripping like a leaky faucet, it could be time for more extreme measures. At the start of the run-off, the spigot may become clogged with rogue grains that escaped past the false bottom. An easy way to solve this problem is simply to shut off the spout for a few seconds and open it. This will increase the pressure and help flush out the grains.

The more daring brewer might attach a piece of plastic hose to the end and try to suck the grains out. This is not recommended. If the brewer fails to remove the hose from his mouth when a visible flow starts at the top of the tube, many important taste buds will be burned to death.

Another good way of dealing with jammed spigots is underletting. Underletting is the practice of introducing

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hot water from beneath the false bottom. It is also a good way to float the grain bed off of the perforated plates when they clog or stick.

Homebrewers can underlet using a bucket with a plastic spigot on the bottom. Secure a plastic hose so that it connects the spigots of the lauter tun and the plastic bucket. Pour hot water (168° F) into the plastic bucket and open the spigots. When you lift the

plastic bucket above the mash tun, gravity will force the hot water under the plates in the lauter tun, clearing out any clogs and resuspending the grain bed.

### A Matter of Mash Mud

A stuck run-off may also be attributed to troubles with top dough or teig (German for "paste"). Teig is a layer of gray sludge caused by the

accumulation of fines on the top of the grain bed during recirculation of wort and sparging. Teig, like fines and flour, is mash mud. However, it is not really a problem unless it builds up to a thick enough layer to keep water from passing through the bed.

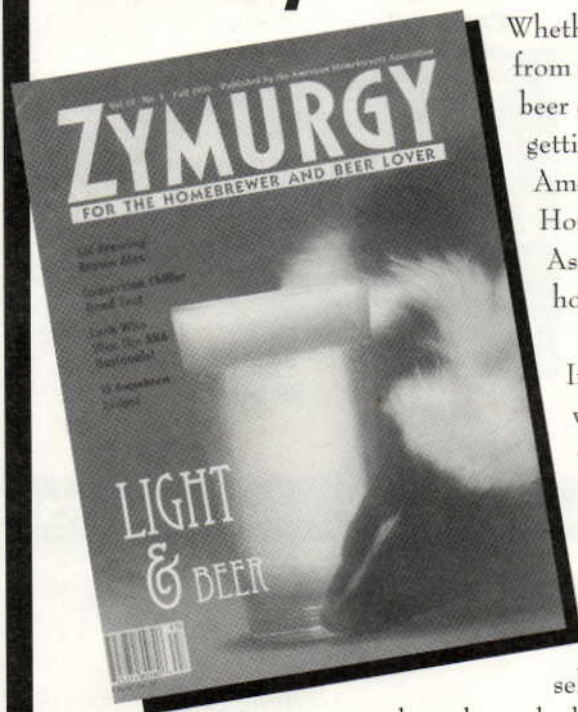
If the teig builds up, the brewer may rake the top of the grain bed with a large fork or cut it across in lines an inch or so deep with a knife. This will allow water to bypass the teig and percolate down. Another way to keep the teig at bay is to not over-recirculate. Brewers recirculate a sparge to remove protein when their runnings are cloudy. Recirculating is time consuming and can build up a mighty teig. Set a time limit of 15 minutes or so for recirculation, and if the wort hasn't cleared, move on. Most of the proteins causing the turbidity will precipitate with a vigorous boil.

### The Last Resort

If all else fails, a brewer has little choice other than to stir the grain bed. This is not so bad considering that brewers who batch sparge do it as a rule. Add some extra sparge water so that the top of the bed is submerged by at least two inches, then stir up the bed with a spoon. The run-off may not be as clear as it is with an undisturbed bed, but at least a brew day isn't wasted. Next time try to figure out why your sparge stopped flowing and keep changing parameters until you don't have to resort to the spoon.

Sparging is the bottleneck of the brewing process. To a professional brewer a drawn-out sparge can make the difference between completing one or two brews in a day. Still, it is a slow process for a reason. Running off too fast can cause a suction from the bottom of the lauter. This may collapse the tiny passages through which the wort flows and result in a stuck mash. Furthermore, the sugars must be extracted by the hot water during the sparge. This takes time. The total sparge time should be at least 50 minutes for a five-gallon batch. Taking time to have a beer and hang out around the lauter tun is one of the many joys of homebrewing, particularly when everything is flowing well. ■

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CIRCLE 5 ON READER SERVICE CARD

# Brewing Beer in a Horse Stable

by Stan Hieronymus and  
Daria Labinsky

**D**an Weirback showed more than a little horse sense when he decided to open an English-style microbrewery with the German name Weyerbacher in an old livery stable in Easton, Pa.

Weirback was running a potato chip distributorship and had been homebrewing for eight years when he decided to open the microbrewery, christened Weyerbacher because that was the Old Country version of his family name. With former partner Joseph

T. Nanovic, a lawyer, he set about raising capital. It took them six months to draw up the business plan and another six months to raise the amount they initially thought they would need.

"It took about \$250,000 to get off the ground, but we've since had to commit another \$50,000 to \$100,000," Weirback says. Construction began in April 1995, and the brewery opened that September. Nanovic returned to his law career but still owns a small share of the brewery.

The brewery building dates to 1888 and once served as the livery stable for a nearby hotel. The brick building has old-fashioned wooden front doors, and if you look beyond the cases of bottles, bags of grain, and brewery equipment inside, you'll find the spindle dividers for the original horse stalls. The wood flooring has been covered with plywood to make it easier for wheeled equipment to travel over the floor.

The old building with its wooden floors gathers a lot of dust, so Weirback installed a closed-off "clean room" to house most of the brewing equipment. He was interested in producing British-style ales, so he installed two 12-barrel open fermenters from manufacturer JV Northwest.

"The foam creates a tremendous barrier," he says. "No bacteria is going to land as long as you take precautions." The fermenters are covered with sheets of plexiglass.

Much of the equipment was purchased used. A 14-barrel dairy tank served as a hot liquor tank for the first eight months and now serves as a holding tank. Another dairy tank is used as a fermenter.

"You can pick up dairy tanks for \$400," Weirback says. "They would have cost \$10,000 if they were called 'brewing equipment.'" A drawback to dairy tanks is that they take up a lot of



*Weyerbacher  
Brewing Co. is  
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floor space. Because space is at a premium in the old building, he bought two 15-barrel unitanks at a cost of about \$15,000 per piece. Weyerbacher expanded the brewing set-up early in 1996 with the addition of three seven-barrel and two three-barrel Grundy tanks, which serve as conditioning tanks.

All of the English-style ales are made with British Munton's malts and both British and US hops, including East Kent Goldings and Cascade. The ales are dry hopped in the fermenters.

ESB Ale weighs in at 5.25 percent alcohol by volume and just less than 30 International Bittering Units. It is made with pale and crystal malt and about 5 percent wheat malt to aid head retention.

"The ESB was something I perfected at home," Weirback says. He quickly

malt," Weirback says. After Cascade and Willamette hops are added, the beer checks in at 42 IBUs.

Only a former homebrewer would attempt to sell the public on a strawberry wheat ale or a raspberry imperial stout. Weirback says he was disappointed with the Strawberry Wheat, which he made last summer with frozen strawberries. The Raspberry Imperial Stout, however, came out exactly as he had hoped. The recipe included pale, crystal, wheat, Munich, chocolate, and cara-pils malt, roasted barley, and Target and Fuggle hops. Tart, whole raspberries were added during secondary fermentation, and the beer sat for seven to 10 days before racking. The result was a well-balanced brew reminiscent of a raspberry-filled chocolate candy. It weighed in at about 8 percent alcohol by volume. At 40 IBUs

*Because the dairy tanks-cum-brewing equipment take up a lot of the microbrewery's 5,000 square feet of floor space, storage room is at a premium.*



learned that the hops utilization for a larger batch is much higher than for a smaller batch, so the recipe required some fine tuning.

Another year-round beer is Easton Pale Ale. British pale ale malts give the pale ale a rich darkness. "Most people think we must use crystal

the beer is not as hoppy as most imperial stouts. Instead the raspberries provide the tart finish.

Other brews have included porter, black-and-tan, Autumnfest Ale, Winter Ale, and an India pale ale with about 55 IBUs. Winter Ale featured 2 percent chocolate malt in addition to pale and

crystal malt, and Fuggle hops. It measured about 6 percent alcohol by volume. Weirback describes it as slightly on the malty side, with a candi sugar flavor (from the chocolate malt, not from candi sugar), very smooth and clean.

When Weirback decided to expand into American-style ales, he created the Two Rivers Brewhouse line, which features more mainstream beers brewed exclusively with American malts and hops. The first beer released, Golden Amber, is a low-alcohol beer (under 4 percent alcohol by volume) in the American amber style.

"Weyerbacher beers are very special beers true to the British style of ales," Weirback says. "They're up there in (malt) flavor and hops. Some people wanted to buy 'the local beer,' but the British-style ales were too much for them."

About two-thirds of the beer sold is bottled. As of early February, Weyerbacher had about 30 draft accounts in the Lehigh Valley area of east-central Pennsylvania and about 30 in the Philadelphia area, with a few in New Jersey and the Harrisburg, Pa., area.

Weirback recently began conditioning beer in small wooden casks and planned to set up regular "Firkin

Fridays" in on-premise accounts. "I think it's a great product and a great way to sell beer," he says. "It harkens back to old times." He uses East Kent

part in production about once a week. Prinz and Parsons also spend some time making sales calls. Financial manager Barbara Lampe handles the

*Production Supervisor Kirk Decker (left) and Al Prinz, a brewer, take a spin at bottling the beer. Two-thirds of the microbrewery's beer is bottled, and bottling takes place every other day.*



Goldings to dry hop these ales in the cask.

For the first six to eight months the brewery was operating, Weirback worked side by side with production supervisor Kirk Decker to brew and package the beer. Now, Decker and brewers Al Prinz and Bud Parsons do most of the hands-on work. Weirback concentrates on sales and only takes

bookkeeping several days a week.

Business "was great at first," Weirback says. "Then there was a lull, which was a little bit of a shock to us, but we managed to work through that." Because sales started off so well, the brewery then made more beer than it was selling, which caused some problems. "I was really concerned about freshness," Weirback says. "We

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want to make sure we don't overproduce again."

Demand has been so strong that the brewers usually brew five to seven days per week. They generally bottle every other day, using a Meheen MicroMaster bottling unit. The in-between day goes to filtering and carbonation. "It's not a sterile filtration; you get some residual yeast," Weirback says. The beers are not pasteurized.

Weirback is concentrating on increasing sales within the current markets rather than expanding into new ones. He has had some problems with distributors, whom he called "the bane of the industry."

"There aren't too many who do just micros and do them well," he says. The Easton area is still a fairly untapped market for micros, but he expects interest to increase at a fast pace this year.

Weyerbacher produced about 1,700 barrels in 1996 and is on track to produce 2,500 to 3,000 barrels this year. "We're growing about 50 percent over last year's sales," Weirback says. Because that translates to a jump from about 1,200 cases a month to about 2,000 cases a month, Weyerbacher is clearly still a small microbrewery. All 5,000 square feet of the building's first floor are often filled with ingredients, bottles, and equipment. In fact when a new shipment of bottles arrives, bags of malt must be moved outside temporarily so there is room to bottle. Weirback plans eventually to expand into the basement, which measures another 6,000 square feet.

Weirback's dream is to one day be "as big as Sierra Nevada," but he adds, "We don't mind waiting 10 to 15 years to get there like they did."

Weyerbacher beer is available primarily throughout east-central Pennsylvania and in the Philadelphia area. Tours are held from noon to 2 p.m. on Saturdays. Admission is \$1, with proceeds donated to local charities. Weyerbacher Brewing Co., 20 South Sixth St., Easton, Pa. Call (610) 559-5561. ■

Stan Hieronymus and Daria Labinsky are authors of the Beer Travelers Guide, which lists more than 1,700 brewpubs, bars, and restaurants in the United States that serve flavorful beer.

# The Curse of Funky Beer

by Greg Furlich

**T**he funk, that's what I called it. What is the funk? All you brewers who brag about never making a contaminated batch wouldn't know. Those of you have been cursed with a batch or two of skunk beer will understand. I, too, used to crow about never having an impure batch of brew. And then it happened.

Late this spring the funk worked its way slowly into my life. I produced one contaminated batch of beer after another. Each batch I brewed came out with a mouth-puckeringly sour flavor. It didn't matter whether I was aiming for a golden lager or a rich chocolate porter, the result was always the same. I had done nothing radically different. I was using the same equipment. My sanitizing procedures were the same, not clinical but not haphazard either.

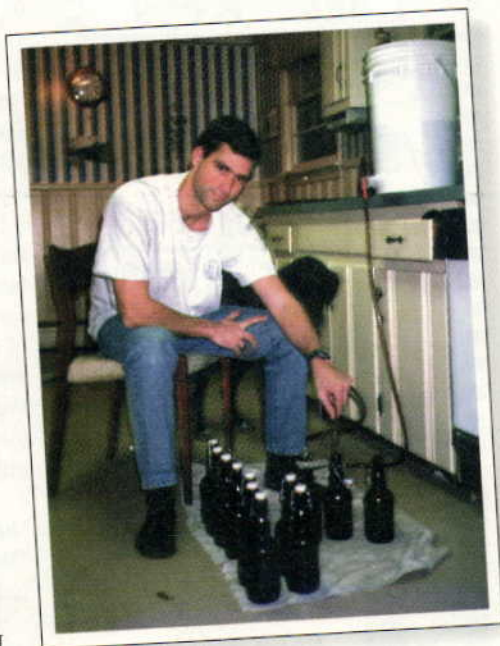
I began to think that I had offended some heretofore unknown god of brewing. I was overcome, distraught, disturbed! My wife was unable to console me. Brewing for me had become more than a hobby. It was a labor of love. Each batch of beer I lost tore at my soul. My self-worth was called into question. I actually considered turning in my carboys and finding a new hobby. I refused, however, to go without a fight.

I was able to determine that my problems were occurring whenever I racked my beer into a secondary fermenter or into the bottling bucket. This realization did me no good. I began by redoubling my sanitation efforts. When this proved ineffective, I replaced my admittedly dingy looking siphon hoses and racking canes. Again, I met with no success. My stress and frustration began to build. Near-clinical depression was not the by-product I had bargained for from what was meant to be a leisurely hobby. Would I ever relax with a

homebrew again?

When I still couldn't shake the funk, I began to feel unclean myself. I hit my low point in the checkout line at the grocery store purchasing commercially made beer. I began to scan the shelves and supermarket sales sheets for bargains on Sam Adams and Pete's Wicked. Something had to be done.

I took my equipment to the home of a homebrewing friend to brew. But the result was predictably the same at bottling time. I was forced now to face the awful truth that something I was doing was destroying the



*By bottling time I was more apprehensive than optimistic.*

very thing I loved. I threw out all of my plastic equipment, old and new alike, and decided to start anew. I hit the brew store for fresh equipment. Any other equipment I used was tossed in the brew pot and boiled. I returned once again to my kitchen for one final attempt at clean beer.

Stubborn mule that I am, I chose a

difficult extract recipe for an apple brown ale. Not only would I have to peel and core eight pounds of apples, but I would have to rack the beer three times. I knew that this effort would make or break me.

The wort was a beautiful brown, and I said a silent prayer as I strained it into the primary fermenter and lovingly pitched the yeast.

A week later I got the first taste of my desperation brew as I moved the beer into the secondary. There was a hint of sourness. Was it the funk or merely the apples? I was sure it was funk, but I forged ahead anyway.

After two weeks of constant fretting, I racked the beer again. The sourness was less pronounced but still present. The story was the same when I bottled. I managed to hold off for a week, and then I had to down a cold one. The sourness had faded into a soft apple background. My beer was not only drinkable, it was good!

Now, throughout this terrible ordeal my brother, my own flesh and blood, was brewing like a fiend. Don't get me wrong, I love my brother, but this was almost insufferable. After all, I got him into brewing. While I was turning out nothing but funk brew, he was making a wonderful Belgian ale, California ale, and a maple brown. Sibling rivalry does not die at age 30. This made that first swallow of clean, unfunked brew all the sweeter.

"Relax, don't worry" may look like a great slogan, and I wish I could put it into practice. But Santa left a brand-new, completely outfitted 10-gallon pot under this stressed-out brewer's tree. Kettle mashing here I come! ■

*Do you have a 750-word story for Last Call? Mail it with a color photo to Last Call, c/o Brew Your Own, 216 F St., #160, Davis, CA 95616.*

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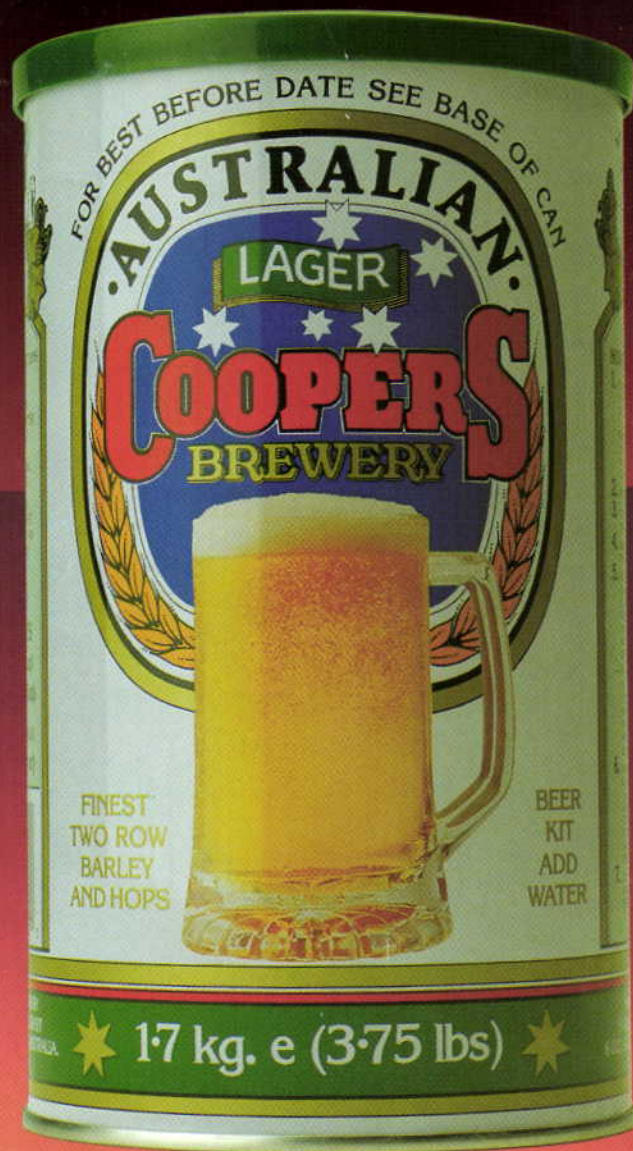
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