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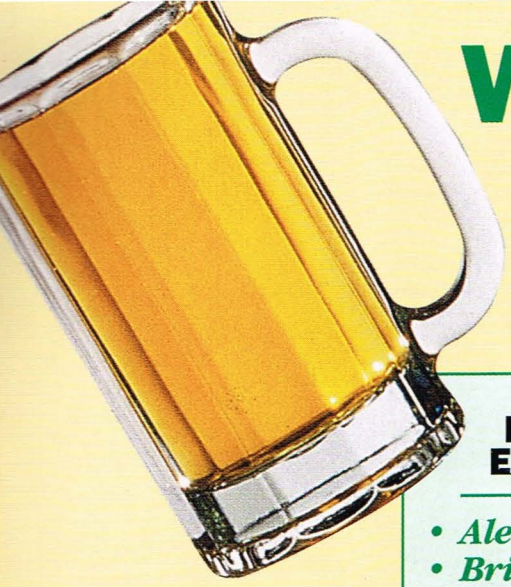

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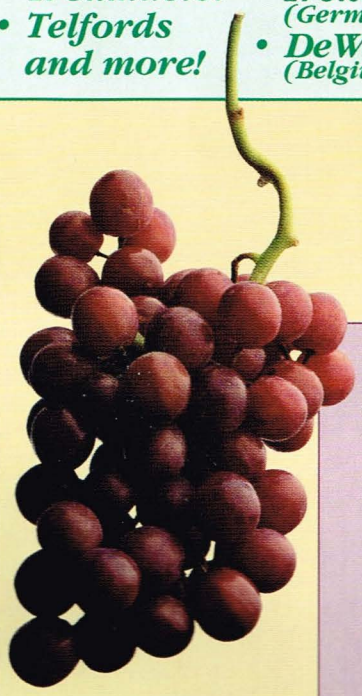

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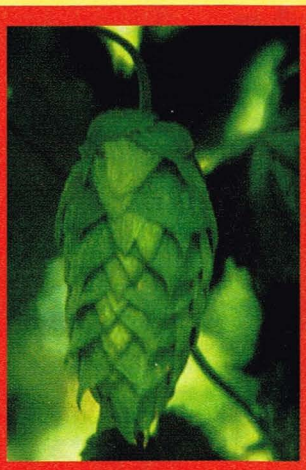

Wicked Weed.

Englysshe Ale is a naturall drynke made of malte and water, yest, barme or godes good. Afore the reformation, they wiche did put hops to ale were punishable by a fine or imprisonment.

King Henry, like the hop, a bitter soveraign who in his ale liked a pretty head, did allow the wicked weed to be cultivated in the county of Kent, mostly by Dutche men.

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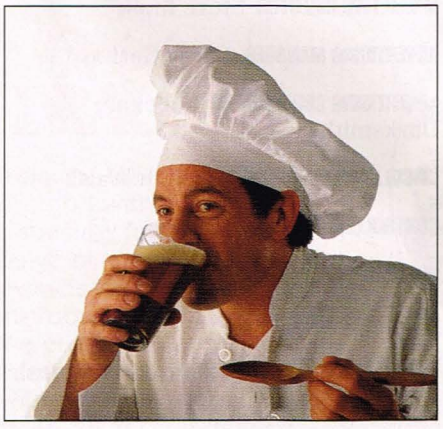

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Happy Birthday to Us

Publishers must love to party. It's the only logical conclusion. How else to explain why our normally level-headed publisher (Carl Landau, if you're writing letters) insisted that I write this month's Editor's Note on the fact that *Brew Your Own* is now one year old.

Don't get me wrong. I'm as thrilled as he is that we've had a great first year. But a whole Editor's Note? Let's see, I could write about the year's highlights (trip to Guinness in Dublin, cover feature on brewers at NASA, an amazing label contest, lots of great how-to stories). But I figure if you were here, you know all that. And if you weren't, there's nothing worse than having someone tell you what you missed.

I could mention that we have more than 60,000 readers and that we've been profiled in newspapers ranging from the Milwaukee Journal to the San Francisco Chronicle. But really, when it comes right down to it, so what?

My theory is that Carl's looking for an excuse to throw a huge bash. Since I wouldn't want to deprive him of the opportunity — and to assure that I get an invitation — here it is: Happy Birthday, BYO (or should it be Happy Anniversary?).

Now, in keeping with this month's theme, on to more important things, more personal things: *my* first birthday. It was a very special day, coming as it did exactly a year after I was born.

It was a warm, sunny Saturday in Springfield, Mass. The whole family was seated at the dinner table. I had assumed my usual seat, where I could keep an eye on the activities from above: the high chair. For once, nobody asked me to bring the beer to the party.

My mother made spaghetti and meatballs and corn on the cob. For dessert there was chocolate cake with a single candle. The whole family enjoyed it. Everyone, that is except for me. I got creamed carrots and broccoli puree. My parents, having skipped a chapter or two of Dr. Spock, never considered the permanent scarring effect this would have on me.

They even had the nerve to put the cake right in front of me on the high chair. I lunged for a hunk of frosting, but Mom was just a little too quick. She whisked the cake away before I could even make incidental contact.

I know what you're thinking. I was only one year old. How do I remember all this? You have to admit that your first birthday is an important occasion. If you're going to remember any birthday, you'd think you'd remember that one. Besides, even though I was the third child, my parents did manage to snap a few photos (though nothing like the three-volume set that illustrates my sister's first year).

And finally, what does all this have to do with beer? After the party my father retired to the living room to watch his favorite team, the Red Sox. Before he sat down, Dad grabbed a beer from the fridge. Black Label, I think.

We won't be celebrating BYO's first birthday with broccoli puree, a bottle of applesauce, or any other yucky libation. We asked 15 homebrew writers to help us celebrate in style. Their recipes for a great party begin on page 36.

Meanwhile, if you feel the need to send us a birthday beer, don't be shy! We're at 216 F St., Suite 160, Davis, CA 95616. We'd love to party with you (or, in your absence, your beer)!

Happy brewday!

Craig Bystrynski

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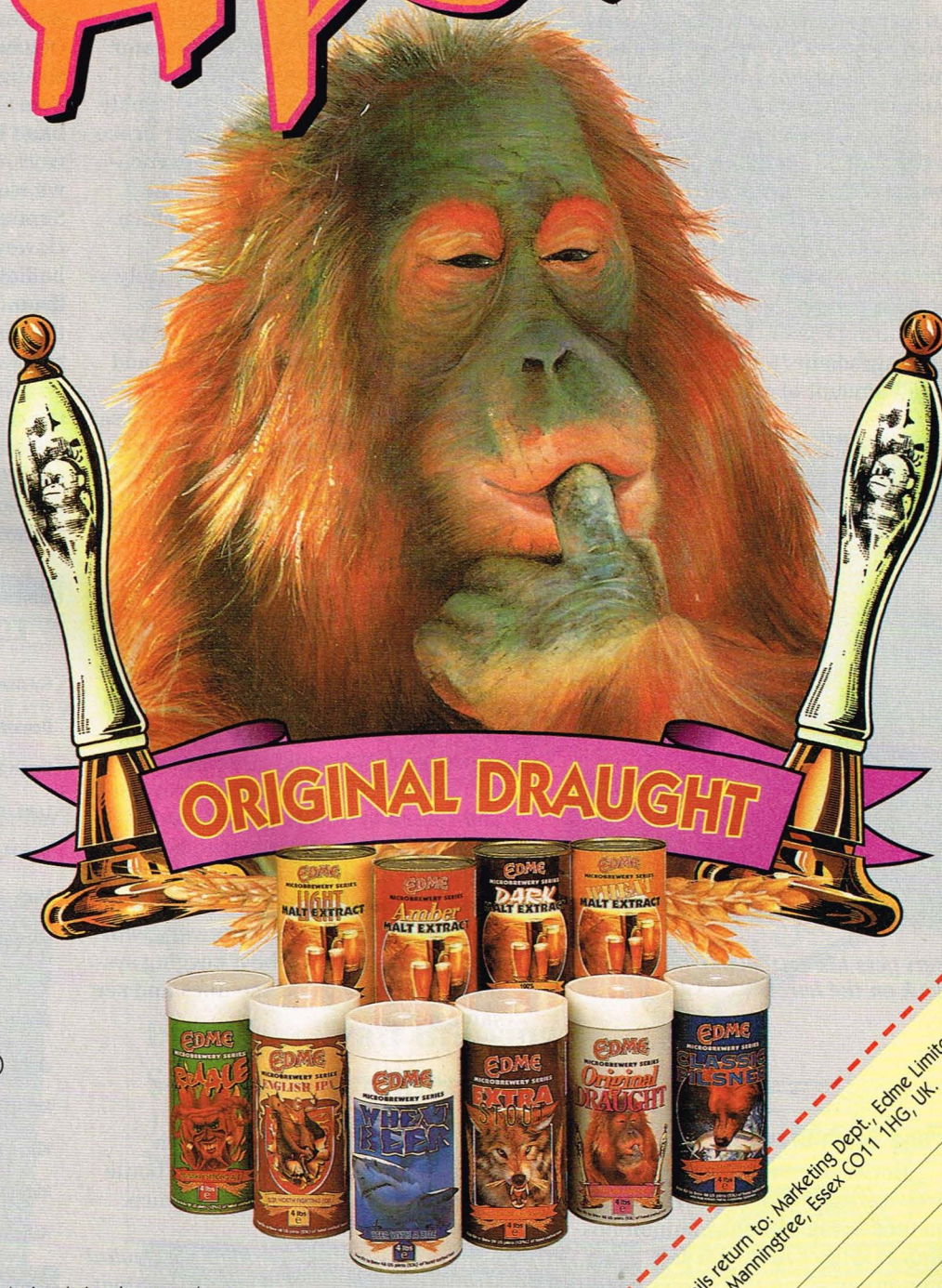

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CIRCLE 21 ON READER SERVICE CARD

Bert and Annette Prytherch
Oriental, N.C.

My wife and I recently took a year off from work to cruise our 41-foot sail boat, the Lorelei, down to the Caribbean by way of the Bahamas and Turks and Caicos Islands. While we were planning the list of provisions, it became apparent that beer was going to be a problem. I figured we would drink two beers each per day. Buying beer in the islands is extremely expensive, so that was not an option. That much beer (60 cases!) would also eat up our limited storage space. The obvious solution was to brew our own as we went.

We settled on a few beers we liked: a German pils, a Czech pils, and a weizen. We ordered ingredients in bulk: hops by the pound and dry extract in 50-pound bags. I distributed the malt extract into Ziplock freezer bags in five-pound portions to make measuring easier. All the equipment and ingredients took up an amazingly small amount of space. We set sail with a batch of beer already in the fermenter, which was strapped to the mast below deck.

Bert gets his bottles together below deck on the Lorelei.

Although we were brewing pils at higher temperatures than is recommended, the beer still came out tasting great. Fresh water is in extremely short supply in the islands, so we did all our cleaning and sterilizing with salt water, using only a small amount of fresh water for a final rinse. We stored our hops and chilled the beer in our 12-volt fridge, which was powered by solar panels and a wind generator. We also made our own bread and caught most of our own food. Our only mishap was when the fermenter broke loose from the mast during a particularly unsavory transit between the Dominican Republic and Puerto Rico. What a mess.

We gained quite a bit of notoriety among the cruising set for our sea-faring brewery. They had run out of beer after only a month or two and were reduced to drinking rum and warm water. We had fun inviting these beer-starved cruisers over for beer bashes. We were able to give out beer like water when everyone else was conserving it like a precious commodity. We were cranking out about three cases a week to meet demand. Needless to say, our beer didn't get much chance to age!

Regrettably, the "Lorelei Brewery" now sits idle. The need to return to work and Annette's announcement that we were expecting a new crew member forced us to end our voyage and return to Germany (Annette's homeland). Brewing our own beer doesn't make much sense here in beer drinker's paradise, but we are looking forward to firing up the brewery with new recipes and maybe a kegging system when we cast off the lines and set sail again.

Pond Scum Brew

Here's one for your strangest brewing ingredients file. I have experimented using Aphanazominon flos-aquae. What's that, you say? It's a blue-green algae that grows wild in Upper Klamath Lake in southern Oregon. I put one gram in each bottle at bottling time. It makes for a nice green beer.

Kenneth Paolini
Livingston, Mont.

Carl Laman
Harwich, Mass.

Our homebrew club, the Cape Cod Lager & Ale Makers (CCLAM) has been in existence for about a year and a half. We hold our monthly meetings at a brewpub, the Cape Cod Brewhouse, and we try to plan group activities such as touring breweries, attending beer festivals, and entering competitions.

One of our more memorable activities was what we dubbed "The Monster Batch." It was held last year on October 21. It was a strange day for a strange brew. We gathered at member Tom Gerraty's house, eager to have a hand in brewing about 70 gallons of wort. The skies were quite clear and we were having one of those "Indian Summer" days the Cape is known for. However, once the water started boiling in the 55 gallon stainless steel drum (under tarps by the old barn) the temperature dropped and the rains came.

This didn't dampen the spirits of the dozen or so brewmasters present. We added 50 pounds of hopped Old Ale extract, 25 pounds of plain dark malt extract, five ounces of Northern Brewer hops, and 10 ounces of

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CCLAMers enjoy the bounty of their rainy-day labor, a very satisfying collection of brown ales.

Williamette hops, and that wonderful aroma wafted through "the brewery." The excitement level grew (or maybe it was just the homebrew flowing), and everyone had suggestions on how to pull this off. The boil lasted an hour.

The hot wort was then circulated through 80 feet of a counterflow wort chiller immersed in ice water. The cooled wort was dispensed equally into waiting fermenters. We then topped off each fermenter to volume with cold water, and each brewer added his own choice of yeast or any other additions (such as dry hops) to his fermenter.

We christened the batch "MCF Ale" and swore not to reveal the name's meaning.

The rain continued, but cleanup was short and sweet with many helpers. We departed with fermenters strapped into our vehicles and hopes of what we felt should prove to be a successful brew.

At our December club meeting we sampled the beer. Everyone was pleased with the resulting brew that fell into the broad "brown ale" category. We are currently planing our second Monster Batch.

Brews Brothers

Do you brew with your bro? Tell us about it, and send us a picture of the two of you. We'll fix you up with a matching wardrobe (well, t-shirts, anyway.) Send your story to Pot Shots, c/o Brew Your Own, 216 F Street, Suite 160, Davis, CA 95616. Or send us e-mail at edit@byo.com. Be sure to include your mailing address!

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I Did It My Way

Dear *Brew Your Own*,

Here's a great time saver for extract-only brewers that also helps feed the yeast during primary fermentation. For each five-gallon batch I buy two 2.5 gallon jugs of spring water. The night before brewing day, I place one of the jugs in the refrigerator. The other I leave out. To start brewing I use 1.5 gallons of the room-temperature water to start the boil. Once brewing is complete, I add the remaining one gallon of water to the primary. Then I add the wort. I add about 1.5 gallons of the refrigerated water to the primary. Now for the two-for-one part.

Before adding the yeast I pull out the spigot of the refrigerated jug and let the remaining water pour into the primary from a height of about three feet. This causes the wort to splash around like crazy, providing plenty of oxygen for the yeast to feast on during fermentation. It's basically a gravity-fed aerator. Also, because the water is refrigerator temperature, the wort is brought to a perfect 80° F instantly. This greatly reduces the chance of bacterial contamination from wort left exposed while cooling.

Ben Bolton
Springfield, Va

Dear BYO,

One of your articles, "20 Tips for Better Brewing" (December '95 BYO), had instructions to build a $3 counter-pressure bottle filler. I read that article when I needed a way to bring some homebrew to a Super Bowl party. I took a two-liter plastic bottle cap and drilled a hole to accept a length of racking hose. I placed the racking hose through the hole and ran a bead of hot glue around the connection. I added a Grölsch-type washer to the bottle cap, and now I have a counter-pressure soda-pop-bottle filler!

By screwing the filler cap onto a bottle and using my kegging system as you described in your article, I can control the flow by slowly unscrewing the filler cap. No foaming, and the beer stays carbonated!

Scott Colligan
Hillborough, N.J.

Dear BYO,

I have formulated a great method of adding that finishing-hop flavor and aroma to my beer. It is similar to dry hopping but without the risk of contamination. I put my finishing hops into a small container and add 1/2 cup of Everclear to one ounce of hops. After swirling this around, I then add 1/2 cup of water. The alcohol kills any bacteria yet is a small enough in quantity to have a negligible effect on five gallons of brew. This amount of liquid used to "rehydrate" the hops is just enough to get them moist, yet I believe the Everclear really pulls some extra flavor from the hops. I add the hops to the secondary fermenter after a few hours of resting. This has to be done with a spoon and can be a bit messy around the mouth of the carboy, but the results are amazing!

Robert Winsor
Keota, Iowa

Cut Kegs and Copper Kettles

Dear BYO,

You address the issue of aluminum brewpots in the January '96 issue of BYO ("Cut Kegs, Copper Kettles, Sexy Stainless"). You regard the uptake of aluminum as a "theory," stating, "The jury is still out on this one..."

It has been established that aluminum uptake is linked to damage of the substancia nigra portion of the brain. This leads to symptoms of tremor and uncontrollable gait in patients over a lifetime of aluminum ingestion. The metal aluminum has been found in those patients that suffer from Alzheimer's symptoms.

Common methods of exposure to aluminum include acidic foods and fluids cooked in aluminum pots, anti-perspirants, fast food cheese slices, baking powder, antacids, and drink cans.

My suggestion to everyone regarding aluminum: Be on the safe side. Simply avoid all unnecessary contact with aluminum. Your health will benefit, and your life will be prolonged for your efforts.

Page Crow
Independence, Mo.

Dear BYO,

I used one of your Stupid Pot Tricks in "Cut Kegs, Copper Kettles, Sexy Stainless" (January '96), and I have to agree that my wort did not scorch. Unfortunately, the chrome reflector pan under the electric burner and the top of my wife's stove did. The technique I used was bending a coat hanger into a triangle. We replaced the reflector pans but couldn't get the scorch marks off the stainless steel stovetop. Was my coat hanger too thick?

Al Audet
Melbourne, Fla.

Bend the coat hanger so it's no larger than the burner and not touching the stovetop at all. Some electric-stove manufacturers sell a canning element that does the same job.

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Lawnmower Bier

by Scott Russell

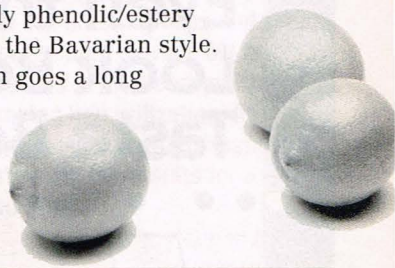
There are some things that make even me cringe when it comes to flavor combinations. Until recently, lemon and beer was one of them. I'd heard tales of people putting lemon syrup into their beer or mixing beer one to one with lemon-lime soft drinks. I swore I'd never try these. But then I had an authentic Berliner weissbier (or rather, a couple of them). It was soft and tart, relatively light.

With the first one, I drank about half and then decided to sample the green woodruff (a sweet-scented herb) syrup in the jar on the bar. It made the beer turn light green and gave it a really interesting herbal, grassy, almost vanilla flavor that balanced the lactic sourness of the weissbier. I started a second one, and my eye wandered back to the jars on the bar. I decided to try the lemon syrup, since someone else was buying anyway. It wasn't at all what I expected. What sweetness may have been in the syrup was cut by the wheat beer and the zesty lemon acidity. The result: a nice tart, citric aroma and a zingy sour flavor. Very refreshing.

Since then I've brewed Berliner weissbiers a couple of times a year. I try to time it so that I have a batch ready for the heat of the summer (it is the ultimate lawnmowing, woodcutting, or lying in a hammock refresher!) and a second batch to be bottled in the fall, dosed with my own homegrown woodruff. I always have jars of lemon and other fruit syrups on hand to add to the summer batch.

But one time I said to myself, "Hey, wouldn't it be nice to not worry about mixing? Why not add that flavor right into the bottle?" I also thought that a lemon flavor would go well with a more full-bodied, Bavarian-style weizenbier. Hmm, an intriguing idea...

In the end I sort of compromised and brewed a hybrid — light and tart like a Berliner style, but with a moderately phenolic/estery finish like the Bavarian style. The lemon goes a long way to make the



Lemonweizen
(5 gallons)

Ingredients:

- 0.5 lb. malted wheat
- 0.5 lb. lager malt
- 0.5 lb. cara-pils (dextrine) malt
- 0.5 lb. raw wheat
- 1 tsp. 88% lactic acid solution
- 5 lbs. unhopped wheat malt extract (German, preferably) or 4 lbs. unhopped wheat dry malt extract
- 0.5 oz. Tettnanger hop pellets
- 0.5 oz. Saaz hop pellets
- 1 oz. shredded fresh zest of lemon (0.5 oz. if dried)
- 10 to 14 grams ale yeast
- 7/8 cup corn sugar
- A few drops of a baker's lemon extract

Step by Step:

Crack the wheats and malts. Mash into a gallon of water at 170° F (it should settle to 150° to 152° F) and add lactic acid solution. Hold the mash near 150° F for 60 minutes, then run it off into your kettle. Rinse/sparge the grains with 6 quarts of water heated to 170° F. You should have 9 to 10 quarts of sweet wort total.

Add extract to the kettle. Bring to a boil, add the Tettnanger hops, and boil 45 minutes. Add the Saaz hops and boil 15 more minutes. Turn off the heat, steep the lemon zest in a hop bag, and chill the wort.

Top off with enough chilled, preboiled water to bring volume up to 5.25 gallons. At 75° F, pitch the yeast (I would use a neutral ale yeast, such as Wyeast 1007 or 1338, instead of a "classic" Bavarian liquid yeast beer strain) and ferment at 65° to 75° F for four or five days. Rack to your secondary and condition cooler (50° to 60° F) for seven or eight days. Prime with corn sugar and add a few drops of a baker's lemon extract to taste. Bottle condition 10 days to two weeks.

This beer does not have a long shelf life, so as soon as it's ready, invite the neighbors over to paint the house, trim the hedges, rebuild the patio, or just pitch horseshoes.

About the Ingredients:

Most commercial wheat extracts have at least a 50 percent barley malt content, because wheat lacks the enzymes and proteins necessary for successful fermentation. One brand, Ireks, packages a 100 percent wheat extract syrup (in 6.6 lb. tins) that is quite good but needs to be used with a couple of pounds of barley malt extract. For this recipe stick with the pre-blended extracts.

Raw wheat is just the "wheat berries" you find in most grocery stores' grain/bulk food aisle. It will give a little cloudiness and starch to the beer, so don't worry if this beer doesn't clear very well. That's part of the mystique.

Lemon zest is the white, fibrous material inside the peel. You can occasionally find dried lemon peel in the spice aisle. This is not exactly the same thing, but it will do in a pinch. Don't use lemon juice instead of lemon extract. It will acidify the beer more than you want.

transition between rich and sweet and light and sour.

Reader Recipes

Rob Clapper's Raspberry Spring Ale
(5 gallons)

"The key to using tea to flavor brew is to use herb tea. Using 'real' tea with caffeine adds a twang/bitterness to the beer. This recipe works with any flavor tea. Try it with peach or chamomile!"

Ingredients:
- 0.5 lb. crystal malt, 40° Lovibond
- 6.6 lbs. amber extract
- 2 oz. Tettnanger hops (5% alpha)
- 2 oz. Willamette hops (4% alpha)
- 1 tsp. Irish moss
- 1 box Bigelow Red Raspberry herb tea
- 14 g. Edme dry ale yeast
- 2/3 cup corn sugar

Step by Step:

Bring crystal malt and 2 gallons of water to 170° F. Pull grains and add extract. Bring to boil and continue for 70 minutes. After 10 minutes add Tettnanger. Add half of the Willamette for 15 minutes, the other half for two minutes. After boil turn off heat and add tea (in tea bags). Cover for 20 minutes. Sparge through tea bags into the fermenter with 0.5 gallons cold water. Pitch rehydrated yeast. Secondary fermentation recommended. Bottle with corn sugar or keg as usual.

Mark Beale's Williamsburg Ale
(5 gallons)

"In colonial times coriander was used by our founding fathers to extend the shelf life and improve the flavor of their beer. Here is my recipe for a delicious bitter similar to that which these men may have brewed on the estates or in the taverns of their time."

Ingredients:
- 4 lbs. dry malt extract
- 3.3 lbs. light malt extract syrup
- 0.5 lb. 60° Lovibond crystal malt
- 3 oz. Kent Goldings (5% alpha)
- 1 tsp. crushed coriander seed
- Wyeast 1098 British ale yeast
- 2/3 cup corn sugar

Step by Step:

Add crushed crystal malt to 1.5 gallons 150° F water and hold for 30 minutes. Remove from heat, add malt extract and 1.5 oz. Kent Goldings, and boil for 45 minutes. Add 0.5 oz. hops and 1/2 tsp. coriander seed and boil for 15 minutes more. Remove from heat, add remaining hops and coriander, and steep for three minutes.

Cool in an ice bath and transfer to primary fermenter filled with 3.5 gallons cold water. Pitch yeast at 70° to 75° F and ferment for seven days at 65° to 70° F. Rack to secondary and add dry hops. Prime with corn sugar and bottle after seven days. Best if conditioned four to six weeks before serving. ■

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CIRCLE 24 ON READER SERVICE CARD

From the Knights That Say "Nee"

Mr. Wizard

Your recent use of a Monty Python reference is to be applauded, however, your source is a wee bit off kilter. It was in the movie "Monty Python and the Holy Grail" that the scene "bring out your dead" appeared (not "Life of Brian").

Now that I have that off my chest, I would like to know a thing or two about using citrus in Lambics. I would like to brew an orange lambic, and haven't the faintest idea of how much fruit to use.

Frank Turfler Jr.
Windber, Pa.

Mea culpa. I wish I could say that my mistake was intentional and that it was all part of a clever survey to determine how many readers of my column are also Monty Python fans. I mean, no red-blooded Monty Python enthusiast could ever read such a glaring error without responding. But I confess that my brain was completely disengaged when that lame attempt at a reference was penned.

On to things a little bit more up my alley. Fruit lambics typically contain one to three pounds of fruit per gallon of beer. This concentration is common to kriek (cherry), framboise (raspberry), cassis (black currant), muscat (grape), and pêche (peach) lambics. In all cases the fruit used for lambics is selected for its sour quality.

Citrus lambics are not part of the lambic tradition but fit in with the sour fruit theme. I would use caution with citrus, however, since citrus peel tends to be quite bitter and both the albedo (the white tissue between the peel and the fleshy center) and the seeds are very astringent.

Although expensive, very ripe blood oranges are in my opinion ideal candidates for brewing. These oranges have a deep purple color and a rich berry flavor married with the typical flavor of an orange. If I used them, I would discard the peel, albedo, and seeds from the whole orange and add between one and two pounds of flesh per gallon for the first attempt. Since blood oranges would give the beer a dark purple color, they may not make the most aesthetically pleasing beer. Included in my concept of a citrus lambic is ground Curaçao orange peel at a concentration of about two ounces per gallon.

If you try it and it's drinkable, let us know the recipe. We'll run it in the Recipe Exchange!

Mr. Wizard

Oh Most Exalted Omniscience:

I just finished reading the April issue's article on wort boiling ("Bubble, Bubble, Boil and Trouble") and would like your all-knowing comments on the following. I am an extract brewer (no apologies here; I'll put my best up against anyone else's best any day). For my most recent batch I wanted to make a very light colored, nicely hopped ale. But I realized that caramelization from an extended boil (of course needed for good hop utilization) could darken my wort

I began the boil using only a gallon or so of water and my bittering hops, with the idea being that hop utilization would be higher in plain water. While the hops were boiling, I added my extract to some additional hot water in a separate pot to get it ready for adding to the 'hop soup.'

After boiling the hops for half an hour, I added the extract soup to the hop soup to create my final wort, which I boiled for an additional half hour, with additions of finishing hops toward the end of the boil.

This brought the total boiling time to one hour for the bittering hops and just a half hour for the malt extract. My hope in this process was to limit caramelization while increasing hop utilization. At the moment my yeasties are still feasting on it, so I won't know the results for a while. What do you think?

Pepper Powers
Odenton, Md.

So you want to know what I think. I think your process is inventive, as are many homebrew methods, but I'm a little leery of its brewing merit. The problem is that water is a poor solvent for hop acids because they are hydrophobic, or "water-fearing," compounds.

Hydrophobic substances need the aid of surfactants (surface-active substances) to be solubilized (made dissolvable). A common example of surfactants bringing hydrophobic compounds into solution is dish soap solubilizing grease from a dirty plate. Surfactants present in wort help solubilize the hop resins responsible for bitterness.

This is not to say that boiling is not part of the picture. If it were not for the isomerization (chemical change) of alpha acid to iso-alpha acid during the boil, very little extraction of these compounds would occur. But the point is that pure water is not the best place to carry out this process.

Although I don't think the method you outlined works, I do have some constructive advice. Basically, you

decided to do this so you could brew a paler beer. One easy solution is to use essentially the same method you described but substitute store-bought, pre-isomerized hop extract for your hop boil method. In the commercial brewing scene there are many hop extracts used by brewers who, like yourself, have the need for an alternative hop preparation. You could simply add the recommended amount of the extract to the kettle along with the malt extract and use a very short kettle boil.

Another way to make light-colored beer is to use adjuncts to replace some of the malt extract, or malted barley if you were to brew all-grain. Ye gads, man! This gives me the willies to type, but a big healthy dose of rice syrup would definitely lighten the wort. And with rice syrup, boiling does not cause appreciable darkening.

A more palatable choice for those who hate the thought of adjuncts is honey. In both cases there are fermentables present but no proteins. Since protein-sugar reactions cause the bulk of color pick-up in the boil, less protein means less color pick-up. Of course if the wort is scorched, it darkens (caramelizes) with or without protein.

Yet another approach is to go to all-grain brewing. With all the hype removed, all-grain brewing offers one simple and important advantage over extract brewing: The wort is never concentrated like the wort used to make extracts. Whether the extract is liquid or powder, it will always be darker when re-constituted than it was prior to concentration. But if you don't mind a little color to your palest homebrew, then this issue may be a moot point.

So there you have it, Pepper. Happy brewing, and best wishes to your experimental brew!

Mr. Wizard

I'm pretty confused about yeast starters. Most of the information I read talks about getting them going but not what to do once they're going. How do I know when I can pitch? Should I decant the liquid off and just pitch the sludge? Should I pitch in high krauesen or after everything has settled down? Oh Great Sage, help!

Jeff Cronin
Appleton, Wis.

This question is about an important topic on which I certainly have strong opinions. I guess that's no surprise. There are some methods that most commercial brewers agree are best for propagation and pitching of yeast in an ideal world.

For starters, yeast propagations begin at some volume and are stepped up in volume by a factor of between five and 10, with 10 being most common. If you have a one-quart starter, the next step is between five and 10 quarts. The tricky part for homebrewers is knowing what volume of starter to begin with, since the quantity of yeast being added to the starter is usually unknown. Under laboratory conditions, a yeast count is performed so that the volume of the first starter can be determined. If you are starting from

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CIRCLE 22 ON READER SERVICE CARD

yeast that has been grown on a petri dish (a microbiological plate containing a solid growth medium) it is common to transfer a single yeast colony to about 25 milliliters of wort and start propagating. The yeast is allowed to grow and, when fermentation is complete, is transferred to 250 milliliters over wort, then to 2.5 liters, and so on.

Once the propagation volume is more than one liter, it is common to allow the yeast to flocculate (clump and sink) to the bottom of the propagation flask. The liquid above the yeast is discarded, and only the yeast sediment is carried forward in the propagation cycle. This accomplishes two things: First, it removes beer that really should not be carried forward since it contains alcohol, essentially the yeast's own waste. Second, a selection of normal yeast is assured. If non-flocculent mutant strains are present in the propagation cycle, they are removed when the liquid is discarded.

This cycle continues until the propagation volume is one-tenth of the fermenter volume. Once fermentation finishes at this stage, the beer is again discarded and only the yeast at the bottom of the propagator is used for pitching the wort. If you typically brew five-gallon batches, the tenfold rule dictates a half-gallon propagation. Again, it is best to let the yeast settle and only pitch the yeast "sludge" which, despite the nasty connotation (I always think of a sewage treatment plant when that word is used), is a healthy crop of yeast just waiting to help you make some beer.

Now it's time for me to anger half of my audience. Almost all homebrewers and microbrewers grossly underpitch their fermentations. I know this to be true because I have done a lot of yeast counts of yeast from "smack-packs," dried yeast, and yeast slurries harvested from a previous brewery fermentation. Underpitching is one of those mistakes that just should not happen. If yeast is underpitched, the resulting beer is simply not as good as it would be if enough yeast were used.

Since homebrewers typically cannot perform yeast counts, using a half-gallon propagation is a reliable method. Also, if yeast is harvested for re-use, you should use about one cup of thick slurry per five gallons of wort.

Mr. Wizard

Having recently purchased a chest freezer for lagering, I was intrigued by the possibility of also using it for conditioning ales. I started thumbing through back issues of BYO and several books on homebrewing. Most of the information I found seemed to be geared more toward kegging and artificially carbonating the beer. Since a kegging system is out of the question for now (Freezer + Wife = No More Funds), the procedure needs to include bottle priming.

The article "Crystal Clear Beer" (January '96 BYO) describes conditioning ales in the secondary fermentation at 50°F and then 40° F for a few days. It then goes

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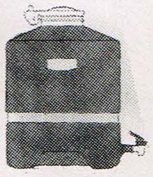

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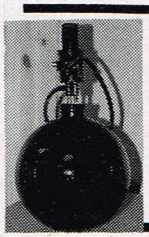

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CIRCLE 33 ON READER SERVICE CARD

on to say that adding sugar would cause the remaining yeast cells to re-suspend and carbonate the beer. However, I came across a couple of references that seemed to suggest that bottle priming with sugar may not work. Instead, using krauesening as a way to introduce fresh, actively fermenting yeast and sugar is the preferred method of carbonation.

What method produces the best results when cold conditioning ales? Also, what are the effects on naturally carbonating ales that have been cold conditioned for a few days, weeks, or months?

Gary Koss
Gahanna, Ohio

I like this question because I am a strong supporter of cold conditioning all beers. If you place your carboy of ale in the chest freezer and hold it at 34° F for about a week, it will become very clear due to yeast settling out. This does cause a problem with bottle priming, as you noted, but it doesn't mean that Clear Beer + Sugar = Carbonated Beer + Happy Wife won't still be true.

Two solutions can be used to solve the problem, which essentially is not enough yeast. One is to krauesen, as you suggest in your question. Krauesening is the addition of actively fermenting wort to clear beer to accomplish carbonation. This sounds easy, but you have to know the concentration of fermentables in the krauesen beer and must calculate the right amount to add to achieve proper carbonation. If you plan to krauesen and bottle, there is little room for error. Small errors either yield poor carbonation or over-carbonated brews with a propensity to explode.

For those reasons I would recommend adding a small amount of yeast and priming sugar to the clarified beer and bottling as usual. If you use a yeast slurry, use about a tablespoon of thick slurry per five gallons. If you use dried yeast, use about a teaspoon per five gallons. This doesn't seem like much yeast, but you don't need a lot for bottle conditioning. Plus, too much yeast in the bottle can give the beer yeast bite, which would defeat one of the reasons to cold condition the beer in the first place.

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Mr. Wizard's Address

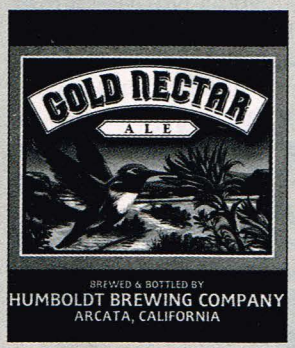
Do you have a question for Mr. Wizard? Write to him c/o Brew Your Own, 216 F St., #160, Davis, CA 95616. You can also reach him by e-mail at wiz@byo.com.

Mr. Wizard will represent his country in Atlanta this summer. He won't be striding for the lead in the 800 meters or bounding down the runway for the long jump. Instead, he'll be engaging in a marathon of recipe calculations, hurdling brewing pitfalls, and practicing the clean and jerk on 16-ounce weights to make his country's beer the best it can be.

Brewing with Adjuncts

by Susan Walton

Fruit, oatmeal, buckwheat — the possibilities are legion. If you love to experiment with adjuncts, this month's pros have some suggestions that will improve the flavor of your beer.



Humboldt Brewery

Brewer: Steve Parkes

"Each ingredient has its own characteristics. Don't make the mistake of treating them all the same. You want to take your time with each one, establishing the best temperatures and times to use."

Bluegrass Brewing

Brewer: David Pierce

"I find that when you're combining a lot of ingredients, you have to think of it like cooking. You probably wouldn't add black pepper and cinnamon in a dish, and you wouldn't do it in a beer either."

Golden Prairie Brewing Co.

Brewer: Ted Furman

"The earlier you add your ingredients, the more integrated they will be. The beer will taste like the adjuncts are really supposed to be in there."

Brewer: Steve Parkes
Brewery: Humbolt Brewery, Arcata, Calif.
Years of experience: 14
Education: Masters Degree in Brewing at Heriot-Watt University in Edinburgh
House Beers: Gold Rush Pale Ale, Red Nectar Ale, Oatmeal Stout, Wheat Beer, Black Cherry

There are some different things to be aware of when you use adjuncts. Basically, you should treat each grain or adjunct individually, then blend them together for the wort separation stage later on, which is the key. Big breweries do this. Each type of grain and adjunct has its own physical parameters, different solubilization temperatures, starches, enzymes, things that work at different ranges. Don't make the mistake of treating them all the same. Take your time with each one, establishing the best temperatures and times to use. So if you are adding more of these adjuncts, you have to be a bit more sophisticated in the way that you actually mash the grains. Use various temperatures and various boil times.

We use a couple of different adjuncts at our brewery. We produce fruit beers (such as Black Cherry), and we use oatmeal in the Oatmeal Stout. I found the best way to work with the adjuncts was to experiment with each ingredient individually to achieve the taste we were looking for.

The most important advice in working with fruit is to add it as late in the boil as you can. Or alternatively, if you can get away with it, add it to the finished beer. Otherwise you lose a lot of the freshness of the aroma and the flavor.

Another good way to experiment with fruit flavors is to use extracts. Commercial breweries use them, so there is no reason homebrewers shouldn't as well. You can buy them in homebrew stores, and you can experiment with the amount that you want to add. A good way to do this is to use an eyedropper and a pint glass. You can measure the number of drops that you want to put in, adding slowly and tasting carefully along the way until you get the flavor you are

looking for. Then scale that up to a full volume.

There are other important factors to working with fruit beers. You need to look out for the gelatin by-products that pectins (in fruit produce. For example when you make jams by just boiling up fruit, the pectins inside the fruit come out and turn the thing into a solid. If you add fruit too soon when you are boiling a wort, then the same type of thing can happen.

If you are bottle conditioning your fruit beer, you have to remember that there is natural sugar in the fruit. You have to adjust the amount of sugar you are adding to avoid a problem.

The other method is to add fruit extracts directly to the bottle, avoiding the pitfalls of boiling the fruit all together. Many commercial breweries handle it this way. Homebrewers have a lot of ability to experiment, and the best way to make an unusual recipe work is to be methodical and careful. Every ingredient has its own variables, and you need to pay attention to what those are.

Brewer: David Pierce
Brewery: Bluegrass Brewing, Louisville, Ky.
Years of experience: Four
Education: Self-taught, homebrewer 12 years
House Beers: Kölsch, Alt, ESB, Dark Star Porter, Raspberry Mead.

With the fruit beers I keep the hopping rate very low and make a medium-bodied beer. I do a Frambosen, which has a high percentage of Munich malt and 5 percent wheat. The balance is two-row. The beer starts out at a gravity of about 1.045.

We keep the hopping rate low (to 10 International Bittering Units), with one addition at the very beginning of the boil. It goes through primary fermentation and, as it gets toward the end of its ferment (about four specific gravity points from where we think terminal gravity is going to be), we add the fruit.

The Frambosen has 160 to 165 pounds of red raspberry puree in a 15-barrel batch. The fruit stays in for about two weeks, then we just filter it as normal.

Since the beer is 65° F or below when we add the fruit, we don't worry about pectins, as they only set at a higher temperature — if, for example, you added them in the boil.

When we experimented we did homebrew-size trial batches, and we waited until the beer was almost fermented out and racked it into a secondary before we added the fruit. I have found if you add the fruit in the primary, the carbon dioxide tends to scrub out the aroma of the fruit.

When you finally get the beer done and in the bottle, you can taste the fruit but you can't smell it. That's bad. Smell is part of the flavor profile; it is perceived as flavor. If you can't smell it, it tends to just taste like generic fruit.

When I started making large batches for the brewery, I wasn't sure about the quantity of the fruit purée to use. I'd only used fresh berries before. I found the amounts pretty comparable. I tend to use about a pound or pound

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CIRCLE 12 ON READER SERVICE CARD

The Tips

Steve Parkes

- Treat each grain or adjunct individually.
- Add ingredients as late in the boil as possible.
- For fruit extracts, experiment with an eye dropper and a pint glass.

David Pierce

- Add fruit in the secondary.
- Start your mash thinner when using oatmeal.
- Use cloves very sparingly.

Ted Furman

- Make sure your ingredients blend well together.
- Use restraint when choosing flavors.
- Make your beer different than the ordinary.

and a half of purée per gallon. Homebrewers might need a little more because of their smaller batch size.

The flavor profile of real fruit is a real advantage over extract. I've used extracts in beers — in one I took a light beer and added a raspberry extract and "raspberry essence," which is just the aroma of the raspberry. They were both 100 percent natural products, but I just didn't like the result. It's not nearly as nice as when you use the real fruit. When you use fruit, the flavor is a lot fuller. The extracts tend to taste like jam or, if you add too much, the flavor will be on the medicinal side.

I also use oatmeal in an Oatmeal Stout. When you use oatmeal you have to keep it to 10 percent of your grist or less, because it tends to get very gummy. One thing we've had to do with our Oatmeal Stout is to underlet the mash before we can start sparging. I don't know how you could do that on a homebrew scale without a pump.

I formulated a Yuletide ale that had ginger, cinnamon, nutmeg, wildflower honey, and just a few cloves, and it won a silver medal in the spice and herb category at the Great American Beer Festival in '93.

I find that when you're combining a lot of ingredients, you have to think of it like cooking. You probably would not add black pepper and cinnamon in a dish, and you wouldn't do it in a beer either — even though I have used black pepper and coriander in Wit beer.

When it comes to figuring out how much of an ingredient to use, start with a base and adjust. A friend of mine, Steven Freed from MacGuire's (Pensacola, Fla.), gave me the rough guidelines for my first batch, and I've played around with it ever since. At first I cut the cloves way back; they tend to overpower a beer. Now I use something like one ounce in a 15 barrel batch. That's not much.

When I'm developing recipes, I use trial and error for amounts. My assistant and I taste the beers and take

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CIRCLE 60 ON READER SERVICE CARD

good notes, so every year I make adjustments. A little less ginger, a little less cloves. We increase and decrease by trial and error.

Brewer: Ted Furman
Brewery: Golden Prairie Brewing Co., Chicago
Years of experience: Nine
Education: Apprenticeship, Siebel short course
House Beers: Ale, Maple Stout, Honey Ginger

My advice to homebrewers is: Be original. For homebrewers the sky's the limit. I only like to brew beers with unusual flavors, and anything is fair game for me if I like it and think it will work well. When you're picking your malts for a recipe with adjuncts — whatever it is, some syrup or honey or spice — make sure they blend well together. You want to marry similar flavors when you're formulating your specialty malts, for example.

As far as amounts, use restraint. I think a subtle flavor is better than a hit-you-over-the-head sort of flavor. I use buckwheat in a buckwheat ale. I have maple stout with maple syrup. I use honey, ginger, and a little pure vanilla extract and nutmeg in my nut brown ale. It is right at the threshold of the taste experience. It's there but it isn't. It's just the little things that give your beer an edge. I think that's the key. I approach brewing as cooking — you know, a little pinch here and a little pinch there — and use restraint.

I don't deal with fruit much. I don't like to add things after the beer is cooled down. You can run into major problems with sterilization and bacteria. I like to try to incorporate the stuff I use into the hot end, either the mash or the boil.

The only other place I might consider adding something is after the beer has actually fermented out and aged, but then the flavor of whatever you are adding is not really integrated into the product. The earlier you add your ingredients, the more integrated they will be. The beer will taste like the adjuncts are really supposed to be in there.

I use a little coffee in the mash of my maple stout. The concept actually started out as a breakfast beer. I was driving up to Wisconsin to get malt with a supplier of mine early one morning and we were thinking "What would be good breakfast beer?" That's where the first inklings of our maple stout came from.

For inspiration a good place to start looking for interesting ingredients is a place that sells bulk grains. Sometimes an idea just hits me and I think "Hmmm..." Then if I'm still thinking about it in a little while, I try it out. I don't madly try something new every week. Maybe once or twice a year I will try something different.

What I'd like to do is kind of weird. I'm not a fruit person, but I'd like to try a maraschino cherry stout. Everyone uses cherries, but no one uses maraschinos. In the future I want to experiment with alternative beverages. ■

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CIRCLE 13 ON READER SERVICE CARD

A New Shade of American Amber Ale

by Jeff Frane

Beers have always had a way of appearing on their own. It is a natural synergy of local water, local ingredients, the brewers' imaginations, current technology and, of course, the fashion of the day. Beer styles have emerged when brewers emulated each other's success, jumping on the bandwagon of bockbier, pilsner, pale ale, porter, or the like.

Of late, however, the natural elements seem only to be market forces, and beer styles emerge not from the water but from the board room. The marketing department has taken over as beer sales have flattened and large breweries scamper for market share. So we get "dry" beer, "ice" beer (I swear that someone in Canada is marketing a Dry Ice Beer, which must be terrific for special effects), and even "clear" beer.

But giant corporations don't hold a monopoly on brewing by market forces. Microbreweries and brewpubs face competition as well, and they have to sell beer to stay afloat. Their brewing strategies have, at times, followed the formula of offering customers what they expect and what they're used to rather than something new and perhaps different.

Amber ales or red ales are a case in point. Amber ales initially appeared in brewpubs. More specifically, they appeared in California brewpubs — making amber ale one of those rare indigenous American beers.

Mendocino Brewery's Red Tail Ale was certainly the first of the type. Mendocino was one of the first brewpubs in the micro-renaissance of the '80s, and Red Tail was their most successful beer. Its reputation was enhanced by its limited availability — in the mid-'80s it could be found on draught at pubs (well off the beaten track) or in champagne bottles in limited distribution (offering the world's heaviest six-pack).

The Mendocino brewers made a credible attempt at creating an American equivalent to a British bitter, copper colored and rich in flavor. The beer stood out as far more robust and interesting than the hordes of bland lagers that filled America's taps at the time, much like an American Bass Ale. (Unlike the beers to follow, there is no apparent color connotation in the name Red Tail Ale. Like Mendocino's other beers, it refers to a bird, and the microbrewery is certainly not to blame for all the other scarlet animals loose on beer labels today.)

Today's amber ales evolved from beers like Mendocino Brewing Co.'s rich Red Tail Ale, a classic American bitter.

As brewpubs spread rapidly through the West, particularly in California, a clear pattern emerged — style over substance. As microbreweries and brewpubs became fashionable, new brewers sometimes were urged not to demand too much of their customers, and many were advised that customers, with much character.

Brewpubs are special because their beer is unique and fresh. Their beer only has any merit, however, if it differs from the beer served around the corner. Sure, fresh is important, but it is only truly valuable if the beer is good and distinctive.

Some brewpub owners believed that making claims to the public about the unique quality of their beer was enough. The theory held that a brewpub should offer its customers three recognizable beers: a light, an amber, and a dark. Like the lights of a traffic signal, their color was about the only distinction among them. If you closed your eyes, you couldn't tell them apart.

These generic brewpub beers were usually well attenuated, dry, crisp, and lightly hopped (usually from a very small palette of hops). There might be a hint of roasted malt in the "dark" version, but nothing more. No particular hop character was allowed, no discernible fruitiness, and no real malt. The amber ale's coppery hue was derived from a small addition of American crystal malt. Color was about all the malt did contribute.

If I may digress, I have a theory. (Well, I have a lot of theories, but this one is more or less relevant.) I believe amber ales are popular because they *look* like something special. When poured into a glass, the beer is notably richer in color than a glass of, say, Bud Light. The customer figures he's getting something special. He's with it. He knows all about microbreweries. This is not his father's Old Bohemia.

This is a good marketing strategy and not a tactic limited to microbreweries. Coors got an early start years ago with Killian's Red, but now the stores are awash with Red Dogs, Red Wolves, and all manner of Red Lagers, Amber Lagers, and soon, no doubt, Red Amber Lager Dogs. Or Dry Red Ice Dogs. None of them are necessarily amber ales, but the strategy is the same.

American amber ales have

developed along two separate paths. One version, generally the paler of the two, is like the brewpub version already defined: copper colored but fairly dry, lightly hopped, but because of the dryness, there is a perception of hoppiness. The hops are invariably American — most likely Cascades, the signature micro hop.

The other version weighs in more heavily with caramel malt, gaining greater color and a definite perception of sweetness in the palate. Not the malty sweetness of a Munich lager but the more sugary sweetness of American crystal malt. At its worst this version is cloyingly sweet, but with a more aggressive hopping rate the beer can achieve good balance.

In both cases yeasts are selected for their neutrality, crisp and clean without much of the classic ale fruitiness. The Sierra Nevada/Ballantine strain is the yeast of choice.

Some have argued that hoppy American amber ales are available, but I say if it's hoppy it ain't amber, it's an American pale ale. At their

Gold Rush Amber Ale

(extract/grain version, 5 gallons)

Ingredients:

- 4 lbs. Alexander's light malt extract syrup
- 3 lbs. Laaglander extra light dry malt extract
- 0.5 lb. cara-pils malt
- 0.5 lb. crystal malt
- 0.5 lb. Munich malt
- 2 oz. chocolate malt
- 2 oz. Perle hops (6% alpha)
- 0.5 oz Cascade hops (5% alpha)
- 0.5 oz Willamette hops (4.5% alpha)
- Wyeast 1056

Step by Step:

Soak crushed grains at 150° F for 60 minutes, rinse into kettle, and add malt extract. Raise temperature to boiling. Boil for 90 minutes. Add Perle hops for 75 minutes, Cascade and Willamette for 30 minutes. Cool as quickly as possible to pitching temperature, aerate thoroughly, and pitch yeast. After primary fermentation at 65° F has finished, rack to secondary, and follow normal kegging or bottling procedures.

OG = 1.052
FG = 1.011 to 1.012

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best (Red Tail or Full Sail's seasonal amber), the beers are well balanced and pleasant. If I sound unenthusiastic, it's because I am. Drinking many amber ales is like watching the "McNeil/Lehrer News Hour": Everything is so balanced, and extremes are so unwelcome, that my eyes tend to quickly glaze over with boredom.

There is no real reason amber ales need be boring, but the execution by many brewpubs and microbreweries leaves a lot to be desired. Much could be done by giving the beer a more floral hop nose and turning the bitterness up even a small amount. Gaining color by using a special malt such as Gambrinus Honey Malt, rather than relying on the sharp-edged American crystal malt, would likewise be an improvement. Finally, a very fruity yeast, or a good diacetyl producer such as Wyeast's 1968, would add some needed character.

It seems to me that a really good American amber ale ought to be the equivalent of a Vienna lager: a similar coppery color, crisp yet malty flavor, and with a noticeable — but not overpowering — hop presence. It would be a beer worth drinking by itself, and a beer that would accompany food without dominating or disappearing.

In a selfless and probably vain attempt to change the world, I offer two versions of an American amber ale — one more or less "traditional" and another experimental version. Both will make good beer, but I know which one I would choose to drink. ■

After the Gold Rush Amber Ale

(5 gallons)

Ingredients:

- 7.5 lbs. 2-row pale malt
- 1 lb. Gambrinus honey malt, 18° Lovibond
- 0.5 lb. Gambrinus Munich-100, 30° Lovibond
- 1.5 oz. Northern Brewer hops (6.5% alpha)
- 0.5 oz. Mt. Hood hops (3.5% alpha)
- Wyeast 1968 or Yeast Lab A05

Step by Step:

Mash in at 150° F. Hold until iodine test is negative (about 60 to 75 minutes). Sparge at 170° F to 6.5 gallons. Boil for 90 minutes, adding Northern Brewer hops for 75 minutes and Mt. Hood hops for 30 minutes. Cool with immersion or counterflow wort chiller to 70° F, aerate thoroughly, and pitch yeast. After primary fermentation at 65° F, rack to secondary, and follow normal kegging or bottling procedures.

OG = 1.048
FG = 1.014 to 1.016

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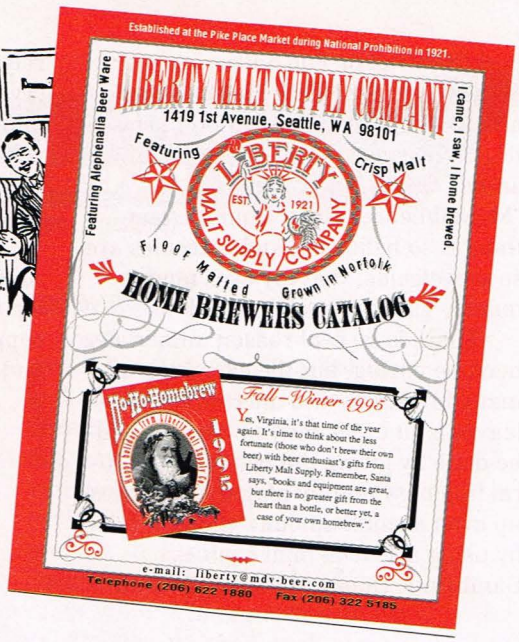
"Can it really be any good?" a young woman whispered. "Heavens no," Thomas exclaimed. "He's never brewed a drop in his life."



They Laughed When I Told Them I Was Serving My Own Home Brewed Beer, But When They Tasted My Pale Ale!—

Thomas brought a gift of his latest micro-brew discovery that he wanted everyone to try. I decided that this would be a dramatic moment for me to make my debut. To the amazement of all of my friends, I strode confidently over to my Alephenalia Micro Brewery-Home Brew Kit and began to pull out the professional looking bottles that I had placed there.

"Chuck is up to his old tricks," somebody chuckled. The crowd laughed. They were all certain that I couldn't brew any more than I could make potatoes au gratin.

"Can he really brew?" I heard Thomas' partner whisper. "Heavens, no!" Thomas exclaimed. "He's never brewed a drop in his life. But just you watch him. This is going to be good."

I decided to make the most of the situation. Holding up the wing capper, I explained that I had bottled it just for this occasion. With mock dignity, I drew out a bottle and cradled it in my arms like a great wine. "Is this another of those disappearing ink trips," called a voice from the rear. The crowd rocked with laughter.

Then I began to pour.

Instantly a tense silence fell on the guests. The laughter died on their lips as if by magic. I poured a glass for everyone, even those who exclaimed "I don't like beer." I heard a gasp of amazement. My friends sat breathless, spellbound.

I sampled it myself and for a brief moment I forgot the people around me. I forgot the hour, the place, my fellow imbibers. The little world I lived in seemed to fade—seemed to grow dim—unreal. Only the ale was real. Only the ale and the visions it brought me. Visions as beautiful and as changing as an autumn sunset, with its amber hues, just like my homebrew.

A real Triumph!

As everyone finished tasting, the room resounded with accolades. I found myself surrounded by excited faces. How my friends carried on! Men shook my hand—wildly congratulating me—pounding me on the back in their enthusiasm! Everybody was exclaiming with delight, plying me with rapid questions. Chuck! Why didn't you tell us you could brew like that? Where did you learn? How long have you been brewing?

"I simply followed the complete instructions included with the Alephenalia Homebrew kit," I replied. "And just a short while ago, I didn't know hops from malt."

"Quit your kidding," laughed Thomas, a real beer enthusiast. "You've been brewing for years. I can tell."

"Only since Rosie gave me an Alephenalia Microbrewery for my birthday, less than three weeks ago. I decided to keep it a secret so that I could surprise all you folks." Then I told them the whole story. "Ever heard of **Liberty Malt Supply Company**?" A few of my friends nodded. "That's a home brew shop and mail order catalog!" One of the oldest in the entire country!

"Exactly," I replied. "They have a great program for learning how to brew beers like a professional, the Liberty Way."

How I learned to brew without a teacher.

And then I explained how for years I had longed to brew my own beer. I shared that dream with Rosie and when she saw the Alephenalia Microbrewery in the Liberty catalog, she knew it was the perfect gift for me.

A Complete Catalog!

Pointing to the colorful Alephenalia Micro-brewery carton, I explained, "It contains brewing equipment that can be used over and over to brew beers like the professionals." I told them how pleased I was with *The Brewer's Companion,* a real home brewers bible. The Liberty Pack included with the microbrewery contained enough pre-measured, concisely labeled ingredients to brew five gallons of the Pale Ale. I explained that each of the Liberty packs used the highest quality ingredients, exclusive to Liberty Malt and that packs for each of the classic brewing styles are available.

I proudly told them that I have already begun brewing Weekend Weiss, a Bavarian style wheat beer and Liberator Dopplebock, both promptly received by simply dialing Liberty Malt's own toll free number, 1-800-990-MALT (6258).

Favorite brewing styles

"Lets order Liberty's Pals Pils Pack!" Thomas pleaded after seeing the Liberty catalog. He took another sip and said, "Which weekend is that Weiss going to be ready?"

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—Charlie Papazian, founder, American Homebrew Association

Troubleshooter's Guide II

By Nico Freccia

Be prepared for the unexpected glitches that can arise during the brewing process, and you won't compromise the quality of your beer. Part Two of our Troubleshooter's Guide examines fermentation, mashing, and more.

11

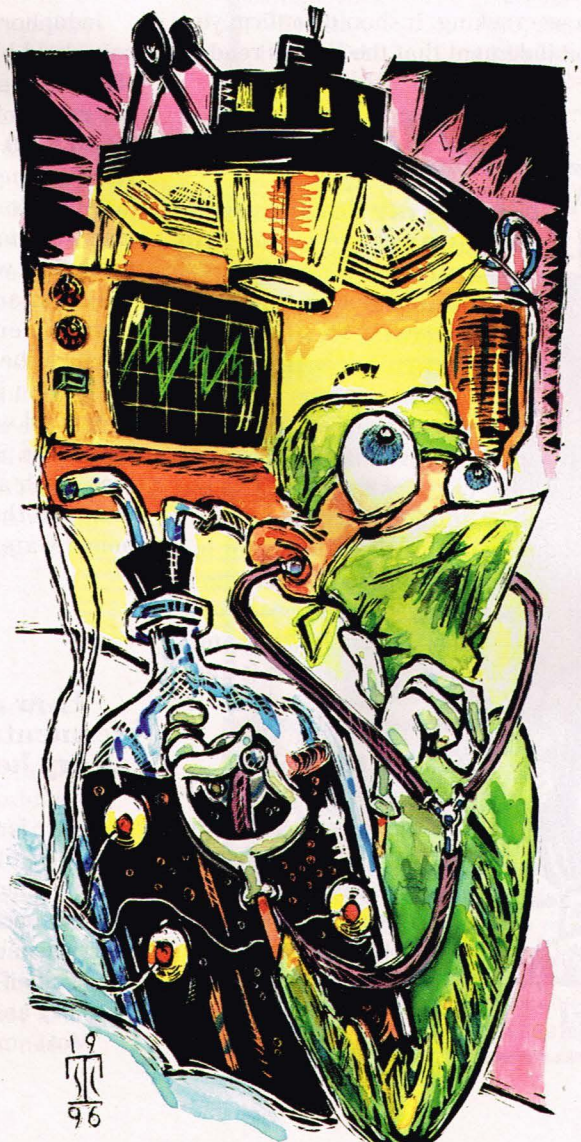
All my beers taste stale or oxidized or get stale quickly.

After primary fermentation is complete, you should be very careful not to introduce any oxygen into the beer. This means never pouring it and siphoning very gently with no splashing.

If you are not already, you should try using a bottle filler for bottling. Bottle fillers allow beer to flow gently to the bottom of the bottle, decreasing spillage and mess. After filling each bottle you should be resting a sanitized cap on top to keep any organisms from falling into your beer.

Instead of capping, set the bottles aside for 15 or 20 minutes while you finish bottling and cleaning. Usually there is a small amount of CO_2 left in the beer from the fermentation, especially if the beer was cold conditioned. During that 15-minute rest, the remaining CO_2 will begin to come out of solution, purging the head space of air. The caps may begin to do a little dance. If you cap now, your beer should be fine for quite a while.

Be aware of your storage conditions as well. Heat and light will cause beer flavor to break down much more quickly. Use brown bottles, and keep your beer in a consistently cool, dark place.



SHAWN TURNER ILLUSTRATIONS

12

My airlock always foams over or gets clogged with gunk.

If you have high-gravity worts, warm fermentations, or very active yeast, you're going to have a lot of blowoff from the fermenter. Do what the commercial breweries do and attach a blowoff tube instead of an airlock when you start fermentation.

Put one end of a sanitized hose in the hole of the rubber stopper where the airlock would go, and put the other end of the hose into a container half filled with clean water. You've just created an airlock, but excess foam can now blow all the way through the tube and into the water if it needs to. But be careful. Blowoff tubes can clog! Check yours often to make sure the hose is clear and the outlet end is bubbling

through the water properly. If you are using glass and the tube becomes clogged, dangerous pressure can build up quickly. As a safety valve, rest the stopper loosely in the mouth of the carboy. Once fermentation slows, replace the blow-off tube with an airlock.

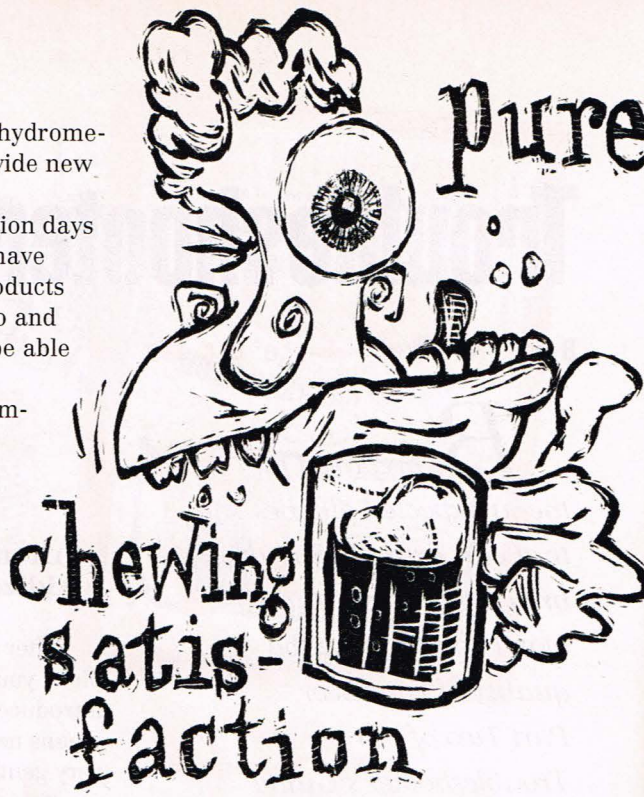
13

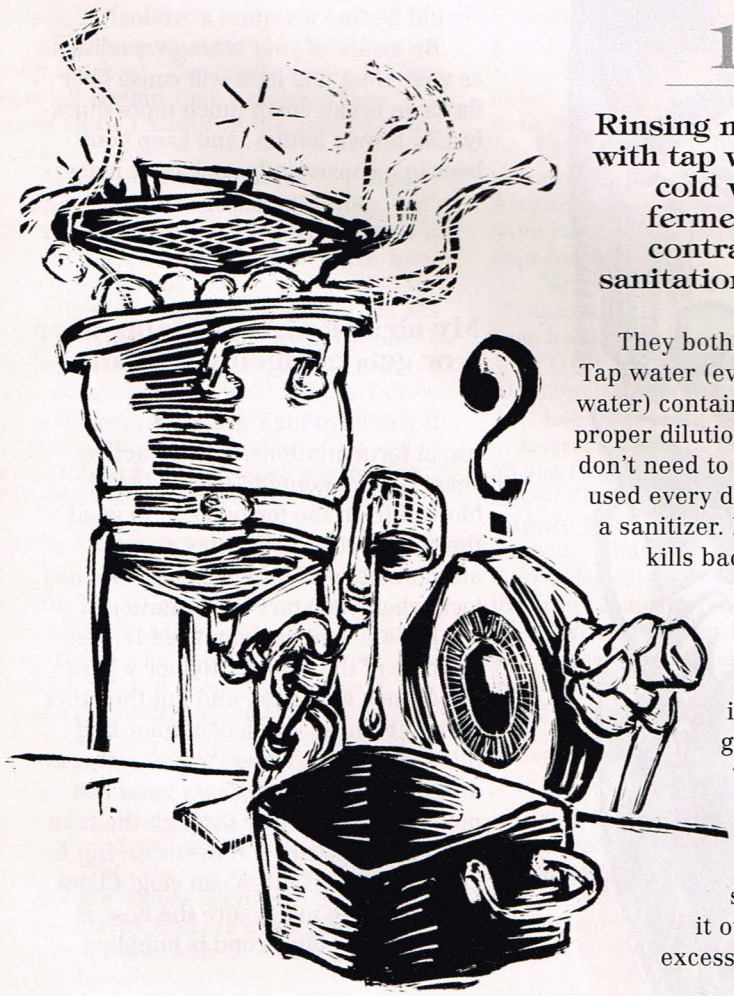
My hydrometer seems useless, and I worry about contaminating my beer when taking readings.

The hydrometer can become your best friend, especially when you are brewing your own recipes and targeting traditional styles. But for the beginner, especially if you are using kits, it can be a distraction more than anything else. So you may not wish to use it. Definitely don't risk contaminating your beer to take a hydrometer reading. If you are brewing from a kit, the instructions will specify the original gravity, and taking a hydrometer reading usually won't provide new information.

Unlike during the prohibition days of exploding bottles, we now have excellent all-malt brewing products and good yeast. If you listen to and watch your beer, you should be able to gauge its fermentation progress. Under normal circumstances an ale should be finished completely in seven days. If you're not sure, give it more time. It's dangerous to bottle beer that's still fermenting.

If you want to take a reading, devise a way to take a sanitary sample of the wort before fermentation. Then record it. Don't mess with it again until your senses have told you that fermentation is finished and you are ready to rack to secondary or bottle. Take a sample as you are racking. It should confirm your good judgment that the beer is ready.





14

Rinsing my equipment with tap water or adding cold water to the fermenter seems contrary to good sanitation techniques.

They both are. Quit rinsing! Tap water (even the hottest tap water) contains bacteria. Use the proper dilution of sanitizer; you don't need to rinse. Iodophor is used every day in restaurants as a sanitizer. It's good because it kills bacteria quickly, and you can see it and therefore know it's working. One tablespoon of iodophor in five gallons of cool water will sanitize fermenters and equipment with 10 minutes of exposure time. Just pour it out, shake off the excess, and use the equipment.

Iodophor is more expensive than household bleach, which is also a very effective sanitizer. Use one tablespoon per gallon of room temperature water for 10 to 20 minutes. At this dilution you don't need to rinse, but chlorine may lead to medicinal flavors, so you may want to drip dry or rinse with pre-boiled water.

If you are adding cold water to your fermenter and want to be safe, sterilize the water first. Buy a few one-gallon plastic jugs. Boil either tap or bottled water at least 15 minutes and cover. Sanitize the jugs by filling them with a diluted sanitizing solution, and then fill them with the boiled water. Chill overnight.

15

How do I sanitize post-fermentation additions such as dry hops or fruit extracts?

After fermentation is complete your beer, now alcoholic and low in pH, presents a much less hospitable environment to bacteria. Therefore, don't worry as much about contamination, especially if your beer will be stored properly and consumed fairly quickly.

Most small breweries that dry hop

their beers simply throw the hop plugs, pellets, or leaves in a hop bag or nylon stocking and drop them in the fermenter. Some brewers throw their hop bags in the microwave. This may make them feel better but probably does nothing about potential bacteria. Likewise, you could boil or microwave fruit extracts, but this would probably diminish or completely obliterate their flavor. Use clean hands, spoons, and hop bags, and don't worry about it.

16

I seem to lose too much wort volume from the kettle to the fermenter.

Wort does seem to disappear, doesn't it? The losses mostly come from evaporation. Depending on the length and vigor of the boil, you can lose a gallon or even two during a standard boil. You will always lose about a half gallon in trub and sediment. And if you don't watch for the boilover, you will lose even more.

If you are using a converted keg or kettle with a bottom drain, you can try adding a small stainless or brass elbow curving to the bottom of the kettle to access more wort, but be careful you don't run the unwanted trub off into the fermenter.

You can always top up your fermenter, if you wish, with boiled, cooled water. If you are worried about contamination, top up the secondary or even the bottling bucket. Remember that topping off your batch will lower the gravity and lighten the color.

17

My beer lacks body.

Proteins that come from malt give your beer its body and mouthfeel. If your brewing process is eliminating lots of proteins through long protein rests, boiling times, or filtering, for example, then you may have beer that tastes thin or light.

Try using some high-protein malt such as wheat or rye, and try using dextrin malts. They provide unfermentable sugars and will make your beer feel fuller in your mouth. If you are brewing from a kit, there is probably just a low amount of malt in the recipe, and you need to add a little more malt extract. You can also try steeping crystal and/or dextrin malts in the kettle as you bring your brewing water to a boil. For all-grain brewers a high mash temperature (155° to 160° F) will produce fuller-bodied beers.

18

My beer tastes harsh or grainy.

It may just be overly bitter. Check your hopping rate, and figure the bitterness units. Does the number seem right for the style? If you are mashing, check that your sparge temperature is not much higher than 170° F.

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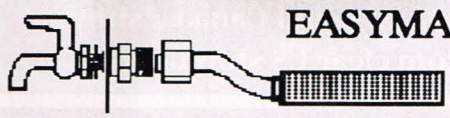

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You may want to begin recirculating the first runnings until your runoff is fairly clear. If lots of husk material makes it into your kettle, you will get some harsh graininess from boiling it.

If you are using a grain steeping bag, try resting at 150° F for a few minutes to make the sugars and starches soluble, then removing the bag.

19

I'm getting very low extract (gravity) from my all-grain mashes.

Every system is different and will have a different degree of efficiency. Make sure that your false bottom is efficient and covers as much area as possible. Your lauters should be taking at least 45 minutes. Don't run off too quickly; you'll leave lots of sugars behind.

You should maintain a couple of inches of water above the grain bed at all times, and make sure that the mash tun is closed, if possible, so you don't lose too much heat during the sparge. Remember that the temperature of the sparge water will be decreasing as it flows down through the bed, and you may not be rinsing enough sugars from the mash. Raising the sparge water temperature a bit should immediately improve your yield.

Maintaining batch-to-batch consistency in your lautering process with temperatures and procedures is important for getting a feel for your system's efficiency and will aid in planning recipes and targeting gravities in future batches.

If your process is consistent and you still have poor yields, check your milling. Coarsely milled malt will always have poorer yield than finely milled malt — although malt that's too fine makes lautering difficult.

20

My mash temperature comes out wrong, and adding hot water doesn't help much.

Again, every system is different, but there are a few things you can do to make your life easier. Try preheating the mash tun with very hot water.

Obviously, if the mash tun and false bottom are cold, you will lose more heat when you begin the mash than you expect. Try to maintain a closed system. Add the grains, then let the strike water run through a hose into the mash tun rather than pouring it in. You'll maintain a lot more heat in a closed system.

A thick mash holds heat best. The thinner the mash is, the more hot water you'll need to add to raise the temperature. Begin with a thick mash and add a small amount (start with a quart or so) of boiling water to raise the temperature of the mash a few degrees. Make sure that your mash tun has a tight-fitting lid.

Also, if the malt isn't a consistent temperature when you begin brewing, hitting target temperatures can be hard. This is solved by allowing the grain to come to room temperature prior to use. ■

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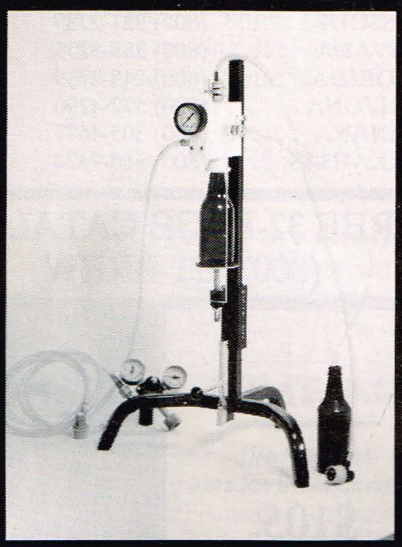

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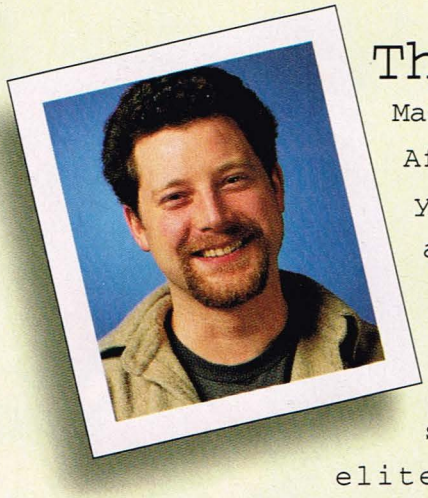
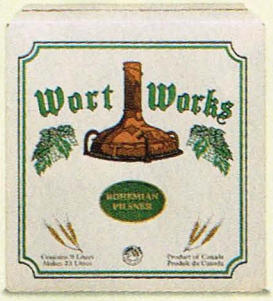


This is Sean. He's our beer guy.

Matter of fact, around Brew King, we call him "The Beer Guy". After all, he knows a thing or two about beer. And as you can see, he's pretty happy right now. Why? Because after months of self-imposed exile in Brew King's (windowless) brewing lab, Sean has emerged with Wort Works, an all-malt brewing kit of pure perfection - even by Sean's standards. You see, Sean belongs to that elite group of home brewing purists - the ones that scoff at most commercial brews and insist on choice natural ingredients for their own brewing masterpieces. With Wort Works, Sean would never cut corners. So what has Sean created? A totally unique, bag-in-a-box packaged product offering 9 litres (2 gallons) of concentrated wort made from 100% barley malt with naturally processed hops and filtered Canadian water, fully boiled in our 1000 gallon brew kettle. Sean even insisted on including a special dry hop package for extra aroma and flavour. And true to form, his instructions are comprehensive, even with information on the specific ingredients used. Sean's no dummy. He made Wort Works with his fellow homebrewers in mind, but he also made sure that its user friendly, no-boil method would be perfect for beginners too. Keep Sean happy. Make his Mom proud. Try Wort Works. The results will make you (and your friends) happy too.



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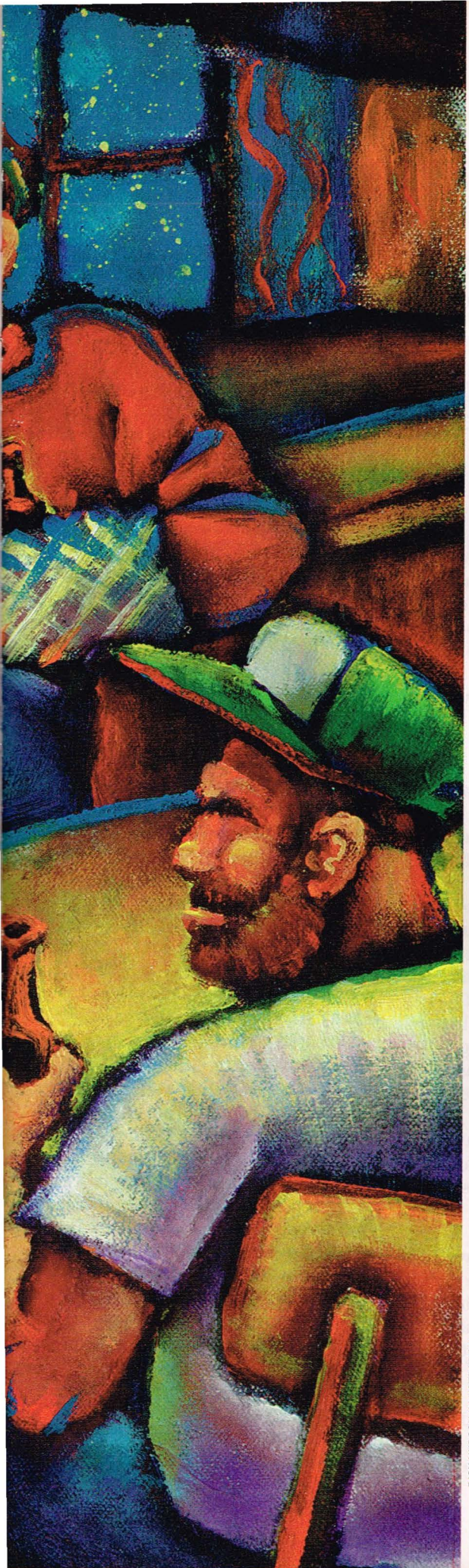

RICK HUDSON ILLUSTRATION

MASTER PARTIAL MASHING

By Nico Freccia

You've been brewing with extract and have made great beers. Maybe you've experimented with steeping grains and have been able to manipulate color and flavor. Now you're starting to get curious about what the grain hype is all about.

There are dozens of different grains at the homebrew shop, each with its own color, aroma, and flavor. You start chewing on some of them with each visit and wonder what they can do for your beer. Maybe you want to brew beer the way they do at your local brewpub. Or maybe you haven't been able to achieve that special fresh malt aroma in certain beer styles.

What's that? You say you haven't got much space, don't want to take a lot of extra time, or spend a lot of extra money getting into an all-grain system? In short you have passed into the partial-mash zone. Don't worry about a thing. You're going to like it here.

Partial mashing consists of making beer the same way you've been doing it with extract, but instead of using all store-bought extract, you will be making a portion of the "extract" yourself. Doing a partial mash will allow you to begin

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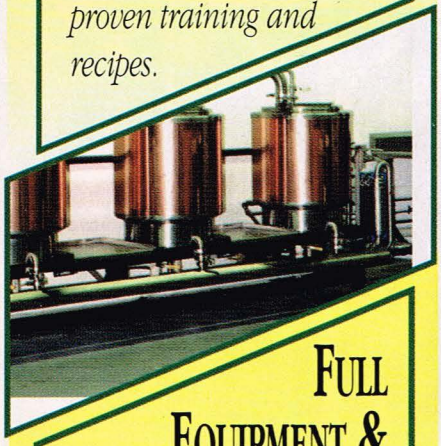

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experimenting with some of the wonderful possibilities of grain. Try adding a few pounds of English ale malt to the next ESB or IPA you make, or some Belgian specialty malts to that bock. This will introduce you to the principles of all-grain brewing, adding only a few simple steps to your brewing process and about an hour and a half to your brew day.

Best of all, doing a partial mash may dramatically improve your beers, and you can do it without buying a single piece of new equipment.

Principles

You may have already brewed some extract recipes that called for steeping some crushed grains in a mesh bag as you brought the brewing water to a boil. This is an excellent way to add color and extract sugars from certain types of malt such as crystal or caramel. Because of the unique process of making crystal malts, these malts have essentially been mashed in their husks. They contain hard balls of caramelized sugar that become soluble and dissolve into hot water when steeped. Other specialty malts, such as chocolate and black patent, can be steeped for color and flavor contributions in a similar fashion.

Regular pale malt, however, consists mainly of starch that needs to be converted to fermentable sugars in the mashing process. Although steeping pale malt in hot water (140° to 160° F) will yield fermentable sugars, the lautering process is left out. Lautering is the process that uses malt husks as a filter to separate undesirable proteins and tannins from the sweet wort. These proteins and tannins can cause beer to be very hazy and to have harsh flavors. Therefore, pale malt is best used in an all-grain process that includes mashing and lautering.

The partial-mash method allows you to use extracts instead of pale malt as your fermentable base and to fine-tune the color and flavor of the final beer with a range of specialty malts. These can include amber, Vienna, brown, chocolate, Munich, black patent, smoked malt, and many others. Because you're also using extract, partial mashing allows you more latitude than either all-grain or extract brewing. You will be able to brew, make mistakes, and learn without risking a batch of beer.

What You Need

To get started you need some sort of strainer to separate the grain husk from the sweet wort. A kitchen pasta colander works well. If you want to get more sophisticated, use a plastic food-grade bucket (available at your local restaurant supply or warehouse store) with lots of tiny holes drilled in

Grandad's Oatmeal
(five gallons)

A full-bodied, creamy, slightly sweet stout with a great head. Nutritious, just like Grandad's oatmeal.

Ingredients:

- 4 lbs. pale malt extract syrup
- 3 lbs. pale two-row ale malt
- 1 lb. flaked oats
- 8 oz. black patent malt
- 8 oz. crystal malt, 80° Lovibond
- 4 oz. black barley
- 1 lb. brown sugar
- 6 oz. Blackstrap molasses
- 1.5 oz. Northern Brewer hops
- 1 oz. Fuggles hops
- Wyeast 1056, American ale, or your favorite ale yeast.
- 3/4 cup priming sugar

Step by Step:

Mash all grains at 150° F until conversion. Sparge. Bring 4.5 gallons of water to boil, reduce heat, add extract, all-grain wort, sugar, and molasses. Boil 15 minutes. Add Northern Brewer hops and boil 30 minutes. Add Fuggles and boil 30 additional minutes. Cool and pitch yeast.

Ferment at 68° to 70° F for five days or until finished. Fermentation may be very active, so use a blowoff tube if possible. Bottle with priming sugar, or rack to secondary for one additional week and then bottle.

OG = 1.060 to 1.065

the bottom. Or visit your local homebrew shop and buy one of the many mash/lauter systems available. Many retailers sell a simple brass, rotating sparge arm that fits over a plastic bucket and does an excellent job of evenly and thoroughly rinsing the grain. If you're the gadget type, you can build any number of mash/lauter tun designs using camping coolers and copper pipe or plastic false bottoms. For the sake of simplicity (and saving money), let's go back to the pasta strainer.

If you only have one pot that you plan to use for the mash and the boil, you will need another container to collect the wort runoff. This can be a food-grade plastic bucket or another cooking pot if you have it. You'll need a pot to heat the sparge (rinse) water — this could be the same pot you used for the mash. Also, you'll need a good thermometer (a dial face works best) to monitor the temperature of the mash.

The Process Step By Step

There are many ways to design the partial mash process to suit your space, equipment, and budget needs.

Go to your local homebrew shop and poke around in the grains. Smell them, taste them, and find some that intrigue you. Have the shop grind the grain for you. They will be able to set the mill properly for a good crush that will expose the starchy interior of the grain while leaving most of the husk intact to act as a filter bed.

Suppose you're brewing a batch of Toasted Red Ale. The grain bill that we have chosen for five gallons is as follows:

- 4 lbs. pale malt extract syrup
- 3 lbs. pale American two-row malt
- 8 oz. 40° Lovibond crystal malt
- 2 oz. unmalted roast barley (black barley)

This recipe will get about half of its fermentable sugar from malt extract and half from grains. It will have a deep red/amber hue from the crystal malt and black barley, and the black barley will lend a hint of toasty nuttiness. The beer should have an original gravity of about 1.050 to 1.055.

1. The Mash. Use a quart of water per pound of grain for a thick mash that will hold its heat. For this grain bill, one gallon of water is perfect. In your brew kettle or another smaller enamel or stainless pot (such as a pasta boiling pot), heat the gallon of water to 168° F and shut off the heat. This is called the strike temperature. Mix all the crushed grains into the hot water and stir well. When the cool grains are added to the hot water, the temperature will drop 15 to 18 degrees and should stabilize near 150° F. If the temperature is below 146° F or above 156° F, use heat from the stove or boiling water to raise it or cold water to lower it, and stir well. Once the temperature has stabilized in the right range, let the mash sit covered for about 40 minutes.

To maintain the temperature you may need to turn on the heat periodically. Alternatively, you can

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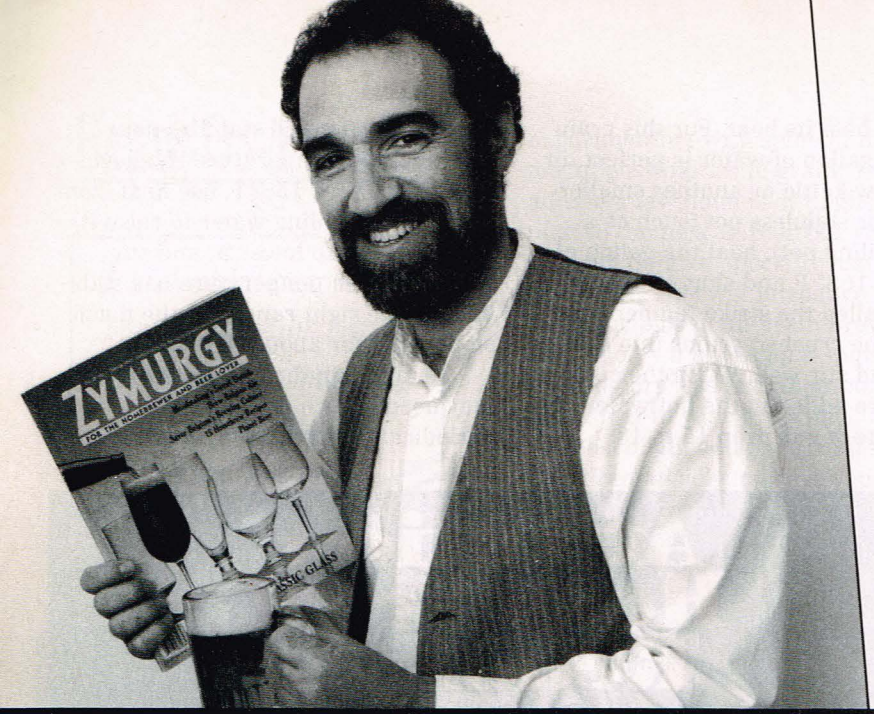

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preheat your oven to about 140° F, turn it off, and set the pot inside. You can also wrap the pot in towels or use a camping cooler to maintain the mash heat. Do what works best for you, and keep it simple.

2. Conversion. After 30 to 40 minutes the conversion should be complete. Different malts have different amounts of enzymes, so conversion may be quicker or take longer depending on the type of malt you use. This recipe uses American two-row barley, which is very high in enzyme power, so conversion happens quickly.

To test for conversion, take a spoonful of the liquid from the mash and place it on a white plate or bowl. Add a few drops of tincture of iodine, which you can buy at your local pharmacy. If there is still unconverted

Toasted Red Ale
(five gallons)

Ingredients:

- 4 lbs. pale malt extract syrup
- 3 lbs. pale American two-row ale malt
- 8 oz. crystal malt, 40° Lovibond
- 2 oz. unmalted roasted barley (black barley)
- 1 oz. Northern Brewer hops
- 1 oz. Cascade hops
- Wyeast 1056, American ale, or your favorite ale yeast.
- 3/4 cup priming sugar

Step by Step:

Mash all grains at 150° F until conversion. Sparge. Bring 4.5 gallons of water to boil, reduce heat, add extract and all-grain wort. Boil 15 minutes. Add Northern Brewer hops and boil for 50 minutes. Add 0.5 oz. Cascade and boil 10 more minutes. Turn off the heat, add the rest of the Cascades, stir, and cover. Cool and pitch yeast.

Ferment at 68° to 70° F for five days or until finished. Bottle with priming sugar, or rack to secondary for one additional week and then bottle.

OG = 1.050 to 1.055

starch, the iodine will turn purple or black. If all the starch has been converted to sugar, the iodine will not change color. Make sure you discard the iodine-tainted mash; it is toxic. If the conversion is incomplete, let the mash sit for another half hour. After an hour in the right temperature range, your mash should be completely converted and you can proceed with sparging.

3. Sparging. Place your strainer over the rim of your collection pot or bucket. Carefully pour the hot mash into the strainer.

Use about a half gallon of sparge water for each pound of grain, or two gallons in this case. Heat your sparge water to 170° F (if you have an extra pot, you can do this while the grain is mashing). This will kill the remaining enzymes and make the mash easier to rinse. There are a number of ways to sparge, or rinse, the grains. The principle is to gently sprinkle or pour hot water uniformly over the grain bed while the sweet wort flows out through the strainer. The husk of the grain forms a natural filter bed, so once sparging has begun, don't stir or agitate the grains!

Some brewers use a bottling bucket with spigot for sparging. With the strainer and collection bucket below you, hold the bottling bucket of sparge water over the strainer and slowly open the spigot, allowing a sprinkle-like flow of water onto the grains. Just move the spigot around the grains in a circular pattern for an even sparge.

You should sparge slowly, allowing all of the grains to become thoroughly rinsed. It should take at least half an hour for the whole two gallons. After the first few minutes you can check the runoff for husk material that made it through before the grain filter bed was well established. Just recirculate this cloudy wort back through the grain bed and it should clear nicely.

That's it! You now have a couple of gallons of all-grain wort to add to your regular recipe. Just boil it, adding extract and hops as you normally would. If you begin heating your regular brewing water when you begin sparging, your extract base will be coming to a boil by the time you are done sparging. You can throw in the grain wort, and you've only spent about an extra hour to make better beer.

Other Equipment

As you experiment with the partial mash process, you may want to add some equipment, such as the mash and lauter system. The best piece of equipment you might think about making or buying is a lauter vessel. The plastic bucket with holes drilled in it works very well. Put the strainer bucket inside a larger bucket to collect the runoff. A larger bucket with a spigot would be easy to drain.

Make or buy a simple brass rotating sparge arm. These have a bracket that fits over the lip of the sparge bucket. Also, a section of thin brass tube with tiny holes drilled in it spins when water flows into it, creating a fine shower over the grain bed. If you have a sparge device, try to keep an inch or two of hot water on top of the grain bed, adjusting the outflow through a spigot to get an efficient lauter.

Some Suggestions

To really get a feel for what different grains can do for a brew, start some controlled experimentation. If you like amber ale, for instance, try the Toasted Red Ale recipe. Take good notes on the flavors and aromas, then make it again using the same recipe and yeast but changing one element of the grain bill. Instead of using American ale malt, for example, try using British ale malt. Or instead of black barley, try using chocolate or aromatic malt. You'll become a master at using and understanding grains in no time.

If you are not already doing a full wort boil, think about investing in a bigger kettle and trying it. For one thing, a bigger kettle will free up your old kettle for mash or sparge water use, making the process go faster. But most important, you will ensure sterilization of the whole wort, you will get better hop utilization, and your beer's overall flavor will improve.

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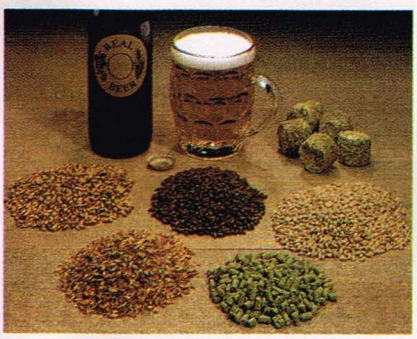

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CIRCLE 83 ON READER SERVICE CARD

15 Great Ext

Top homebrew writers share their favorite brews to celebrate BYO's first birthday.

Byron Burch

Light in the East Pale Ale
(5 gallons)

Ingredients:
- 3 lbs. light dry pale extract
- 3 lbs. amber dry malt extract
- 1 oz. 100% dextrin powder
- 1 tsp. gypsum
- 1/8 tsp. salt
- 0.5 oz. Columbus hop pellets
- 1 oz. Willamette hop pellets
- 3/4 cup corn sugar
- Wyeast 1968 liquid ale yeast

Step by Step:

Combine malt extracts, dextrin powder, gypsum, and salt with enough warm water to give you about 6.5 gallons total volume. Heat to boiling, stir in Columbus pellets, and boil one hour. Cool with an immersion wort chiller, transfer to a sanitized fermenter, and ferment between 60° and 70° F.

When the head drops to the surface, place the Willamette pellets in a sanitized five-gallon carboy and siphon in the beer. Top off as needed, and allow to settle for about a week. Siphon the beer off the settlings, prime, bottle, and let stand at cellar temperature for one to two weeks.

David Weisberg

Back to Basics Bitter
(5 gallons)

"Use this recipe to brew yourself a great traditional British Bitter ale."

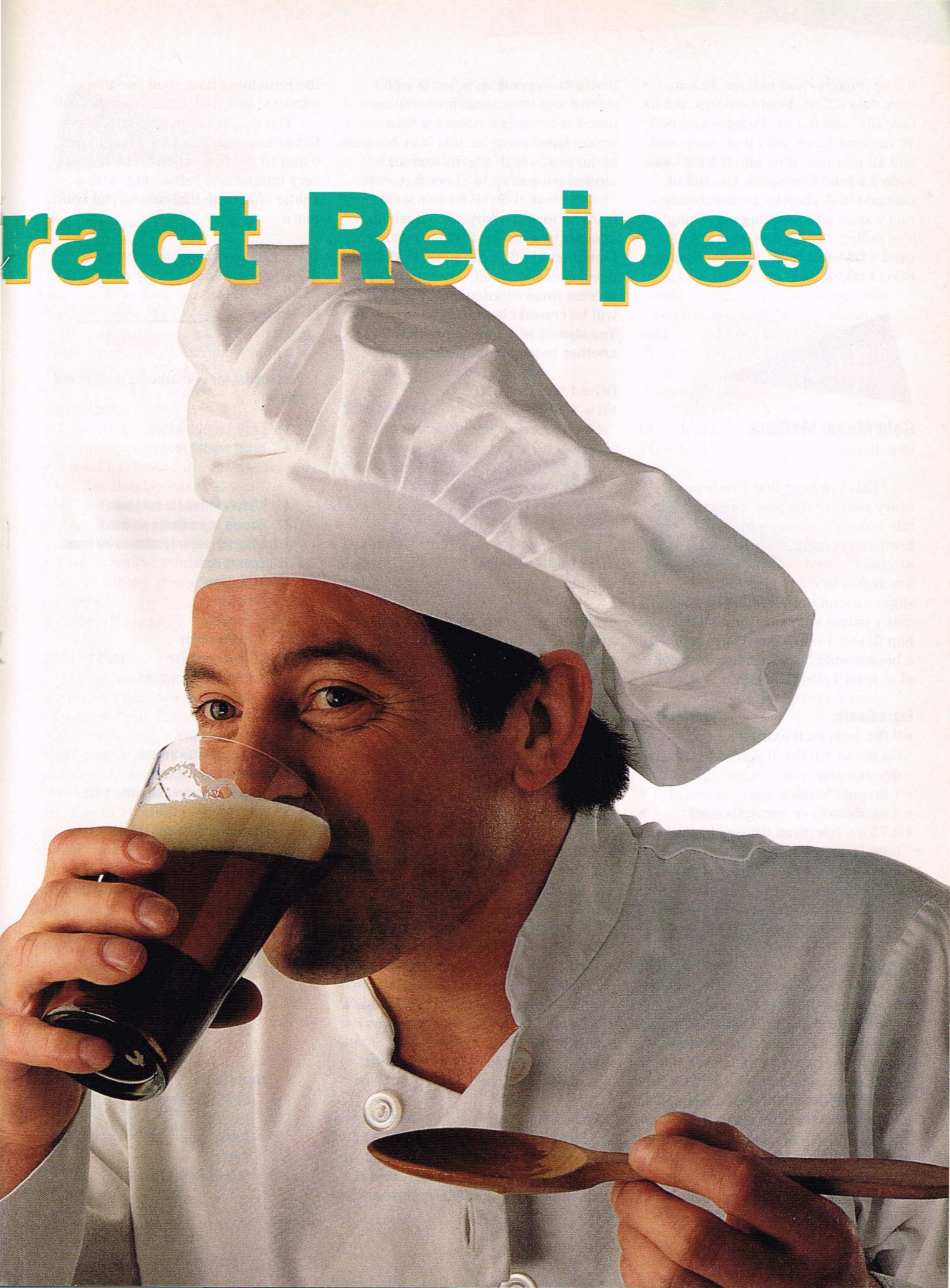
Ingredients:
- 3.3 lbs. light unhopped malt extract syrup
- 3.3 lbs extra-light unhopped malt extract syrup
- 1 cup caramel (crystal) grains, 60° Lovibond
- 1 teaspoon Irish moss
- 1.5 oz. Kent Goldings hops
- 1 oz. Fuggles hops
- 1 oz. Cascade hops
- 2 packages of ale yeast (10 to 14 g. total)
- 2/3 cup corn sugar (for priming)

Step by Step:

Crack the grains and steep for 30 minutes in 2 quarts of water at 160° F. Strain grains before adding to brewpot for boil. Add 1 oz. Kent Goldings and

KENT LACIN

ract Recipes



0.5 oz. Fuggles and boil for 30 minutes. Add 0.5 oz. Kent Goldings, 0.5 oz. Cascade, and 0.5 oz. Fuggles and boil 10 minutes more. Add Irish moss and boil 10 minutes, then add 0.5 oz. Cascade for final 5 minutes. Use 0.5 oz. Cascade to dryhop in the secondary. Enjoy soon after bottling and aging.

OG = 1.044 to 1.048
FG = 1.008 to 1.012

Gold Medal Maibock

(5 gallons)

"This is a beer that I've brewed every year for the past three years in late February or early March to celebrate the coming of spring. It's my all-around favorite brew. It will be medium amber in color, should have a slight alcohol nose, and a big, sweet, malty palate with very subtle German hop flavor. To be a true German bock, a beer should have an original gravity of at least 1.064, and this one does."

Ingredients:

- 9 lbs. pale malt extract syrup (or about 8.5 lbs. if you're using dry extract)
- 1 lb. pale Munich malt
- 8 oz. dextrin or cara-pils malt
- 0.75 oz. Northern Brewer or Perle hops (6.8% alpha)
- 2 oz. German Hallertauer hops (2.6% alpha)
- Wyeast 2124 Bohemian Lager (or any good lager yeast)

Step by Step:

Steep the grains in a grain bag for 30 minutes at 150° F. Remove bag and rinse into brewpot, then discard grains. Bring water to a boil. Add extract. When it returns to a boil, add the Northern Brewer hops and boil for 30 minutes. Add 1 oz. Hallertauer hops and boil another 20 minutes. You may need to adjust your amounts for differences in alpha acid. Add 1 oz. Hallertauer hops and boil 10 more minutes.

I used a Wyeast liquid smack pack that was stepped up into a 0.5-pint starter and then again into another pint. I recommend culturing up a strong lager yeast for this beer because of the wort's high gravity and high alcohol content as the beer ferments.

Ferment at 50° F for two weeks, transfer to secondary, and finish for another two weeks. Bottle as usual. Condition at 50° F for a few weeks to develop carbonation. Lager at 32° F for at least three more weeks. The beer will be crystal clear after a few weeks. You should be able to store it until another batch is ready next spring.

OG = 1.065 to 1.070
FG = 1.017 to 1.020

Wisconsin Spring Porter

(5 gallons)

"This one is my all-time favorite, and it took a bronze award in the '94 AHA National Homebrew Competition. It should be brewed in the spring when the maple sap starts to run."

Ingredients:

- 3.3 lbs. plain dark malt extract (Northwestern)
- 1.5 lbs light dry malt extract (Laaglander)
- 1 lb. crystal malt
- 0.25 lb. black patent
- 0.25 lb. roasted barley
- 1 cup dark brown sugar
- 1 lb. clover honey
- 3.5 to 5 gal. maple sap (used as brewing water)
- 2 oz. Goldings hops
- 2 tsp. spruce essence (or half of amount recommended on bottle)
- 0.25 oz. fresh wintergreen leaves (roll in hands to crush)
- Yeast Labs English liquid ale yeast in a 1-pint starter

Step by Step:

Steep the grains and remove just prior to the boil. Add malt and boil. At start of boil add 1.5 oz. hops, spruce, and wintergreen. Boil 45 minutes. Add the remaining hops, boil two more minutes, and cool. Pitch yeast at 70°F.

The maple sap is very important. Get as much as you can. I had to add water to get five gallons. The taste is very unique and refreshing, with a subtle aftertaste that makes you want more.

OG = 1.062
FG = 1.020

Brewer's Checklist

Personalize for your brewing method and recipe.

BEFORE BREW DAY

- ❑ Yeast starter ready

BREW DAY

- ❑ Water chilled (to cool wort)
- ❑ Recipe Ingredients on hand
- ❑ Salts for water treatment on hand

Sanitizing

- ❑ Spoons
- ❑ Bowls
- ❑ Brewpot
- ❑ Hydrometer
- ❑ Thermometer
- ❑ Primary fermenter
- ❑ Airlock
- ❑ Others

- ❑ Grains steeped
- ❑ Bittering hops added
- ❑ Aroma hops added
- ❑ Irish moss/other clarifier added
- ❑ Wort cooled
- ❑ Wort transferred to primary
- ❑ Yeast pitched
- ❑ Airlock secured
- ❑ Beer stored in cool, dark place

TRANSFER TO SECONDARY

Sanitizing

- ❑ Hydrometer
- ❑ Secondary fermenter
- ❑ Siphoning Tubes
- ❑ Airlock

BOTTLING/KEGGING

Sanitizing

- ❑ Bottling Bucket
- ❑ Bottles
- ❑ Bottle caps
- ❑ Keg(s)
- ❑ Siphoning tubes

Short Order Bitter

(5 gallons)

"I like this particular recipe because it is very simple, yet it produces a fine bitter in short order. Extract beers always seem to come out a lot darker than I hope — in this one, even the very light extract couldn't keep the color down."

Ingredients:

- 4 lbs. Alexander's extra light malt extract syrup
- 3 lbs. Laaglander dry malt extract
- 0.5 lbs. Belgian cara-pils
- 0.5 lbs. Belgian biscuit malt
- 2 oz. flaked barley
- 2 oz. Centennial hops (10% alpha)
- 1 oz. aromatic British hop (e.g. East Kent Golding, Progress, Bramling Cross)
- Edme ale yeast

Step by Step:

Crush malts and soak with flaked barley in 1 gallon water at 150° F for about one hour. Rinse grains with hot water, collecting a total of about 2.5 to 3 gallons for boil. Boil for 15 minutes, then add Centennial hops. Boil 45 minutes more, adding remaining hops for last five to 10 minutes.

Strain wort into 2.5 gallons preboiled, chilled water (to make 5 gallons). Aerate thoroughly, and pitch a healthy yeast starter. I prefer an open fermenter for primary fermentation. When kraeusen falls, rack to carboy for secondary fermentation, then bottle or keg by normal procedures.

OG = 1.048
FG = 1.008

LFD's Light Honey Ale

(5 gallons)

"This light-flavored ale is adapted from a Charlie Papazian recipe. It has a pleasant honey flavor that satisfies a homebrewer but isn't too challenging to the non-enthusiast. It's a bit high in alcohol — about 7 percent by volume — so treat it with respect. LFD are my wife's initials. She likes this recipe!"

Ingredients:

- 2 tsp. gypsum
- 4 lbs. light dry malt extract
- 3 lbs. orange blossom honey
- 4 oz. Cascade hops (5.8% alpha)
- Liquid ale yeast
- 3/4 cup dextrose

Step by Step:

Boil extract, honey, water crystals and 2 oz. Cascade hops in 1 gallon of water for 50 minutes. Add 1 oz. Cascade and boil 10 minutes more. Add 1 oz. Cascade hops after heat is cut off. Cool wort, bring to 5 gallons, and pitch yeast. Follow your typical fermentation procedure, priming with dextrose before bottling.

Variations:

Use dark extract for a light-bodied dark beer. Try a different type of honey. Substitute hop varieties — perhaps Fuggles for first two additions and Goldings for dry hop.

Maple Brown Ale

(5 gallons)

"This is one of the first recipe I made up, and it is a favorite. The secret is the maple syrup. I made it with syrup from my dad's trees that was reduced over a wood fire. This gave it a slightly smoky flavor. The maple and the Cascade hops go well together. Be warned: This is a strong one."

Ingredients:

- 3 lbs. hopped amber malt extract
- 3 lbs. hopped dark malt extract
- 1 lb. crystal malt, 40° Lovibond
- 1 quart (3 lbs.) maple syrup
- 2 oz. Cascade hops
- Doric dry ale yeast
- 3/4 cup sugar

Step by Step:

Rehydrate dry yeast in 1 1/2 cups sterilized water at 80° to 100° F up to an hour before pitching.

Add grains (in bag) to 1 gallon cold water. Steep until 160° F, hold 15 minutes, remove grains. Add extract and maple syrup. Boil 55 minutes. Add Cascades and boil for five minutes. Add 3.5 gallons cold water in carboy. Pitch rehydrated yeast into 7-gallon carboy. Bottle with sugar dissolved in 2 cups of water.

OG = 1.075
FG = 1.018

Indigo Pale Ale

(5 gallons)

"I tend to like the hoppier pale ales (like the IPAs). Here is a nice pale ale that always brings a smile to my face."

Ingredients:

- 7 lbs. light malt extract
- 1 lb. honey
- 1 oz. Cascade hops
- 0.25 oz. Hallertauer hops
- 1 tsp. gypsum
- 1 tsp. Irish moss
- American ale yeast (Wyeast 1056)
- 3/4 cup light dry malt extract

Step by Step:

Bring extract, honey, and gypsum to a boil. Add 0.5 oz. Cascade hops and boil 45 minutes. Add Irish moss and another 0.5 oz. Cascade hops and boil 10 minutes. Add 0.25 oz. Hallertauer hops and boil for five minutes. Cool and adjust volume to 5 gallons. Pitch yeast. Ferment and bottle with dry malt extract.

OG = 1.054
FG = 1.014

Michael Sabo

Dry Wheat
(5 gallons)

"If you are into wheat beers you will love this one, but this is not a traditional weizenbier. My goal was to design a wheat beer that finished very dry without using barley malt. I also wanted to bring out the flavors created by quality German Weihenstephan yeast. This beer would be very difficult for an all-grain brewer to produce. It would be a challenge for a homebrewer to mash 100 percent wheat...How does Ireks produce 100 percent wheat extract? I haven't a clue, but it tastes great!"

Ingredients:
- 6.6 lbs. Ireks 100% wheat malt extract
- 1 lb. dry rice extract
- 2 oz. Hallertauer whole hops (3.2% alpha)
- 1/2 tsp. Irish moss
- Liquid Wyeast #3068 (Weihenstephan)
- 3/4 cup of corn sugar

Step by Step:
While the can of malt extract is sealed, heat for 15 minutes in 1 gallon of 150° F water (removed from burner) to make it easier to pour. Bring 2 gallons of quality bottled water to a boil. Add wheat malt extract and dry rice extract, stirring constantly to keep from scorching. Bring wort to a boil for 15 minutes. Add 1 oz. hops. Boil for 15 minutes. Add remaining hops. Boil 15 more minutes. Add kettle coagulant and boil another 15 minutes. Remove from heat and cool to about 150° F.

Add wort to primary and bring total volume to 5.5 gallons with pre-boiled, room-temperature water. Pitch the yeast. It is critical that you use Weihenstephan; do not substitute any other

Ferment in primary for three days. Secondary fermentation is usually complete in five to seven days. Prime with corn sugar. Leave bottles at room temperature for two weeks. Place in refrigerator for four to six weeks. This will remove the chill haze common to wheat beers. This beer will mature over eight to 10 weeks.

Rich Curtin

Maple Surprise
(5 gallons)

"This recipe is a classic example of the 'barter system' at work. I helped a friend collect the sap from his maple trees. In return he gave me a few gallons of the best maple syrup I have ever tasted, and I gave him some of the best beer he's ever tasted!"

Ingredients:
- 3.5 lbs. John Bull Lager (hopped) malt extract syrup
- 2 qts. maple syrup
- 1.5 oz. Cascade hops
- 1/2 tsp. Irish moss
- Dry ale yeast
- 3/4 cup of corn sugar

Step by Step:
Bring malt extract, maple syrup, and 1.5 gallons of water to a boil. Add 1 oz. hops and boil for 30 minutes. Add 0.5 oz. hops and Irish moss and boil for 15 minutes. Sparge with 3.5 gallons cold water into fermenter. Pitch yeast when temperature reaches 80° F. Ferment for seven days in primary, then rack to secondary for five days. Bottle and age at least two weeks.

OG = 1.044
FG = 1.014

Sal Emma

"Old Coot"
(5 gallons)

"I racked this to secondary after six days and bottled it 10 days later. It was excellent. The malto-dextrin gave it just a hint of sweetness without being syrupy, and it had excellent body. The demerara provided extra alcohol and the molasses gave it a unique warm and cozy feeling. I was trying to copy Old Peculier but was unsuccessful. Old Coot is a really tasty and satisfying strong brown."

Ingredients:
- 8 oz. roasted barley
- 4 oz. British crystal malt
- 4 lbs. dark liquid extract, unhopped
- 2 lbs. demerara sugar
- 1 cup black strap molasses
- 1/2 lb. malto-dextrin
- 1.5 oz. Northern Brewer pellets (7% alpha)
- 2.5 oz. Fuggles pellets (4.5% alpha)
- 1 tsp. Irish moss
- Wyeast 1028 London Ale yeast

Step by Step:
Two to three days before brewing, activate yeast and make a starter. On brew day crush the grains, wrap them in a straining bag, and steep them in the brew pot, keeping the water around 160° F for 30 minutes.

Remove the grains, let them drain into the brewpot, and discard. Bring liquid to a boil, remove from heat, and add malt extract. Stir well. Return to boil. Add sugar and malto-dextrin and stir well. Return to boil. Add Northern Brewer hops and 0.5 oz. Fuggles and boil 45 minutes. Add 1.5 oz. Fuggles and Irish moss and boil 15 minutes more. Cool, rack to fermenter, and pitch starter.

OG = 1.046

Daria Labinsky

Orange Blossom Special
(5 gallons)

"This light, effervescent beer has a lovely honey color with a fluffy, white head. We like to drink it chilled during warm-weather months. The fresh orange peel and coriander produce a flavor reminiscent of a fine orange liqueur, and the sweet, Belgian-yeast taste comes through strongly. It is

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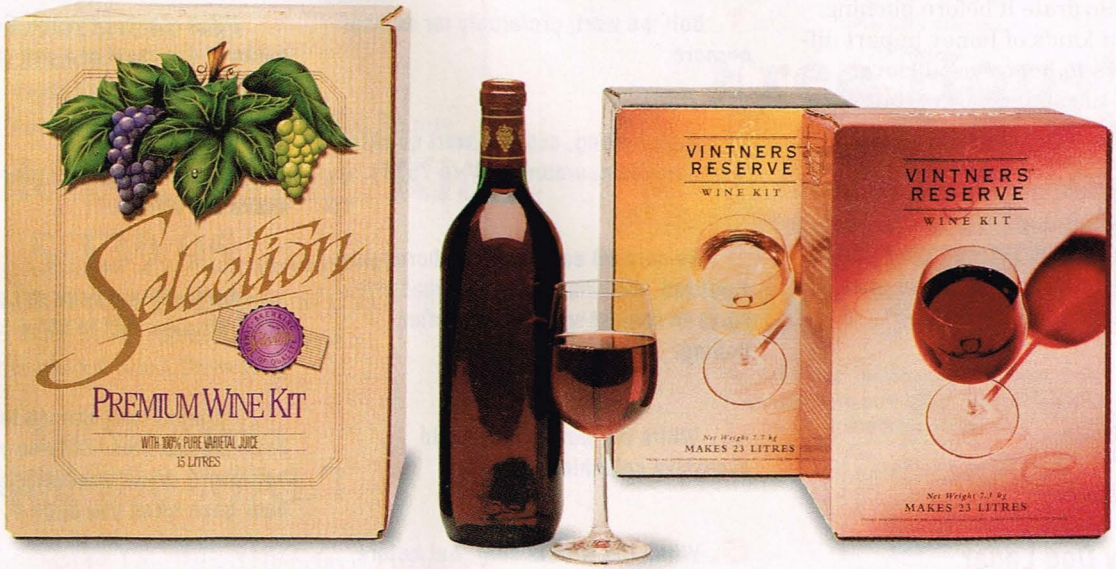

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based on a recipe in *The Complete Joy of Homebrewing*."

Ingredients:

- 5 lbs. extra-light dried malt extract
- 3 lbs. honey
- 2 oz. Hallertauer hops (4-6% alpha)
- 2 oz. freshly crushed coriander seeds
- 1 oz. freshly grated orange peel
- Wyeast 1214 Belgian ale yeast
- 1 1/4 cup dried malt extract

Step by Step:

Prepare yeast starter culture in advance. On brew day add malt extract, honey, and 1 oz. hops to 1.5 gallons water and boil for one hour. Add 1 oz. crushed coriander and 0.5 oz. hops and boil for 10 minutes. Add remaining coriander and orange peel and boil for three minutes. Add remaining hops and boil for two minutes.

Pour two gallons of cold water into fermenter and sparge wort into fermenter. Top off with water to equal five gallons. Follow normal fermentation procedures (five days in primary, a week in secondary), prime, and bottle as usual. Age two weeks.

About the Ingredients:

You'll get a stronger fermentation if you culture the yeast before adding it to the wort; just remember to start a day or two before you plan to brew. Otherwise, use one package of dried ale yeast and rehydrate it before pitching.

Different kinds of honey impart different flavors to beer. I used clover honey from the supermarket, but some swear by honey purchased directly from a beekeeper.

Grind the coriander seeds shortly before brewing; don't use the already-ground kind. Fresh orange peel adds a more intense flavor than dried peel from the supermarket.

Sam Wammack

Old Yellow Dog Lager

(5 gallons)

"This one is not to be confused with Yellow Dog Malt Extract (the beer recipe came first). I first made this beer in '87 and won a nationwide competition with it. Yellow Dog is even better if cold lagered with a liquid lager yeast."

Ingredients:

- 1 oz. chocolate malt (not crushed)
- 11 oz. Dutch light dry malt
- 1 can Alexander's malt extract
- 0.75 oz. Cluster hop pellets
- 0.5 oz. Hallertauer hop pellets
- European lager yeast
- 3/4 cup corn sugar
- 1/2 tsp. Irish moss flakes

Step by Step:

Heat five gallons of water and uncrushed chocolate malt. Remove the chocolate malt when the water reaches 170° F. When water boils, turn off heat and stir in malt extracts. Resume boil, add the Cluster pellets, and boil for 45 minutes. Add Irish moss and boil 15 more minutes. Turn off heat, stir in the Hallertauer pellets, and let sit for a few minutes.

Cool the wort to 70° F and siphon into a primary fermenter. Pitch yeast into the stream going into the primary. When you reach the bottom of the brewpot, carefully siphon the clear wort off and leave the trub and hop particles behind. Use a two-stage closed fermentation, siphoning into a secondary fermenter when the kraeusen has dropped from the beer in the primary. Bottle after fermentation is done and the beer has become clear in the secondary fermenter.

OG = 1.036
FG = 1.008

Scott Russell

My Favorite Märzen

(5 gallons)

"This is an Oktoberfest-style ale with a lovely, toasty flavor underlying the hops and the rich maltiness. I know it is not quite authentic, but boy is it nice!"

Ingredients:

- 1 lb. toasted and cracked lager malt
- 0.5 lb. Munich malt
- 0.5 lb. chocolate malt

Tips for Better Beer

1. Boil the wort, preferably for an hour or more.
2. After boiling, cool the wort quickly to pitching temperature (70° to 75° F).
3. Be sure all equipment is thoroughly sanitized, especially anything that will come in contact with the wort after boiling.
4. While the wort is hot, avoid excessive splashing.
5. When the wort is cool, but before the yeast is added, stir vigorously. This will add air to the wort, an essential element of starting fermentation.
6. Pitch plenty of yeast. Generally, two packs of dry yeast of a cup or liquid yeast starter is safe.
7. Once the yeast is added, don't stir or shake the wort.
8. Ferment in a cool, dry place (68° to 75° F for ales, 50° to 55° F for lagers).
9. Ferment long enough to be sure the beer has clarified. Leaving yeast in the bottle will cause yeast bite and make the beer gush when you open it.
10. Thoroughly clean, then sanitize, bottles or kegs. Be sure to remove yeast residue from the bottom.

- 3 lbs. unhopped amber dry malt extract
- 6 lbs. unhopped amber extract syrup
- 2 oz. Hallertauer hop pellets
- 1 oz. Spalter pellets
- 1 oz. Mt. Hood pellets
- 11.5 g. Edme ale yeast

Step by Step:

Toast lager malt in a 350° F oven for 10 minutes. Crack all three malts and add them to 2.5 gallons cold water (in grain bags), steeping while bringing the water to 170° F. Remove grains to a colander suspended over your fermenter, and sparge with 2 quarts preboiled 170° F water. Add unhopped amber dry malt extract (reserving 1 cup for priming) and unhopped amber extract syrup to the kettle, stirring to avoid scorching.

Bring up to a full boil and add Hallertauer pellets. Boil for 30 minutes. Add Spalter pellets and boil an additional 15. Remove from heat. Pour into sanitized fermenter, add 3 gallons cold water and Mt. Hood pellets. Let cool. Pitch the yeast. When wort hits 75° F, seal and ferment as usual. Rack after five days, let settle six more. Bottle, priming with reserved dry malt extract. Age cool (45° to 50° F) for four weeks or more.

OG = 1.055 to 1.058
FG = 1.012 to 1.015

Tom Fuller

Maple Porter

(5 gallons)

"Being from Michigan, I really enjoy trying to use as much of the Michigan resources as I can. Lots of great produce is grown in Michigan, and so are maple trees. Maple syrup is a Michigan staple, and it seems only natural that it end up in Michigan beer. The best part of this beer is that not only is the maple quite evident in the flavor but in the aroma also."

Ingredients:

- 6.6 lbs. unhopped light malt extract syrup
- 2 lbs. light dry malt extract
- 0.25 lbs. black malt
- 0.5 lbs. roasted malt
- 10 oz. chocolate malt
- 0.75 lb. caramel (crystal) malt, 50° Lovibond
- 1.5 oz. Northern Brewer hops
- 16 oz. maple syrup
- Wyeast 1098

Step by Step:

Add the crushed grain in a grain bag to 1.5 gallons of water in the kettle. Bring to a boil. Remove the grain just before boil begins. Add the extract and bring to a rolling boil. Add hops, and boil for one hour. Pour in maple syrup two minutes before the end of boil. Strain the wort into a fermenter containing 3.5 gallons of cold water. Top up the fermenter to 5 gallons. Pitch the yeast and wait for the goodness.

OG = 1.070
FG = 1.016

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Fermenting with

And other sound, if offbeat, ways to

By Ashton Lewis

Typically, homebrew recipes have intriguing names, long ingredient lists, and elaborate instructions for mashing and wort boiling. Then they begin to fizzle. The too-frequent finale of a homebrew recipe is "add the yeast to the cooled wort and ferment as usual." A legitimate question at this point is: What on earth is normal fermentation — especially if the brewer doing the brewing hasn't brewed enough to develop a "normal" method?

For many homebrewers "normal" means fermenting in a glass carboy, racking the beer out of the carboy into another carboy, letting it sit for a week or so at room temperature, then bottling the beer. Perhaps this is normal, but are there other methods out there? Absolutely!

Brewing methods used for centuries often include processes modern brewers view as unnecessary. Why is this opinion so pervasive? Perhaps it is because people, especially brewers, seem to think that their way of doing anything is the best way. But older methods, even if they're no longer practical for professionals, provide many options for adventurous homebrewers interested in exploring different techniques.

Tanks for the Memories

Flotation tanks and cold trub tanks are specifically used to remove trub that forms after hot, clear wort is cooled. The trub is called cold break or cold trub. On one hand some cold break is important, since it contains amino acids and lipids along with small proteins and tannins. The amino acids and lipids are important yeast nutrients.

Your Vacuum Cleaner

adapt traditional methods to your homebrew set-up

On the other hand cold trub can contribute harsh, astringent flavors to finished beer and, if the trub survives into the final product, is involved in haziness. Excessive cold trub in wort is also known to form protein layers on yeast cell walls, which diminishes yeast vigor when it is re-used. There are two traditional techniques used by lager brewers for the specific removal of cold trub.

Using a flotation tank is one of those methods. Cooled wort is pumped into these tall and narrow tanks after cooling and sometimes before yeast pitching. It remains there for three to six hours, during which time sterile air is gently sparged through the tank bottom. This aerates the wort in preparation for the yeast and causes the cold trub to float to the top.

When the trub rises it forms a dense, thin layer on top of the wort. The clarified wort is removed from the tank bottom. Once the trub layer falls to the bottom of the tank, wort transfer to the fermenter ceases. One of the advantages of this method is that there is little wort loss since the trub layer is very thin.

Cold trub tanks accomplish the same goals as flotation tanks, but the trub settles to the bottom of the tank rather than floating to the top. Cooled wort (with or without yeast) sits for four to six hours to allow for cold trub settlement, and then the wort is taken off the top, into the primary fermenter.

This method is effective, but it removes less cold trub than flotation, and the wort losses can be slightly

higher. However, this method is easier to use because it does not require any fancy equipment. A cornelius keg with a slightly shortened out tube (about 1/4-inch shorter than normal) works well as a cold trub tank. After sedimentation is complete, the wort is easily transferred by applying a slight pressure to the keg and pushing the wort into the primary through a racking cane.

In both of these methods, yeast can be pitched with the wort before it enters the vessel. One of the advantages to pitching at this stage is that the dead yeast are removed with the cold trub and the living yeast tend to stay in solution. This is especially useful if you re-use yeast, since yeast harvested from a prior fermentation usually has some dead cells along with some trub. Removing both of these tag-along components will improve the beer.

Skimming the Surface

Skimming is loosely defined as the practice of removing the top layer of yeast from the fermenter during some point of the fermentation. This method is generally practiced with open fermenters, especially the large, flatbed fermenters used in many professional breweries.

In some traditional British ale breweries, fermenters were skimmed multiple times during the course of fermentation. Brewers discarded the yeast from the first and last skimming, and saved the yeast from the middle skimmings for re-pitching.

Since many of these breweries used mixed yeast strains, this practice helped brewers maintain consistent mixed yeast populations — not an easy task. Skimming also helped remove trub from the fermenter. The trub rising with the yeast has a very unpleasant taste, and it was (and still is) considered important to remove this material before it falls back into the beer at fermentation's end.

Almost every fermentation method, both contemporary and traditional, includes cooling steps to help settle the yeast.

Skimming was also practiced by lager brewers, but only for trub removal. Lager yeast was harvested from the bottom of the fermenter after emptying the vessel.

Whether the brew is ale or lager, commercial skimming of open fermenters is done with large, hand-held yeast skimmers that resemble slotted spoons. In fact the easiest method to skim an open fermenter at home is to use a sanitized slotted spoon.

Burton Union and Other Skimmers

Several other methods for skimming fermenters were once in common use: parachute systems, dropping systems, and the ultimate self-skimming

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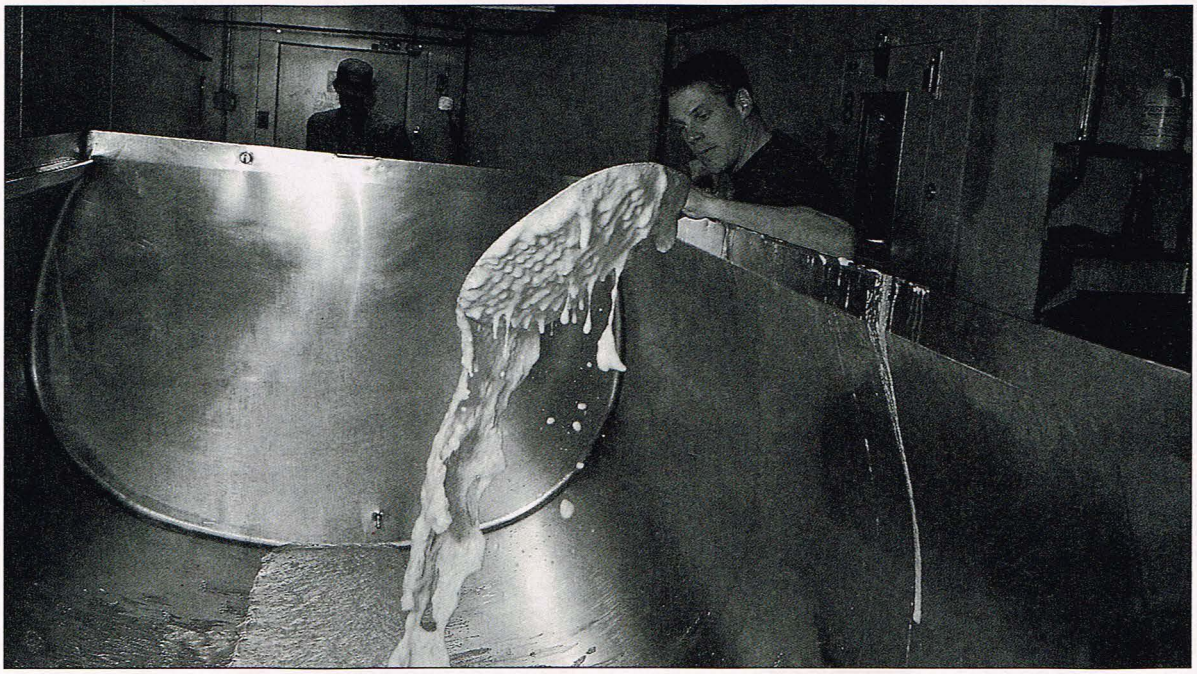

Some professional brewers use the equivalent of a giant slotted spoon to skim trub from the fermenting wort. This is accomplished in large, open tanks.

systems, the Burton Union System and Yorkshire Squares. Although they were very different, they all had the common feature of removing the yeast head at some point during fermentation. In the case of Burton Unions and Yorkshire Squares, skimming was automatic and continuous.

Burton Unions were made famous in the brewing of Burton pale ales such as Bass. The Unions existed as a "set" of about 24 150-gallon wooden barrels. The set was filled from a single primary fermenter about 24 hours into fermentation, and the fermentation was completed in the Unions.

During active fermentation in the Unions, the yeast head and trub would blow out of the casks through "swan necks" into a central trough. The trough was cooled to preserve the yeast for future use, and the beer that drained from the yeast was collected in a central collecting vessel that ran the beer back into the set of Unions. At the end of fermentation, the beer in the Unions was cooled and racked off into smaller casks for conditioning and distribution to local bars.

Brewers of the period reported that this method provided excellent yeast for re-pitching and beers with unique flavor profiles. However, due to the work involved in running one of these systems, they were phased out of most traditional breweries in the late 1940s to make way for closed fermenting vessels with automatic cleaning systems. Marston's in Burton-on-Trent continues to use wooden Unions today.

Although many of these traditional systems became scarce, some of the basic concepts of skimming still survived in some unlikely locations. In some of its breweries, Anheuser-Busch still uses large, closed square fermenters that are designed to be self-skimming.

The Coors Brewing Co. uses a similar system. Coors has a special collection vessel above its square fermenters. This method bears a remarkable resemblance to the Burton Union System, except at Coors the yeast in the skimming vessel is discarded rather than saved for re-pitching.

All of these methods, both traditional and contemporary, specifically remove undesirable compounds from active fermentation. Carboy fermentation, the standard method of fermentation used by most homebrewers, keeps these compounds in contact with the beer.

However, you can ferment in wide buckets with lids, which would allow for periodic skimming. Another good method is to fill your carboy high to cause the fermentation to blow over, purging some of these compounds. Also, if the beer is racked out of the primary fermenter before the yeast head and associated trub fall back into the beer, a clean separation can be accomplished. Such methods, which are no more difficult than other home fermentations, produce smoother, less astringent beers with cleaner flavor profiles than beers made in less-involved systems.

Fermentation Cooling

Almost every fermentation method, both contemporary and traditional, includes a cooling step to help settle the yeast. This is typically done after fermentation is finished and before the beer is moved on to the next step.

The extent of cooling necessary depends on what the next step is. For example some traditional British ales were cooled from fermentation temperature to 55° to 60° F, then racked into casks for further conditioning. Although this was cool enough to settle about 95 percent of the yeast in young beer before racking, enough yeast was left to allow for a secondary fermentation in the cask.

Traditional treatment of lager beers is similar, but the beers are cooled to 38° F or so before being transferred to lager storage. Again, this removes the majority of the yeast from primary fermentation but leaves enough for secondary.

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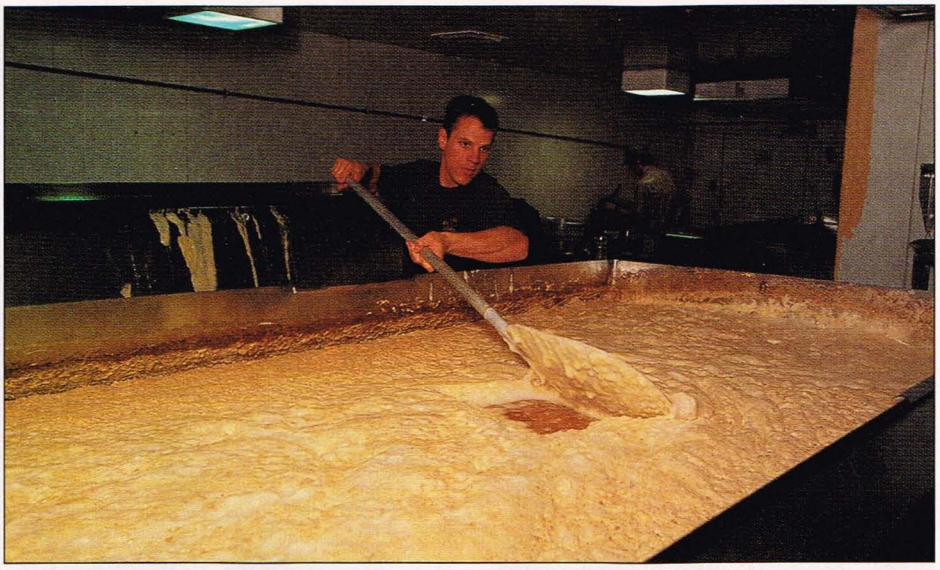

As ales ferment, yeast clumps together and rises to the top of the fermenter. Removing the clumps, or trub, from the beer helps prevent off-flavors. For brewers who harvest yeast, it also helps maintain a consistent yeast population.

Yeast removal before storage is very important for two main reasons. The first is that it is best to harvest yeast for re-use immediately after primary fermentation, and the most efficient way to harvest yeast is to force it to settle out of solution by cooling. Incidentally, both ale and lager yeast will settle out of solution when cooled. This is different from the phenomenon of certain ale strains forming a dense "top crop" during fermentation.

The second reason to remove yeast before secondary fermentation is a flavor issue. Excessive amounts of yeast passing into secondary fermentation will lend yeasty flavors to the finished beer. Most brewers view such flavors as defects in the finished product.

At home there are several ways to accomplish fermentation cooling. The simplest is to place the primary fermenter in the refrigerator for about a day before racking. This will cause dramatic yeast flocculation but may pose problems for bottle conditioning. Many homebrewers just add a small amount of yeast to the not-yet-bottled beer, about one-twentieth of the amount added for primary fermentation, to ensure that healthy yeast are present for carbonation.

If you don't have a refrigerator, then an ice or cold-water bath will work just as well. Most homebrewers don't cool at all but rather let the primary sit for about a week before racking. Although this does allow for substantial yeast flocculation, the yeast will begin to die (autolyze) and contribute yeast flavors to the beer at these warm temperatures. Yeast are best kept cold when not actively fermenting. Whatever method you use, the beer racked out of primary should be fairly clear after this process.

Carbonation Techniques

In traditional brewing methods carbonation was accomplished in casks after primary fermentation. Bottling was not an option for most brewers of the world until the bottle cap was invented in England during the 1800s.

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Excessive amounts of yeast passing into secondary fermentation will lend yeasty flavors to the finished beer.

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were possible before the advent of the bottle cap, but remember that beer was always a commoner's drink, and the labor-intensive nature of corking prohibited that technology from being used on a wide scale.

Beer was carbonated in cask by two primary methods. Lagers were either kraeusened — a proportion of beer in the high-kraeusen stage of fermentation was added to completely fermented beer and aged — or were plain old lagered.

The beer was transferred from primary before it completely fermented. The fermentation finished in a closed vessel, thus creating carbonation pressure. Since these methods were long and cold, they also allowed the beer to become very clear and the beer's flavor to mature during the period of carbonation and aging. After cold storage these beers were racked into smaller casks (called *fass* in Germany) for transfer to pubs.

In Britain almost all of the beer was racked from primary into cask, at which stage priming sugar, isinglass, and dry hops were added before bunging (sealing with a wooden plug). This method allowed for carbonation (priming sugar), further yeast flocculation (isinglass), and a kiss of fresh hops from dry hopping. The net result was not much different from those methods used for lagers, except these cask ales were ready for consumption about a week after kegging.

Homebrewers can really use any of these methods or can force carbonate their beers in soda kegs. You shouldn't rule out force carbonation — it works very well for most beers. But for special ales and lagers you might prefer one of the more traditional methods.

Essentially, an ordinary household vacuum cleaner is used to suck yeast and trub through a racking hose...

One Unconventional Method

Here's one brewer's usual fermentation method: Cool and aerate the wort as it fills into a soda keg (with a shortened out-flow tube) that contains liquid brewing yeast. After four to six hours in the soda keg (before fermentation), use a racking tube to rack the beer out of the keg and into a carboy.

Fill the carboy to the shoulder and fit the top with a large-diameter (at least 3/8-inch inner diameter) blow-off tube with one end submerged in a small bucket of water. During active fermentation some yeast, trub, and hop resins will blow out into the bucket. This is self skimming on the homebrew level.

Another skimming method is a cross between a spit sucker (the thing the dentist stuffs in your mouth during the routine check-up) and a vacuum cleaner. Essentially, an ordinary

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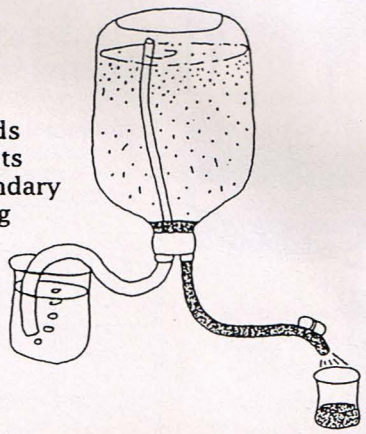

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household vacuum cleaner is used to suck yeast and trub through a racking hose, and the yeast is collected in a mason jar. This device can be used for multiple skimmings of a carboy, like the traditional British skimming methods, and the clean second skimming can be saved for re-pitching. However, this device may not be for every homebrewer.

Active fermentation is obviously over when the beer begins to clarify at the surface of the carboy. At this point check the gravity to confirm that everything is going as expected. Remove the blow-off hose and cover the carboy mouth with sanitized aluminum foil, then tape it up and place it in a refrigerator.

This is important because as the beer and headspace cool, they contract. If an airlock with water is inserted into the carboy before it is cool, the water will be sucked into the beer. Not good! Therefore, you should cool the fermenter for about a day, then fit it with an airlock.

Keep the fermenter in the refrigerator for about three days. Rack the beer into either a keg or bottling bucket, harvest the yeast at the bottom of the primary fermenter (carboy), and store for later use.

Exposed

Another option for primary fermentation is to use an open fermenter. Basically, any large plastic bucket can be used as an open fermenter as long as it can be adequately cleaned and is placed in a clean room with little traffic from people, pets, and other dirt-carrying creatures.

As fermentation progresses, the open fermenter can be skimmed of trub, and if you are using ale yeast, the healthy, clean crop of yeast under the trub layer can be harvested and reused. Again, after primary fermentation is complete the beer is cooled, then racked to a bottle or keg. The major difference with using an open rather than closed primary fermenter is the lack of cover. Since dust and debris can contaminate the beer, it is best to cover an open fermenter before cooling it, since the beer loses its protective layer of yeast and carbon dioxide when it cools.

Finishing Up

You can force carbonate the beer in the soda keg, or add some fresh yeast and priming sugar to a bottling bucket and bottle the beer for bottle conditioning.

For other brews, rack from the primary into a soda keg when the gravity falls near 1.020. Then move the keg to the refrigerator for lagering. Once the keg is in the fridge, monitor the pressure and keep it near 13 psi. After about two weeks in lagering, rack the beer to a second soda keg and give it one more week in the cold.

Now it's easy. Either dispense out of a keg and enjoy the brew or pour it into your favorite glass and enjoy!

So the next time you're thumbing through recipes and read "ferment as usual," consider the many methods in the world that can be used for fermentation, arguably the most delicate and hard-to-master stage of brewing.

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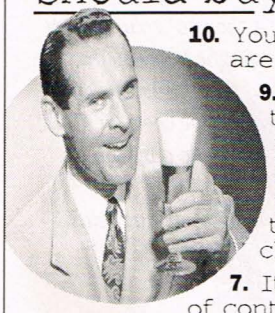

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HA56

Czech Teens Learn to Brew in School

by Rachel Sarah

Think of this as any teenager's dream class. Not only do you learn to brew beer, in *school*, and get *credit* for it, you get to drink the beer, too.

This could only happen in a country where brewing is part of the culture, where it's considered an important craft. Where people take beer seriously. It happens in the Czech Republic.

"They can taste the beer up to a point," Frantisek Svec, head craftsman at Mestan Brewery in Prague, says of his 15- to 17-year-old apprentices. Young apprentices are allotted about a liter a week, Svec says. The legal drinking age in the Czech Republic is 18.

On the other hand both Svec and head professor Jan Smid each get at least a free liter of beer a day. But can the instructors drink that much beer daily? "Well, one has friends," Svec says, laughing as he helps himself to a second glass of student-made beer.

Smid is quick to add, however, that the Brewers' Apprentice School "doesn't have a party character." Neither, unfortunately, does the school have a long future ahead.

AHMED RAHIM

In the classroom the apprentices end their day with a lecture from professor Jan Smid.

The Brewers' Apprentice School started at the Prague brewery in 1987, two years before Czech communist leaders stepped down and playwright Vaclav Havel took the presidential post. It's one of four brewing apprentice schools in the country; the others are in Plzen, Ceske Budevice, and Moravia.

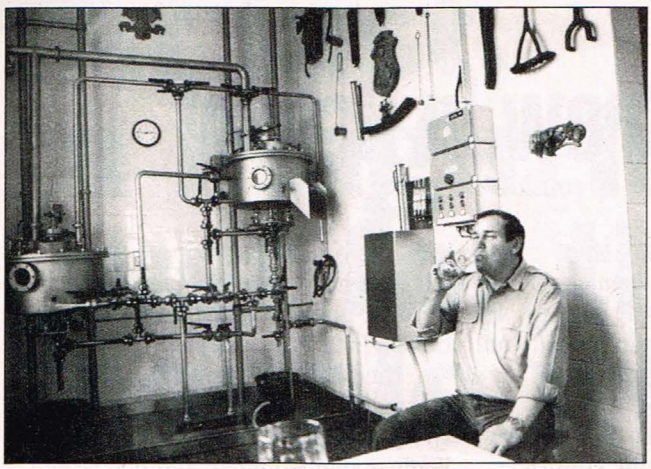
Daily classroom instruction, using brewing textbooks specific to the year of training, begins at 6:30 a.m., followed by hands-on learning on the brewery's premises. Seven-hour days end back in the classroom at 1 p.m. with a half-hour summary of the day's work.

For hundreds of years, apprentices have been learning the art of brewing in programs such as this one. Even Czech vocational schools and *gymn ziums* (grammar schools) include basic instruction about how this country's best-loved drink is made. The fact that young Czechs study hands-on with professional brewers, after which they work in a brewery for a minimum of three years, shows just how integral beer is to this culture.

Apprentice Jan Lumbert, 16, wanted to be a chef, "but apprentice schools for cooks are private, and I didn't have the money. So I came here."

Sixteen-year-old Stepan Kabzer, a shy redhead in his second year at Mestan, has brewing in his blood. Stepan's father was a brewer, but he recently left the trade to work in construction. This week Stepan, in a flannel shirt and blue jeans, is monitoring the boilers.

Besides their youthful appearance, apprentices are easy to spot. Unlike professional brewers in blue coveralls, they're dressed in jeans and ratty t-shirts. As Svec passes the boilers upstairs, he stops to pat a couple of apprentices on the shoulder. Basically, Svec is around to give pointers, answer



AHMED RAHIM

Jan Smid drinks student-made beer in front of the Czech Republic's only pilot brewery. When the school closes next year, he'll be out of work.

questions, and take care of his brewers-to-be.

This year Svec, who has been training brewers for seven years in Prague, has 25 pupils, six of whom are girls. Although they don't pay for their three years of study, graduates must work as a trade-off at Mestan (or another brewery with which Mestan cooperates) for an additional three years.

At the end of the day, Katka Souckova, 17, hangs her head over her notebook as Professor Smid lectures on kegs. Neither Souckova nor any of the students take notes as Smid talks about cleaning, assembling, and moving kegs.

For the brewing apprentice, however, school isn't easy, according to both Smid and Svec. Apprentices do everything from sweeping the barley, which is lined up in 40- to 50-meter-long rows on a tiled floor to sprout, to stirring the wort. For the hands-on work students are divided into groups and sent to separate departments.

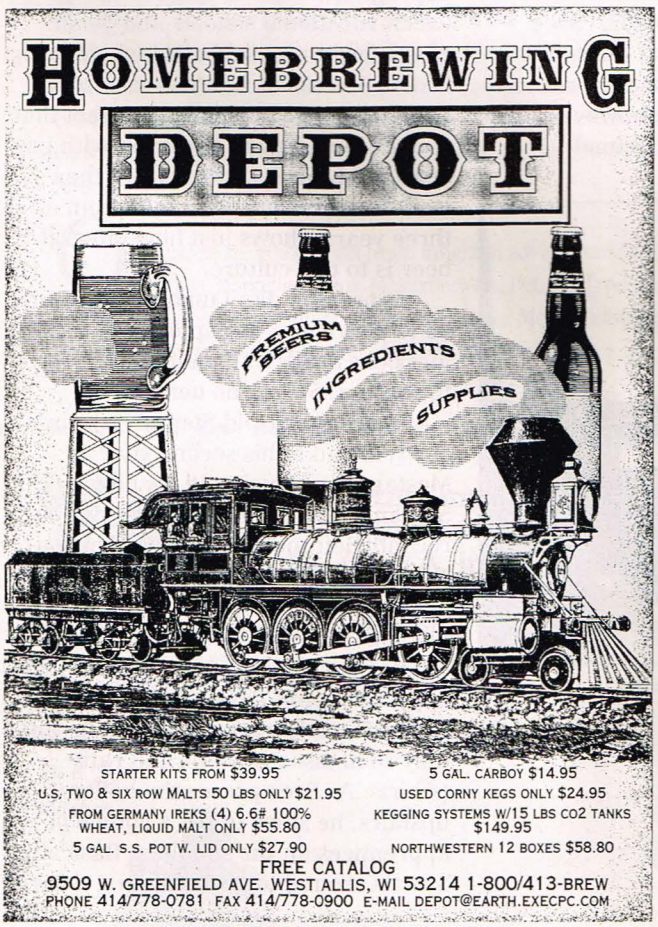
The apprentices take up three different rooms upstairs in the brewery: a typical classroom with desks and chairs, a locker room, and a miniature brewing room with the only pilot brewery in the country, according to Smid.

Manual bottling machines from the '20s, refurbished by Smid, decorate the tables. Tools used for capping beer that, Svec says, "my father used to use" hang from the walls. This is the second largest brewery antique collection in the country (the largest is in Plzen). Many visitors have offered to buy these artifacts, but they're not for sale, Smid says.

From below the apprentices' rooms, a humid smell escapes. In one of the first brewing steps, apprentices boil barley in huge, white, 60-year-old tanks. Over the next 12 hours this boiling liquid slowly drips out of metal taps and winds its way to another tank, where the hops are added.

It's here that the original gravity of the beer is decided. Original gravity, usually 10° or 12° Plato (1.040 or 1.048) in Czech beers, is the measure of malt sugar in the beer before it ferments.

The beer is then transferred to



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150-hectoliter (3,960-gallon) tubs, where the production of carbon dioxide during fermentation forms layers of white foam like bubble bath. Here, the liquid is cooled and the yeast turns the sugars to alcohol. In one of the final steps of brewing, eight long, hippo-shaped conditioning tanks hold the foaming liquid for 20 to 42 days (depending on the gravity), where the CO_2 is trapped, carbonating the beer.

Student-made beer at Mestan is placed in kegs, labeled, and graded, while the rest is put in bottles or kegs to be sold.

A Fading Legacy

Unfortunately, the Czech Republic's brewing apprentice schools are closing their doors next year, Svec says.

"The school will be closed due to the lack of interest on the part of students," Svec says. "Everyone wants to go to a secondary school (where they can earn high school degrees). Breweries believe they'll be able to continue with unqualified workers. But they'll see. Maybe in 10 years this school will open again."

Due to the decreasing birth rate in the Czech Republic, many schools throughout the country — not just the brewing programs — will be closing in upcoming years, Smid says. Moreover, when the apprentice programs shut down next year, Svec and Smid will probably be out of work. This isn't just because their teaching duties have been scratched, Svec says. England's Bass brewery, which purchased shares in Mestan three years ago, will soon bring new brewing technology to replace manual workers.

So where will young Czech brewers-to-be learn? One secondary school in Prague will teach students everything about brewing — minus the hands-on work. From any secondary school they can enroll in the brewing course at Prague's University of Chemical Technology.

The university's Department of Fermentation Chemistry and Bio-engineering has been churning out the country's top brewers for more than 100 years. "In 1816 this was the first school in Europe to teach beer brewing," says Gabriela Basarova, who heads this department and was the first woman to work at Plzensky Prazdroj in Plzen (the Czech Republic's largest brewery, founded in 1842).

"We're still the institute with the most intensive university course for beer brewing in the Czech Republic. Our beer industry continuously needs new, professional brewers," says Basarova.

Students aged 18 to 22 study malting, brewing, and biotechnology here. Graduates of this fermentation department have gone on to become general managers of the country's largest breweries, such as Plzensky Prazdroj, Budejovicky Budvar (Ceske Budejovice), and Staropramen (Prague). Unlike countries such as the US, where strict drinking laws keep the art of making beer somewhat taboo among youth, Basarova says that "all Czechs should know a little about brewing beer." ■

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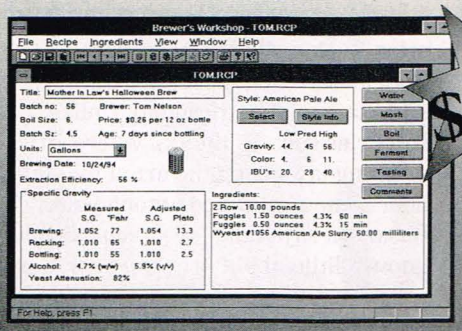

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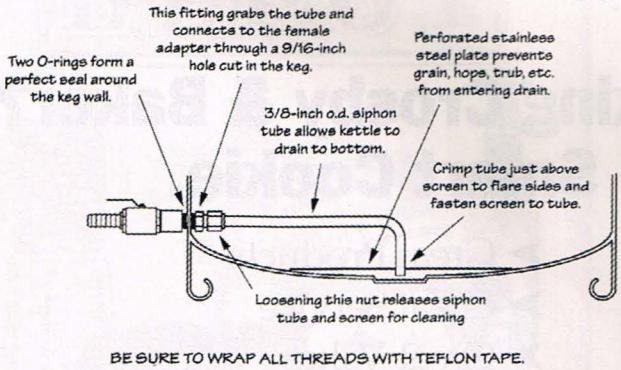

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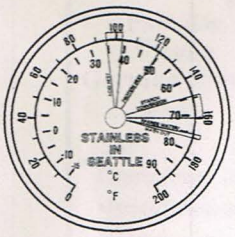

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CIRCLE 68 ON READER SERVICE CARD

Germans Aim for a Homebrew Revival

by Matt Johanson

In beer gardens and brewpubs from Bavaria to Hamburg, German beer enthusiasts worry as they empty their frothy mugs.

During the last few years, they've become aware of an unacceptable situation: The world's homebrewing scene has left them behind. Hobby clubs and supply stores exploding like overcarbonated bottles across the US, Great Britain, and Australia finally prompted megabrewing companies to produce microbrewery-like specialty labels.

Meanwhile, microbreweries abound in the Vaterland, but homebrewers and supplies are hard to find. In most areas only commercial warehouses sell ingredients, and usually not in small quantities. (Need some grain? Okay, how many tons?)

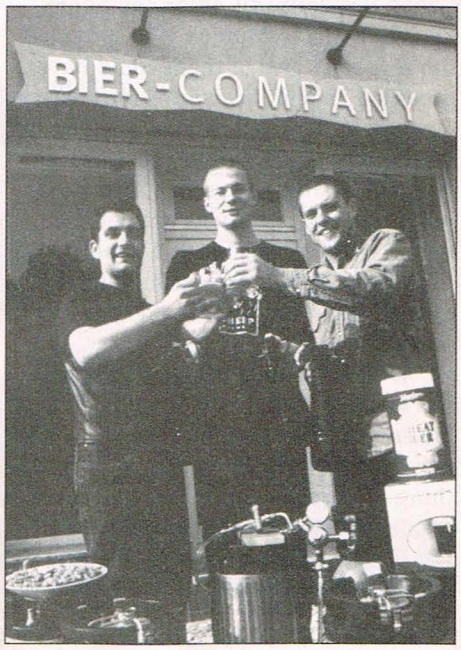
"In Germany homebrewing is still in its baby shoes, and a lot of people don't even know how beer is made," said Fabio Cani, a homebrewer from Gönningen who, for his wedding, made a batch that he admitted was less than impressive. "That's why I'd like to marry my wife again," he said. "The Americans are a step ahead of us."

How did the world's perennial beer capital miss the party? "Homebrewing was popular a century ago," explained Christian von der Heide, a professional brewer and international consultant from Munich. "Nearly every household made its own bread and its own beer. Some little villages had a common brewhouse, which every citizen shared.

"But after the war, most of the homebrewers stopped brewing," he said. "Industrial beer became affordable, and no one saw a reason to do it any more."

Another obstacle is the nation's law requiring all homebrewers to notify their nearest customs office of how much beer they intend to brew, what kind of beer, and how strong it will be.

Germany is hardly crawling with beer cops, but anyone who brews more than 200 liters a year is supposed to make a monthly report and pay a few marks of tax per batch.



Stefan Wendt, Frank Seifert and Asbjörn Gerlach founded the Bier-Company, Germany's first homebrew store.

"The big breweries in Germany have a huge lobby and everyone thinks, 'Why make your own beer when there are so many good beers you can buy?'" said Cani.

Cani and von der Heide both belong to a club trying to change that attitude — a new 50-member group called the Association of Homebrewers in Germany, the first of its kind in the nation.

"Homebrewers aren't trendy people who really want to join a club and organize, but they do want to meet others with similar interests to trade recipes and ideas," said Martin Stoll-Hafkus, the club's secretary from Hamburg. "Talking with other brewers is often the best way to improve technique and avoid mistakes."

Many of the club's members met in the village of Wolfersdorf for a small homebrew festival in November to do just that.

Wolfersdorf German Märzen
(5 Gallons, All-Grain)

Ingredients:

- 5 lbs. 6-row barley (high enzyme)
- 2 lbs. Munich malt
- 1 lb. toasted malted barley
- 2.5 oz. Saaz hops
- 1 to 2 packages lager yeast
- 1 1/4 cups dry malt extract

Step by Step:

Toast the malted barley at 350° F for 10 minutes. Combine the crushed grains with 2 gallons of 130° F water. Raise the temperature by adding 4 quarts of 200° F water and continue with starch conversion at about 150° F for 15 minutes. Complete conversion by raising the temperature to 158° F and holding for 10 to 20 minutes. Sparge with 4 gallons of 170° F water.

Bring the wort to a boil, add 2 oz. Saaz. Continue to boil for an hour, adding the remaining hops for the final two minutes. Remove the spent hops and sparge. Cool the wort as quickly as possible. Pitch the yeast and ferment. Bottle with malt extract.

- Paul Denzler

They also toured the homes of three beer lovers in the area, whose incredible brewing set-ups revealed another reason the hobby fails to interest more Germans.

"Almost everything was custom made in stainless steel except the brew kettles, which were copper," said Calvin Perilloux, an American homebrewer living in Munich who attended the festival. "Two of them could have qualified as pilot breweries for larger operations. One fellow even installed temperature and flow sensors every step of the way, and a master control panel showed what was happening with the brew process as it progressed.

"They all had professional labels. As you might expect, the beer was top notch."

When Perilloux asked why hobbyists would spend six-digit sums on a basement operation, he received a surprising answer. "They think it's a good thing for equipment to cost that much, because then the brewer will pay adequate attention to his work and not make bad beer," he said.

Homebrewer Calvin Perilloux enjoys a lager in Munich.

"As for the labels, the Germans thought it was pretty sad that a lot of US homebrewers don't label their beer. They consider it a matter of pride to do it right instead of what they perceive as a halfway job."

Dunkles, bocks, and helles were among the beers entered in the festival's contest, all traditionally made according to the Reinheitsgebot, Germany's purity law, which allows brewers to only use hops, grain, yeast, and water. In other words no corn sugar, no salt, no gypsum, and *ach*! forget about strawberries, pears, and apricots, too.

"Fruit beers especially drive them crazy," said Perilloux. "They say, 'We do not brew beer with pumpkins!'"

Not all the brewers in attendance used such elaborate equipment, and many of the beers were sour and cloudy. "Two were so underhopped they were nearly undrinkable," Perilloux said

Fortunately, Germany's first homebrew supply store opened in October to remedy these difficulties. "Our aim is to open people's minds and to teach them how to appreciate beer that has quality, and not just a big name," said Steffan Wendt, a founder of the Bier-Company in Berlin.

"We also try to show our customers how to make a brew with very simple equipment, so that brewing five gallons won't cost more than $100 for the first time."

The Bier-Company also holds regular classes and teaches all students how to make a full mash.

"It's like missionary work in the world's greatest beer country," Wendt said. ■

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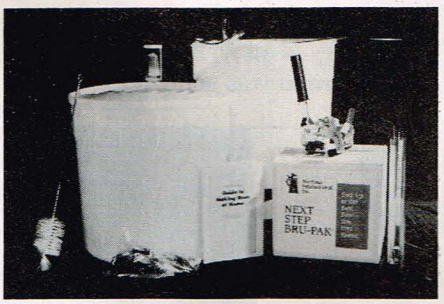

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Britain's Exclusive Homebrew Club

by Dr. John Harrison

For 25 years the Durden Park Beer Circle has been one of the world's foremost homebrewing clubs. Members of the West London group have researched historic beer styles, developed recipes, and even published books about brewing.

In the late '50s home winemaking took off like a rocket in the UK, with homebrewing traveling far behind. There were a number of reasons for this. Wine was an expensive item for someone earning average wages, but ingredients for home winemaking were either free (such as wild blackberries) or could be cheaply grown in a backyard garden (raspberries).

Beer, on the other hand, was relatively cheap to buy and available in reasonably good quality. Ingredients for homebrewing were very difficult to find, and it was not until the '60s that mail-order businesses selling home wine equipment and ingredients began to offer a supply of basic items for home beer brewing.

In mid-1971 there were some 400 home winemaking clubs in the UK but not a single beer-only club. Beermakers usually joined the nearest wine guild and found themselves in a minority of the membership. As a result, brewers usually got only one talk on brewing a year, and it was pretty elementary to allow the winemakers to follow what was going on.

The author (seated) and Nick Redman, the Whitbread archivist, study a ledger detailing one-year's production of ale.

John Harrison (left) and Durden Park Beer Circle's resident barleywine specialist Bob Broadwood preview the beers up for tasting.

Ted Hickson, a grain brewer, found this state of affairs extremely frustrating, so he founded The Durden Park Beer Circle.

The first meeting was attended by 16 brewers and the numbers rose rapidly to about 35, which is the maximum reasonable occupancy at our meeting place. Ted Hickson was a cricketer as well as a brewer, and through his connections the Beer Circle was allowed to use the Durden Park Cricket Club's Pavilion on Thursday evenings. This pavilion also has its own bar. In the time since the Circle was founded, there have been about 70 members.

Historical Mission

The original charter for the club's activities was "To improve the practice of homebrewing for the benefit of Circle members and homebrewers in

general." In late 1972 we added another goal spurred by a book entitled *The History of English Ale & Beer* by H.A. Monkton. It revealed a by-gone age of beers such as original India ale, double and triple stout, Christmas ales, and more. We decided to include "To research, make, and evaluate Old British Beers from AD 1400 to 1814" to our original caveat. This research was accepted with enthusiasm by Circle members.

The first tasting of seven old beers was held in December '73, and we tasted lost gems such as Unhopped Ale OG 40 (original gravity 1.040) and

Circle Meetings

A typical year's program would include most of the following:

1. Talk by a professional brewer from a respected brewery.

2. Talk by an expert on some topic related to brewing (e.g. water quality, hops, roast malts, mashing technique).

3. Tasting of experimental beers produced by a member to illustrate some aspect of brewing (e.g. effect on beer flavor of using different hops).

4. Sharing of useful information picked up by members at training courses for professional brewers.

5. A gadget and techniques evening to compare novel ways of performing brewing operations.

6. Comparative tasting class of commercial beers (such as strong lagers, strong bitters, barley wine, Christmas ales).

7. Tasting of members' attempts to imitate a well-liked commercial beer (e.g. John Courage's Bulldog).

8. Tasting of best beers found while on holiday.

9. Our Christmas party and Old Beers Night (usually 20 to 25 beers, some old favorites but mostly new beers of our rolling research program).

10. A bus trip to an interesting brewery plus one or two public outings; or a straight-forward pub crawl around an interesting area.

Whitbread's 1850 Porter
(5 gallons)

Ingredients:

- 11 lbs. pale malt
- 1.75 lbs. brown malt, 53° to 60° Lovibond
- 4 oz. Fuggles hops (4.5% alpha) or equivalent
- 0.5 oz. Kent Goldings hops
- English ale yeast

Step by Step:

Mash at 150° to 153° F for 2.5 to three hours. Sparge slowly to get 5.5 gallons sweet wort. Boil with Fuggles hops for 90 minutes. Add Kent Goldings hops two minutes before end of boil. Cool wort, strain hops. Add cold, boiled water or boiled sugar syrup to hit 1.062 gravity. Pitch yeast.

Ferment at 60° to 68° F. Mature for three months. If fermented beer tastes too dry, add a little non-fermenting sweetener.

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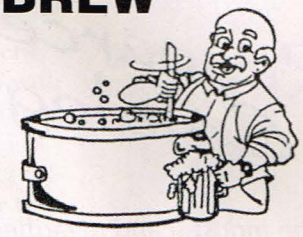

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When we started researching old beers in 1972, there was no central index of brewing archive material. We didn't know that many large breweries kept brewing books that were compiled when a beer was made, going back to the late 1700s.

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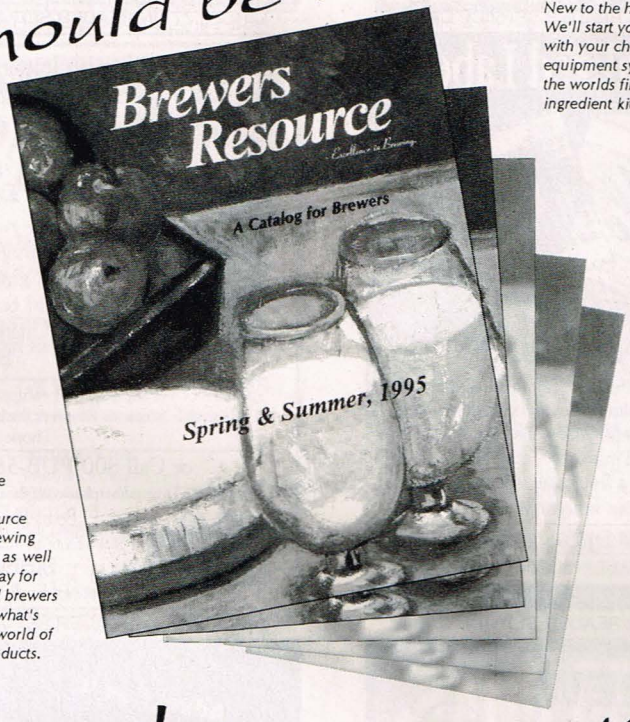

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CIRCLE 14 ON READER SERVICE CARD

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- 1.5 oz. Kent Goldings or other aroma hops
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- High-alcohol beer yeast

Step by Step:

Use a very stiff mash at 147° to 149° F for 2.5 hours. Sparge very slowly while checking specific gravity (SG) of the collected wort (not the runoff). When the gravity has dropped to 1.090, begin sparging into a second container until the SG of this second collected wort drops to 1.050. Boil the second wort up to a SG of 1.090. Combine the two worts and boil with Fuggles hops for one hour, adding the late hops 10 minutes before the end of boil.

Cool and strain the hops. Check the original gravity and adjust to 1.100 by adding cold, boiled water or cold, boiled sugar syrup as required. Ferment at 60° to 64° F with a barleywine or other high-alcohol beer yeast. Final SG should be 1.016 to 1.018. Dry hop. Mature for six weeks.

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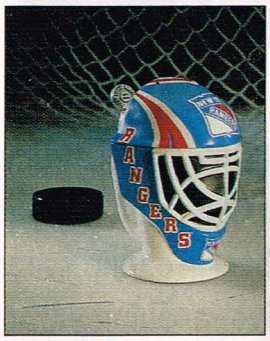

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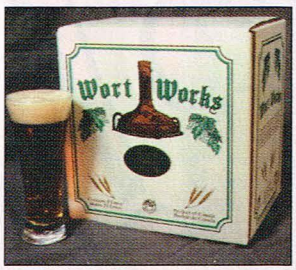

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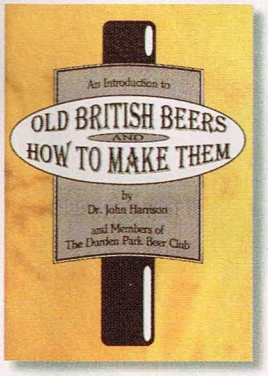
The Private Brewer's Guide was originally published in 1822. It describes old brewing processes, excise tax laws, and original recipes for a variety of classic beers. Reprinted with updated information, it is a fascinating reference for the traditional brewer. It is published by Zymoscribe.



Also published by Zymoscribe is *Old British Beers and How to Make Them,* under the direction of Dr. John Harrison of the Durden Park Beer Circle. Check out the club's recipes along with information on classic ingredients and how to use them.

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Getting There

If stopping is the most important part of your road trip, Coop's "Road Map Guide to Microbreweries and Brewpubs" is the perfect way to get there.

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America Keeps on Brewin'

Brew-on-premise shops in the US keep on coming, according to The Brew Store, the Canada-based manufacturer of BOP brewing systems.

Five more outlets featuring Brew Store equipment opened recently or will open by early summer in cities such as Denver and Fort Collins, Colo., San Diego and Santa Barbara, Calif., and Allentown, Penn. The Colorado stores are sisters to The Beer Store in Boulder, Colo., becoming the first multi-outlet BOP operation in the US.

The Brew Store has recieved 400 inquiries over the last six months regarding the BOP concept.

The Brew Store can be reached at (905) 845-2120 or by e-mail at brewstor@hookup.net. ■

CIRCLE 25 ON READER SERVICE CARD

The Other Brewery in Golden, Colo.

by Steve Johnson

Golden, Colo., is home to a famous brewery. It has the largest production of any brewery in the world, national distribution, and a baseball stadium named after it. Coors certainly doesn't qualify as a "Microbrewery You've Never Heard Of." But wait, there is a second brewery in Golden that may fit the bill.

Occupying an old machine shop in the backyard of Charlie and Janine Sturdavant's home, Golden City Brewery is downright minuscule compared to Coors. Despite its small size, Golden City Brewery is still the "second largest brewery in Golden."

With Coors so big and famous, and Golden City so tiny and unknown, Janine Sturdavant says there isn't a day that goes by that she doesn't receive at least one phone call for Coors. It didn't take her long to memorize the Coors number so that she could easily refer callers to the other brewery, which is just four blocks away. Janine says callers are usually incredulous to learn that there is another brewery in Golden. Helping people reach the other brewery in town is just one of those things that one brewery does for the other — kind of a good-neighbor policy.

All of the brewery's equipment, including the second-hand dairy-tank mash tun, was purchased with an initial $80,000 investment.

So how do Coors and Golden City compare in size? In 1995 Coors produced about 20 million barrels of beer (that's 54,795 barrels every day, 2,283 barrels every hour, and 38 barrels every minute). Golden City, on the other hand, made only 600 barrels during the entire year. That's 1.6 barrels a day.

Coors has nearly 6,000 employees worldwide. Golden City has three full-time and three part-time employees. The malt kilning rooms at Coors are as long as a football field. Golden City can put all the malt it needs for a week's worth of brewing in the back of a pick-up truck. Coors averages about 1,000 visitors daily. Golden City doesn't count, but there are rarely more than five or six visitors at a time.

Janine says that a major portion of Golden City's production is sold right at the brewery. "A lot of dads stop by to buy beer after they go to day care to pick up their kids. The kids play in the sandbox outside the brewery while the dads have a taster or two in the hospitality room." She adds, "I don't think there is any other brewery in the country that has a sandbox." Nor are there many others that have rabbits for the kids to feed.

Symbolic of the differences between the two breweries in Golden are their respective entries in the annual Buffalo Bill Days and Golden Fest parades — Coors had a stylish beer wagon pulled by a handsome team of Belgian horses, while Golden City entered a mini-keg in a small buckboard pulled by a team of miniature horses.

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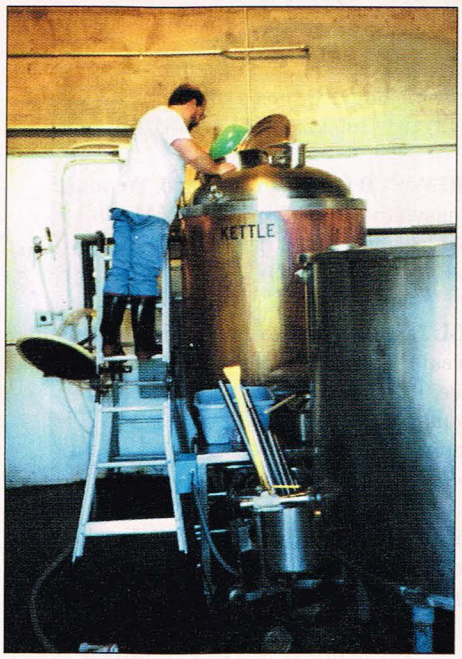

Brewer Jeff Wilson adds hops to the kettle, the only genuine piece of brewing equipment in the brewery.

Coors and Golden City do have one important thing in common: They both use water from the same place, Clear Creek Canyon. Also, neither company pasteurizes its beers. Because the Golden City Brewery's water comes from the city and is chlorinated, an activated-charcoal water filter is used to remove the chlorine.

Since the water out of Clear Creek naturally favors malty beers such as German lagers, Golden City, like Coors, emphasizes malty beers. The Sturdavants would like to make lagers, if they only had the tankage, Janine says.

Golden City's first product was a red beer that was pretty close to a German alt. The brewery has since added two more all-season beers, a cream ale and an oatmeal stout, which both emphasize malt rather than bitterness. Both the red and the cream are dry hopped "to make them a little more interesting," says Janine. "This gives them a hoppy, not a bitter, character," she points out.

Two seasonals have been added as well: Cherry Bomber Ale and Centurion Barleywine Ale. To make the Cherry Bomber they use a pound of bing cherries per gallon. The pitted cherries come from Oregon in sterile foil packages. The brewers place the

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cherries in the secondary fermenter, pump the beer on top of them, then let it ferment again. This gives the beer a fermented cherry flavor, not a sweet fruit flavor, Janine says.

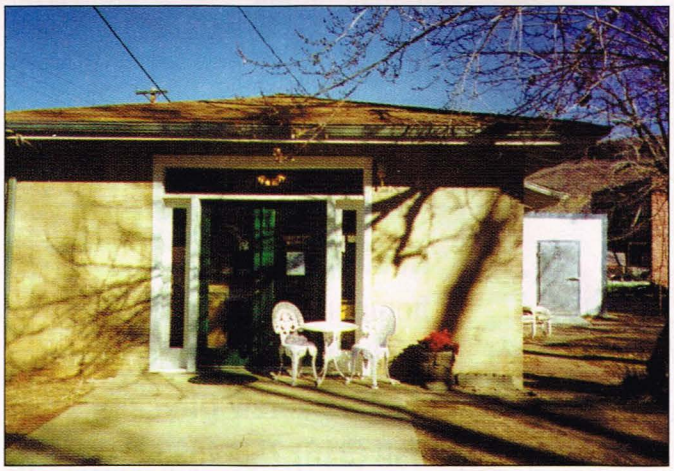
The Sturdavants moved to Golden nine years ago, and both worked as geologists. They live at the corner of 12th and Cheyenne streets, in the 12th Street Historic District. Their house sits on the original site of pioneer doctor James Kelly's house, built in 1879. The old cinderblock machine shop in their backyard houses the brewery, and the old carriage house is now the hospitality room.

Charlie was an avid homebrewer who made 50 batches during his first three years with the hobby. Then he and Janine decided to investigate opening their own brewery. Two factors that entered into their decision to go commercial were Charlie's genuine love of brewing and the lack of stable employment for geologists. They had always wondered what they could do with the old building in the back. Luckily, their property was zoned for commercial use. Janine says, "Everything just kind of fell into place."

They raised $80,000 among themselves and friends and formed a limited liability company. They bought the cheapest equipment possible, and everything was obtained second hand. The kettle is the only genuine piece of brewing equipment they have. It came out of Carver's Bakery Cafe Brewery in Durango, Colo. The rest was used dairy tankage that had been converted for brewing. The mash tun is a dairy tank with a slotted pipe in the bottom for lautering. Janine says almost all of the reconditioned equipment was purchased from Dairy Engineering in Denver. From the time they began planning, it took about seven months to get into production. They chose to name the brewery after the first brewery in Golden, the Golden City Brewery, which operated from 1864 until about 1874.

The brewhouse produces eight-barrel batches, which they triple batch into 1,000-gallon primary fermenters. The fermenters are closed, sealed, and jacketed for cooling. "Because we believe in the handcrafted aspect of brewing, we bottle condition beers," says Janine. Beer for bottling is racked out of the secondary fermenter to a six-head wine filler. The bottles are hand capped and hand labeled using a homebrewer's capper and self-adhesive labels. They have three part-time employees who help on bottling day. For kegged beer they rack from the secondary fermenter to a bright beer tank, where they add carbon dioxide and then keg.

All of the pale malt used in Golden City beers is domestic, purchased from Great Western Malting in Vancouver, Wash. Specialty malts come from Hugh Baird in England. The Sturdavants take their spent grain to a nearby dairy farm for recycling. They started out using leaf hops but switched to pellet hops after clogging the sewer once. They use a variety of hops, including Perle, Tettnanger, Hallertauer, and Cascade. The beers are not filtered but fined in the secondary fermenter.



On weeknights the neighborhood dads congregate in the tasting room while their kids feed the rabbits or play in the brewery's sandbox.

During the first year, Charlie was able to keep his regular job with Henderson Mining. He has since opened a brewpub, the Tommyknocker Brewery & Pub, in nearby Idaho Springs. Because Colorado law prohibits ownership of both a brewpub

and a brewery, Charlie has stepped down as president of Golden City and Janine has moved from being an "alewife" and helper to company president. Janine says Charlie still keeps an eye on the quality and makes suggestions.

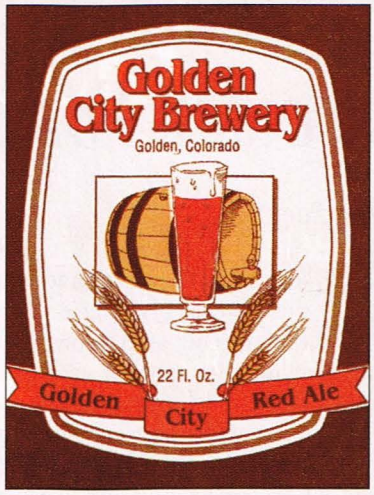
The first batch of beer was available on Halloween of 1993. The brewery produced 30 barrels in '93, 380 barrels in '94, and more than 600 barrels in '95. They hope to double that this year. Brewery customers carry out more than half the brewery's beer in kegs, 22-oz. bottles, and half-gallon jugs. To distribute the remainder of the beer to Golden and Denver, the Sturdavants market and deliver the beer themselves.

Janine recommends that mothers who want to work at home consider opening breweries in their own backyards.

The Sturdavants have two children, eight and five years old. Raising a family and running a brewery at the same time sounds more difficult than it is, says Janine. In fact, she adds, it's a very convenient arrangement because the business is in the backyard and it allows her to stay home and take care of the kids. She recommends that mothers who want to work at home consider opening breweries in their own backyards.

Now that Charlie is working full-time as head brewer at Tommyknocker's, two engineering students from the Colorado School of Mines have stepped in to do the brewing. Aaron Fleet is the new head brewer and Jeff Wilson is brewer. Both were homebrewers before coming on board.

If you happen to be in the Golden area, stop by the brewery. Tours are offered daily from noon until 5 p.m. and until 6 p.m. on Fridays. There is beer for take-out as well as Golden City Brewery t-shirts, hats, and glasses. Janine recommends that you take a tour at the Coors brewery as well.



The Golden City Brewery is located at 920 12th Street in Golden, Colo. 80401. You can call them at (303) 279-8092. ■

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

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Brewer For a Day

by Bob Paolino

Many homebrewers have wondered what it would be like to take the big step to professional brewing. For most of us, the financial realities of investing in a brewpub or craft brewery are enough to keep us stuck to our kitchen or basement breweries and our five- or 10-gallon batches.

Even though I haven't quit my day job, I did get a chance to formulate a recipe, brew 10 barrels (not gallons!), and watch people order and enjoy it in a commercial establishment.

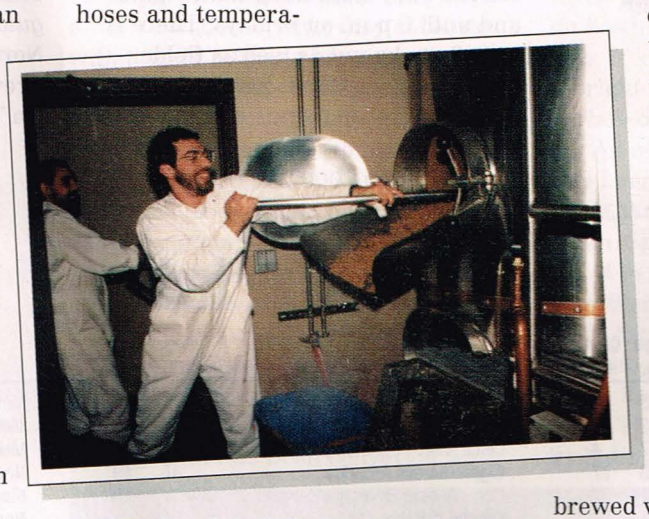
A local brewpub, the Great Dane Pub and Brewing Co., sponsored the "Great Dane Challenge" as part of an annual homebrew competition. My winning homebrew was an aggressively hoppy American pale ale. It was a last-minute brew — I filled a few bottles and primed from secondary after only two days of dry hopping.

Hearing the announcement that my beer had won was a thrill, but I was especially honored when Rob LoBreglio, Great Dane's brewmaster, asked if I'd like to brew it for the pub's offering on the beer engine, temporarily replacing his excellent India pale ale. As the room filled with a chant of "hand pump, hand pump..." he knew my answer.

We set the date for the big brew day in late January. Rob's knowledge of brewing and the characteristics of his brewhouse were invaluable in helping me reformulate my recipe from 5.5 gallons to 10 barrels.

What to do about all the hops was a big question. This was a beer that I'd brewed to please a Yakimaniac. Rob had never used Columbus hops before and was nervous about the commercial acceptability of a beer as hoppy as mine. We scaled back the hops a bit to account for a number of factors, including the greater alpha acid utilization in a larger-scale brew and in the differences between the loose flowers I had used and the pellets we would be using at the brewpub. We used Rob's brews and their hopping rates as a known base, decided how hoppy this one would be, and determined how much to use for each hop addition.

I donned the brewer's whites and Sorels on brew day, and we began hauling almost 750 pounds of grain (50 pounds at a time) from the storage area to the mill. I understand the all-grain process reasonably well for someone who lives in a small apartment with no space for an all-grain home brewery. But all those valves and hoses and temperature controls in the brewhouse were amazing, and Rob explained them.



Bob Paolino did all the hard work when he was brewer for a day.

After the magical transformation of that 750 pounds of grain into sugars, then sparging to get the right volume of wort, we started the boil. The ceremonial first hop addition (3.25 pounds of 12.4 percent Columbus) got Rob thinking about all those hops again. He cautioned me, "No more than a pound!"

I stopped in at various times during the next couple weeks to check on the beer. By the time we were ready for dry hopping, Rob seemed to have gotten over his hop anxiety. We had originally planned on four pounds of Columbus as a proportionate amount to the ounce I used in my homebrew, but Rob gave in and said I could use five pounds instead. "That extra pound could make the difference between a good beer and a great beer," he said.

The big day approached. I came in after work and observed the filtering process — Rob did the messy job. By Friday the beer was ready, and I pulled the ceremonial first pint to begin the Great Dane's "Hoppy Hour." We named it "NGHAB American Special Bitter," and the name went up on the wall. The first part of the name is the abbreviation for my personal internet signature, "Now go have a beer."

The beer was well-received and sold as well as Rob's tasty IPA. Contrary to his early fears, the hops didn't scare the customers away.

Given the differences in brewing conditions between the homebrewed and commercial versions, it's remarkable how similarly they turned out. Some differences were evident. The homebrewed version had a lower starting gravity and because it had fermented at room temperature, it was a little fruitier. But it's tough to compare the two because the homebrew was almost three months old when the brewpub version was first served.

Brewing on a commercial scale was great fun, and the free beer was nice. But the reward that can't be overlooked was the satisfaction of sitting quietly at the end of the bar, just watching people order the beer, drink it, and then ask for another pint. ■

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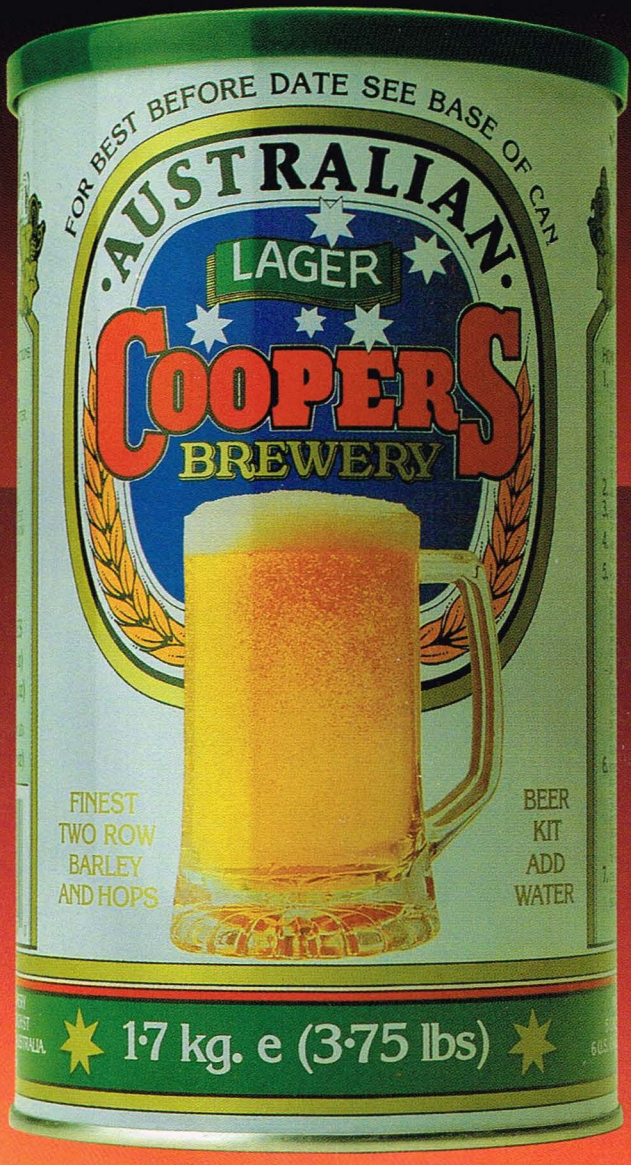

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