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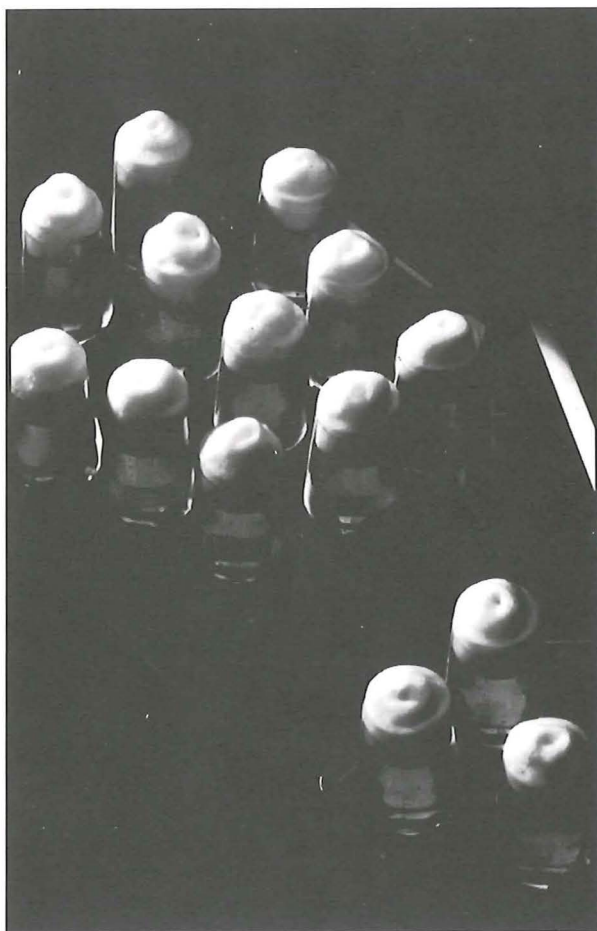
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To promote public awareness and appreciation of the quality and variety of beer through education, research and the collection and dissemination of information; to serve as a forum for the technological and cross-cultural aspects of the art of brewing; and to encourage responsible use of beer as an alcohol-containing beverage. Printing by EBSCO Media, Birmingham, Alabama.

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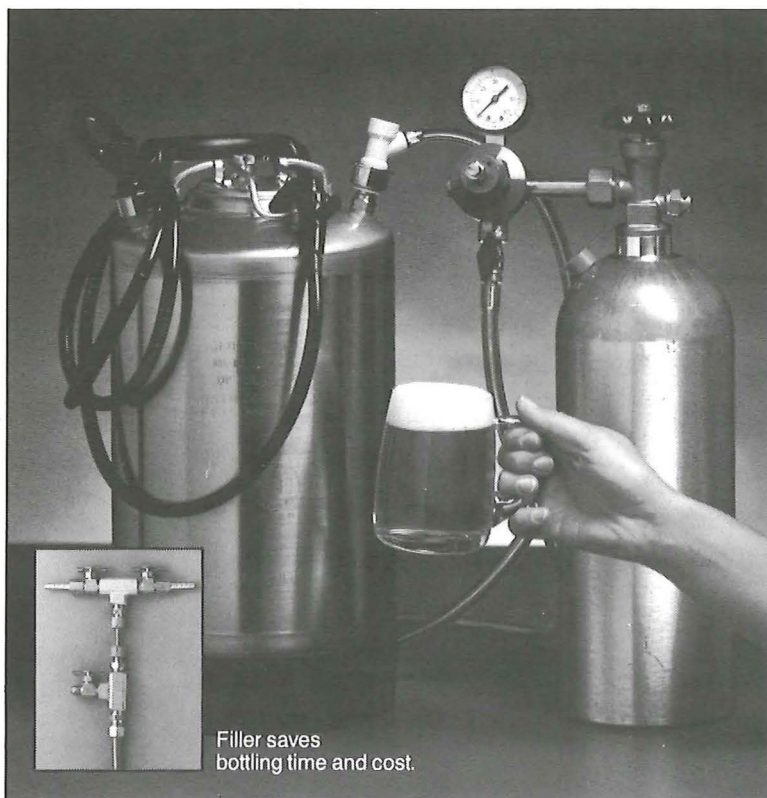


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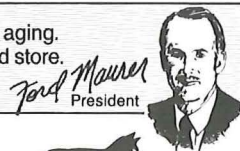
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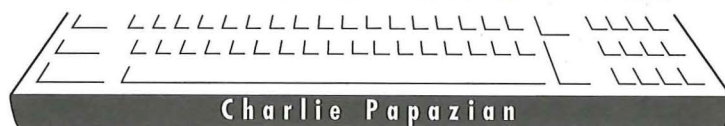
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EDITORIAL



American homebrewing is a unique phenomenon.

There is a small interface between American homebrewers and those who recognize the quality of what we are brewing. Even more so there are very few who really understand the impact American homebrewers have had on American beer culture. It is truly a grass roots phenomenon like no other. It is passive and friendly. It is based on quality and education. It doesn't really assert itself by overtly trying to be anything other than making great beer. But the impact on our culture is beyond imagination.

Nowhere else in this world are there so many beer drinkers willing to try something different and take pride in their adventures. Britain has its beloved ale. As a nation Germany will never forsake its basic lagered Pilsener. Ah, the idiosyncratic ales of Belgium, now there might be a partial exception. But for most of the world the concept of embracing national choice and variety is nonexistent.

Sure, America's specialty beers only hold 1 percent of the entire market (that's not including homebrew), but nowadays you can find a choice of beer styles in almost any beer market. Stout, porter, Vienna, pale ale, bock, Weissbier, barley wine; you'll find them in New York just as you'll find them in Minnesota, California, Missouri, Colorado or Florida. Homebrewed, you'll find them in all 50 states and in our nation's capital.

Try to find a traditionally brewed bock beer in England or an altbier in Bavaria. A smoked beer outside of Bamberg? Forget it. A lambic in Melbourne, Australia? An Oktoberfest lager in Brussels? Are you beginning to see a picture?

There is only one country on this planet where beer diversity thrives. Why? Because of the enthusiasm and development of homebrewing during the last 15 years. Homebrewing is and has been the grass roots movement responsible for developing interest in diversity and creating the marketplace for commercially made beers. Just as your homebrewing has personally enriched your own life, your efforts have had a dramatic secondary effect in helping enrich the beer culture in the United States.

Foreigners who travel to this country, especially those from great brewing nations, are truly boggled by the array of beers offered. They

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are startled that people can make a living selling such diversity. This is unheard of anywhere else in the world. Those who never travel to America but read accounts about the "beer renaissance" have absolutely not a clue about what is really going on here. Let alone about the impact homebrewing has had on igniting the enthusiasm and marketplace.

I see glimmers of hope that diversity and consumer choice might evolve in other nations. Marketing and big money aren't going to change the way people feel about the beer they wish to drink. If it happens it will be a grass roots movement of homebrewers brewing quality beer. Not just homemade beer for the sake

of alcohol, but beer quality on a par with the most famous breweries of the world.

There are several nations that disallow homebrewing altogether. Some of these nations are the more famous brewing nations in the world. To those countries who admire the quality, diversity, marketplace and the new-found respect the American people have acquired for beer, I confidently say take a good hard look at the reasons why small breweries are thriving here. Consider the choice one has in places like Oregon, Colorado, Illinois, New York, California: altbier, stout, bock, Weissbier, Pilsener, pale ale, rauchbier, fruit beer and porter are listed on the same menu — 3,000 miles apart! It works here in America because consumer interest has been nurtured in a friendly and enthusiastic way by hundreds and thousands of homebrewers.

America. We've never had it so good. And it's going to get better. Homebrewers started it all and will continue to do it like no million-dollar marketing campaign ever could.

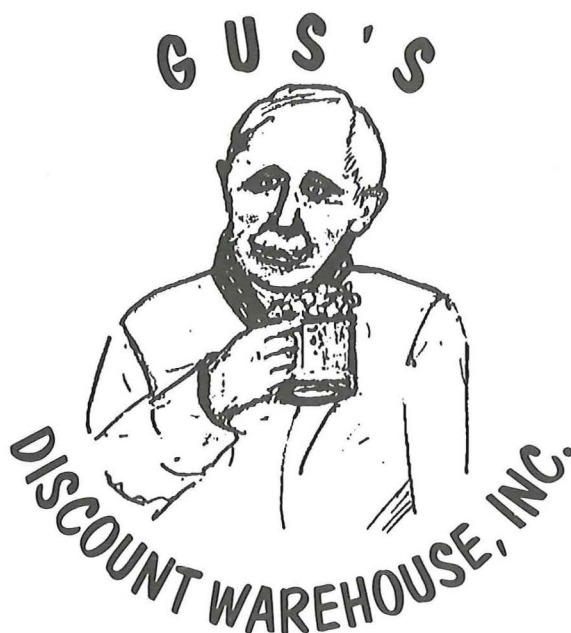
This issue of *zymurgy* marks the 15th anniversary of this magazine and the American Homebrewers Association. The entire staff of the American Homebrewers Association and the Association of Brewers takes great pride in having had a part in the last 15 years of American beer history. And especially in knowing all of you homebrewers out there who have *really* made something special happen in America and perhaps in little bits and pieces in other parts of the world. That bottle of beer you just capped the other day means so very much more than you ever imagined.

Relax. Don't worry. Have a homebrew. Natch.

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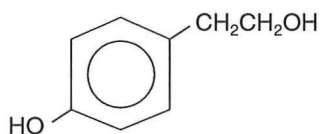
Z Y M U R G Y

Our Readers

Corrections

On page 45 of the 1993 Summer Issue of *zymurgy* (Vol. 16, No. 2) the line in Mark Garetz's article that reads, "You will want to use whole hops as opposed to pellets, otherwise you'll still have to let the beer sit with the hops for about two weeks..." should read, "You will want to use whole hops as opposed to pellets, otherwise you'll have hop particles in your beer as you drink it. If you force carbonate the beer, you'll still have to let the beer sit with the hops for about two weeks to allow the hop oil to be extracted into the beer."

The last two sentences on page 32 in the article "Fusel Alcohols" in *zymurgy* Fall Issue (Vol. 16, No. 3) should read: "As is typical of well-understood areas of brewing science, there is widespread agreement about the implications that brewing procedures and brewing materials have on fusel alcohol levels. Some of the most important of these points will be discussed." On page 33, it should be noted that aromatic alcohols are also nonvolatile. The structure for tyrosol is:



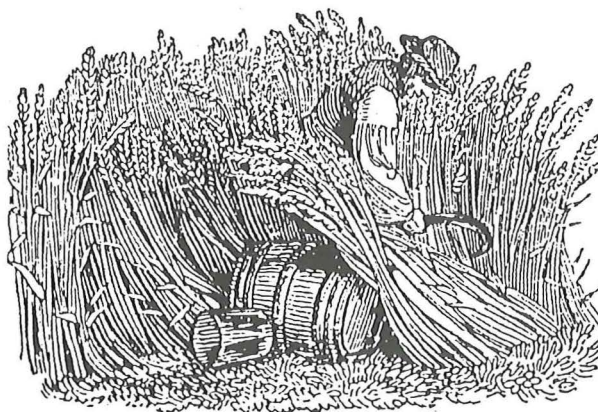
Brewing Pride

Dear *zymurgy*,

I feel the rivalry intensifying, the self-righteousness more palpable. Segregation surely looms on the horizon. Okay, so maybe

I am blowing this out of proportion, but lately I feel somewhat like a relic.

The polarization that exists between extract and all-grain brewers was at one time nonexistent because everyone I know started homebrewing with extracts. Now, however, it



TYNDALES
HOME BREW

seems most of these same brewers have made the transition to all-grain brewing and I am not among them. It's a natural progression, right? It is, indeed. So why haven't I made the move up to mashing? Well, time, space, money, equipment, patience, allergies, in-laws and a fermenter full of equally lame excuses. I've been confronted by my all-grain compadres countless times only to repeat the same tired alibis, save one — the real one: "If it ain't broke, don't fix it." I don't bother using "the real one" because it's a little too simplistic for these pedantic overachievers. They seem to believe there is an unwritten law requiring all-extract brewers to graduate to all-grain brewing, posthaste. Because I haven't I am being silently chastised for my impudence. A bit paranoid,

perhaps? I don't know. Recently I overheard a conversation where the two factions were described as the "All Grainers" versus the "No Brainers."

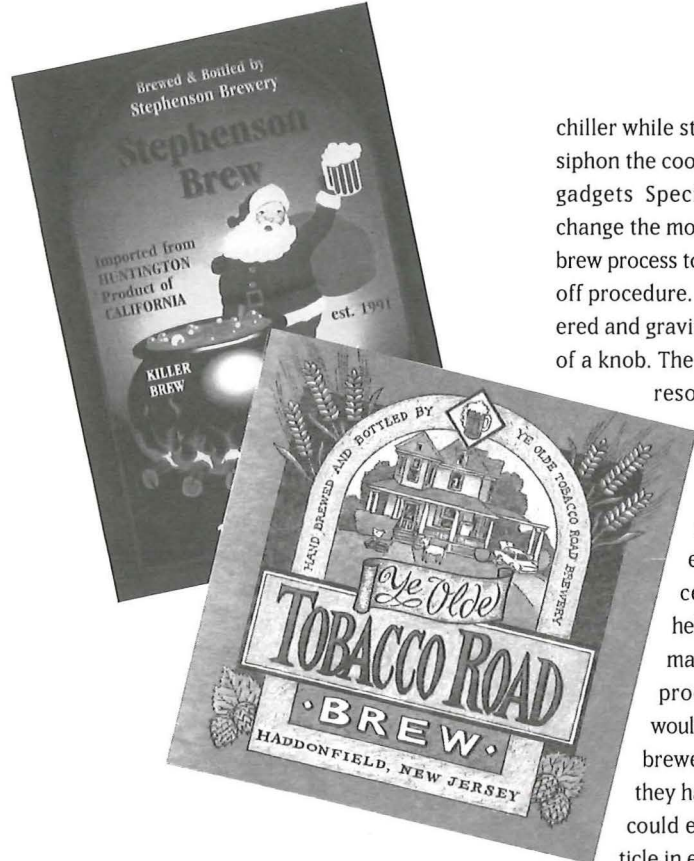
I was saying that I don't bother fixing what isn't broke. Oh sure, I make the occasional five gallons of bilge water but I can always find some unsuspecting friends and neighbors who are all too happy to accept free beer. Easily outweighing these mild failures, though, are a fair share of colorful ribbons garnered in competitions across the country, not to mention the begrudging accolades of my beer-brewing friends. Through it all I haven't lost that "seat-of-the-pants" brewing style that attracted me to the hobby in the first place. I understand the need to conform to specific tried-and-true brewing methods, but when it comes to the "is it art or is it science" argument, I stand firmly on the side with the artists. With all due respect to all-grain brewers, I find the

exacting temperatures, weights, measures and formulas tedious and restricting. A pinch of this and a handful of that has always been my style.

So, am I a relic? A dying breed? A minority of one? I think not. Last year at the AHA National Homebrew Competition, five of the 24 first-place beers were extract-based brews. Numerous others also used extracts somewhere in their recipe. If I were a betting man, I'd put my money on an increase in those numbers in 1993.

Oops, did I just throw down the gauntlet?

Marty Nachel
Frankfort, Illinois



Great Gadgets!

Dear **zymurgy**,

I wanted to congratulate you on **zymurgy** 1992 Special Issue (Vol. 15, No. 4) featuring gadgets and equipment for the homebrewer. That issue improved my brewing process more than any I have received. Picking up at least four ideas so far, my brewing process has jumped light-years in simplicity and efficiency. I have cut hours and have noticed a considerable improvement in quality that I believe can be attributed to decreased exposure to airborne wild yeast and bacteria.

The changes I made were to incorporate a stainless-steel screen false bottom (Randy Mosher, page 32) in my new brewpot that has a spigot outlet which allows me to drain the hot wort, leaving the hops behind. I attach a hose to my spigot that takes the wort through coils of copper submerged in an ice bath and straight into the carboy. On the end of the hose that leads from the chiller to the carboy, I have a 12-inch piece of copper tubing with four holes drilled in the first end (Larry Barelo, page 34) that draw air into the flow for wort aeration. In my old process I strained out the hops by hand and then used an immersion wort

chiller while stirring the wort. Then I would siphon the cooled wort into the carboy. The gadgets Special Issue motivated me to change the most labor-intensive part of my brew process to an almost completely hands-off procedure. The boiling wort can be covered and gravity does the rest with the turn of a knob. The gadgets issue will be a great resource for my brewing equipment technology as my system grows.

My brewing techniques improve the most when I'm exposed to other people's processes. That's why this issue helped me so much. There are as many variations to the brewing process as there are brewers. I would love to see more letters from brewers published describing ideas they have come up with. Maybe you could even consider a "Gadgets" article in each issue like you do for "The Brewgal Gourmet" or "For the Beginner."

Sincerely,
Dave Kinney
Everett, Washington

Stooge Brew

Dear **zymurgy**,

After a long day at work I like to put my feet up and watch a little television while sipping one of my latest homebrews. Today's venue happened to be the "Three Stooges." And what do you think the Stooges were doing? Brewing, of course!

Their recipe called for two cans of malt, a half pound of hops and three cakes of yeast in a crock of hot water, in strict accordance with the *Reinheitsgebot*. Things were going pretty well until Moe, Larry and Curley each put in three cakes of yeast plus a few more for good measure. It must have been good yeast, because the wort started bubbling in about five minutes, and wouldn't you know it, the Stooges forgot their blowoff tube. But they didn't worry. Instead, they did their best to catch the overflow in every container they could find, including a suitcase and the bathtub. They bottled immediately, obviously without checking for a stable specific gravi-

ty because about half the bottles blew their tops, soaking the Stooges in suds. And to top it all off, Curley made the mistake of trying to sell a bottle to a detective, which ended up buying the Stooges a 40-year jail sentence. They forgot that even though it is legal to brew up to 100 gallons a year for your personal consumption, it is very illegal to sell your homebrew.

I found the episode so delightful that I decided to write to see if the AHA could get a copy of this episode and sell video cassettes through the *Beer Enthusiast Catalog* so other homebrewers could enjoy it. Charlie Papazian might even change his slogan to "Relax, Don't Worry, Even a Stooge can Homebrew."

Sincerely,
Bert Ozgun
Durham, North Carolina

An Ounce Isn't An Ounce

Dear **zymurgy**,

I keep noticing that every so often homebrewers are having difficulty converting English recipes to U.S. equivalents. The problem arises in concluding that there are five U.S. quarts (one gallon) to four imperial quarts (one gallon) because there are 32 ounces per U.S. quart and 40 ounces per imperial quart. The ratio 40 to 32 is indeed 5 to 4. However, the U.S. ounce is larger than the imperial ounce so the ratio is nearly 1.2 to one or six U.S. quarts to five imperial quarts.

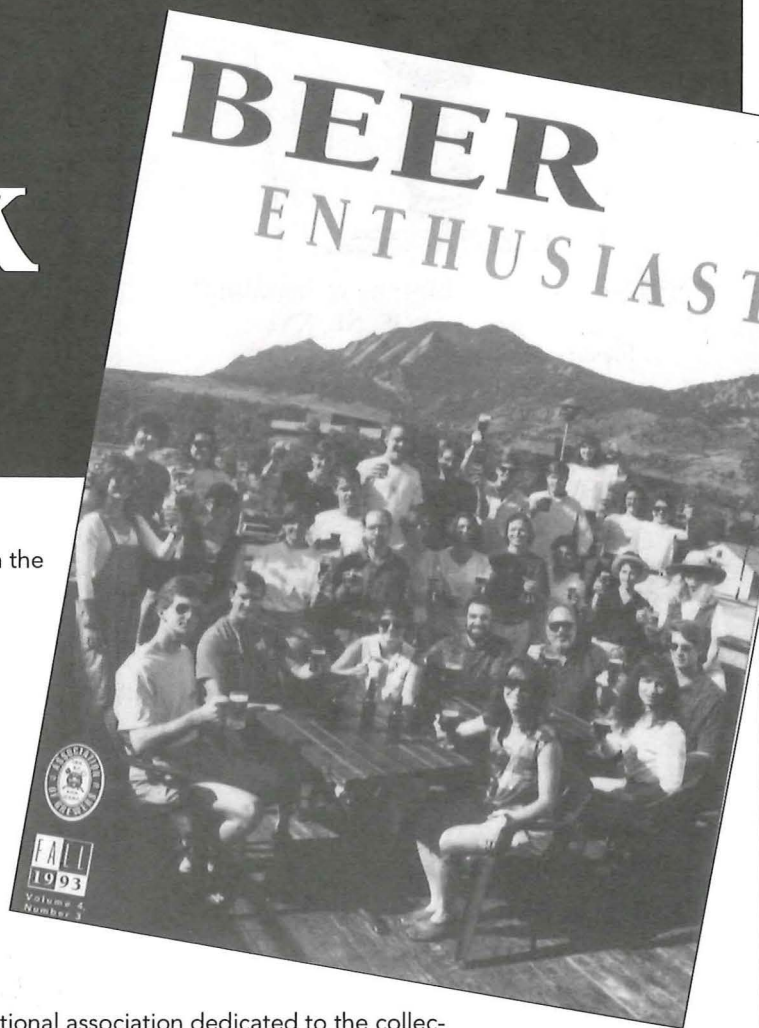
Typical cases are the article by Ray Daniels, page 46 of **zymurgy** Fall 1992 (Vol. 15, No. 3) and Dave Miller's *The Complete Handbook of Home Brewing* (Garden Way Publishing, 1988).

Sincerely,
Dick Lang
Lincoln Center, Massachusetts

Editor's Note: The National Institute for Science and Technology confirms that the imperial ounce is smaller than the U.S. ounce. One imperial ounce equals 28.41307 cubic centimeters and one U.S. ounce equals 29.57353 cubic centimeters. So the imperial ounce is 96 percent of the U.S. ounce.

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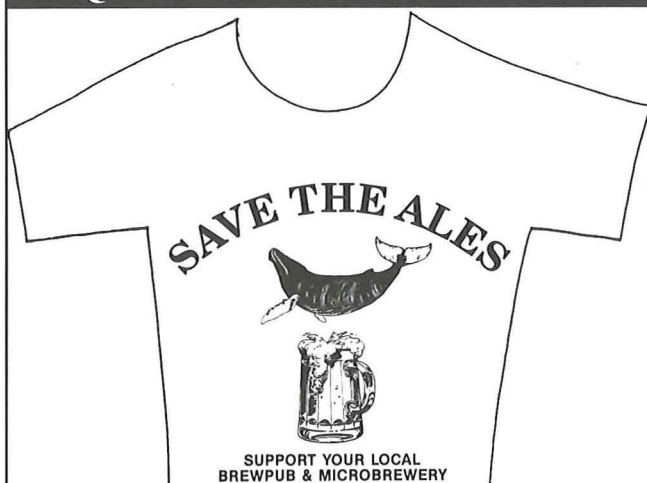
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A S S O C I A T I O N NEWS

← Karen Barela →

AHA Honors Dave Logsdon

Congratulations to Dave Logsdon, president of Wyeast Laboratories, founder and former brewmaster of Full Sail Brewing Co. The 1993 AHA Recognition Award was presented to Logsdon of Mt. Hood, Ore., for outstanding contributions to the brewing community. Logsdon received the award during the AHA National Homebrewers Conference in Portland. Wyeast was the first to produce a variety of yeasts in easy-to-use convenient packaging and has provided homebrewers with a reliable source of brewing yeasts. The phenomenal growth of homebrewing can be attributed partly to Logsdon's insightful contributions to the development of this important ingredient.

The AHA recognizes one person each year who is selected by the Board of Advisers to receive this prestigious award. Past recipients are 1992, Ed Busch, Somerville, N.J.; 1991, George Fix, Arlington, Texas; 1990, Byron Burch, Santa Rosa, Calif.; 1989, Patrick Baker, Weston, Conn., and 1988, Fred Eckhardt, Portland, Ore.

Congratulations to Logsdon and all of the AHA Recognition Award recipients.

Rager New BJCP Co-Director

Jim Homer, Beer Judge Certification Program co-director representing the AHA

for the past seven years, will step down in December from his volunteer position to pursue other homebrewing interests. Homer has been influential in bringing the number of BJCP participants to its current total of 1,115 by carefully guiding and shaping the program.

Alberta Rager, who previously held the position of associate director, will be the new co-director representing the AHA effective Jan. 1, 1994. Rager brings her grading, judging, brewing and organizational skills to the position and will continue the momentum Homer has begun. Rager, along with Pat Baker, the co-director representing the Home Wine and Beer Trade Association, are jointly responsible for writing and scheduling the BJCP exams. The exams are graded by the co-directors and associate director. (Steve Stroud is the associate director representing the AHA. The HWBTA will be appointing a new associate director to replace the position previously held by Rager.)

The AHA thanks Homer for all of his hard work and dedication to the program and his commitment to educating judges which has helped provide the program with a solid base on which it will continue to grow. Congratulations to Rager and we look forward to her continued involvement in the BJCP.

Board Meets In Portland

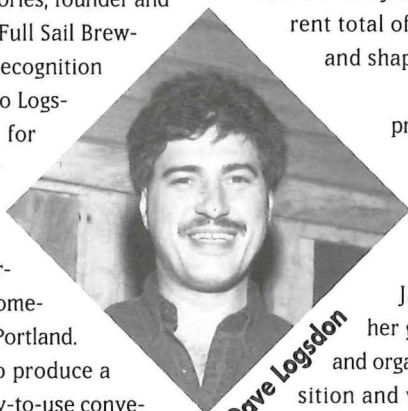
The AHA Board of Advisers met July 27, during the National Homebrewers Conference, in Portland, Ore. The Board's general purpose is to recommend activities, programs and courses of action for the AHA. Board members are expected to:

- promote the art and science of homebrewing specifically and quality beer and brewing in general;
- serve as AHA ambassadors by promoting AHA activities and programs;
- strengthen the AHA as an educational association by communicating suggestions, complaints, needs and trends;
- review and recommend AHA activities;
- support the AHA mission statement.

The Portland meeting focused on suggestions and modifications for *zymurgy*. The other AHA membership benefits and services also were discussed, with the Board offering many insights to help the AHA continue to produce quality information for homebrewers and beer lovers. The Board members are listed on the staff page in this issue. Copies of the meeting notes and Board-of-Adviser bylaws are available on request from Karen Barela, AHA president, PO Box 1679, Boulder, CO 80306-1679.

Summer Survey Results

We ran an AHA membership survey in *zymurgy* Summer 1993 (Vol. 16, No. 2) to find



Dave Logsdon



Alberta Rager

out who you are so we can better provide the types of information you're looking for. At press time, we've received more than a 10 percent response with surveys still trickling in daily. Here are a few of the facts we discovered about our membership:

- 95 percent male, 5 percent female;
- 69 percent married, 31 percent single;
- 73 percent professional, 9 percent administrative, 9 percent labor, 8 percent student;
- average time homebrewing: three years and eight months;
- average amount brewed per month: eight gallons;
- 14 percent extract/kits, 38 percent extract/specialty grains, 22 percent mash/extract, 23 percent exclusively mash.

Many of you wrote to us with suggestions and constructive criticisms that will help us tremendously throughout the year as we make decisions about the direction of **zymurgy** and other AHA services. If you are an AHA member and would like the complete results of the survey, contact Lori Tullberg-Kelly, Association of Brewers marketing director.

Congratulations to Daniel Krus, Newmarket, N.H., and J. Alan Burkholder, Columbus, Ohio, who each won a complete Classic Beer Style Series library. Their names were drawn at random from a big box of surveys on July 30.

Members Mingle at GABFSM

The Great American Beer FestivalSM celebrated its 12th anniversary Oct. 8 and 9 in Denver, Colo., with 208 participating breweries, more than 956 American beers and 19,000 people. On Oct. 9 from 2 to 5 p.m., AHA and IBS members along with participating brewers were given the opportunity to mingle during the Members-Only Tasting. The Professional Panel Blind Tasting results were announced giving first-, second- and third-place medals in each of 32 categories. AHA members were able to attend the award presentations, enjoy the uncrowded atmosphere and taste a few of America's greatest beers. The Members-Only Tasting was a huge success. Make plans now for the 1994 GABFSM and Members-Only Tasting — a great membership service. Check **zymurgy** Calendar of Events for dates or call the Association of Brewers at (303) 447-0816.

Competition Kudos

| | |
|-------------------|---|
| FEB. 13-14 | HWBTA International Homebrew Competition, San Jose, Calif., 345 entries. Paddy Giffen of Cotati won Best of Show. |
| FEB. 27 | S.N.O.B.S. Sampling, Cleveland, Ohio, 168 entries. Dan McConnell of Ann Arbor, Mich., won Best of Show. |
| APRIL 17 | Bluff City Brewers Fifth Annual Homebrew Extravaganza, Memphis, Tenn., 94 entries. Phil Rahn of Cordova, won Best of Show. |
| APRIL 17 | Crescent City Competition, New Orleans, La., 185 entries. Ed Greenlee of Baton Rouge won Best of Show. |
| JUNE 6 | Oregon State Fair, Portland, 102 entries. Jon Morgan of Beaverton, Ore., won Best of Show. |
| JUNE 11 | Edmonton Klondike Days Open Competition, Edmonton, Alberta, Canada, 78 entries. Neil Herbst of Edmonton won Best of Show. |
| JUNE 12 | Sierra Nevada Junefest, Quincy, Calif., 48 entries. Jim Overstreet of Quincy won Best of Show. |
| JUNE 20 | Alameda County Fair Homebrew Competition, Pleasanton, Calif., 41 entries. Tom Altenbach of Tracy, won Best of Show. |
| JULY 12 | Red River Valley Fair, Fargo, N.D., 77 entries. Neil Gudmestad and Ray Taylor of Fargo won Best of Show. |
| AUG. 29 | Puget Sound Amateur Wine & Beer Makers Club/Western Washington Fair Beer Competition, Puyallup, 203 entries. Rick Star of Kirkland, won Best of Show. |

Giffen Gets Festival Trip

"Kilts on Fire," a smoked Scottish wee heavy, earned Paddy Giffen the title of 1993 Homebrewer of the Year and a trip to the Great American Beer FestivalSM courtesy of the Association of Brewers. Giffen was hardly incognito during the festival, as AHA members from around the country pursued him in search of brewing advice and techniques that won him the prestigious award. Giffen works full time at The Beverage People in Santa Rosa, Calif., and part time as a brewer for the Marin Brewing Co. in Larkspur, Calif. Giffen proudly witnessed Marin Brewing Co., receive three medals. Marin took the gold medal in the Fruit/Vegetable category for their Blueberry Ale, the silver medal in the

Porter category for their Point Reyes and the bronze medal in the American Wheat category for their Marin Hefe Weiss.

BrewStorm '94!

Thunderous brews and enlightening seminars are on tap for BrewStorm '94. The AHA National Homebrewers Conference is coming to Denver, Colo., June 22 through 24, followed by the Colorado Brewers Festival in Fort Collins, Colo., June 25 and 26. Plan now to attend the hands-on yeast lab, hear an analysis of mead and meadmaking, learn the inside profile of German-style wheat beer and more. It will be a downpour of information from a lineup of speakers including Dan

McConnell, Ph.D., University of Michigan yeast lab director; Ken Schramm, Mazer Cup Mead Competition director; Andy Tveekram, Great Lakes Brewing Co. head brewer; Michael Thompson, Liberty Malt Supply Co. general manager; Eric Warner, author of *German Wheat Beer* (Brewers Publications, 1992) and brewmaster at Tabernash Brewing Co., Denver, Colo. Effervescent entertainment will surround you while stormy solutions whirl about wort and tumultuous trub. Come early to Colorado, climb a mountain and seek the truth from Homebrew Guru Charlie Papazian, who will be perched on a peak awaiting the opportunity to reveal his brewing secrets. Complete details about Brew-Storm '94 will be available in the *zymurgy* Spring 1994 or call the AHA after March 1 at (303) 447-0816.

Contemporary Club News

We hope you enjoyed the new club section that debuted in *zymurgy* Fall 1993 (Vol. 16, No. 3). In the new club section devoted to articles by members about club activities, our goal is to bring you the most up-to-date information and to provide you with tangible club news. We will no longer list all 362 AHA-registered clubs in each issue. Rather, we will list new clubs in every issue and include the complete list in *zymurgy* Summer 1994. To receive complete club lists at any time AHA members may call (303) 546-6514. We look forward to bringing you exciting club

news and welcome ideas for future articles. As always, your comments about these changes and any other AHA services are encouraged.

We're Open

During the holiday season the customer service department of the Association of Brewers will have extended hours Nov. 1 through Dec. 23. As a special service to our members and other customers, we will take merchandise orders between 8 a.m. and 6 p.m. Monday through Friday and noon to 4 p.m. (MST) on Saturdays. We have added an order-only phone line to help process merchandise orders and provide you with faster service. During the holiday rush, our customer service department promises your order will be shipped within three days of receipt and usually the very next day. Overnight and other special deliveries are always available. The offices of the Association of Brewers will close at noon on Dec. 24 and reopen at 8 a.m. Jan. 3. For business, phone (303) 447-0816, for merchandise orders, phone (303) 546-6514 or FAX (303) 447-2825.

We Listen

The American Homebrewers Association welcomes your input. We encourage your comments on our membership services and our publication, *zymurgy*. Send your ideas, outlines and proposals for articles. All correspondence will be answered. Also remember to send your beer news. We want to know about any news items on beer that appear in your local media. Direct *zymurgy* inquiries to Elizabeth Gold, editor-in-chief, and direct beer news and AHA inquiries to Karen Barela, AHA president, at the American Homebrewers Association, PO Box 1679, Boulder, CO 80306-1679.

MICRO AND PUBBREWRIES

Information provided by the Institute for Brewing Studies, Boulder, Colo.

OPENINGS

UNITED STATES

Microbreweries

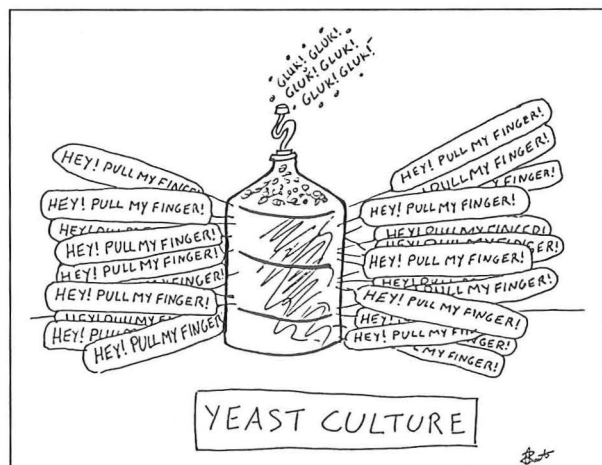
Louisiana: Rikenjaks Brewing Co., Jackson
Massachusetts: The Brewery on Martha's Vineyard, Oak Bluffs
Oregon: Deschutes Brewery (No. 2), Bend; Portland Brewing Co. (No. 2), Portland
Virginia: Potomac River Brewing Co., Chantilly

Brewpubs

Alabama: Port City Brewery, Mobile
Arkansas: Vino's, Little Rock
California: Live Soup Brewery & Café, Santa Cruz; Old San Marcos Brewery and Grill, San Marcos; Pacific Tap & Grill, San Rafael; Red, White & Brew, Redding; San Diego Brewing Co., San Diego
Colorado: Cheyenne Brewing Co., Colorado Springs
Florida: Thai Orchid Restaurant, Coral Gables
Indiana: Lafayette Brewing Co., Lafayette
Maine: Sweet Waters of Acadia Brewing Co., Bar Harbor
Marshall Islands: Marshall's Best Micro Brewery, Majuro
Nevada: Great Basin Brewing Co., Sparks
New Mexico: Organ Mountain Brewing Co., Las Cruces
New York: Manhattan Brewing Co., New York (reopened)
Oklahoma: Tulsa Brewing Co., Tulsa
Oregon: Eugene City Brewing Co./West Bros. Bar-B-Que, Eugene
Tennessee: Big River Grill & Brewing Works, Chattanooga; Smoky Mountain Brewing Co., Knoxville
Virginia: Cobblestone Brewery and Pub, Richmond
Washington: Hazel Dell Brewpub, Vancouver; Winthrop Brewing Co., Winthrop

CLOSINGS

California: Gorky's Café and Brewery, Los Angeles
North Carolina: French Quarter New Orleans Café and Brewery (formerly Old Heidelberg), Durham
Virginia: The Lone Star Cantina and Brewery, Roanoke



Winner of the 1993 AHA Cartoon Contest.

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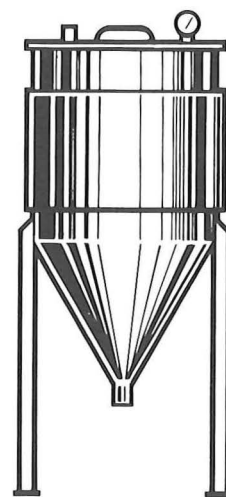
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CALENDAR



DECEMBER

- 6** Poignant Porter, **AHA Club-Only Sanctioned Competition**. Entry deadline is Dec. 6. Contact James Spence at (303) 447-0816.
- 17** BJCP Exam, St. Louis, Mo. Contact David Miller at (314) 241-2337.
- 18** Happy Holidays Homebrew Competition, **AHA Sanctioned Competition**, St. Louis, Mo. Entry deadline is Nov. 24. Contact Ginger Wotring at (314) 577-8571.

1994 JANUARY

- 22** Eighth Annual Bay Area Brewoff, **AHA Sanctioned Competition**, Dublin, Calif. Entry deadline is Jan. 8. Contact John Pyles at (510) 790-8160.
- 23** First National Deaf Homebrew Competition, **AHA Sanctioned Competition**, Portland, Ore. Entry deadline is Jan. 8. Call the Grateful Deaf Homebrew Society at (503) 245-1795.
- 24** Hail to Ale Club-Only Competition, **AHA Sanctioned Competition**. Entry deadline is Jan. 24. Contact James Spence at (303) 447-0816.

FEBRUARY

- 6** Florida State Fair Competition, **AHA Sanctioned Competition**, Tampa, Fla. Entry deadline is Jan. 31. Contact Ray Badowski at (904) 375-3772.
- 12** Annual Homebrew Contest — Homer Winter Carnival, **AHA Sanctioned Competition**, Homer, Alaska. Entry deadline is Feb. 11. Contact L. E. Livingston at (907) 235-2874.
- 18-19** Kansas City Biermeisters' 11th Annual Regional Homebrew Competition, HWBTA Sanctioned Competition, Kansas City, Mo. Entry deadline is Feb. 5. Contact Alberta Rager at (913) 894-9131.
- 20** BJCP Exam, Lenexa, Kan. Contact Alberta Rager at (913) 894-9131.
- 25** Homebrew Competition of New England, HWBTA Sanctioned Competition, Westport, Mass. Entry deadline is Feb. 12. Contact Leslie Reilly at (508) 636-5154.
- 27** BJCP Exam, Westport, Mass. Contact Patrick Baker at (603) 355-3359.

MARCH

- 5-6** HWBTA 1994 National Homebrew Competition, Rockville, Md. Entry deadline is Jan. 31. Contact Judi and Reuben Rudd at (301) 984-9557.
- 6-12** Bluebonnet Brew-off, **AHA Sanctioned Competition**, Irving, Texas. Entry deadline is Feb. 26. Contact Tom Henderson at (214) 713-0906.
- 11** International Beer Festival, Peoria, Ill. Call (309) 682-2500.
- 11-12** March Mashfest, **AHA Sanctioned Competition**, Fort Collins, Colo. Entry deadline is March 1. Contact Jason Goldman at (303) 221-1513.
- 12** America's Finest City Homebrew Competition, **AHA Sanctioned Competition**, San Diego, Ca. Entry deadline is March 1-9. Contact Skip Virgilio at (619) 566-7061.
- 21** Bock is Best Club-Only Competition, **AHA Sanctioned Competition**. Entry deadline is March 21. Contact James Spence at (303) 447-0816.

APRIL

- 10-13** The Institute for Brewing Studies' National Microbrewers and Pubbrewers Conference and Trade Show, Portland, Ore. Call the IBS at (303) 447-0816.

**10
16**

BJCP Exam, Portland, Ore. Contact Nancy Johnson at (303) 447-0816.
Queen of Beer Women-Only Homebrew Competition, **AHA Sanctioned Competition**, Placerville, Calif. Entry deadline is April 15. Contact Elizabeth Zangari at (916) 621-7506.

23

Dukes of Ale's Spring Thing, **AHA Sanctioned Competition**, Albuquerque, N.M. Entry deadline is April 15. Contact Guy Ruth at (505) 294-0302.

23

Crescent City Competition III, **AHA Sanctioned Competition**, New Orleans, La. Entry deadline is April 19. Contact Wayne Rodrigue (504) 468-9273.

28

Fifth Annual Central Florida Sunshine Challenge, **AHA Sanctioned Competition**, Orlando, Fla. Entry deadline is April 21. Contact Tom Moench at (407) 957-4472.

**29-
May 8**

AHA 1994 National Homebrew Competition first-round judging. Entry deadline is April 4-15. Call the AHA at (303) 447-0816.
U.S. Open Competition, Charlotte, N.C.

30

MAY

7

National Homebrew Day. Contact Lori Tullberg-Kelly at (303) 447-0816.

21

Stout Bout Club-Only Competition, **AHA Sanctioned Competition**. Entry deadline is May 31. Contact James Spence at (303) 447-0816.

21

James Page Open, **AHA Sanctioned Competition**, Minneapolis, Minn. Entry deadline is May. 14. Call James Page Brewing Co. at (612) 331-2833.

JUNE

2-6

HWBTA International Conference, Brighton, England. Contact Dee Roberson at (813) 685-4261.

19

Beer Unlimited Zany Zymurgists' First BUZZ Off, **AHA Sanctioned Competition**, Malvern, Pa. Entry deadline is June 12. Contact David Houseman at (215) 458-0743.

22-25

American Homebrewers Association National Homebrewers Conference, BrewStorm '94, Denver, Colo. Complete details available in Spring *zymurgy* (Vol. 17, No. 1), Call the AHA at (303) 447-0816.

25-26

Colorado Brewers Festival, Fort Collins, Colo. Call the Fort Collins Downtown Business Association at (303) 484-6500.

AUGUST

8

Weiss is Nice Club-Only Competition, **AHA Sanctioned Competition**. Entry deadline is Aug. 8. Contact James Spence at (303) 447-0816.

OCTOBER

3

Best of Fest Club-Only Competition, **AHA Sanctioned Competition**. Entry deadline is Oct. 3. Contact James Spence at (303) 447-0816.

21-22

Great American Beer FestivalSM XIII, Denver Colo. Contact Lori Tullberg-Kelly at (303) 447-0816.

DECEMBER

5

Specialty Quest Club-Only Competition, **AHA Sanctioned Competition**. Entry deadline is Dec. 5. Contact James Spence at (303) 447-0816.

To list events, send information to *zymurgy* Calendar of Events. Competition organizers wishing to apply for AHA Sanctioning must do so at least two months before the event. To be listed in Spring *zymurgy* 1994, information must be received by Jan. 25, 1994. Contact James Spence at (303) 447-0816, FAX (303) 447-2825, PO Box 1679, Boulder, CO 80306-1679.



1993 GREAT AMERICAN BEER FESTIVALSM MEDAL WINNERS

ALE

AMERICAN BROWN ALE

GOLD: Old Elk Brown Ale, Walnut Brewery, Boulder, Colo.

SILVER: Brown Ale, Butterfield Brewery, Fresno, Calif.
BRONZE: Downtown Brown, Lost Coast Brewing Co., Eureka, Calif.

AMERICAN PALE/AMBER ALE

GOLD: Sierra Nevada Pale Ale, Sierra Nevada Brewing Co., Chico, Calif.

SILVER: Red Nectar, Humboldt Brewery, Arcata, Calif.
BRONZE: Red Fox, Heritage Brewing Co., Dana Point, Calif.

BARLEY WINE

GOLD: Old Crustacean Barley Wine, Rogue Ales Brewery/Oregon Brewing Co., Newport, Ore.

SILVER: Old Bawdy Barley Wine, Pike Place Brewery, Seattle, Wash.
BRONZE: Old Woolly, Big Time Brewing Co., Seattle, Wash.

BLONDE ALE

GOLD: Prime Time, Big Time Brewing Co., Seattle, Wash.

SILVER: Alpine Pearl Pale, Tied House Cafe & Brewery, Alameda, Calif.

BRONZE: Alaskan Pale Ale, Alaskan Brewing and Bottling Co., Douglas, Alaska

CLASSIC ENGLISH PALE ALE

GOLD: Holy Cow! Pale Ale, Holy Cow! Casino, Cafe and Brewery, Las Vegas, Nev.

SILVER: Burning River Ale, Great Lakes Brewing Co., Cleveland, Ohio

BRONZE: Pike Place Pale Ale, Pike Place Brewery, Seattle, Wash.

DRY STOUT

GOLD: Ugly Dog Stout, Dempsey's Sonoma Brewing Co., Petaluma, Calif.

SILVER: Old No. 38 Stout, North Coast Brewing Co., Fort Bragg, Calif.

BRONZE: Ryan's Irish Stout, Jones Street Brewing Co., Omaha, Neb.

ENGLISH BROWN ALE

GOLD: Home Run Ale, Champion Brewing Co., Denver, Colo.

SILVER: Bond Street Brown Ale, Deschutes Brewery and Public House, Bend, Ore.

BRONZE: Bison Brown Ale, Coyote Springs Brewing Co. & Cafe, Phoenix, Ariz.

INDIA PALE ALE

GOLD: Renegade Red, High Country Brewery Inc., Boulder, Colo.

SILVER: Liberty Ale, Anchor Brewing Co., San Francisco, Calif.

BRONZE: Punjabi Pale Ale, CooperSmith's Pub & Brewing, Fort Collins, Colo.

PORTER

GOLD: Edmund Fitzgerald Porter, Great Lakes Brewing Co., Cleveland, Ohio

SILVER: Point Reyes Porter, Marin Brewing Co., Larkspur, Calif.

BRONZE: Tower Dark Ale, Butterfield Brewery, Fresno, Calif.

SCOTTISH ALE

GOLD: Wrigley Red, Rockies Brewing Co., Boulder, Colo.

SILVER: Golden Gate Red Ale, Golden Pacific Brewing Co. Inc., Emeryville, Calif.

BRONZE: Sonoma Irish Ale, Dempsey's Sonoma Brewing Co., Petaluma, Calif.

STRONG ALE

GOLD: Auld Tartan Wee Heavy, Vermont Pub & Brewery, Burlington, Vt.

SILVER: Imperial Stout, Pacific Coast Brewing Co., Oakland, Calif.

BRONZE: Steelhead Snug Harbor Old Ale, Pizza Deli and Brewery, Cave Junction, Ore.

SWEET STOUT

GOLD: Seabright Oatmeal Stout, Seabright Brewery Pub & Restaurant, Santa Cruz, Calif.

SILVER: Zoser Stout, Oasis Brewery and Restaurant, Boulder, Colo.

BRONZE: Oatmeal Stout, San Diego's Riptide Brewery, San Diego, Calif.

TRADITIONAL BITTER

GOLD: No Medal Awarded

SILVER: Boulder Amber, Rockies Brewing Co., Boulder, Colo.

BRONZE: Emerald Special Bitter, Steelhead Brewery & Cafe, Eugene, Ore.

LAGER

AMBER LAGER

GOLD: Old West Amber, Florida Beer Brands, Orlando, Fla.

SILVER: Samuel Adams Oktoberfest, Boston Beer Co., Boston, Mass.

BRONZE: Rhomberg Classic Amber, Rhomberg Brewing Co., Davenport, Iowa

AMERICAN DRY LAGER

GOLD: Olympia Dry, Pabst Brewing Co., Milwaukee, Wis.

SILVER: Esquire Extra Dry, Jones Brewing Co., Smithton, Pa.

BRONZE: No Medal Awarded

AMERICAN LAGER

GOLD: Drummond Bros., Evansville Brewing Co., Evansville, Ind.

SILVER: Lone Star, Lone Star Brewing, San Antonio, Texas

BRONZE: Brewski Brew Pub Classic, Brewski Brewing Co., Culver City, Calif.

AMERICAN LIGHT LAGER

GOLD: Special Export Light, G. Heileman Brewing Co., La Crosse, Wis.

SILVER: Lone Star Light, Lone Star Brewing, San Antonio, Texas

BRONZE: Brewski Brew Pub Light, Brewski Brewing Co., Culver City, Calif.

AMERICAN MALT LIQUOR

GOLD: Mickey's Malt Liquor, G. Heileman Brewing Co., La Crosse, Wis.

SILVER: Magnum, Miller Brewing Co., Milwaukee, Wis.

BRONZE: King Cobra, Anheuser-Busch, St. Louis, Mo.

AMERICAN PREMIUM LAGER

GOLD: Leinenkugel's Limited, Jacob Leinenkugel Brewing Co., Chippewa Falls, Wis.

SILVER: Budweiser, Anheuser-Busch, St. Louis, Mo.

BRONZE: Point Special, Stevens Point Brewery Co., Stevens Point, Wis.

BOCK

GOLD: No Medal Awarded

SILVER: Bock, Stoudt Brewery, Adamstown, Pa.

BRONZE: Samuel Adams Double Bock, Boston Beer Co., Boston, Mass.

DARK LAGER

GOLD: Lowenbrau Dark, Miller Brewing Co., Milwaukee, Wis.

SILVER: Berghoff Dark, Joseph Huber Brewing Co., Monroe, Wis.

BRONZE: Henry Weinhard's Dark Beer, Blitz-Weinhard Brewing Co., Portland, Ore.

MUNCHNER HELLES AND DORTMUNDER EXPORT

GOLD: Penn Light Lager, Pennsylvania Brewing Co./Allegheny Brewery & Pub, Pittsburgh, Pa.

SILVER: Los Gatos Lager, Los Gatos Brewing Co., Los Gatos, Calif.

BRONZE: No Medal Awarded

MIXED STYLE

AMERICAN LAGER-ALE/CREAM ALE

GOLD: Country Cream Ale, Lonetree Brewing Ltd., Denver, Colo.

SILVER: Genesee Cream Ale, Genesee Brewing Co., Rochester, N.Y.

BRONZE: McMahon's Potato Ale, Minnesota Brewing Co., St. Paul, Minn.

AMERICAN WHEAT

GOLD: Easy Street Wheat, Odell Brewing Co., Fort Collins, Colo.

SILVER: Whistlepin Wheat, H.C. Berger Brewing Co., Fort Collins, Colo.

BRONZE: Marin Hefe Weiss, Marin Brewing Co., Larkspur, Calif.

DUSSELDORF ALTBIER

GOLD: Atlantic Amber, New England Brewing Co., Norwalk, Conn.

SILVER: Rhino Chasers American Ale, William & Scott Brewing Co., Culver City, Calif.

BRONZE: Alt Nouveau, North Coast Brewing Co., Fort Bragg, Calif.

EUROPEAN PILSENER

GOLD: Pilsener, Stoudt Brewery, Adamstown, Pa.

SILVER: Hübsch Brau Pilsner, Sudwerk, Privatbrauerei Hübsch, Davis, Calif.

BRONZE: Golden Spike Pilsner, Riverside Brewing Co., Riverside, Calif.

FRUIT, VEGETABLE

GOLD: Blueberry Ale, Marin Brewing Co., Larkspur, Calif.

SILVER: Passion Pale, Tied House Cafe & Brewery, Alameda, Calif.

BRONZE: Taos Green Chile Beer, Eske's Brew Pub/Sangre De Cristo Brewing Inc., Taos, N.M.

GERMAN WHEAT

GOLD: Heavenly Hefe Weizen, Heavenly Daze Brewery & Grill, Steamboat Springs, Colo.

SILVER: August Schell Weizen, August Schell Brewing Co., New Ulm, Minn.

BRONZE: HOPS! Hefe-Weizen, HOPS! Bistro & Brewery, Scottsdale, Ariz.

HERB, SPICE

GOLD: Celis White, Celis Brewery Inc., Austin, Texas

SILVER: Yuletide Ale, Silo Brew Pub & Restaurant, Louisville, Ky.

BRONZE: Our Special Ale, Anchor Brewing Co., San Francisco, Calif.

NON-ALCOHOLIC

GOLD: Birell N/A, Evansville Brewing Co., Evansville, Ind.

SILVER: O'Doul's, Anheuser-Busch, St. Louis, Mo.

BRONZE: Pabst Non-Alcoholic, Pearl Brewing Co., San Antonio, Texas

SMOKE FLAVORED

GOLD: Alaskan Smoked Porter, Alaskan Brewing and Bottling Co., Douglas, Alaska

SILVER: Willkommen, Rogue Ales Brewery/Oregon Brewing Co., Newport, Ore.

BRONZE: No Medal Awarded

SPECIALTY

GOLD: Abbey Trappist-Style Ale, New Belgium Brewing Co., Fort Collins, Colo.

SILVER: Winterfest, Coors Brewing Co., Golden, Colo.

BRONZE: Raspberry Honey, Spanish Peaks Brewing Co. and Italian Cafe, Bozeman, Mont.

For more information regarding the 1993 Great American Beer FestivalSM or the list of medal winners, please contact Lori Tullberg-Kelly, Association of Brewers marketing director, at (303) 447-0816 or write to PO Box 1679, Boulder, CO 80306-1679.

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16-5

BREW NEWS

James Spence

HEAD LINES

Whitbread Beer Survives 50 Years

Members of Britain's Hartlepool Diving Club discovered 48 bottles of Whitbread beer in the galley of the H.M.S. Port Napier, a mine-laying vessel that sank in 80 feet of water during World War II.

After tasting the salvaged beer, diver Tony Brumwell reported it was "foamy with a mature flavor and you could still taste the beer." The divers gave some to Whitbread's Castle Eden brewery for testing. According to Whitbread Regional Director Jim Kerr, the brewers want to test the beer's condition and alcohol content.

The H.M.S. Port Napier sank near the Isle of Skye in 1942 after fire broke out aboard. The Royal Navy recovered the mines, but the vessel remains on the sea bed and is frequently explored by divers. (United Press International, August 1993.)

CAMRA Fights Canned Drafts

After receiving complaints from Britain's Campaign for Real Ale (CAMRA) and other individuals, the Local Coordinating Committee of Trading Standards Officers (LACOTS) of Burton-upon-Trent declared, "The term draught must relate only to the way the beer is delivered and not to its taste or appearance. It would therefore be inappropriate to apply this term to canned beers." After meeting with Bass, Courage and Guinness, however, LACOTS revised the declaration to read,



"Where a canned beer is of the same composition and has the same properties as its bulk dispensed equivalent, no consumer prejudice arises through describing it as 'draught.'"

Les Bailey, LACOTS senior executive officer, said the revised declaration noted the term "draught" was being applied to a "new generation of low-carbonated canned beers which are said to be exactly the same as their traditional draught equivalents." Peter King, managing director of brewer King & Barnes, which makes real draft beer for pubs, disagrees, noting it would be difficult to prove that the canned beers are exactly equivalent. "If the method of service is the actual distinction between the two, it would still be inappropriate to describe a canned beer as a draught beer," he said.

As a result of the initial declaration by LACOTS, CAMRA sought the advice of Barrister Alex Carlile, who said there would be a "very reasonable chance of conviction" under the Trades Description Act. Due to limited resources, CAMRA has no plans to prosecute the case in court.

ited resources, CAMRA has no plans to prosecute the case in court.

The canned beers in question use special plastic inserts to carbonate the beer when the can is opened, producing a thick, creamy head similar to that produced by dispensing systems used in pubs and bars. Guinness recently released Pub Draught Guinness nationwide in the United States, after strong test-market sales. (What's Brewing, March 1993, August 1993.)

Euro Beer Group Fights for Brewing Traditions

In the wake of the fall of communism and formation of the European Economic Community, many of Europe's small breweries are threatened by the changing economics of the evolving nations. The European Beer Consumers Union hopes to preserve local brewing traditions by supporting beer culture, traditional beer brewing and the beer-loving consumer. To that end, the group supports several causes. The EBCU believes that all beers and other alcoholic drinks should be required to list ingredients, that advertising alcohol via mass media should be prohibited, and that punitive excise taxes on beer are unfair and inefficient. (Charlie Pazanian, August 1993.)

Roaming the World of Foam

"To consumers, foam is a very important characteristic of beer," says Alexander Ronteltap. But "it varies from time to time and we don't know why." Ronteltap's job for

Dutch brewer Heineken is to find out why, because any number of subtle changes in a brewery can affect foam — a new batch of barley, for instance, or a new boiling process. Heineken isn't alone in its quest for ultimate foam. Anheuser-Busch of St. Louis, Japan's Kirin Brewery and other large operations continually study the physics of foam to ensure that the millions of their bottles and cans sold around the world are consistent in appearance and flavor. "Like a Coke or Big Mac, a Heineken or Bud is supposed to look and taste the same all around the world," according to the *Wall Street Journal* article. Heineken, for instance, rejects a batch of beer if the head does not last five minutes after being poured, give or take 20 seconds.

Sophisticated lab equipment pokes and probes the head to measure the size, shape and population of beer bubbles as the head collapses. Scientists have discovered that beer bubbles get their strength from the proteins in the barley used to make beer and, according to Ronteltap, molecules inherited from hops. The proteins work like scaffolding to hold a bubble's delicate structure intact. The protein content of beer is one reason beer bubbles are so much stronger than soft drink or Champagne bubbles.

Bubbles form when the dissolved carbon dioxide comes out of solution. They form on small nicks and scratches in the glass, grow bigger, break off and float to the surface. A typical beer forms a million or so bubbles in just a few seconds. Bubbles shrink or break because they leak carbon dioxide, or dry out. And, as any homebrewer knows, oil repels water and dries the bubbles quickly, hence the need for "beer-clean" glassware. (*Wall Street Journal*, July 1993.)

Yakima Brewery and BATF Duel On

After complying with orders from the Bureau of Alcohol, Tobacco and Firearms to remove nutritional information from its Scottish Ale packaging (*zymurgy* Summer 1993 Vol. 16, No. 2, Brew News), Yakima Brewing and Malting Co. of Yakima, Wash., thought the controversy was over. In fact, the BATF was reportedly considering revising the decision.

A surprise inspection by the local BATF

representative in April reincarnated the nightmare. The agent showed up while brewery President Sherry Grant was attending the Institute for Brewing Studies National Microbrewers and Pubbrewers Conference and Trade Show in New Orleans and, after a two-week inspection, issued three punitive orders. The first two required the brewery to stop selling Celtic Ale and Spiced Ale because of alleged label violations. Apparently the labels on the bottles did not match the labels on file in Washington.

The third order required the brewery to immediately stop producing and selling their hard cider, pending a ruling on whether the cider should be considered a wine. After three months of lost sales, the Bureau declared the cider a "wine," that Yakima had been "illegally operating a winery" and is accountable for back taxes and penalties. The cider has been on the market since 1984. According to Grant, the three orders were issued verbally and the inspection agent refused to put them in writing.

Yakima Brewing has not heard from the Bureau about penalties or punitive measures for the alleged violations. (*The New Brewer*, September-October 1993.)

FLAVOR ANALYST SEPIOL DIES

James M. Sepiol, 35, died July 31 of a heart attack. After a college wrestling accident left him nearly blind, Sepiol became a successful professional beer tester. He worked as a beer flavor analyst for Boston Beer Co. and consulted for small breweries as founder and owner of Tastefully Done. (*Boston Globe*, August 1993.)

TECHNOTES

New Generation Sanitizer

The chemical peroxyacetic acid has several advantages over other brewery sanitizers. In addition to other positive characteristics, the chemical kills a broad spectrum of contaminants, works over a wide range of

pH and temperatures, has a low toxicity, is non-staining, is non-corrosive to stainless steel and aluminum (it is corrosive to copper and brass, but less so than chlorine) and has excellent storage stability. It decomposes into harmless acetic acid, oxygen and water. High concentrations are not needed for sanitizing, making it environmentally friendly. In 1986 the Environmental Protection Agency approved a stabilized form of the chemical as a no-rinse sanitizer under the trade name "oxonia active." (*Master Brewers Association of the Americas Technical Quarterly*, Vol. 29, No. 2, 1992.)

High-Gravity Wort Pitching Rates

Scientists at the VTT Biotechnical Laboratory in Finland report that the optimal pitching rate in high-gravity worts, defined as 1.048 to 1.064 (12 to 16 °Plato), is about 0.3 grams per liter wet weight per 1 percent of original wort gravity. M.-L. Suihko, A. Vilpola and M. Linko also report that for higher gravity worts, 1.080 to 1.092 (20 to 23 °Plato), the optimal pitching rate is 0.4 grams per liter. Higher pitching rates did not improve the fermentation. The test worts were aerated with compressed air. Room temperature was 50 degrees F (10 degrees C). Fermentation was carried out until the apparent attenuation was about 80 percent. (*Journal of The Institute of Brewing*, July-August 1993, Vol. 99.)

Lambic Aromas Source Identified

Belgian scientists H. Martens, E. Dawoud and H. Verachtert of the Laboratory of Industrial Microbiology and Biochemistry studying aroma compounds of enterobacteria defined which fermentation products found in lambic are of enterobacterial origin. The researchers confirmed that *Enterobacter species* are responsible for the production of 2,3-butanediol, acetic acid, lactic acid, succinic acid, ethyl acetate and higher alcohols, all of which are the main aroma compounds found in young lambics. The scientists used laboratory growth media and hopped lambic wort from two breweries for their studies. (*Journal of The Institute of Brewing*, 1992, Vol. 98.)

New Use for White Chocolate

White chocolate readily absorbs volatile substances that cause taints in breweries. In addition, scientists report that white chocolate lends itself well to organoleptic assessment to determine the necessity of laboratory analysis of absorbed taints. (S. L. Campbell, A. Aspell and J. Dunbar report, Institute of Brewing, *Proceedings of the Australia and New Zealand Section Convention*, 1992, Vol. 22.)

Stuff You Wish Were Your Stuff

The Tecator Bittertec 5800 is an instrument that automatically determines the bitterness rating of beer in European Brewery Convention or American Society of Brewing Chemists bitterness units. The machine takes six minutes to analyze a sample and determines EBC to 2 bitterness units.

Scientists have developed a computer model using a Control Data Corporation Cyber 855 running the GPSS V/6000 (Version

1.3) discrete event simulation language that models the fermentation, maturation and filtration of beer. The computer program can be used to improve production efficiency in commercial breweries.

The Foam Analyzer, a machine that detects light as it bounces off beer bubbles, is used in commercial brewing to analyze the size and distribution of bubbles. (*Journal of The Institute of Brewing*, Vol. 98, 1992.)

Starved Yeast Clings Better to Glass

Brewing yeast does not naturally adhere to glass surfaces because yeast cells and glass surfaces are negatively charged and repel each other. According to researchers at Bass Brewers, however, yeast that was starved in plain water for at least three hours exhibited a 30 percent increase in the number of cells adhering to glass surfaces. In the presence of alginate-based finings, which are negatively charged, the starved yeast adhering to the bottle increased until 80 percent of the yeast

was attracted to the glass wall. Isinglass, a common fining, is positively charged and facilitates the sedimentation of yeast cells from beer. Unfortunately, when isinglass and alginate-based finings are used together, the glass/yeast attraction falls to 15 percent. (*Journal of The Institute of Brewing*, Vol. 98, 1992.)

Light Beer Gives Less Blood Alcohol

German light beer is a low-gravity beer with about 40 percent less alcohol. Researchers studying the physical effects of drinking these light beers found that blood alcohol levels were significantly lower than can be accounted for by the 40 percent less alcohol. In fact, after five light beers in a five-hour period, the blood alcohol level of four people was less than 0.02, whereas drinkers of regular beer had levels of more than 0.08. Possible explanations for the effect are the higher proportion of water and non-alcoholic constituents in the light beer and the higher nutrient content per alcohol unit in the light beer. (*Brauwelt International* 1993/11.)

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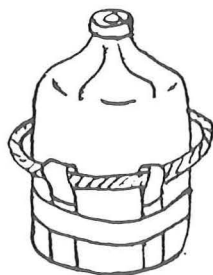
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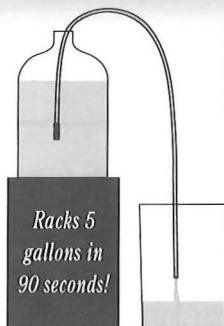
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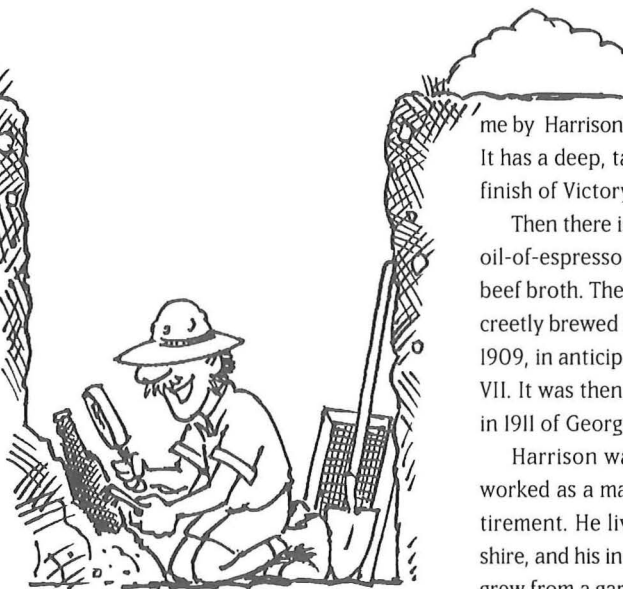
Would I like to taste an 1832 Truman's XXX? How could I resist such a singular invitation?

John Harrison produces a screw-top pint bottle such as I have not seen in many years and pours a russet liquid that forms a thick, creamy head in the glass. Its texture is creamy, too, though never thick or cloying, and its palate a remarkable balance of malty sweetness, floweriness and intense hoppy dryness. It is one of the best beers I have tasted in a lifetime of sampling.

The last batch of XXX to be made at Truman's brewery in London was released on Feb. 29, 1832. The "K" indicated a "keeping beer." In those days, February and March were the last months of the beer-making season before warm weather and airborne wild yeasts rendered brewing impossible. "Keeping beer" was made to lay down in the cellar as a provision to be drawn upon during the summer. The tradition ended when the development of refrigeration made it possible to continue brewing during the warmer months.

Because hops act as a natural preservative, they were used very generously in "keeping beers." This one has three times the hop content of its winter counterpart. It was probably intended to last seven months, when the new brewing season began in October.

This 1832 beer has not lasted 160 years. The oldest beer I have ever tasted (though it was still in good order) was a Trappist Ale 21 years in the bottle. This "keeping beer" was made according to Truman's 1832 specifications, but it was brewed in a pressure cooker by Harrison on his kitchen stove in May 1991. I tasted it at a little more than seven months old, and it had reached the peak of its condition. (An



Beer Archaeologists

everyday ale is more likely to have been matured for about seven days.)

Harrison is among a group of English hobby brewers who recreate beers from the heyday of British brewing. In the earliest days of the Industrial Revolution, British brewers were world renowned. The Golden Age ended with the shortages of fuel and materials during the First World War. Everyday beers have never been as potent or as tasty since.

The work of these hobbyists recaptures flavors we beer lovers thought had gone forever, never to be tasted by present-day drinkers or generations to come. To sample their brews is to taste history: agricultural, industrial, economic, social and gastronomic.

The Truman's brewery ceased all production in the last few years, but its brand name is still extant, in the hands of Courage. The William Black brewery of Aberdeen ceased production in the 1930s, but here is a glass of its 1835 XXX ale being offered to

me by Harrison's brewing buddy, Eric Clarke. It has a deep, tawny color and the warming finish of Victory-V lozenges.

Then there is an 1841 stout that tastes like oil-of-espresso, and a 1909 ale as meaty as beef broth. The ale seems to have been discreetly brewed by Younger's of Edinburgh in 1909, in anticipation of the death of Edward VII. It was then released for the coronation in 1911 of George V.

Harrison was trained as a chemist and worked as a materials scientist until his retirement. He lives near Maidenhead, Berkshire, and his interest in the making of drinks grew from a garden laden with fruits. He began turning those into wines, then decided to have a shot at his favorite drink, Guinness.

"People said this was the one beer that no one could convincingly homebrew," he recalls. "Rumor had it that there was a secret ingredient. I am sure there isn't. It is a question of getting the balance right between the roasted grains and the hops, and creating enough body."

Harrison began by roasting his own barley on baking trays in his kitchen oven. He experimented even to the degree of picking individual grains from the tray to achieve a consistent level of kilning, and he produced a homebrew that was "pretty close" in the view of those who have tasted it.

Homebrewing in England became legal in 1963. In 1971, Harrison became a founding member of an early club for practitioners, the Durden Park Beer Circle. The club has since maintained a level of 25 to 30 members, most from the stretch of the Thames Valley between Maidenhead and the western edge of London. They meet once a month at the Durden Park Cricket Club in Southall to swap experiences and brew.

Anyone who is this serious about beer has gone far beyond the use of homebrew kits. The Durden Park group even spurns English homebrew supply stores. "Shops have too few specifications of malt," says Clarke, "and they don't know enough about the hops they sell. What are the varieties, where were they grown, what is their content of alpha acids and resins?"

Three, four or five pounds of malt and just an ounce or two of hops will produce a U.K. gallon of beer (1.2 U.S. gallons), depending on the style. Some members make their infusions in large saucepans. Tea urns also are used. The most cherished homebrew vessel is the Burco wash boiler, a classic domestic appliance of the post-war period. Clarke, a retired avionics engineer, has a rare Burco made from copper.

This is a less amateurish arrangement than it sounds. In the 1820s, the famous Allsopp brewery in Burton is said to have made that town's first great pale ale in a teapot. In the 1840s, the founder of Carlsberg made his first batch of lager in his mother's copper wash kettle.

The Durden Park group began by trying to match today's beers, but soon had the thirst for new frontiers and started to delve into brewing history. At first, brewers were reluctant to release archive information on their past products, but that attitude has changed over the years.

"Breweries would close and their archives would be destroyed," sighs Harrison. (Here, we both incant the most criminal destruction: Fowler's Wee Heavy Brewery of Pestonpans.) "With the greater interest in conservation, and in beer, people have realized that should no longer be allowed to happen."

Whitbread, which has in recent years assembled a substantial archive in London, has been very helpful to the Durden Park group. Their work has aroused the interest of Fuller's in London and Courage in Bristol. Some defunct breweries' archives have been taken over by local museums. Scotland, which has suffered the worst loss of fine breweries, has a national archive of the industry housed at Glasgow University.

Breweries normally keep a log of every batch they make: kilning specifications and quantities of malts and hops, what time each stage of production began and ended and what temperatures were used. Each has its

own way of setting out this log and some are hard to decipher.

In the past many used abbreviations or codes for specifications of malt and hops, or simply identified the supplier rather than the variety. Some archaic terms indicate long-forgotten styles of malt. Adjustments have to be made, too, for the changes that agricultural practice have brought to the character of barley and hops.

Details of procedures that are standard practice in the particular brewery are sometimes taken for granted and not noted. Some logbooks specify quantities of malts and hops, but do not say how much beer this produced.

The Durden Park brewers pore their way through copperplate records, trying to decipher the abbreviations, codes and archaic terms and figure out procedures and quantities. How accurate are their results?

In 1976, Harrison made a black potion and offered it as "Guinness" to a lady who was 86 years old. "This isn't Guinness," she scolded him. "This is London Porter. I used to drink this when I was in service." The sample had been based on a Whitbread London Porter from

1850. Soon, all such witnesses will be gone.

More recently, the John Smith's Brewery of Tadcaster, Yorkshire, considered adding a small working plant to make a "Victorian" beer for guests at its museum. What would be a suitable brew? The Durden Park group was invited to work on the project and has been experimenting with an 1880 bitter.

Anyone wishing to make their own essay into the past might wish to browse through the 60 "recipes" in a booklet produced by the Durden Park club and released in a new edition. *Old British Beers and How to Make Them*, from John Harrison, 5 Dorney Reach Road, Maidenhead, Berkshire SL6 0DX.

This article originally appeared in The Independent, London, Jan. 18, 1992. Reprinted with author's permission.

Michael Jackson is internationally the best known writer on beer. His articles, books and documentary films have introduced beer styles to countless drinkers and brewers outside their native lands. His use of taste descriptions and accounts of his travels introduced a new genre of writing on beer.

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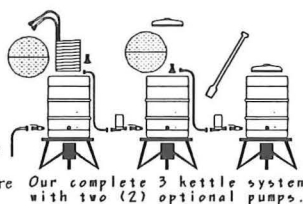
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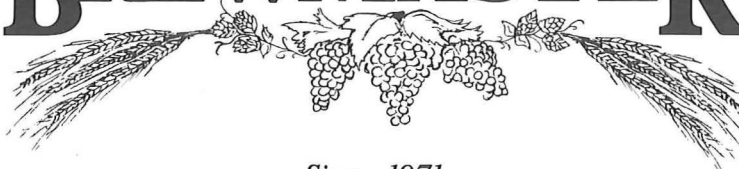
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Candy Schermerhorn

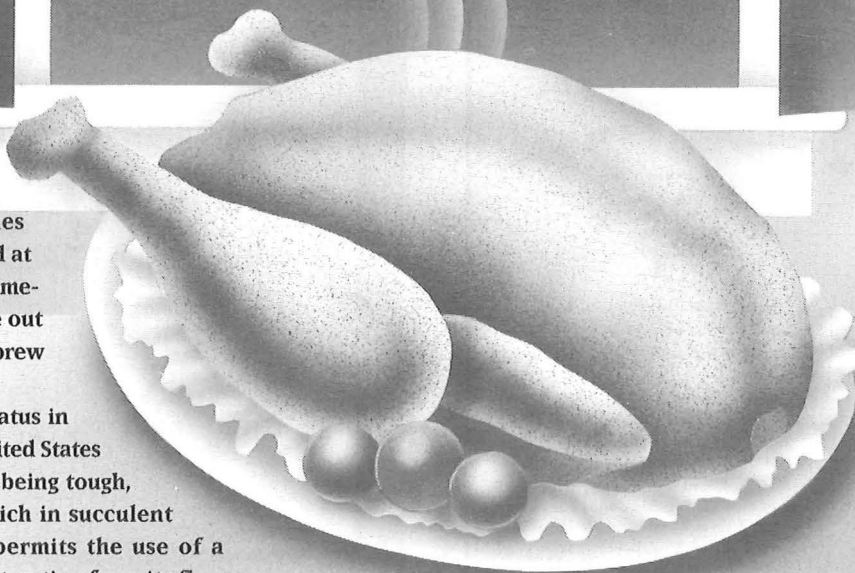
A Festive Feast

When listening to Charles Dickens' tale of Scrooge, have you ever wondered what Bob Cratchet's wife said when the butcher delivered the fat, prize goose to her doorstep and *she* was expected to do something quite wonderful with it? I have a feeling she said something like:

"Thanks a lot, this goose is just ducky, now what the 'dickens' do I do with it?"

Yes, this was the real behind-the-scenes dilemma of poor Mrs. Cratchet as she stared at that plump goose. If only Bob had been a homebrewer, he could have given her this recipe out of *zymurgy* along with a cache of cherished brew for preparing both goose and stuffing.

Although goose still enjoys a revered status in England, Europe and Canada, here in the United States it seems to have acquired a reputation for being tough, greasy and tasteless. Not true! Goose is rich in succulent dark meat with a depth of flavor that permits the use of a stuffing both bold and complex without detracting from its flavor.



When using beer in a complexly flavored dish such as this it is desirable to use a variety of beers to define the diverse qualities of the ingredients. For example, placing all the dried fruits into one bowl and soaking them in one style of beer would result in all three fruits tasting alike. However, using a distinctive beer for each fruit ensures each will retain its individual nature. As always, let your own tastes, budget and supply on hand guide you in the choice of beers.

If you have never "cooked your goose" before (I couldn't pass that one up!), you will find that preparing such a memorable meal is relatively expensive and will require the added effort and time of adhering to a detailed recipe.

Can it possibly be worth all that, you ask? Be assured, *this* golden, delectable goose replete with jeweled stuffing and spicy apple-sauce will far surpass even Dickens' romanticized accounts of holiday fare. And just what would you end this truly extraordinary feast with? Why, the truly sublime plum pudding featured in the recently released *Great American Beer Cookbook* (Brewers Publications, 1993) by yours truly, of course!

The Stuffing

For a 12- to 14-pound goose

- 2 cups brown basmati rice
- 2 teaspoons salt
- 1 cup nut brown ale
- 1 cup water
- 2 tablespoons butter
- 2/3 cup wild rice
- 2 tablespoons unsalted butter
- 1 1/3 cups hard cider
- 1/2 teaspoon salt
- 1 tablespoon butter
- 2 small leeks, split, washed and coarsely chopped
- 5 large shallots, peeled and finely chopped
- 4 tablespoons butter
- 1 tablespoon thyme
- 2 teaspoons marjoram
- 1 cup shelled pecans, roasted at 350 degrees F for 10 to 12 minutes
- 1 cup hazelnuts, roast as above then rub skins off

- 24 chestnuts, roasted, peeled and halved (or use canned)
- 1 1/2 tablespoons grated orange rind
- 2 tart apples, peeled, cored and chopped
- 2 teaspoons freshly ground black pepper
- 1 teaspoon salt
- 1 cup chopped dried apricots
- 1/2 cup Berliner Weiss or cream ale
- 1 cup chopped dried pears
- 1/3 cup Grand Cru or barley wine
- 1 cup dried cherries
- 1/4 cup krik or spiced holiday beer

The night before the feast:

(1) In separate bowls, soak the apricots in Weiss, the pears in Cru and the cherries in krik.

(2) Roast pecans and hazelnuts, rubbing skins off the hazelnuts. Cool and place in an airtight container.

(3) Place the brown basmati in a pan with 4 cups water and 2 teaspoons salt to soak overnight.

(4) Prepare the wild rice by heating 2 tablespoons butter over medium heat in a saucepan until hot. Toss in the wild rice and sauté for five minutes, stirring constantly.

(5) Add the cider, 1/2 teaspoon salt and additional tablespoon butter. Cover and simmer the rice on medium-low 45 minutes.

(6) Uncover and continue simmering for an additional 25 minutes. Remove pan from heat and set aside. Cool and refrigerate overnight.

The morning of the feast:

(1) Drain the basmati rice and place it in a large saucepan.

(2) Add water, ale and butter, cover and bring to a rapid boil. Immediately lower the heat and cook on low for 30 minutes.

(3) Remove from heat and allow to stand five minutes before uncovering and fluffing with a fork. Cool.

(4) Sauté chopped leeks, shallots, thyme and marjoram in 4 tablespoons butter until wilted.

(5) Combine cooked wild rice, basmati rice and all remaining ingredients in a very large bowl, including any liquid from the wild rice and dried fruits that was not absorbed.

The Goose

Delicious tender meat with crisp skin, this goose tops all. Serves six to eight.

12- to 14-pound goose*

- 1 lemon, juiced
- freshly ground black pepper and kosher salt
- 1/3 cup Grand Marnier mixed with 1 cup spiced holiday beer

(1) Wash goose thoroughly, inside and out. Remove excess fat and save for rendering, if desired.

(2) Rub goose inside and out with lemon juice. Salt and pepper the cavity. Using a poultry needle and heavy thread, pull the neck skin up to the back and secure.

(3) Lightly stuff the cavity two-thirds to three-quarters full. Any remaining stuffing can be baked after the goose is cooked using the juice and pan drippings.

(4) Place a piece of crumpled foil over the opening and truss the legs to the tail and the wings to the body. Salt the outside of the bird thoroughly for a very crisp skin.

(5) Set the goose breast-side up on a greased rack in a shallow roasting pan. Bake in preheated 400-degree-F oven for one hour. Remove and prick the entire goose with a fork to allow the fat to drain.

(6) Lower temperature to 350 degrees F and continue roasting. As the fat melts and collects on the bottom of the pan remove it with a bulb baster and save, if desired, for other uses. Be sure to leave a small amount of drippings in the pan at all times to keep the pan from burning.

(7) After two hours of total cooking time, pour the spiced beer and Grand Marnier mixture over the goose and baste. Continue roasting, basting with pan juices every 15 to 20 minutes until done. A thermometer should read 175 degrees F in the thickest part of the thigh.

(8) Place goose on a hot platter and cover. Allow to rest 15 minutes before removing the stuffing and carving.

*Nothing beats a farm-fresh goose dressed out mere hours before cooking. However, most of us must rely on supermarkets, where frozen geese are located next to the turkeys. Because these birds are

flash-frozen, they are often fresher than so-called "fresh" birds.

Carving Hints: Remove the wings first to allow the breast meat to be carved, but save them to make soup stock. The legs should be removed and sliced for serving.

Spiced Applesauce

A fabulous sauce that perfectly complements the richness of the goose. Serves eight.

- 1/2 cup brown sugar, firmly packed
- 5 large tart apples, peeled, cored and coarsely chopped
- 1 1/4 cups Grand Cru, barley wine or althier
- 1/2 cup strong apple cider
- 3 tablespoons unsalted butter
- 3 shallots, finely chopped
- 1 onion, finely chopped
- 1/2 teaspoon salt
- scant teaspoon ground cinnamon
- 1/8 teaspoon cardamom
- 1/2 teaspoon cayenne (or to taste)
- 1 cup goose or chicken stock

(1) Over medium heat combine sugar and apples in a large skillet, stirring until the sugar is dissolved. Cook on high three minutes, stirring once or twice.

(2) Stir in beer and continue cooking over medium-high until the mixture caramelizes, about 20 to 25 minutes, stirring frequently.

(3) Remove from heat, stir in cider and set aside.

(4) Heat butter in a large sauté pan. Add shallots, onion, salt, cinnamon and cardamom. Sauté over medium-high until tender (three minutes), stirring constantly.

(5) Add the caramelized apples, cayenne and stock. Simmer 15 minutes or until thickened, stirring occasionally.

Candy Schermerhorn of Phoenix, Ariz., is culinary instructor in the Phoenix area and an author. Schermerhorn takes great joy in educating the public about beer and its culinary potential through her cooking classes. This enthusiasm for homebrew cooking has prompted her to write the *Great American Beer Cookbook* (Brewers Publications, 1993).



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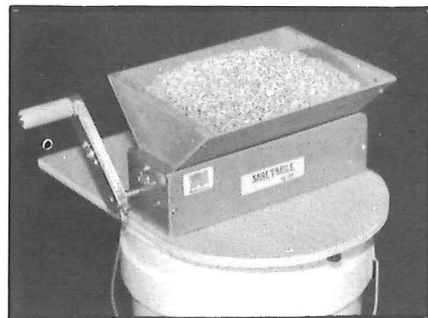
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Saving Time by Saving Beer

Yeast Starter and Kraeusening Tips

By Douglas Serrill

As a beginning homebrewer I remember being affected by the desire to keep my brews pure — using only hops, barley, water and yeast as ingredients. With the guidance obtained from articles in *zymurgy* and Charlie Papazian's *The New Complete Joy of Home Brewing* (Avon, 1991), I adopted the simple technique of saving some of the unfermented beer each time I brewed. This was refrigerated and used as a priming medium when the batch was bottled and as a yeast starter for the next batch. The method presented here is extremely simple and has been tested and refined for at least the last 20 batches brewed in my garage. I offer it for the benefit of the beginning brewer who wishes, as I did, to brew using only the four primary ingredients — water, barley, hops and yeast. Although for me that desire is not as strong as it once was (like many brewers, I have found there are far more important factors to consider when brewing good beer), I have retained this method because it is the simplest and fastest method of preparing an effective yeast starter and priming medium. With the obligations of a family and full-time job, any time saved in the brewing process is desirable.

The Method

During the transfer of cooled sterile wort, or gyle, into the primary fermenter, siphon a predetermined amount of liquid into a sanitized container. Although almost any type of sealable jar will do, I use 22-ounce beer bottles, sanitized, filled to provide one inch of airspace in precisely the same manner as for finished beer and sealed with crown caps. If the wort is being cooled in the fermenter, then simply siphon from the fermenter into the prepared container. Seal the container and store in the refrigerator for later use as a yeast starter and priming and conditioning medium.

Sanitizing

Sanitation is especially important here to preclude the possibility of bacterial contamination in the bottle or jar. Remember that cooled wort is an extremely fertile medium for bacterial growth, and the prospect of having to scrub a refrigerator assaulted by a dangerous exploding bottle is not

pleasant. Although I have never experienced a contamination problem with this technique, I have religiously followed accepted sanitation procedures. I have stored unfermented hopped wort in the refrigerator for up to five months and used it successfully. If in doubt, substitute a rubber stopper and fermentation lock for the sealed cap or bottle the wort hot. Any activity in the bottle or fermentation lock is a sure indication that some form of bacterial or yeast contamination has occurred.

I follow the sanitation method prescribed in an article titled "Sanitation" by Quentin Smith in *zymurgy* Fall 1991 (Vol. 14, No. 3). Jet-rinse the bottles, siphon and any other brewing equipment in hot tap water, then soak in a chlorine solution of two tablespoons unscented household bleach to five gallons of water for 20 minutes. Drain and air dry upside down in a dishwasher or bottle dryer. It is not necessary for the bottles to be completely dry inside, because the minute amount of weak chlorine solution left will not greatly affect the fermentation to take place later.

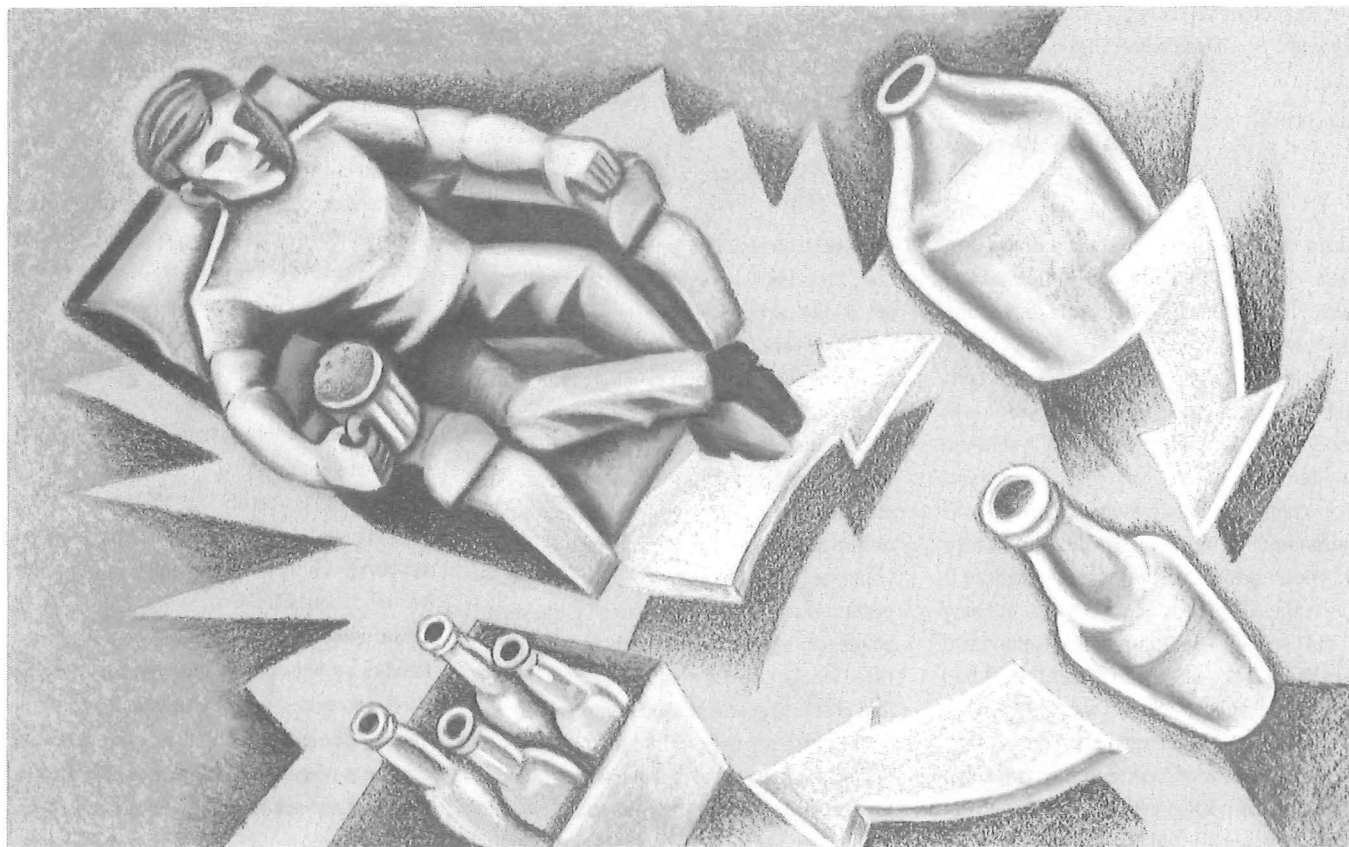
Sanitize the crown caps or jar lid. Just before capping, immerse momentarily in weak chlorine solution or alcohol, 70 percent alcohol with 30 percent water works best. (Note: Most of the above can be incorporated the sanitation of other equipment prior to brewing. Just remember to include the extra bottles and caps as part of your normal preparation.)

Yeast Starter

The standard recommendation is two cups of starter for a five-gallon batch of beer, providing about 40 billion active yeast cells at the peak of activity in the full volume of wort, the optimum pitching rate to suppress bacterial growth in fermenting beer and to allow immediate yeast growth. Although a bit in excess of this, a 22-ounce beer bottle filled with unfermented wort makes a fine yeast starter for a five-gallon batch. Because all of the starter is eventually returned to a future batch, nothing is lost by having a yeast starter that is a bit large. Relax.

If using liquid yeast, activate the package ahead of time according to the manufacturer's instructions. Allow one additional day for propagation of the yeast in the starter. One day before brewing, remove your bottle of starter from the refrigerator and immerse in a weak chlorine solution for 20 minutes or so to sanitize around the neck and cap. Remove and allow to air dry and stabilize at room temperature.

Prepare a somewhat larger container to hold the starter and yeast along with a suitable stopper and fermentation lock. I use a 1 1/2 quart juice jar to allow plenty of head space for the foaming that occurs during fermentation and a large rubber stopper drilled for a fermentation lock. Sanitize these items in the same manner as the bottles. Sanitize the liquid yeast package and scissors. When all is ready, cut open the yeast package and pour it into the empty container. Open your bottle or jar of unfermented wort and pour over the yeast. Install the fermentation lock and fill halfway with weak sanitizing solution.



Active fermentation should be evident within 20 hours and at high kraeusen within 24 hours. Optimally, the yeast and starter should be pitched into the wort at this point, although my timing is rarely optimal. I remind myself to relax. The starter can be pitched after the yeast have settled out. Just put the starter in the refrigerator to drop the yeast then flame the container top as before, pour off the majority of liquid on top, then rewarm the yeast to room temperature before pitching. This method has the advantage of not diluting the original brew with one quart of weak starter slurry.

Priming Medium

Priming your beer just prior to bottling is a simple matter of adding unfermented wort to your finished unconditioned beer. Sanitize around the neck and cap of your bottle or jar of gyle by immersing it in a weak chlorine solution and air dry. Put the gyle into a sanitized bucket then rack in your beer. Bottle or keg by your favorite method.

The question is, how much gyle to add? A method of estimating the correct amount for a five-gallon batch recommended in *The New Complete Joy of Home Brewing* (Avon, 1991) is:

$$\text{Quarts of Gyle} = \frac{12 \times \text{Gallons of Wort}}{(\text{specific gravity} - 1) \times 1000}$$

This results in a somewhat weak level of carbonation for the beer styles I enjoy, so I have experimented with multipliers of between 12 and 20 and settled on 14 to 15 as the best level for my purposes.

A simple experiment I performed with corn sugar combined with a quick derivation will verify the validity of this approach. A solution of three-fourths cup of corn sugar (the amount most commonly prescribed for priming a five-gallon batch) to one quart of boiling water was cooled to room temperature, where it had a specific gravity of 1.043. After pitching liquid yeast into the solution and waiting two weeks to make sure all fermentation had ceased, the specific gravity was 0.994.

Assuming the same ratio in products of fermentation between beer and the corn sugar solution (about 50 percent CO₂ and 50 percent alcohol by weight), and assuming the same de-

gree of attenuation (or same beginning and ending specific gravities), we could conclude that the amount of unfermented beer required to achieve adequate conditioning in a five-gallon batch is equal in volume to the corn sugar solution, which in this case is one quart.

We know from experience, however, that beer typically achieves a terminal specific gravity of about one-fourth the original specific gravity. For an original specific gravity of 1.043, we could expect a terminal gravity close to 1.011. The ratio of volume of beer to corn sugar solution required, given the same original specific gravity, can be expressed as:

$$\text{Quarts of Gyle} = \frac{1.043 - 0.994}{1.043 - 1.011} = 1.53$$

Adjusting for differences in original specific gravity and batch size, this becomes:

$$\begin{aligned} \text{Quarts of Gyle} &= \frac{1.043 - 0.994}{0.75 \times (\text{OG} - 1)} \times \frac{\text{Gallons of Wort}}{5 \text{ gallons}} \\ &\text{or:} \\ \text{Quarts of Gyle} &= \frac{13 \times \text{Gallons of Wort}}{(\text{OG} - 1) \times 1000} \end{aligned}$$

This is a bit higher than the figure suggested in the reference text.

Example: For a 10-gallon batch with an original specific gravity of 1.060:

$$\text{Quarts of Gyle} = \frac{13 \times 10}{0.75 \times (1.060 - 1) \times 1000} = 2.9$$

or close to the amount required to fill four 22-ounce bottles. For kegging beers that will be artificially carbonated, use half this amount.

The level of carbonation is not only affected by the amount of priming medium introduced in beer to provide conditioning, but also by the time and temperature during the initial conditioning of the bottled beer. For an ale yeast for which optimum fermentation occurs at 65 degrees F (18.5 degrees C), store your beer at this temperature (or room temperature) for about 10 days to give the yeast ample opportunity to reactivate. An additional three weeks at cellar temperature will result in a properly aged and well-rounded beer.

Because my experience with lagering is limited, I will leave the optimum circumstances for conditioning of lager beers to the reader. Remember, you are attempting to accommo-

date the same yeast that was used during initial fermentation of your brew. Lager yeasts work just like ale yeasts but their optimum temperature is lower so fermentation takes longer. The equations will function the same.

Benefits

So, what have we learned? We now have a simple method for saving unfermented gyle during the process of racking into the primary fermenter. For our imaginary 10-gallon batch of homebrew with an original specific gravity of 1.060, we saved two 22-ounce bottles for a future yeast starter (one for each five-gallon fermentation bucket) and four bottles for priming, for a total of six bottles saved. That's about a gallon of wort, or 10 percent of the batch total. This will eventually return as added ingredients in our finished supply of homebrew and preserve our intention of producing a beer consisting solely of natural ingredients.

Expect a bit more bottle sediment when using this method, caused in large part by flocculation and settling of protein solids in the bottle of gyle after initial racking. This will carry through to the finished beer in greatly diluted amounts. The end result is quite satisfactory, however, and will result in a nicely compacted sediment that will stay in the bottle with the last ounce if tipped carefully.

The next time you meet with a group of fellow homebrewers you can assume your most dignified composure and proudly proclaim that your homebrew has been prepared in strict accordance with the German purity law enacted in 1516. You will certainly impress your fellow brewers, create lasting relationships and assure that you will always be esteemed as a homebrewer of the highest order.

And, with practice, I am sure this method will save you time.

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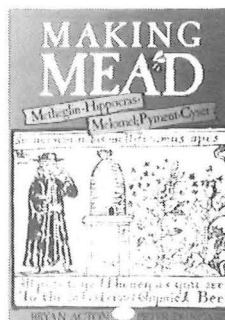
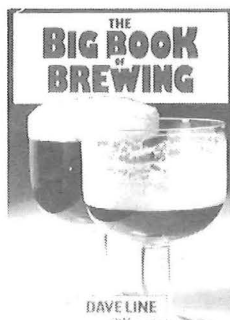
Douglas Serrill is a Boeing engineer who resides on Whidbey Island, Wash. A chronic do-it-yourselfer, he built his home and dedicates a portion of it to his all-grain brewing system. A homebrewer for three years, he has received awards for his favorite brew, a robust porter.



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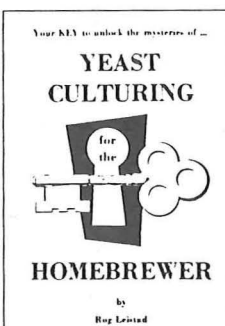
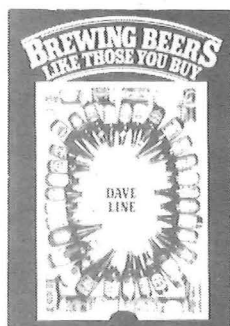
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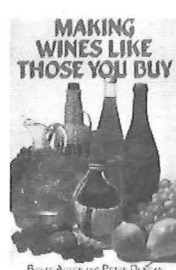
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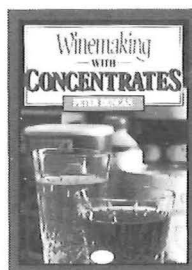
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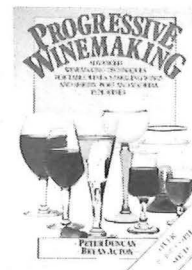
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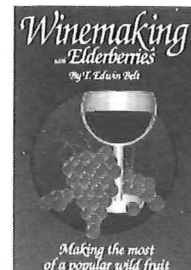
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Hop Schedule Record

*Hops — the brewer's
spice — those wonderful
flowers that lend so
much character to beer.*

By Richard Larsen

When I first started homebrewing, I couldn't understand why some brewers used so many different kinds of hops in one batch. My motto then was "keep it simple." I used to brew using one, maybe two varieties, one for bittering and one for finishing. My friends would give an appreciative nod when tasting my beer, but then follow up with the comment that "something was missing." The simple method of boiling the bittering hops for 60 minutes and tossing in the finishing hops for the last 15 was just not cutting it.

I've never claimed to be a hop head, in fact, anything but! I've always claimed the title of "malty," but I have learned that the complexity of the final brew can be enhanced by blending different varieties throughout the boil. When this procedure is followed, each hop will give its own unique profile to the final product.

Several award-winning recipes are excellent examples of this hopping technique. For this article I have chosen an especially well-hopped imperial stout recipe from the winners of the AHA 1992 National Competition in *zymurgy* Special Issue (Vol. 15, No. 4). The recipe is for Dick Van Dyke's first-place "Rose's Russian Imperial Stout with Mayo." I will not repeat the entire ingredients list; instead, I will detail only the hops.

The brewer added five different varieties of hops at four different time intervals. The problem with so many hop additions is that it tends to be confusing about what to add when and how much. For example, the standard way of listing the hopping schedule is to list the hops by variety:

- 1 ounce Chinook hops, 11.3 percent alpha acid (60 minutes)
- 1 ounce Chinook hops, 10.8 percent alpha acid (45 minutes)
- 5 1/2 ounces Eroica hops, 10.6 percent

alpha acid (60 minutes)

- 1 ounce Goldings hops, 4.7 percent alpha acid (45 minutes)
- 1 ounce Goldings hops, 4.7 percent alpha acid (30 minutes)
- 1 ounce Goldings hops, 4.7 percent alpha acid (10 minutes)
- 1 ounce Cascade hops, 4.9 percent alpha acid (45 minutes)
- 3/4 ounce Cascade hops, 4.9 percent alpha acid (30 minutes)
- 1 ounce Fuggles hops, 4.5 percent alpha acid (45 minutes)
- 1 ounce Fuggles hops, 3.4 percent alpha acid (10 minutes)

This list clearly shows what kind of hops are needed for the brew, but it is difficult to determine what hops are to go into the boil at any given time. Somewhat better would be to list the hops by boil time:

- 1 ounce Chinook hops, 11.3 percent alpha acid (60 minutes)
- 5 1/2 ounces Eroica hops, 10.6 percent alpha acid (60 minutes)
- 1 ounce Chinook hops, 10.8 percent alpha acid (45 minutes)
- 1 ounce Goldings hops, 4.7 percent alpha acid (45 minutes)
- 1 ounce Cascade hops, 4.9 percent alpha acid (45 minutes)
- 1 ounce Fuggles hops, 4.5 percent alpha acid (45 minutes)
- 3/4 ounce Cascade hops, 4.9 percent alpha acid (30 minutes)
- 1 ounce Goldings hops, 4.7 percent alpha acid (30 minutes)
- 1 ounce Goldings hops, 4.7 percent alpha acid (10 minutes)
- 1 ounce Fuggles hops, 3.4 percent alpha acid (10 minutes)

Table 1 HOP ABBREVIATIONS

| Abbreviation | Hop Type and Alpha Acid | |
|--------------|-------------------------|---|
| | CH1 = | Chinook 11.3 percent alpha acid 1 ounce |
| | CH2 = | Chinook 10.8 percent alpha acid 1 ounce |
| | E = | Eroica 10.6 percent alpha acid 5 1/2 ounces |
| | G = | Goldings 4.7 percent alpha acid 3 ounces |
| | C = | Cascade 4.9 percent alpha acid 1 3/4 ounces |
| | F1 = | Fuggles 4.5 percent alpha acid 1 ounce |
| | F2 = | Fuggles 3.4 percent alpha acid 1 ounce |

Table 2 HOPPING TABLE

| | Hop Type | | | | | | |
|----------------|----------|-----|-------|---|---|-----|----|
| | CH1 | CH2 | E | G | C | F1 | F2 |
| Time (min.) 60 | 1 | | 5 1/2 | | | | |
| 45 | | 1 | | 1 | 1 | 1 | |
| 30 | | | | | | 3/4 | |
| 10 | | | | | 1 | | 1 |

Now it is clearer when to add the hops, but there is a confusing array of hop varieties. In addition, one could be confused about how much of each variety is needed.

My solution is the hop table. The above example can be simplified using this method. The first step is to list all hop varieties and total ounces needed. Different alpha-acid content of the same variety should be listed as a separate hop. Then give each hop an abbreviation (see Table 1).

Now draw a table with the hop abbreviations across the top and boiling times down the left side (see Table 2). Where the columns and rows meet, the ounces of hop for that boil time are found. If no additions are to be made at that time, leave the space blank.

Generally, I like to put the hop varieties with the higher alpha-acid ratings to the left and the lower to the right. This way the bittering hops, which are usually the higher alpha anyway, appear at the left of the table and the flavor and aroma hops tend toward the right. The resulting table appears fairly well-organized.

It can be determined at a glance which hop should be added at different times of the boil.

For example, for 60 minutes, 1 ounce of Chinook 11.3 percent alpha acid and 5 1/2 ounces of Eroica 10.6 percent alpha acid should be boiled. Likewise, 3/4 ounce of Cascade 4.9 percent alpha acid and 1 ounce Goldings 4.7 percent alpha acid are boiled for 30 minutes.

Most recipes won't be hopped to this extreme, and the table will be simpler. For instance, following is my recipe for a strong Scotch ale.

Strong Scotch Ale

Ingredients for five gallons

- 12 pounds English pale ale
- 1 pound CaraPils malt
- 1 pound 40 °Lovibond crystal malt
- 1/4 cup chocolate malt
- Wyeast British Whitbread yeast
(see Table 3 for hop schedule)

Mash at 115 degrees F (46 degrees C) for 30 minutes, raise to 150 degrees F (65.5 degrees C) for 60 minutes, 158 degrees F (70 degrees C) for 30 minutes and to 168 degrees F (75.5 degrees C) for 10 minutes.

This method is designed to record hop schedules for recipes you have created and was not intended for conversion of existing recipes. To convert the example to the hop table here took considerable effort to make sure I wasn't missing any hops. If this method is incorporated into your future recipes, I think you will find it a simple and concise method of hopping. Come to think of it, maybe I didn't change my motto of "keep it simple."

Rich Larsen has been homebrewing since 1988. A homebrew consultant, malt packer and general flunky at You-Brew Homebrew supplies in Mokena, Ill., he also is brewmaster at the Blind Dog Brewery "Homebrewpub" in Midlothian, Ill.

Table 3 HOPPING TABLE

| | Hop Type | | |
|----------------|----------|-----|-----|
| | B | KG | F |
| Time (min.) 60 | 1/4 | | |
| 45 | 1/4 | 1/4 | |
| 30 | | 1/4 | 1/2 |
| 15 | | | 1/4 |
| Dry | | | 1/4 |

B = Brewers Gold 7.0 percent alpha acid 1/2 ounce
 KG = Kent Goldings 5.5 percent alpha acid 1/2 ounce
 F = Fuggles 3.4 percent alpha acid 1 ounce



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PILSNER for 12 or 20 l.

- Starting specific gravity : 1.042.
- Alcohol content : 4.6%.
- Light, blond beer, comparable with the commercial Lager beers (recipe for 20 l.) or the better Pilsner beers (recipe for 12 l.). Low alcohol content.

GOLD for 12 l.

- Starting specific gravity : 1.053.
- Alcohol content : 5.5%.
- A real deluxe pilsner type of beer with a far better taste than the normal Lagers. Also comparable with Scandinavian deluxe-beers.

ABBEY BEER for 9 l.

- Specific gravity : 1.070
- Alcohol content : 8%.
- One of the Belgian specialty beers : the Abbey beer with vinous character due to its high alcohol content. Strong dark reddish brown beer with long keeping properties. Full flavoured taste with a malt aroma. Very thick and long lasting head (lacy).

AMBIORIX for 15 l.

- Starting specific gravity : 1.047
- Alcohol content : 6.5%.
- Amber beer with a red copper tint. Slightly acidic palate at first but with a sweet after-taste. Comparable with the well known beer of Roeselare.

DIABOLO for 9 l.

- Starting specific gravity : 1.071
- Alcohol content : 8%.
- Belgian specialty beer : golden colour beer with a thick and long lasting head (lacy). Characteristic aroma of devil type Belgian beers, soft palate with a slightly sweet after-taste. Diabolo also compares with triple Belgian beers (Tripple).

KRIEK for 12 l.

- Starting specific gravity : 1.053
- Alcohol content : 5.5%.
- Kriek is the best known of the famous Belgian fruit-beers. Kriek is made by macerating cherries in beer. A slightly acidic and sweet aromatic beer with a red copper tint. Each kit contains pure cherry juice of at least 3 kg of cherries !

OLD FLEMISH BROWN for 12 l.

- Starting specific gravity : 1.060
- Alcohol content : 6 %.
- A dark brown beer with a red copper tint and a slight liquorice aftertaste that also compares with the Dutch 'Bock'-beers. In Belgium Oud Bruin (Flemish for Old Brown) type beers are strong aromatic beers with long keeping properties.

FRAMBOISE for 12 l.

- Starting specific gravity : 1.053
- Alcohol content : 5.5%
- BREWFERM framboise or raspberry beer, is a Belgian specialty. Together with the BREWFERM kriek this Framboise is the only fruit-beer-kit available in the world. Furthermore, these kits contain NO artificial flavors ! Each kit has an equivalent of 2 kilo of raspberries. This framboise beer has a very delicate aroma and is ideal as a refreshing summer-beer or as a surprising apéritif !

CHRISTMAS for 7 l.

- Starting specific gravity : 1.065
- Alcohol content : 6%.
- Dark strong heavy-bodied Belgian beer, sweeter than Abbey style beers. Strong malt flavor and aroma. Christmas type Belgian beers (brewed with top-fermenting yeast) are beers with long keeping properties which get better and better after long maturation period. Thick and lacy head with extraordinary head retention.

KING for 9 l.

- Starting specific gravity : 1.070
- Alcohol content : 8%.
- An amber beer with vinous character due to its high alcohol content. Sweeter and lighter in colour than Abbey beer. A real beer for dessert with a fantastic taste !

SCOTCH for 9 l.

- Starting specific gravity : 1.050
- Alcohol content : 5%.
- Brewferm Scotch tastes like traditional scotch ales. Halfway between Christmas and Abbey style beers, this Scotch is a mouthfull and malt-accented beer. Good keeping properties.

WHEATBEER for 15 l.

- Starting specific gravity : 1.053
- alcohol content : 5 %
- This is the first wheatbeer kit available ! It is very similar to the well known Belgian 'Witbieren' : very pale, honey-type, opaline colour, low alcohol content, sweet smell and a slightly acidic taste. An old recipe using oat flakes and a secret herb mixture.

GRAND CRU for 9 l.

- Starting specific gravity : 1.075
- Alcohol content : 8%
- The latest addition to the BREWFERM beerkit range. Gold opaline coloured, with strong flavor of grains and even bread. Very little hop aroma. Very mouthfull and even slightly fruit taste with a sweet aftertaste. Also these kits contain wheat malt and a special herb mixture.

TRIPLE for 9 l.

- Starting specific gravity : 1.075
- Alcohol content : 8%
- Triple is a well known deep golden colored Belgian specialty. Due to its high malt contents it has a very pleasant aroma and taste. Mouthful, full bodied and even a bit herbaceous. High alcohol content.



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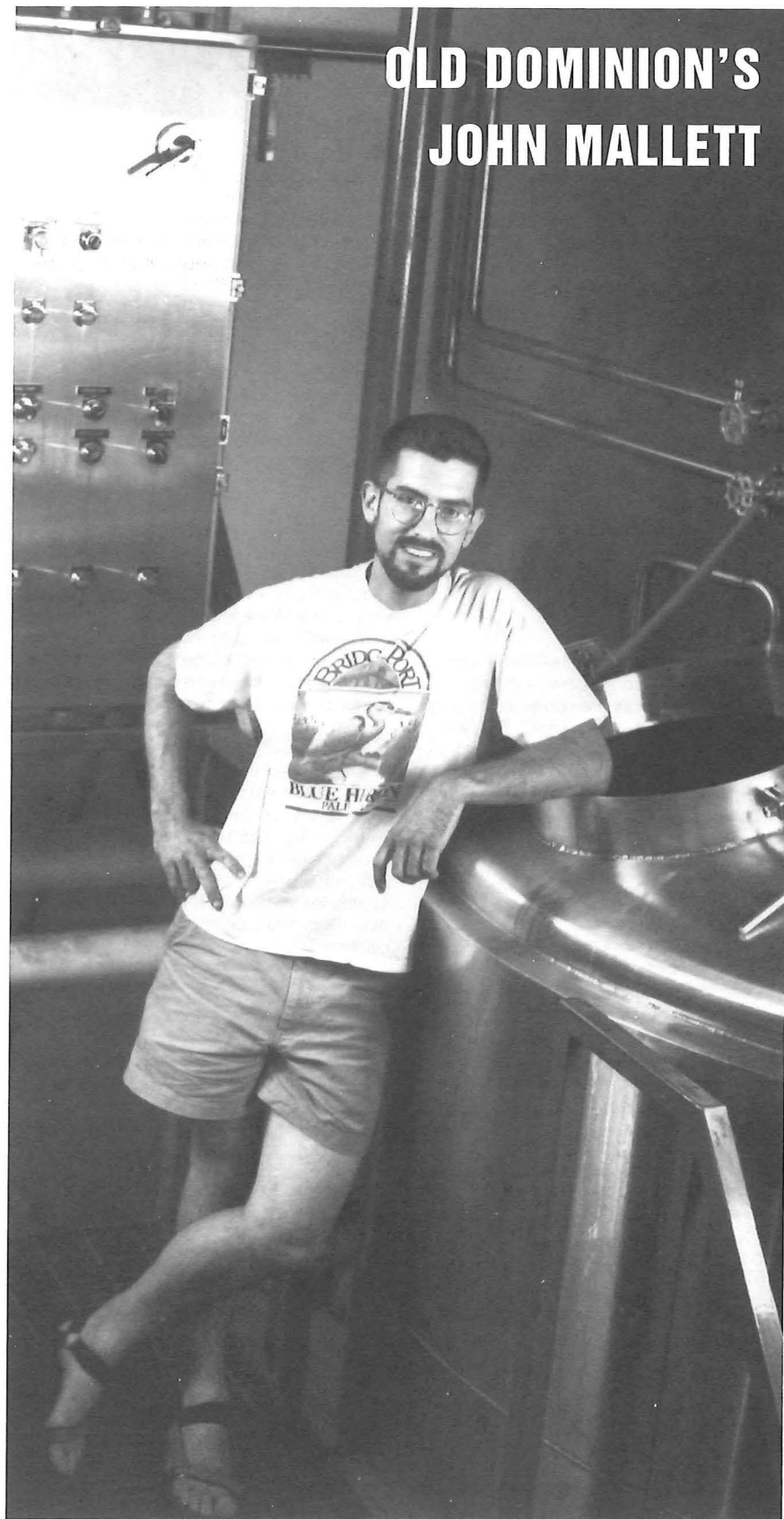
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THE MAKING OF A MICROBREWER

OLD DOMINION'S JOHN MALLETT



BY STEPHEN SNYDER

Somewhere in the back of almost every homebrewer's mind as we stand in the aromatic vapors of our brew kettle there lurks the fantasy of one day becoming a professional brewmaster and crafting award-winning microbrews for legions of appreciative customers. This dream has become a successful reality for John Mallett, 28-year-old head brewer at Old Dominion Brewing Co. near Washington, D.C.

On the deserted service road outside the brewery, John Mallett momentarily swerves his old Subaru head-on into the path of an oncoming Old Dominion delivery truck. The truck's headlights flash wildly as Mallett swings back into his own lane and the two vehicles come to a stop. The driver, obviously used to this type of behavior, smiles as Mallett asks him to tie up a few loose ends back on the loading dock. The conversation ends quickly and we speed away to the next obligation in Mallett's relentless schedule.

It is here, in Mallett's car, that I finally am able to find out just how this rising star of the microbrewing world got where he is, still finding it hard to believe that this young iconoclast, who looks more like a member of a progressive West Coast rock band, is a head brewer. For me, the stereotypical image of a brewmaster as the pot-bellied, middle-aged guy named Gus dies hard.

"I am pretty much typical as far as microbrewmasters go," says Mallett. And in that, he is quite atypical in the brewing world as a whole, where the large brewing giants strictly control how, when and what a brewer creates. It becomes obvious talking to Mallett that he felt a calling most homebrewers can empathize with — he loved quality beers and soon felt a strong desire to craft his own.

"When I was a kid, I used to watch my cousin and my dad make beer in his biology lab, so I've known for a long time that it's something that can be done fairly easily. And when I was in college, I was exposed to good beers and developed an appreciation for quality beer, which got me into homebrewing."

At the time, Mallett was working toward an engineering degree at the University of Lowell in Massachusetts, and his love of quality beers led to homebrewing and the realization that he wanted to brew professionally. But Mallett knew you just didn't walk into a brewery and get a job. Luckily, there was a kitchen job open at the Commonwealth Brewery in Boston, so Mallett took work as a cook, determined to work his way into the gleaming copper-and-brass brewery.

When the position of brewer's assistant became available, Mallett asked for the job but was turned down. He promptly threatened to quit. Realizing that losing Mallett from the kitchen was better than losing him completely, management decided to create a place for him working alongside the head brewer. Before long, Mallett discovered he had a talent for this work and soon mastered all of the duties in this brewpub devoted mostly to English-style beers.

After working a few years at Commonwealth, Mallett decided he had to learn more about beer-making and decided to get serious. He scraped together his life savings and enrolled in the 10-week brewing science course at the Siebel Institute of Technology in Chicago. While the majority of his classmates attended the school comfortably under the sponsorship of the brewing giants, Mallett took a cheap apartment in a less-than-savory section of Chicago and commuted the 35-mile daily round trip to class on his bicycle.

Twice Mallett was nearly forced to drop out; first by acute appendicitis and then by a serious cycling accident. But he persevered and graduated on time.

"Forty hours a week for 10 weeks — that was the only time I've ever really been burnt out on beer," Mallett says, recalling those days at Siebel hearing nothing but beer-beer-beer all day, everyday, for 2 1/2 months. But it was a labor of love and the school taught him everything a brewer had to know from acidic carboxyl groups to yeast metabolism and zymurgy. The Siebel Institute helped Mal-

lett develop reliable brewing techniques, something that would help immeasurably in Old Dominion's success later on. He learned that beer was serious business and to survive you had to be a businessman as well as a brewer.

"I am probably the first person in my family to go into a real business," he says with a grin. "I come from a long line of professional scholars." And for awhile, it looked like he would join them by pursuing a career in teaching. Vestiges of that family heritage remain in wire-rimmed glasses and goatee.

I couldn't resist asking Mallett what his favorite beers are (besides Old Dominion, of course). "Belgian lambics," he replies without hesitation. "My family traces its roots to Belgium so I made a trip there a few years ago and spent three months just traveling around to the old breweries. The brewing operations are really old and outdated, but the beers are excellent."

I ask Mallett if he dreams of moving on to a bigger, more dominant brewery. "No way," he replies, "I need my freedom. I take my work very seriously and I need to be happy. It's hard to do that when you have no control over what you're making." Freedom, and the chance to fulfill his desire to brew German-style beers, drew him to Old Dominion.

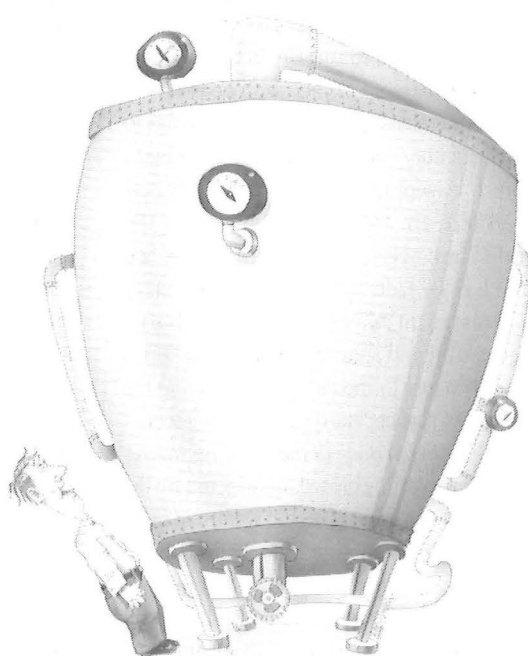
Mallett is living proof of the Newtonian theory that things in motion tend to stay in motion. After catching a Grateful Dead show at the end of a long workday, Mallett finally gets to bed at 3 a.m. The next morning he is at a business meeting by 9. At 2, another meeting to broker the sale of surplus brewing equipment to a fledgling microbrew operation in North Carolina. At 4 it's back to the brewery to perform some maintenance on a fermentation tank amid the chaos of a brewery tour. At 5 there is time for a very late lunch eaten standing up in the brewery lobby, then it's time to sample a new batch of wheat beer.

Fresh from the tank, it is some of the best I've tasted, easily on a par with any of the Hefe Weizens I've sampled in Bavaria. "I really love the Maisel's Weisse," Mallett says, "so I tried to pattern our summer wheat after that." Mallett's

wheat is krausened with speise, in this case a still-fermenting lager, giving the beer a smooth and rounded quality that perfectly complements the estery and phenolic sweetness of a Hefe Weizen.

Situated in the gently rolling farmland just beyond Dulles Airport in Ashburn, Va., Old Dominion Brewing Co. is the Washington metro area's first microbrewery. The camaraderie and enjoyment here is evident among the employees. On one recent Friday the company president, Jerry Bailey, was out making keg deliveries for a driver who had the day off. Bailey also began as a homebrewer.

Old Dominion is small, with only nine full-time employees consisting of four brewers, three delivery drivers, an office manager and the president. Despite its size, they are able to craft 14 beers and an old-style root beer soft drink. The beers they produce, primarily intended to challenge the import market, are Dominion Lager, Dominion Helles (a German Pils), Dominion Ale, Dominion Stout, Victory Amber, Virginia Native Brite, Hard Times Select, Blue Pint (a dry-hopped ale), O'Bannon Dark Beer, St. George (contract brewed for local Ethiopian restaurants), Old Dubliner Amber Ale, Blarney Ale/Minnigan's Ale, Dominion Red and special seasonal beers such as the German Wheat, Oktoberfest and Holiday Ale. The beers are made in the European style using decoction and step infusion techniques, and are all natural with no additives or preservatives.



Mallett's lagers are well-hopped with sometimes as many as five varieties, reflecting his chef's training in creatively blending complementary ingredients. His Old Dominion Lager, for instance, is bittered using Cluster and Hallertauer from Washington state's Yakima Valley and finished with a blend of domestic Tettnanger, German Hallertauer Hersbrucker and the classic Czech Saaz, giving the lager a unique dryness and complexity.

"I think my background as a chef, as well as my experience in construction work, really prepared me for the work of a microbrewer. I was able to correct Old Dominion's problems of space economy in a more efficient brewery layout." Ironically, Mallett has little time these days to do any actual brewing, a task leaves mostly to the three brewers he supervises. "I spend most of my time doing maintenance and engineering work keeping the brewing and bottling machinery running smoothly."

Mallett's pride and joy is the new Krones bottling system. The state-of-the-art system eliminates the threat of oxidation by removing virtually all air from the bottles, greatly extending the shelf life of the unpasteurized beer, even if left unrefrigerated.

Later, Mallett takes me on a tour of Bardo, a brewpub in Arlington where he acts as brewing supervisor and consultant. In this vast, former car dealership packed with beer-loving young Americans, you might think you are in a hallucinatory version of the Hofbräuhaus in Munich, except the beer selection is far better. There are 108 taps drawing 33 of the world's best beers including barley wine and Woodpecker Cider, all fresh and plentiful.

Dressed in baggy technicolor shorts, ragged shirt and a tapestry beanie, Mallett is the only figure in the teeming crowd that fits in with the psychedelic decor depicting scenes from the *Tibetan Book of the Dead*. He weaves through the young crowd, unaffected by the masses paying homage to the wealth of quality beer now available below the Mason-Dixon line. "My goal is simple, I want to make the best beer that can be had in the Washington area," Mallett says, shouting to be



John Mallett strikes a pose on the Old Dominion brew kettles.

heard above the sound system.

As I sample the beer list at Bardo, I meet Rick Garvin, minister of education for BURP (Brewers United for Real Potables), the 12-year-old Washington-area homebrew club with more than 300 members.

As a homebrewer, Garvin is unequivocal in his praise of Mallett and the crew at Old Dominion. "They really go out of their way to help the local 'knucklehead' homebrewers," says Garvin. "Many homebrewers I know have actually called the Old Dominion for brewing advice when they've run into problems." As a further example of Old Dominion's service to the local homebrew community, Garvin tells how the brewery once accommodated a local homebrew competition that was expected to feature just 30 beers when the number mushroomed to 185 entries. Old Dominion gladly donated storage space in their cooler alongside their own beers. "Anytime we ask John to speak to our homebrew club, he's there," says Garvin.

Garvin recalls the pre-John Mallett days that weren't so good. "The original Old Dominion Lager was awful! It tasted like bad iced tea. But John came in a couple of years ago, and he and brewer Ron Barchet (a Weihenstephan graduate and homebrewer) turned the place around."

A veritable font of local beer facts and figures, Garvin grows less empirical as he recalls wistfully the Mallett-era specialty beers of Old Dominion. "Their Mai Bock was my favorite — absolutely incredible; and the Scotch Ale last Christmas was great." As for year-

round beers, Garvin recommends Hard Times Select, a bronze medal winner in the Münchner Helles and Dortmunder Export category at the 1992 Great American Beer FestivalSM contract-brewed by Old Dominion. "Definitely the best lager on draft in the D.C. area!" says Garvin.

Now, besides being helpful and friendly, Old Dominion has gained quite a reputation for the availability and consistent quality of its products, something that has proved difficult for many microbrewers. Old Dominion's amber-bottled beers are stamped with

an expiration date in plain English so the purchaser knows instantly if the product is fresh.

Perhaps you're wondering what John Mallett does in his rare moments of leisure? Rock climbing. A rapidly growing sport requiring physical and mental toughness, self-reliance and nerves of steel, not to mention a healthy dose of craziness. I suppose it makes perfect sense.

Here are two of John Mallett's beer recipes to try.

AMERICAN PALE MALT

Although this beer fits the American pale ale style, the use of British malts contributes greatly to this brew. Feel free to adjust your grain bill since extraction ratings may vary.

Ingredients for 5 gallons

- 8 pounds British pale malt**
- 2/3 pound 40 °Lovibond malt**
- 3/4 ounce gypsum**
- 1 ounce Perle hops, 5 percent alpha acid (70 minutes)**
- 1 ounce Mt. Hood hops, 4 percent alpha acid (70 minutes)**
- 1 ounce Mt. Hood hops, 4 percent alpha acid (10 minutes)**
- 1 ounce Cascade hops (finish)**
- 3/4 ounce Cascade hops (dry)**
- Wyeast No. 1056 Chico ale yeast starter**
- 3/4 cup corn sugar to prime**
- Original gravity: 1.052 (13 °P)**

Heat 2 gallons water and the gypsum to 164 degrees F (73.5 degrees C). Add the water to the grains to produce a 146- to 147-degree-F (63.5- to 64-degree-C) mash stand. Let rest for one hour, then reheat the mash to 160 degrees F (71 degrees C) and allow to stand for 10 minutes. Raise temperature to 170 degrees F (77 degrees C). Lauter and sparge to collect 6 gallons of wort. Boil for 90 minutes. Cool to 65 degrees F (18.5 degrees C) and pitch a healthy yeast starter. Ferment at 65 degrees F (18.5 degrees C). Following primary fermentation, typically four to seven days, rack into carboy with Cascade hops. Lager at 50 degrees F (10 degrees C) or colder for at least two weeks. Prime and bottle.

SOUR MASH SUMMER BEER

This sour mash beer was Mallett's attempt to brew a microbiologically clean, refreshing summer beer. By producing sour notes before boiling and sanitizing the fruit, some "wild beer" flavor is incorporated and should not change radically over time.

Ingredients for 5 gallons

- 4 pounds two-row pale malt
- 4 pounds wheat malt
- 1/2 ounce gypsum
- 1 ounce Willamette hops, 4 percent alpha acid (60 minutes)
- Wyeast 1056 Chico ale yeast starter
- 10 pounds skinned, pitted, chopped peaches♦
- 3/4 cup corn sugar to prime

♦ Original gravity: 1.049 (12.25 °P)

Heat 2 1/2 gallons water to between 130 and 135 degrees F (54 and 57 degrees C), add gypsum and malt and let stand at about 122 degrees F (50 degrees C) for 10 minutes. Raise temperature 2 degrees F (1 degree C) per minute to reach mashing temperature of 153 to 154 degrees F (67 to 68 degrees C). Pour this mash into a preheated picnic cooler and let stand overnight. The next day, pour the sour mash into the mash pot, heat to 170 de-

grees F (77 degrees C) then laut and sparge to collect 6 gallons of wort. Boil 90 minutes. Cool wort to 60 degrees F (15.5 degrees C) and pitch starter. Ferment at 66 degrees F (35 degrees C). At high krausen (about 24 hours after pitching) add peaches. After five days, rack and lager one week at about 50 degrees F (10 degrees C) then rack again and store at 34 degrees F (1 degree C) for one month to settle out haze.

♦Whole, unbruised peaches were prepared by dipping into very hot water, peel-

ing and pitting them in a solution of 4 grams metabisulphate dissolved in 4 gallons of water and chopping them with a sanitized knife on a sanitized cutting board.

Steve Snyder is a free-lance journalist and screenwriter working out of New York City. He is an avid homebrewer whose current obsession is making Bavarian-style wheat beers.

Expect the best!

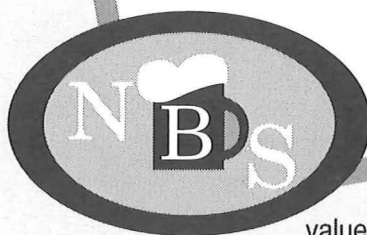
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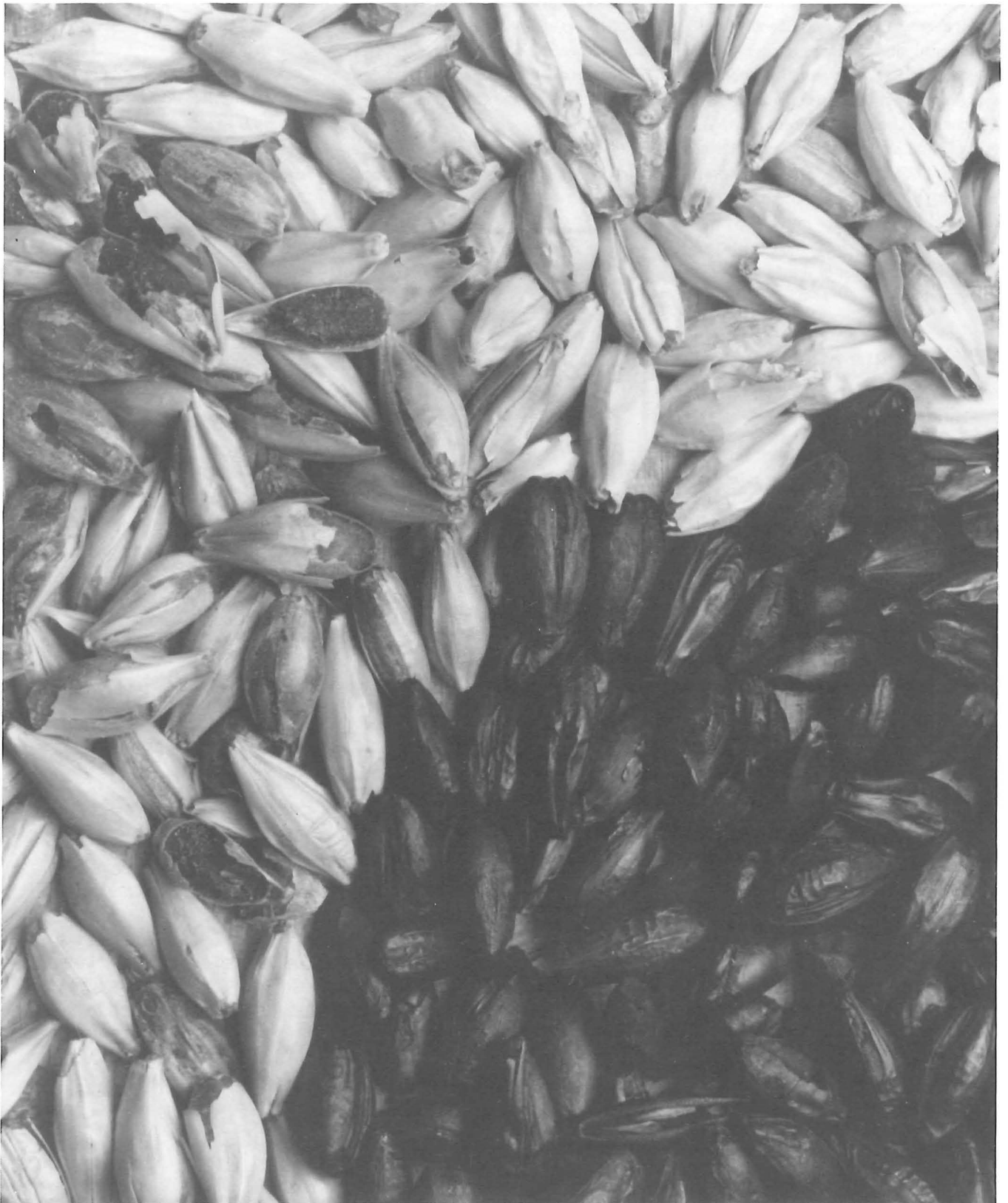
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Special Malts for



Greater Beer Type Variety

By Ludwig Narziss, Ph.D.

Production of an ever-increasing number of beer types, in particular of alcohol-free and light beers, necessitates a corresponding versatility in raw materials, especially in malt — the basic raw material. This is a challenge facing the maltster in more ways than one: on one hand, the most commonly used malts must become "more typical," on the other hand, it is necessary to produce special malts that impart certain beer properties such as flavor, aroma, body, improved foam or more color.

The boundaries between the two are fluid: How should dark malt be classified, should wheat malt be regarded as a special malt or not, to which category should rye malt be assigned, should Vienna malt be regarded as a commonly used variety? It cannot be disputed that caramel malts, brumalts, black malts as well as acid malts are special malts. However, this article does not deal exclusively with the latter, but in a shorter section describes the differentiation between the main malt types.

Malt for Various Types of Beer

Table I summarizes which malts are used for various types of beer. Even Pilsener beers

can benefit from very pale caramel malts. Otherwise, as for the main grist, homogeneous, specifically modified Pilsener malt is still used; however, with modern low-oxygen brewhouses this may be cured slightly more than was previously the case or than is required in old plants that have not yet been optimized. Pale beers or certain export types sometimes require darker malts although this is problematic in that these could not be produced in a sufficiently uniform degree. The result is many breweries generally require a malt color of 3 to 3.5 EBC units and adjust by adding special malts for various beer types (1, 2, 3).

Märzen or even dark beers are very much dependent on a uniform quality of dark malt. This must be available in at least two depths of color: one group of 15 EBC and the other of 25 EBC units. A brewery might need a malt of 10 EBC units; however, this must not be produced by blending a ratio of 15-to-3 EBC malt. The same applies to Vienna malt which should be produced separately with a depth of color of approximately 7 EBC. In the case of Weizenbier, the versatility of blend is augmented by pale and dark wheat malts. Caramel malts are used everywhere, and brumalt has been rediscovered particularly for light beers or for reinforcement of the dark malt character of dark beers, Märzen or altbier respectively.

The malt grist of alcohol-free and light beers is especially tailored to "flavor carriers" to somewhat offset the lower original gravity. Contrary to original expectations, significantly higher proportions are appropriate in this instance (4).

"Normal" Malts

Two points have emerged in connection with Pilsener malts:

- It is advisable that modification be somewhat reduced because varieties such as Arena, Alexis, Dorett and Gimpel have a tendency toward overmodification. The limit is considered to be a fine/coarse difference of 1.7 to 2.0 percent, a viscosity of <1.58 milli-Pascal (mPas), whereby in that instance, neither a higher rate of non-germinating grains nor anything less than 80 percent of mealy grains are required. Protein modification should be around 40 percent (± 1 to 2 percent), with the FAN (free amino nitrogen) being at least 20 percent of soluble nitrogen.
- Curing may be increased so the awkward DMS precursor will be brought down to a safe value range (5,000 to 7,000 ppb). This is important for modern wort boiling systems and particularly for brewhouses operating under optimized oxygen conditions.

Colors of approximately 4 EBC (boiled wort color 6.5) would be desirable indeed, had not some maltsters "disposed" of their off-color malts into this pool instead of curing to a sufficient extent. In the first instance, this attempt misfired so persistently that the breweries in question use small quantities of caramel malt for color correction.

Dark Malts

The principles governing production of dark malt are known: High protein content

barleys, more intensive germination [increased moisture, a slightly less dramatic temperature drop during falling germination, possibly a higher temperature of 64 to 68 degrees F (18 to 20 degrees C) on the last day of germination], a damp and warm wither and a higher curing temperature of 212 to 221 degrees F (100 to 105 degrees C) that should last for four to five hours so that the aroma-imparting Maillard products can form. These variations easily allow for a differentiation between the aforementioned stages of approximately 15 and 25 EBC. An overmodifica-

tion in the box (caused, for example, by higher final temperatures) together with shorter kilning periods or lower kilning temperatures would also create color and aroma, but these malts were less uniform. Such processes have been tried at all times; however, a process that, after the required preliminary conditions have been satisfied, controls the Maillard reaction by means of the time-temperature program is the preferred one.

Tables 2a and 2b give a survey on the formation of the N-heterocyclic compounds which are desired here, in the case of simply curing a pale green malt or in the case of a warm wither with the same degree of curing. Table 2c also includes data on a pale caramel malt in which a number of substances are present in a reduced form because of the rapid removal of water and the associated evaporation of aromatic substances. This is very important for some beer types (5, 6).

Present-day dark malt is characterized by an excellent modification; moreover, its enzymic capacity remains practically intact because of a gentle kilning process. This is demonstrated in particular by the saccharification times. The final attenuation is lower because of the sugar consumption required for formation of Maillard products and because of a certain diminishment of the beta-amylase. One might pose the question: Why two different qualities of dark malt?

A 15 EBC malt provides the basis for the dark beer character. It may well be used under conventional conditions such as in old brewhouses, a three-mash method or a very intensive two-mash method with a proportion in the grist of 85 percent (the remainder being pale malt), but only on condition that it not be older than three months. Otherwise, aromatic substances will be lost.

Malt of 25 EBC units in a proportion of 25 to 40 percent is useful for intensifying the aroma when, for example, the brewhouse is new or the mashing methods employed are less intensive.

The former may be used in low proportions (see Table 1) for color correction of pale beers.

It would be beneficial if certain maltings concentrated on the production of dark malts and offered a uniform, not-too-old product at all times. Too fresh a malt in amounts of 15 percent may even be advantageously used as it contains a lot of original aroma, how-

TABLE 1: MALT TYPES AND THEIR USES FOR VARIOUS BEERS 1

| Beer type/Color EBC | | EBC Malt types (Color EBC) | | | |
|---------------------|---------|----------------------------|--------------|-------------|-------------|
| Pils | 6 - 7 | P3.0 | CP 4.0 to 5% | | |
| | | (P 3.5) | | | |
| Pale | 8 | H 3.5 | | | |
| | | P 3.0 | CH 25 to 5% | | |
| Pale Export | 9 | | D 15 to 10% | [SM 3 - 5%] | |
| | 12 | | CD 120 to 1% | | |
| Dark | 50 - 60 | | D 15 90% | H 3.5 9% | FM 1% |
| | | | D 15 40% | D 25 40% | CD 5% |
| | | | H 14% | | FM 1% |
| | | | D 15 50% | BM 35 30% | FM 1% |
| Märzen | 30 | | WI 5.5 90% | H 3.5 10% | [CH 25 10%] |
| | | | H 3.5 30% | D 15 70% | [CD 120 5%] |
| | | | D 15 100% | | |
| | | | H 3.5 30% | D 15 50% | BM 20% |
| Weizen | 12 | | WM 50 - 90% | H 3.5 | |
| | | | WM 70% | CH 25 5% | H 3.5 |
| | | | WM 70% | D 15 5% | H 3.5 15% |
| | 40 | | WHM 60% | D 15 40% | (FM 0.5%) |
| | 40 | | WHM 40% | WMD 30% | D 15 30% |
| Alt | 35 | | H 3.5 99% | FM 1% | |
| | | | D 15 90% | H 10% | |
| | | | H 3.5 85% | CD 120 15% | |
| | | | D 15 50% | BM 35 50% | |
| Kölsch | 10 | | H 3.5 95% | CH 25 5% | |
| | | | H 3.5 85% | WM 15% | |
| Low gravity beer | 8.5 | | H 3.5 70% | D 15 15% | CH 25 15% |
| 7.2% | | | H 3.5 40% | D 15 10% | CH 2.5 15% |
| | | | WI 5.5 30% | SM 5% | |
| | | | H 3.5 70% | CD 2% | SM 5% |
| | | | WI 5.5 23% | | |
| Alcohol-free beer | 8.5 | | similar | | |
| 7.2% | | | | | |

up to 30% CH!

Abbreviations: P = Pilsener malt; H = pale malt; D = dark malt; WI = Vienna malt; BM = brumalt; WM = wheat malt; WMD = dark wheat malt; CP = Pilsener caramel malt; CH = pale caramel malt; CD = dark caramel malt; FM = black malt; SM = acid malt

ever, when used exclusively, the underdeveloped enzymic capacity, in particular the peptidases, will lead to problems.

Wheat Malt

Although its production is well-known, the malting wheat varieties have not yet been satisfactorily defined. A number of varieties have proven to be more suitable, for example, Ares, Basalt, Caribo, Kanzler, Rektor, Sorbes and a number of new breeds (7), however, either the protein contents are a matter of mere chance or they are subject to little or no control at all by the maltster. Wheat malts must not contain too much soluble nitrogen, and within that range, they may not be overmodified; rather the degree of protein modification should not be more than 42 percent. It is known that the amino nitrogen level is lower, but this does not lead to any difficulties on account of the very intensive fermentation of top-fermented yeast. As a rule, it is best to achieve about 18 percent of FAN out of total nitrogen in the wort. As far as the cytolytic solution is concerned, a viscosity of below 1.65 mPas is aimed for; in most cases, the fine/coarse difference must be about 1.0 percent EBC to achieve this aim.

Manufacture of dark wheat malts proceeds along the same lines as dark malt; that is, adjustment of a higher moisture content of the germ plus suitable parameters for further degradation processes at a warm wither and formation of Maillard products together with high curing.

Vienna Malt

This is known for effecting a correction of excessively pale malt colors or, when used predominantly, for the production of "golden" beers. In the case of a normal modification, it is cured at 194 degrees F (90 degrees C); in this process, circulating air may be started at an earlier stage to facilitate the achievement of the most popular color of 5.5 to 6 EBC units. Accordingly, overmodified malts, or off-colors, should be avoided, and malt blends (50-to-50 pale-to-dark malt) should not be supplied as "Vienna" malt. In the former case, the foam of the beers will most likely be inferior, and in the latter the character of the dark malt will "linger on." This very phenom-

TABLE 2A: INFLUENCE OF THE KILNING TEMPERATURE ON SOME N-HETEROCYCLIC COMPOUNDS OF MALT

| Kilning temperature | °C | 70 | 85 | 100 |
|--|-----|----|----|-----|
| Thiazole | ppb | 1 | 2 | 11 |
| 2-methylpyrazine | ppb | 1 | 3 | 46 |
| 2-et-3, 6-dime-pyrazine | ppb | <1 | <1 | 46 |
| 2-acetylpyridine | ppb | 1 | 2 | 24 |
| 6, 7-digydro-5H-5-mecyclopentapyrazine | ppb | 5 | 40 | 570 |
| 2-acetylthiazole | ppb | 3 | 6 | 20 |
| Benzooxazole | ppb | - | - | 30 |
| 2-acetylpyrrole | ppb | 5 | 70 | 320 |
| Malzoxazine | ppb | 6 | 73 | 270 |

TABLE 2B: N-HETEROCYCLIC COMPOUNDS IN VARIOUS MALTS (IN PPB)

| | Pale | Dark | Black malt |
|--|------|------|------------|
| Thiazole | 1 | 8 | 350 |
| 2-me-pyrazine | 6 | 80 | 6,200 |
| 3-me-pyridine | <1 | 4 | 130 |
| 2, 6-dime-pyrazine | 1 | 6 | 380 |
| 2, 3- | 2 | 13 | 860 |
| 2-et-3, 6-dime-pyrazine | <1 | 5 | 270 |
| 6, 7-dihydro-5H-5-mecyclopentapyrazine | 40 | 220 | 52,000 |
| 2-acetylthiazole | 5 | 14 | 550 |
| Benzooxazole | - | - | 890 |
| Pyrazole | 10 | 100 | 3,200 |
| 2-acetylpyrrole | 60 | 900 | 4,700 |
| 5-acetyl-2, 3-dihydro-1 H-pyrrolizine | 33 | 500 | 13,500 |
| 5-formyl-6-me-2, 3-1 H-pyrrolizine | 170 | 190 | 24,000 |
| 5-acetyl-6-me-3, 3-1 H-pyrrolizine | 12 | 40 | 2,300 |
| Malzoxazine | 60 | 300 | 1,800 |

TABLE 2C: N-HETEROCYCLIC COMPOUNDS IN VARIOUS MALTS (IN PPB)

| | Pale | Dark | Caramel | Black malt |
|-------------------------|------|------|---------|------------|
| Pyrazine | + | 168 | 61 | 338 |
| Thiazole | 31 | 71 | 24 | 1540 |
| 2-me-pyrazine | 15 | 790 | 397 | 38260 |
| 4-me-thiazole | - | + | + | 465 |
| 2, 5-di-me-pyrazine | 6 | 395 | 219 | 1954 |
| 2, 6-di-me-pyrazine | + | 28 | 85 | 362 |
| Tri-me-pyrazine | 13 | 240 | 1148 | 2267 |
| 2-e-3, 6-di-me-pyrazine | 1 | 196 | 37 | 365 |
| 2-e-3, 5-di-me-pyrazine | + | 28 | 85 | 362 |
| Pyrrole | 30 | 163 | 451 | 733 |
| 2-acetylpyridine | 12 | 70 | 44 | 850 |
| 2-acetylthiazole | 42 | 80 | 22 | 1270 |
| Nic.sre.-me-ester ??? | 6 | 57 | 4 | 117 |
| Benzothiazole | 6 | 6 | 7 | 66 |
| 2-acetylpyrrole | 366 | 4585 | 2305 | 6533 |
| Indole | 8 | 17 | 10 | 70 |

enon is to be avoided by the Vienna malt. It is a malt type of its own. Once again, certain maltings could establish themselves in this niche.

Possibly the above explanations are only commonplace, however, a lot has certainly been missed or deliberately circumvented or ignored in the past. The aim is to develop special types, and breweries need a certain malt quality in order to achieve this. It is obvious that Vienna and dark malts are standard types — although they must be well-manufactured. From the point of view of shelf life, it is not feasible to achieve a further differentiation in terms of protein contents or modification properties or even variety classifications (unless larger quantities are ordered that justify a number of additional batches).

Caramel Malts

Caramel malts have received renewed attention, particularly due to the production methods that are based on novel brewhouse technology. Table 1 shows that the quantities used heretofore ranged from 2 to 5 percent; however, in the production of light and alcohol-free beers, substantially higher quantities were required to compensate for the lack of body in these beers or to contribute a malt extract that has already reached a certain stage of degradation and the composition of which will hardly change any more due to enzyme shortage. Moreover, as can be seen in Table 2c, a pale caramel malt, for example has very much less Maillard products (N-heterocyclic compounds) because they are expelled by the steam that escapes during heating for the purpose of roasting.

This provides an opportunity to suppress, at least in part, the formation of a worty flavor impression.

Manufacture of Caramel Malt

Originally, the starting material has been cured malt brought again to a moisture content of 44 percent in a step lasting from about six to 10 hours; however, leaching may cause considerable extract losses of up to 3 percent. The use of green malt with a moisture content of 45 to 50 percent is more advantageous. In this instance, for example on the last day of germination or during the last 30 to 36 hours, it is possible to raise the temperature in the grain to 122 degrees F (50 degrees C), the same as for brumalt, and cause a liquefaction of the grain constituents because of the action of the proteolytic, cytolytic and amylolytic enzymes. This in turn will lead to higher levels of soluble nitrogen, in particular low-molecular nitrogen, to break down products of the carbohydrates which are manifested by an increase in the proportion of inverted sugar.

Saccharification as such takes place in the roasting drum between 140 and 176 degrees F (60 and 80 degrees C), which brings about other, higher enzyme optima as a result of the extract-to-water ratio of approximately 1-to-0.6 as compared to mashing with 1-to-2.5 and 4. With proper pretreatment in the germination box, 60 to 90 minutes is adequate, in the case of cured malt which has been steeped again, the process of liquefaction and saccharification lasts for 150 to 180 minutes; however, this does not proceed in

a fully uniform manner. Grain modification is not homogenous, just as the enzyme distribution in the grain varies. Following this rest, heating to between 302 and 356 degrees F (150 and 180 degrees C), accompanied by a rapid removal of the steam, will last for approximately 60 minutes, and this temperature is maintained for one to two hours to allow caramelization of the grain contents. The final level and duration are predetermined by the color of the caramel malt. Subsequent to the liquefaction phase, the "water-white" caramel malt is only dried in the drum.

Emptying of the drum is followed by immediate and uniform cooling. In this phase, the grain content — still soft at a moisture content of 6 percent — becomes solid. As becomes apparent from Table 3 showing results of an earlier project at Weißenstephan, caramel malts in quantities of 8 or 15 percent are very suitable, even in the case of relatively dark colors of 40 to 80 units. The beers had a pure and typical flavor, and in particular the dark malt flavor impression was well developed (8).

Pale caramel malts of less than 35 EBC units are suitable for pale beers although it is very important to harmonize color and quantity. It has already been mentioned that this leads to a fuller and more balanced taste, an improved bitterness and a positive influence on the beer foam.

Questions naturally arise about the costs associated with the use of caramel malt, or whether this makes sense from an economic aspect.

The water-white caramel malt "CaraPils" has only been saccharified and then dried. It does not contain any products that result from thermal degradation. When used in

TABLE 3: USE OF CARAMEL MALT AND BEER QUALITY (8)

| Proportion | Normal | Color 4 EBC | | Color 37 EBC | | Color 93 EBC | | Color 147 EBC | | Color 277 EBC | |
|----------------|----------|-------------|---------|--------------|---------|--------------|---------|---------------|----------|---------------|-------------|
| | | 8 | 15 | 8 | 15 | 8 | 15 | 8 | 15 | 8 | 15 |
| Beer color EBC | 9 | 8.5 | 8.5 | 12 | 14 | 17 | 26 | 25 | 35 | 38 | 65 |
| Foam R & C | 125 | 130 | 129 | 129 | 131 | 126 | 131 | 136 | 137 | 142 | 146 |
| Gums mg/l | 147 | 147 | 134 | 262 | 234 | 231 | 231 | 225 | 252 | 225 | 235 |
| Viscosity mPas | 1.58 | 1.59 | 1.59 | 1.68 | 1.69 | 1.66 | 1.67 | 1.68 | 1.68 | 1.68 | 1.67 |
| Iodine test ΔE | 0.20 | 0.30 | 0.35 | 0.30 | 0.27 | 0.26 | 0.26 | 0.20 | 0.26 | 0.30 | 0.34 |
| Taste | pure | pure | pure | pure | malty | sl.malt | malt | malt | str.malt | str.malt | vy.str.malt |
| | | aroma | aroma | aroma | aroma | aroma | aroma | | | | |
| Body | adequate | vy.good | vy.good | vy.good | vy.full | vy.good | vy.full | vy.full | vy.full | vy.full | vy.full |

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quantities of 8 and 15 percent, it imparts rather pale colors, slightly improved foam and better body. The resulting beers were superior compared to the reference beer. In the production of light beer, or a 7 to 8 percent alcohol-free beer resulting from suppressed fermentation, 10 to 30 percent caramel malts are used in order to lower the final attenuation and bring about the above-mentioned effects. This has proven itself.

What is expected of caramel malts:

- Certainly "water-white," a color of 4 EBC for Pilsener beers (3 to 5 percent), also suitable for the production of light beer (30 to 50 percent of the caramel malt proportion);
- A pale caramel malt of 25 to 30 EBC, to be used in the main for pale beers but also in order to improve the body of dark ones;
- A dark caramel malt of 100 to 120 units, suitable for dark light beers in quantities of between 5 and 10 percent and for pale light beers in quantities less than 1.5 percent. Although darker colors can be obtained, this could lead to a slightly burnt flavor impression.

It is difficult to achieve other shades, but they may be obtained by blending various malt types. This could facilitate work in the brewery (for example the setting of the malt mill and introduction of small quantities with first and second runnings), the work, however, is transferred to the malting stage.

In any event, breweries should be very familiar with color and other data in order to dose the correct quantity and thus avoid color variations which would certainly also lead to taste variations.

Manufacture of Brumalt

A batch based on dark green malt, malt containing more protein (≈ 11.5 percent) and an approximately 48 percent higher germ moisture content, is brought to temperatures of 104 to 113 or 122 degrees F (40 to 45 or 50 degrees C) during the last 36 hours of a steeping and germination period of about seven days and left in that condition for 18 to 20 hours. This is done by simply switching off the germination fan. The carbon dioxide formed enters the space beneath the floor, entraining air from the germination box chamber. Consequently, the lower layer contains

more carbon dioxide than the top one. For this reason, it would be favorable if, analogous to the so-called "small aeration" in the backfall box, the carbon dioxide formed could be sucked out of the chamber beneath the floor every six hours for about five minutes.

The growth of the embryo is arrested at about 104 degrees F (40 degrees C) although the enzymic activity continues; this results in an accumulation of low-molecular breakdown products such as glucose, fructose, amino acids and peptides. The consistency of the grain content changes; it is partly liquefied.

Two alternatives exist for the wither: the warm green malt is either dried at 122, 131 and 140 degrees F (50, 55 and 60 degrees C) for approximately nine hours while waiting for the breakthrough at 149 degrees F (65 degrees C) after two to three hours, representing the most common method; or "scalding" is continued at 122 to 131 degrees (50 to 55 degrees

C) for four hours at a time with 75 to 80 percent recirculated air [exhaust air temperature 91 to 97 degrees F (33 to 36 degrees C)], then the drying process is initiated at 140 to 149 degrees F (60 to 65 degrees C) with 80 percent fresh air in 2 1/2 hours, and the malt is heated to 158 degrees F (70 degrees C) in one hour then the temperature is raised to 176 to 185 degrees F (80 to 85 degrees C) with the proportion of fresh air being reduced to about 25 percent in a stepless or stepwise manner. In accordance with the color required, the curing temperature is 176 to 194 degrees F (80 to 90 degrees C) for three to four hours, and 90 to 100 percent circulating air may be used. The total kilning period falls within the usual time frame of 19 hours. Kilning temperatures of 176 to 194 degrees F (80 to 90 degrees C) are adequate for yielding colors of 30 to 40 EBC units or, as the case may be, remaining below this figure. At tem-

TABLE 4: MALT ANALYSES OF PALE, DARK, BRUMALT (9) AND BEER ANALYSES

| TYPE | PALE | DARK | BRUMALT |
|---------------------------|---------|---------|---------|
| Water % | 4.7 | 3.2 | 4.9 |
| Extract anhydr. % | 81.9 | 81.4 | 80.3 |
| Fine/coarse diff. EBC % | 1.0 | 0.8 | 1.5 |
| Viscosity mPas | 1.49 | 1.55 | 1.56 |
| Protein anhydr. % | 10.6 | 9.6 | 10.1 |
| Sol.N mg/100 g dry matter | 646 | 696 | 754 |
| Kolbach index % | 38.1 | 45.5 | 46.6 |
| Hartong index 45°C % | 38.3 | 45.5 | 51.0 |
| pH | 5.99 | 5.64 | 5.54 |
| Color EBC | 2.7 | 14.0 | 34.0 |
| Saccharification min. | 10 - 15 | 10 - 15 | 15 - 20 |

| Beer analyses | | | | | |
|-----------------------|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 |
| Color EBC | 33.0 | 33.0 | 27.0 | 29.0 | 31.0 |
| pH | 4.48 | 4.26 | 4.21 | 4.22 | 4.15 |
| Final attn. % | 80.7 | 83.9 | 82.3 | 83.3 | 78.0 |
| Total N mg/100 ml 12% | 66.6 | 57.7 | 67.3 | 58.2 | 61.0 |
| FAN mg/100 ml 12% | 8.4 | 5.5 | 7.8 | 6.4 | 7.2 |
| Tannoids mg/l 12% | 18 | 22 | 15 | 27 | 19 |
| Foam R & C | 135 | 126 | 132 | 137 | 139 |
| HMF | 142 | 14 | 97 | 55 | 157 |
| Taste ranking | 1 | 5 | 3 | 4 | 2 |

| | |
|-----------------------------|--|
| 1:Pale:Brumalt 41:49 | 3:Pale malt + brumalt + colored beer = 60:40 + 0.2% |
| 2:Pale + colored beer 0.62% | 4:Pale malt + brumalt + colored beer = 80:20 + 0.25% |
| | 5:Dark malt + Dark malt 45:55 |

peratures above 185 degrees F (85 degrees C), the enzymes are damaged because drying the partly liquid starchy endosperm is quite sluggish, and the concurrence of temperature and moisture leads to steeliness of the malt.

An abundance of low-molecular breakdown products gives rise to the formation of many chromophoric and aromatic substances. As the manufacture of these malts can be better controlled, and in the absence of any uncontrollable processes with in part undesirable metabolic products, larger proportions can be turned to good account. In the old process on the malting floor an acidification of the malt occurred at times producing a strong estery odor. These malts by themselves, even with low grist percentages of approximately 15 percent, imparted a slightly sour flavor impression, the taste stability deteriorated and the beers had a higher susceptibility to infections, particularly those caused by *Lactobacilli*. This

is no longer the case. Nowadays, they can be processed together with pale or even dark malt in quantities up to 50 percent if saccharification is assured. They are further used to improve the aroma of dark malt grists (approximately 25 percent), as a replacement of black malt or sugar coloring for malt beer or alt as well as more generally for alcohol-free and light beers. Table 4 lists the results of this (9).

No special equipment is required for the manufacture of brumalt. It is an inexpensive process that is, however, characterized by a loss of malting yield of about 4 percent. The extract yield of brumalt is 1 to 1.5 percent lower than that of a comparable malt. The other data are normal nowadays.

Black Malt

In routine tastings of dark beers, it is sometimes believed that these beers have less dark malt character and less body than in the past

and that the black malt flavor seems to leave a burnt or even burnt/bitter impression.

Admittedly, black malt nowadays is rarely milled and separated independently, rather it is added to the last residual mash to avoid boiling; however, it also "cuts" in the case of infusion processes. The upset seems to emanate to a lesser degree from the brewhouse operation but rather more from black malt itself. Therefore, a number of important points for the manufacture of black malt will be called to mind:

- The starting material should not be any pale malt but a pale cured malt which is perfectly modified and may well be slightly darker in this instance;
- The malt will be brought to a moisture content that is 5 percent higher, the water should be evenly distributed in the roasting drum without draught at 158 degrees F (70 degrees C) (samples should be tested to ascertain that the starchy endosperm is moistened thoroughly), and after about three hours heating for the roasting process should be initiated. Roasting should last for about 1 1/2 hours at temperatures between 347 and 392 degrees F (175 and 200 degrees C);
- Overheating must be avoided during that period (sample cut); and
- Rapid and even cooling after roasting must be ensured.

It is evident that unmalted barley will give completely different taste results that in fact underline the type of foreign specialty; however, these are not suitable for our beers and incidentally are not admissible according to the Beer Tax Law.

Black wheat malt that may be used only for top-fermented beers, and peeled black barley malt which also imparts a well-rounded flavor, produce better results than black barley malt.

In the production of dark export or high-gravity beers, a splitting-up of the dye, for example into black malt and colored beer, (addition during casting) has proven advantageous.

Acid Malt

Acid malt has originally been developed to compensate for unfavorable influence of waters of a high carbonate hardness during mashing of pale or Pilsener beers.

The simplest means of manufacturing acid malt is to steep pale cured malt in pure wa-

TABLE 5: EFFECT OF ACID MALT USE (10)

| Quantity % | 0 | 3 | 6 | 9 |
|--------------------------|------|------|------|------|
| Hard water | | | | |
| pH mash | 6.08 | 5.84 | 5.51 | 5.40 |
| pH wort (end of boiling) | 6.10 | 5.91 | 5.74 | 5.57 |
| pH beer | 4.47 | 4.45 | 4.45 | 4.37 |
| Beer analyses: | | | | |
| Final attenuation % | 81.5 | 82.3 | 82.5 | 82.8 |
| Color EBC | 7.3 | 7.4 | 7.3 | 7.0 |
| Total N mg/100 ml 12% | 66.0 | 71.1 | 79.7 | 87.3 |
| Viscosity mPas 12% | 1.68 | 1.64 | 1.61 | 1.60 |
| Polyphenols mg/l 12% | 125 | 125 | 143 | 152 |
| Foam R & C | 139 | 141 | 137 | 138 |
| Bitter substances EBC | 37 | 35 | 33 | 32 |
| Taste ranking | 4 | 3 | 2 | 1 |
| Soft water | | | | |
| pH mash | 5.69 | 5.42 | 5.29 | 5.02 |
| pH wort | 5.36 | 5.24 | 5.05 | 4.91 |
| pH beer | 4.24 | 4.21 | 4.18 | 4.15 |
| Final attenuation % | 84.0 | 84.5 | 83.1 | 82.6 |
| Color EBC | 5.8 | 5.3 | 5.4 | 5.4 |
| Total N mg/100 ml 12% | 68.7 | 78.3 | 88.2 | 94.1 |
| Viscosity mPas 12% | 1.63 | 1.60 | 1.61 | 1.62 |
| Polyphenols mg/l 12% | 164 | 161 | 159 | 167 |
| Foam R & C | 135 | 135 | 134 | 133 |
| Bitter substances EBC | 36 | 34 | 34 | 31 |
| Taste ranking | 4 | 3 | 2 | 1 |

ter at 113 to 116 degrees F (45 to 47 degrees C) until the *lactobacilli* present on the malt have formed an acid concentration of 0.7 to 1 percent. The liquid is then drained, and the malt is dried carefully at 122 degrees F (50 degrees C), rising to a maximum of 140 degrees F (60 degrees C) toward the end of the process. The lactic acid is concentrated in the drying process; it amounts to 2 to 4 percent in the dry malt. The liquid that has been drained can be used once or twice for the manufacture of subsequent acid malt batches accelerating the acidification process. Instead of 24 to 30 hours required for the first acidification, the process will then take only 12 to 16 hours as the rods already have a raised population density. Too frequent use of the mother solution leads to additional coloring; moreover, the multiplication of rods is accelerated each time, and they take on other morphological shapes. When cultivated in this temperature range, they are free from other organisms, and they can under no circumstances grow in the beer on account of their sensitivity to even insignificantly tiny quantities of hop bitter substances (< 1 milligram of alpha acid per liter).

The (steep) tanks for lactic acid propagation of malt must be insulated and located in a room that can be heated. A thermostatically controlled heating system (hot-water jacket and cone heating) is just as important as circulation pumping for steep liquid. The steep should be drained "to a dry state" without problems.

It has already been mentioned that acid malts have a lactic acid concentration of 2 to 4 percent. This must be determined so the addition of acid malt can be clearly defined.

Table 5 shows that the results of acid malt addition were clear-cut: An improved enzymic action during mashing, a more favorable composition of the polyphenols, a paler color and a mellow, pure and well-balanced taste of the finished beers. The acid malt quantity in that instance was about 9 to 10 percent with a residual alkalinity of 10 degrees German hardness. Because of the improved action of the phosphatases among others and careful handling of acidic phosphates during mashing, a significantly better buffering was built up. This in turn diminished the pH drop during fermentation so that the expected low pH values in the beers were not always achieved.

Acid malt is also used for a pH improvement of mash and wort in soft brewing waters. In order to bring about optimal pH values, a proportion of only 3 to 4 percent of the grist is required; 6 percent would be more favorable in terms of the taste (Table 5) while a higher percentage imparts a somewhat hot and sour flavor impression. The final improvement was achieved in particular with the combination of hard water plus 9 percent acid malt, however, as in the case of soft water, pH drop during fermentation was insufficient (10).

It was therefore recommended that small breweries prepare a malt extract (water to acid malt 1-to-5) and use the excess liquid for wort boiling and the deposit for mashing-in. Although good beers were brewed in this manner, this method could not be integrated into the production process, especially in automatic brewhouses. For this reason, many breweries changed to biological acidification but biological lactic acid was obtained from *lactobacilli* present on the malt during a fermentation process which has been developed into a continuous operation. So what is the reason for acid malt nowadays? It is used in particular for specialty beers that are developed by breweries that do not operate with lactic acid. The following properties may be obtained in this way:

a) In the case of low gravity/light beers: The body is improved, and a particularly "mellow" flavor impression is imparted, especially in combination with hard mashing water. In most instances, 6 to 9 percent of the malt grist is required, this is equivalent to 300 to 350 grams of pure lactic acid per 100 kilograms of malt;

b) In the case of alcohol-free beers with a suppressed fermentation: A "more pleasant" malt body is obtained; in this instance, a higher quantity is required in order to approach a pH of 4.5 with acid malt extract;

c) In the case of dark beers and Weizenbier: The body and the mellowness of the beer are improved;

d) In the case of malt beers: The pH is lowered.

Conclusions

Specialty beers require special raw materials, at least in many instances an addition of special malts, in order to emphasize

certain properties of the beers. It is also very important to have the properties of the malts of the main grist known exactly and that a uniform quality be maintained, at least for Pils/pale beers, dark beers and Weizen. This might possibly also apply to Vienna malt if this is needed. Although Pils/pale beers and Münchner are a Vienna as far as the color goes, the malt character is excessive and, at 212 to 221 degrees F (100 to 105 degrees C), will give rise to a very strong flavor due to an intensive formation of Maillard products.

Summary

The use of special malts in the production of a very broad beer range was discussed. After repeating the definition of properties of pale, intermediate, dark and wheat malts, the use of caramel malts and brumalts of various shades as well as of acid malt was described in detail.

The manufacture of such malts was also discussed, and possible problem areas pointed out.

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Ludwig Narziss, Ph.D., studied brewery sciences at Weihenstephan, Munich's technical university. His activities as a scientific worker and head brewer eventually led him back to Weihenstephan where he worked as a professor and chair of brewing technology from 1964 through 1992. Ludwig retired in early 1992.

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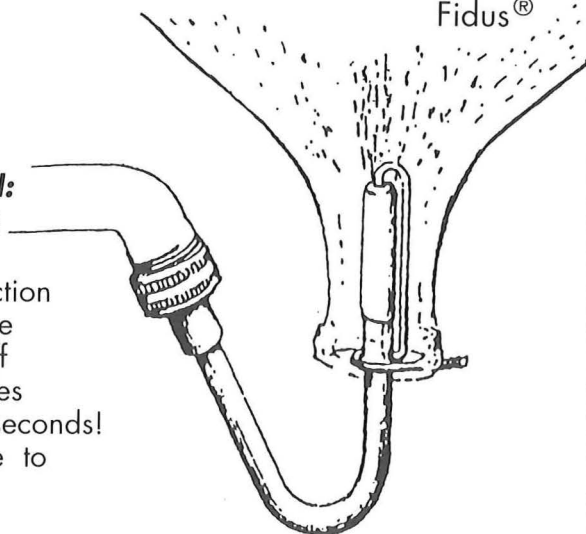
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Dear Professor Turns 15!

By Elizabeth Gold

Where did he come from? How did he learn all he knows? What are the changes he's seen in homebrewing over the years? Has he always had facial hair?

Our Dear Professor Surfeit — an idol to most anyone who's ever gotten close enough to a brewpot to steam their glasses — marks a milestone with this issue of *zymurgy*. We've read his advice for 15 years now and watched him perform at AHA conferences over the years. He's walked most of us through our first few batches of beer and

strengthened our confidence as we branched out into more exotic brews. And in our moments of despair, the good Professor has always reminded us to relax, stop worrying and have a homebrew.

In honor of the 15th anniversary of the American Homebrewers Association, we've contacted Professor Surfeit to bring you a personal view of the man behind the nose. On the other side of a stack of letters written by enthusiastic brewers, the Professor pushed his keyboard aside, lit up a cigar and brought us into his world.

Where else but in Wuryphree, Colo., did Surfeit spend his early clean-shaven years. It was there he met Brewlia, his former wife. "We used to be married," explains Surfeit, "but now we have an arrangement." Together, they have three, four or five children who still eagerly assist with bottling the latest Surfeit concoctions, he adds.

Surfeit received his formal education at You Near Neversity beginning with a cigar appreciation course. From there his studies went underground and six years later, he emerged a brewing genius.

"Then this guy Papazian rang me up to get me on board with *zymurgy*. It took him several tries since I was on a party line at the time," says Surfeit. "The questions were already there waiting for me and they've never been lacking since. Homebrewing, after all, is just one big question."

The Professor's all-time favorite letter, he says, was a Valentine's Day profession of affection from "A Shy Brew Baby." She describes her recurring dream of "standing around a steaming kettle of boiling, frothy wort — our bodies dripping with sweat and our eyes glazed with the sweet stickiness of the moment." See the Summer 1991 *zymurgy* (Vol. 14, No. 2) if you're curious. Luckily Brewlia missed that issue and only reads *Brewing Techniques* now, so the Professor is safe, he sighs in a puff of smoke.

Fifteen years ago, most of the problems posed to the Professor could be addressed and corrected with attention to sanitation tech-



niques. Today the queries lean more toward how equipment, ingredients and process affect flavor balance. Regularly, homebrewers ask about improving yields, explains Surfeit. "A lot more information needs to get out there about all-grain mashing and getting reasonable extracts from them," he says.

The Professor's advice? Watch the quality of your grind and the quality of your water. "Observe what malt looks like when ground properly. Visit a successful brewery or a homebrewer who gets good yields," he explains. "If your water is high in carbonates or bicarbonates, you'll have difficulty getting good yields. Use water that is soft or make it soft by reducing those levels of carbonates and bicarbonates."

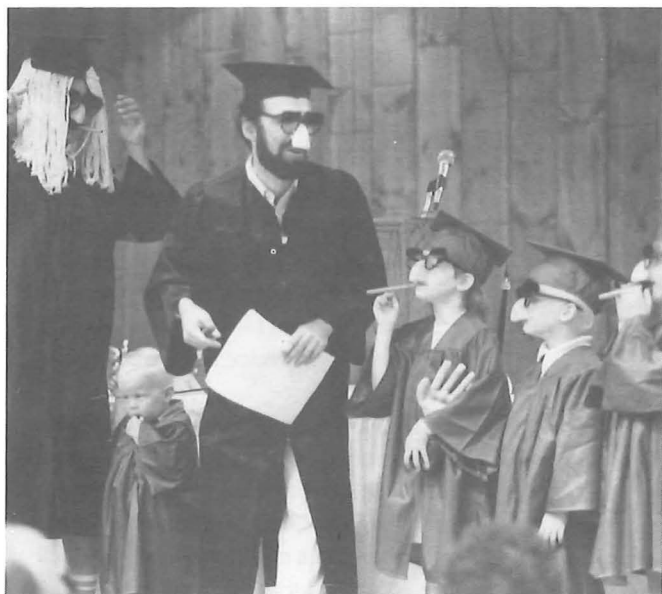
The Professor is still called upon regularly to break the tie between plastic or glass equipment. His recommendation remains that food-grade plastic is fine for the first few batches of beer — but the risk of contamination increases with each use thereafter. "To put the odds more in your favor," says Surfeit,

"use adequate amounts of clean, bacteria-free yeast to get an active culture going. Bacteria will have less of a chance of survival when it's met with overwhelming populations of yeast." He also recommends that you never store anything in your plastic container — rough handling increases the chance of scratches that will thwart sanitation attempts.

If your checking account can handle it, however, glass containers are hands-down better than plastic. Just be sure to handle them carefully, he warns.

And what about the choice between aluminum and stainless steel? Which is better? — ask many letter-writing brewers.

Aluminum can *indeed* be used in the brewing process, according to the Professor. Then why don't professional breweries use it, you ask? "Commercial breweries use caustics which are alkaline in nature to clean their vessels. These chemicals react with the aluminum and create an explosive hydrogen gas — something you *don't* want as an ingredient," explains Surfeit. Elbow grease and a weak solution of chlorine are the best cleaners in a homebrewer's sanitation procedures. Aluminum isn't as strong as other metals, of course, but on the small scale that homebrewers oper-





ate, structural strength is not an issue.

Ingredients take over where equipment ends in determining the quality of your finished brew. To choose the best, you need to basically know your ingredients and experiment with how they affect your beer.

The Professor uses malt as an example for suggesting ways to sharpen your knowledge of *all* ingredients. "The best advice I can offer someone who wishes to understand all about malt is to recommend he or she read at least 10 authors, resources and books about malt and its influence on beer. Take notes and divide them into two groups. Make a list of points that every source generally agrees on and trust those rules, facts, statements and opinions. Then make a list of the points that are either contrary or don't match with other sources. Seek out discussions with "experts" and explore why your sources disagree or why the facts don't match. Stock your refrigerator with several of your own beers to maintain contact with reality while doing this work. When you are through drinking all of your beer and have completed this research, *you* will be an expert. It's an individual thing at a certain point."

Surfeit believes extract brewers can match the quality of grain brewers with the right information, the best methods and good qual-

ity yeast. "The key overall is using fresh quality ingredients," he adds.

"People ask me all the time why a homebrew tastes better. I say it's because I made it. Anyone can say that, and it would be true. Basically there is no difference between professionally brewed beer and homebrewed




beer. You make it how you want it and you drink it at its peak. Remember that "fresh" also has to do with aging. Which is "fresher" — a one-month-old barley wine or a one-year-old barley wine? Is young fresh or is mature fresh? You need to know what you prefer. Fresh really has to do with the time a beer reaches out of its bottle, pinches you and says, "I'm ready for you *now*!"

Ever wonder what type of homebrew system the Professor uses for *his* brews? It all comes from equipment stored in a closet in his basement. One four- and one ten-gallon pot, a wooden spoon and a plastic Zapap lauter tun are his basics. "If I mash, I do it on my stove," he claims. "With big batches, I take some of it outdoors to my Cajun cooker — nothing sophisticated. I use pots to ladle water and hot wort and hand-held strainers to sparge hops."

The Professor explains that 80 percent of his beers are made with malt extract, often in combination with other ingredients. "Sixty percent of that 80 percent are mini-mashes (mash extracts), 10 percent are all grain and my leftover 10 percent is mead. In some ways, mead is more intriguing than beer. There are lots of variables with honey and fruit. You make the mead with what's available each year."

Even though the questions that are today posed to the Professor are in some ways more sophisticated than they were 15 years ago, he says he continues to receive the basic questions that light a fire to his soul. "These questions are the roots of who we are as homebrewers. Those of us who are veteran brewers need to continue making ourselves accessible to the simplest of questions. We've got to remember that no matter how many years we've been brewing or how many brews we've tasted, there's really no such thing as an omnipotent expert. Homebrewing is a hobby and it's supposed to be fun. Enjoy it! You can continue to ask the most technical of questions, but don't let it get you uptight. Keep learning. And relax, don't worry — have a homebrew."

The Professor plans to celebrate the 15th anniversary of the AHA (Dec. 1) by having a beer with Gretchen Graff, the first AHA member. "Then I'll share a brew with Charlie Papazian, smoke a cigar and answer my mail like I do every night," he twinkles. 



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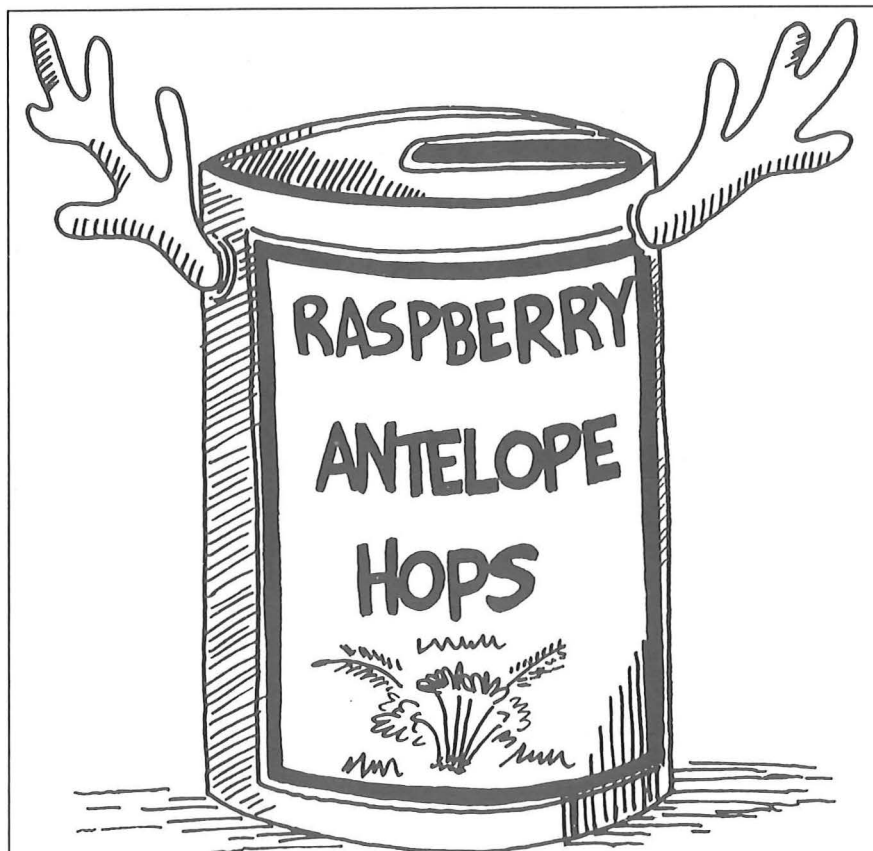
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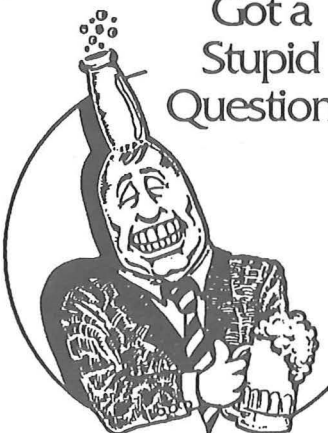
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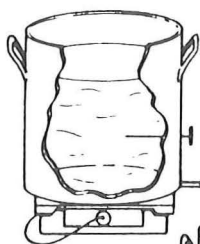
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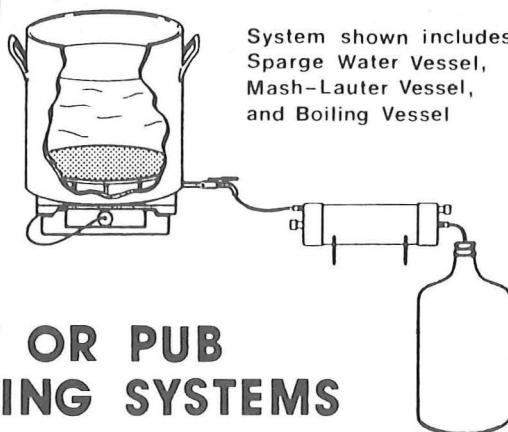
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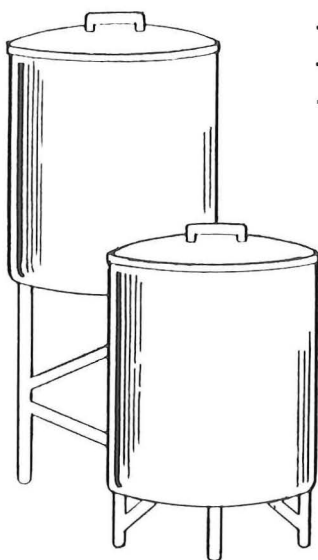
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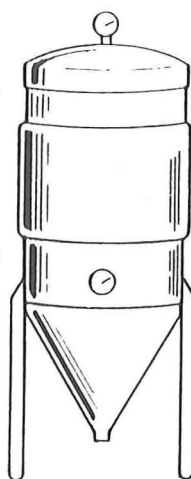
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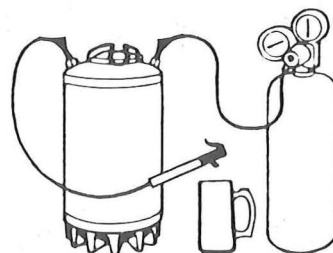
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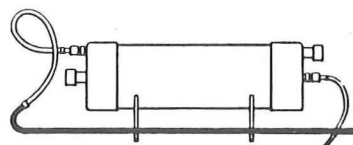
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The Oregon Nut Brown Ale Trail —

Brewing the '93 Commemorative Beer

By Dena Nishek

The task loomed large — it would take 190 pounds of grain, a pound of hops, 16 carboys, an accommodating family room, some 900 bottles and time. In the span of 45 winter days, Christopher Studach brewed 80 gallons of Oregon Nut Brown Ale as the commemorative beer for the 1993 American Homebrewers Association Conference.

It took Studach four days to mull over the process and decide that he could brew the 80-gallon batch.

"I was really honored to have Karen call and ask me to do this. The first thing I wanted to do was say 'yes,' but then I heard this 'no' come out of my mouth," Studach said about the call he received from AHA president Karen Barela. He knew from the start he wanted to, he just had to make sure he could do it right before committing to the task.

"I talked to people, wrote out the whole process and figured out what kind of equip-

ment I needed to beg, borrow or steal," he added.

He wanted to brew the nut brown because of its low-to-middle original gravity — he knew he could serve this beer in peak condition within the time frame — and because it just felt right.

"Oregon Nut Brown Ale seemed to go with the 'Brewing Frontiers' theme of the Conference. It is a specialty beer and homebrewers lead the way in these kinds of styles. The beer really seemed to fit the atmosphere," Studach said.

A brewer since 1985, Studach had quite a bit to figure out before beginning the challenge. He typically brews five-gallon batches so he had to calculate recipe sizing, how to handle the larger batch sizes with his equipment and the pieces he was borrowing, where to brew and how these variables would affect his final product.

"I was changing variables that I usually

handle differently," Studach said, "I had to think about how that would affect the final beer."

Ingredients were donated from malt, hop and yeast suppliers. A few calls convinced Stearns and Lehman, the hazelnut extract manufacturer, that this is a whole new market for their product and landed him all the extract he needed for flavoring his beer.

"I don't know if the AHA would have picked me if they'd have known, but I'm the least technical brewer there is," Studach says, "I'm not into gadgets. I love brewing. I love the brewing process and the hands-on aspect. I'm in it for making good beer regardless of cost or the time it takes. I'm definitely art first, technical second."

Barela knew he was a good brewer. Technical gadgets or not, his beers had won in local competitions and several brewers in the area had recommended him. It took sheer dedication to the art of good beer and a love

of the process to spend four 13-hour days brewing. These made Studach the perfect brewer for the job.

"We'd start between six and seven in the morning and finish around eight at night, then get up and do it again," says Studach, describing the two weekends he, his wife Julianne and friends spent brewing the eight 10-gallon batches. There were never more

than four people helping, Studach said, because there would be too much going on. The brewing went very smoothly, he says, describing his gravity-feed setup. His own and borrowed equipment were assembled outside on his deck for the day-long brewing sessions.

"I borrowed a 15-gallon straight-side sawed-off keg as a boiler. It had a one-inch

pipe and ball spigot at the bottom, which was really nice because the hops didn't plug it up. The lauter-tun was on the railing of the deck leading into the boiler on a borrowed propane burner. When the boil was complete the wort was fed off the edge of the deck through a screened funnel into a carboy."

Studach, the self-described non-gadget man, borrowed an immersion wort chiller



rather than employ his usual technique of cooling the wort in a bathtub of cold water. Heating sparge water on his kitchen stove saved him time because he could overlap steps of the two 10-gallon batches.

"Anything that made heat had a pot on it with friends watching temperatures," Studach says, remembering the temperature-controlled step mash he used.

Brewing outdoors in February in Eugene, Ore., presented some interesting challenges. Studach designed an insulated plywood box to keep the mash pot hot. The plywood design, insulated halfway up the sides with plastic sheeting and gator foam, Styrofoam and Masonite on the bottom and a Styrofoam lid, maintained a constant temperature for more than an hour.

The week before his first brewing session Studach started the yeast, weighed and browned the malt in the oven at 375 degrees F for 40 minutes, crushed the malt and boiled the brewing water. For each 10-gallon batch Studach would dough-in with 10 quarts of tap water, add 10 quarts of boiling water, protein rest for 20 minutes at 122 degrees F (50 degrees C), raise the temperature to 156 degrees F (69 degrees C) for 90 minutes then

mash-out at 170 degrees F (77 degrees C) for 10 minutes. He sparged with 10 gallons of 175-degree-F (79-degree-C) water and recirculated the mash until it was clear. To reduce the sweet wort by three gallons, he boiled for 60 to 90 minutes with hop additions at 45 and five minutes from the end of the boil. The Danish malt extract was added 45 minutes before the end of the boil to contribute a unique malty flavor. The wort was chilled and poured into sanitized 6 1/2-gallon carboys.

"I own five carboys and borrowed 11 more, plus some other equipment, from the Home Fermenter Center," Studach said.

He fermented at room temperature in one of the cooler rooms of his wood-heated home. Studach thinks the cooler fermentation temperatures gave the nut brown ale a nice, smooth finish.

"One night my friend John Maier from Rogue Ales Brewery (Oregon Brewing Co.) stayed overnight in my family room where the 16 carboys happened to be — airlocks bubbling away. Luckily only half of them were in primary fermentation. I apologized to John for the racket in the morning. He said, 'Don't worry, it was music to my ears.'"

Each batch was left in the primary fer-

menter about 12 days. After racking the wort into the five-gallon secondary, he capped each primary fermentation vessel with an airlock to retain the yeast cakes. When he siphoned a new batch into a primary fermenter, it went in on top of the yeast cake.

"Fermentation took right off," Studach said of the repitching method.

After about two weeks in the secondary it was time for bottling. Studach had planned to blend the batches for a more consistent product, but after taking hydrometer readings and sampling the batches he decided no one could tell the batches apart.

"I hated the bottling! It is my least favorite part of the brewing process anyway," Studach confessed. Julianne, thankfully, was very involved with the bottling. They bottled 700 six-ounce bottles and 200 Champagne bottles on their kitchen floor with the traditional bottling bucket on the counter, filler wand, capper and Pure Seal Caps®. It took three long days to complete the task. Nine hundred bottles later, it was time to apply the pregummed labels. Studach, an architect, provided the rough sketches for the label design that was produced by the Association of Brewers staff especially for the commemorative brew.

When bottling and labeling were completed, Admiralty Beverage Co. arrived at Studach's home, palletized the boxes of beer and trucked them to Portland, where the brew was stored at 40 degrees F (4.5 degrees C) in their walk-in coolers.

"Admiralty was great. There was a lot of labor donated in that effort," Studach said.

The beer then had a few months to bottle condition before its debut at the 15th annual Homebrewers Conference July 27 through 30. To say Studach was nervous prior to the Conference would be an understatement. What? With all the relaxing and not worrying he'd done?

"You'd be nervous, too, if you were serving your beer to the pickiest sons of bitches on the face of the earth," Studach said.

A room full of homebrewers with exacting palates would have an effect on even the most relaxed brewer.

"I like it when people like my beers. This was a great opportunity for my peers to sample my beer," he said.

Lots of people like Studach's beers, not



just homebrewers, but professional brewers too. Rogue just brewed a 15-barrel batch of his Oregon Nut Brown Ale to sell to the local market. Rogue already brewed one of Studach's recipes, an imperial stout, that sold out in just four days.

"I've been hit up by three different breweries to be a brewmaster, but I won't do it. They don't pay enough," Studach says. He has a family to support and can't imagine taking a pay cut to brew full time.

"Sure, I have the romantic notion about family-held breweries with traditions passed down to the children, but it boils down to the daily grind of a very physical job," Studach says, "And most professional brewers don't stay homebrewers. Brewing becomes a job and they lose the fun of brewing. I want to keep brewing my five-gallon batches — I'm really into brewing as a hobby."

Oregon Nut Brown Ale

Recipe for 10 gallons

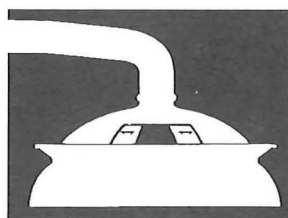
- 14 pounds two-row malt
- 4 pounds domestic two-row malt
roasted in 375-degree-F oven for
40 minutes
- 1 pound 50 'Lovibond British crystal malt
- 1 pound 10 'Lovibond British crystal malt
- 1/2 pound 135 to 165 'Lovibond
British crystal malt
- 1 teaspoon gypsum
- 3.3 pounds unhopped Danish malt
extract syrup
- 1 1/2 ounces Perle hops, 7.8 percent
alpha acid (45 minutes)
- 1/2 ounce Mt. Hood hops (five minutes)
- 1/2 teaspoon Break Brite (Irish moss
treated with sodium bicarbonate)
(20 minutes)
- Wyeast No. 1338 alt yeast
- 2 1/2 fluid ounces hazelnut extract
(added to secondary)
- 1 cup dextrose to prime

•Original specific gravity: 1.060

•Terminal specific gravity: 1.020



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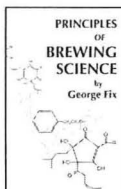
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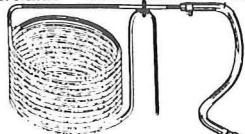
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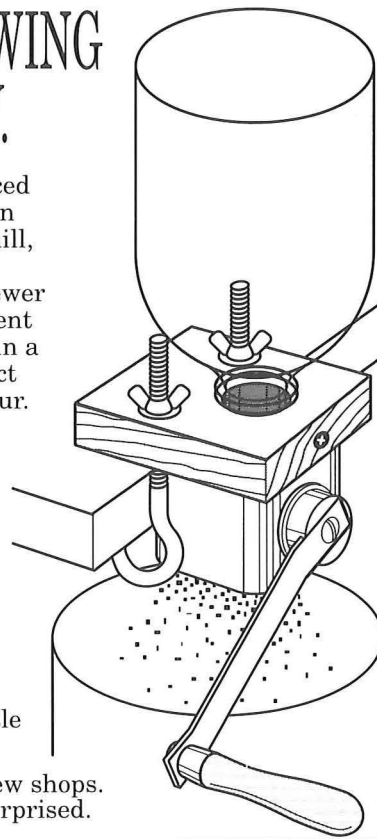
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FOR THE BEGINNER

Fred Hardy

Care and Feeding of Your Carboy

Yes, you know you're supposed to relax, not worry, etc., but not seeing what is happening during primary fermentation in your plastic fermenter is more than you can stand. The beer has been super, so improving quality is not your main concern — you just have to see more of the action. You must have a carboy and \$15, or less if you are a bargain hunter, is a good investment.

A carboy is not essential to making good brew, as thousands of brewers will attest. It is essential if you want to make mead (you'll need two), or if you use a system of extended secondary fermentation common with lagers and some ales because plastic will allow oxygen to seep into the resting brew. So, for curiosity or by necessity, you decide to acquire a carboy. Do not take this decision lightly. A carboy is a precision instrument that requires respect and care if it is to serve you properly.

Like puppies, you may adopt one from a private owner (look for yard or tag sales to find carboys and other brew gadgets for only a few bucks), or from a breeder (homebrew supply shop). Like a puppy, the carboy alone is not enough — there are some ancillary items that make living with the carboy much more pleasant.

First and foremost, realize that a carboy can be very dangerous unless properly handled. The glass is reasonably thick, but it is glass and will break if dropped. Serious injury can result. Even if you escape injury, you can imagine the joy of cleaning five gallons of porter from the new white shag carpet. Remember, a full carboy weighs 50 to 56 pounds and is nothing to play around with.

Safety is simple: Be careful and use a carboy handle. These provide a positive grip for moving the carboy and they can help save

your back. They sell for about \$5 at homebrew shops.

Cleanliness is essential throughout the brewing process, so cleaning the carboy deserves adequate planning and effort. A carboy with dried yeast streaks, wort residue and a beard of lint and dust on the outside probably has wee beasties that will mess with your brew. Consider the carboy to be just what it is: a big glass bottle. Wash the outside of the carboy with any dishwashing detergent and warm water; rinse well to remove any residue. The inside of the carboy presents a different challenge.

To clean the inside pour about an ounce of unscented chlorine bleach into the carboy and fill it to the brim with cold tap water. Cover the neck with plastic wrap secured with a rubber band and set it aside for at least an hour (or overnight or several weeks) before using it for your brew. Before using, drain and rinse well with hot tap water to remove any traces of chlorine and you have a sanitized carboy waiting to do your bidding.

How you clean it depends on how it was last used. If it was already sort of clean (just purchased, or cleaned after the last use) just

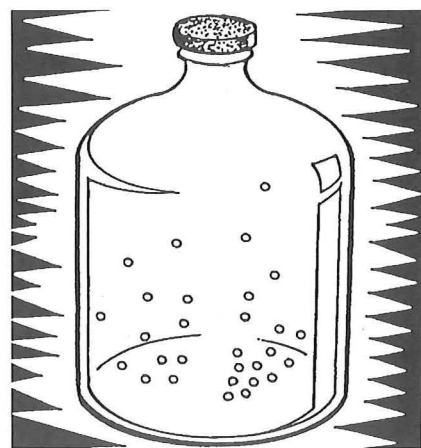


ILLUSTRATION BY MATT BROWNSON

rinse with tap water and proceed to the bleach rest described above. If you just racked your brew out of the carboy after a primary fermentation, cleanup requires a bit more effort. A few special tools can make the job easier.

Primary fermentation (and to some degree, secondary fermentation as well) leaves an ugly residue of hop acids, yeast and caked-on wort around the inside. Because only the most extraordinary brewer can reach inside far enough to scrub the residue by hand, I recommend the purchase of a carboy brush. They are available from any homebrew supplier for around \$4 and are well worth it. A carboy and bottle washer also helps to make the job easier, but is not essential.

Start by rinsing the carboy to remove the spent yeast, remaining brew and any loose particles. Scrub thoroughly with the bottle brush and continue the brush-and-rinse cycle until the carboy appears clean. It is good practice to repeat the bleach rest cycle before storing your carboy until the next use. Drain the bleach solution but don't rinse before storing, cover and store the carboy. Use plastic wrap secured with a rubber band to cover the neck and it will rest contentedly until the next time it is called forth for duty.

All of this rinsing and filling presents a problem of moving water from the sink into the one-inch mouth of the carboy. A pan with a funnel works but usually results in about a quart of water on the floor for every five gallons in the carboy. There is a better way.

Using an aerator adapter in place of the standard aerator on your faucet will let you attach a bottle washer or the female end of a garden hose. Cut a half-inch-diameter garden hose about eight feet from the end with the female coupling and use this segment for rinsing carboys and plastic fermenters. It will prove to be an invaluable tool. The bottle washer is a super timesaver and is great for rinsing both carboys and beer bottles. However, even though I consider mine indispensable, it is not essential for either task.

When you have a cleaned and sanitized carboy, your next concern is how to use it in brewing. There are two cases: primary and secondary fermentation.

Primary fermentation in a carboy may be conducted two ways: either leave enough head space for the fermentation to proceed within the confines of the carboy (about eight

inches), or provide a blowoff tube running from the mouth of the carboy, down the side into a bucket of sanitized water. This method allows the primary fermentation to blow-out all the froth and carbon dioxide while preventing air from coming in contact with the fermenting beer, thus avoiding contamination. Some brewers say the blowoff tube rids the brew of bitter acids and fermentation byproducts and gives a cleaner brew. Others believe it has no effect.

The best and safest blowoff method is to use thick-walled, one-inch tubing available at

most homebrew supply shops. The tubing fits snugly into the carboy neck and costs about \$.20 per foot (you'll need about four feet).

Insert the other end in a quart or so of sanitized water and you have a combination blowoff tube and airlock. Be sure there is adequate space in the container of sanitized liquid to allow up to a quart of additional liquid from the blowoff. I use a clean plastic gallon jug containing two quarts of water to which I add one crushed Campden tablet for sanitizing. I make sure the outlet end of the blowoff hose reaches to within an inch or so

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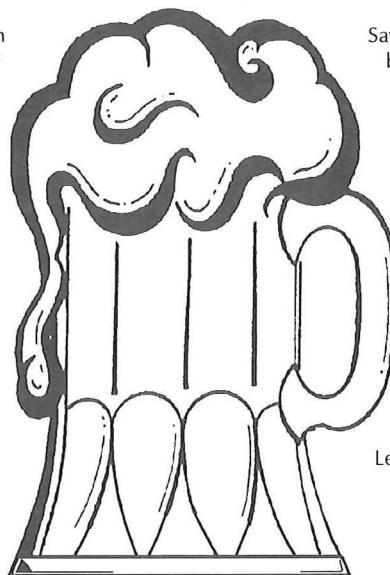
Relax with a dry/toasted or sweet/caramel Malt flavor and vary the texture with malt varieties and other additions.

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of the bottom of the jug, and my setup is complete. This serves as both a blowoff and an airlock until fermentation is complete. But if it reduces your worry, after the foaming subsides it is a simple matter to remove the tubing from the carboy and insert an airlock.

Avoid the orange, two-horned carboy caps designed to accommodate both a blowoff tube and an airlock. The passages through the horns are too small and prone to clogging for the cap to be used safely during blowoff. The caps fit poorly, and clamping the cap on tightly may permit a clog to result in an exploded carboy.

For secondary fermentation there is no concern about blowoff or spillover. The main concern is to prevent air from getting into the carboy. Either the orange carboy cap (adequately snugged with a 1 5/8- to 3 1/2-inch radiator hose clamp available from any auto parts or hardware store) or a Number 6 1/2 drilled stopper will hold an airlock and perform admirably. When using a standard airlock, I like to fill it with 153 proof vodka to make sure no wee beasties enter my brew.

Finally, you may need to transfer hot wort into the carboy so it can cool before adding yeast for primary fermentation. For most extract brewing you will have about 1 1/2 gallons of hot wort. Be sure you have at least three gallons of cool water in the carboy before adding the hot liquid to prevent thermal shock, which can cause the carboy to shatter (remember the white shag carpet). Do not fit the airlock until you are ready to add the yeast. While the liquid is cooling, cover the neck with plastic wrap stretched tightly and secured with a rubber band. Punch a couple of pin holes in the plastic so the brew can breathe. Relax. Don't worry. Have a homebrew. An alternate technique is to cool the wort by placing the kettle in the sink or tub with cold water. Then pour cooled wort into the carboy.

When the liquid is cool, add the yeast, fit the airlock, have another homebrew and enjoy watching the activity that goes on as the yeast busily converts your efforts into a batch of superbrew.

A 30-year computer industry veteran, Fred brewed his first beer 25 years ago using Blue Ribbon malt, table sugar and bread yeast. He brewed his second beer two years ago. He is founder of the Dulles Regional Brewing Society (DREBS), a BJCP beer judge and has won several ribbons with his all-grain beers. 

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WINNERS

C I R C L E

James Spence

Brewing in the winter isn't all that bad. If you live in the South, it's just like summer only nicer. If you're out in your garage or brew house in the great white North, you and your friends can keep warm by the simmering brewpot and sip warm sweet wort from coffee cups. Indoors, turn the football game on and brew to the tune of 50,000 people screaming for their favorite team. For most folks, winter is the perfect time to brew because fermentation tem-

peratures stay lower indoors and the air isn't full of wild yeasts and other summertime nasties that might get into your brew.

Here's the first batch of recipes from second- or third-place winners in the 1994 AHA National Homebrew Competition. These recipes are taken directly from the brewers' entry forms and are the product of different homebrewers who use different processes and equipment to craft their brews. Remember, your results may vary. But, that's okay.

HERB BEER



Third Place
Michael Millerick
Fairfield, Connecticut
"Winterfest Celebration"

Ingredients for 5 gallons

- 9 pounds English two-row pale malt
- 1 pound 60 °Lovibond crystal malt
- 6 ounces chocolate malt
- 6 ounces wheat malt
- 2 pounds Munich malt
- 1/2 ounce Hallertauer hops, 3.2 percent alpha acid (60 minutes)
- 1/2 ounce Cascade hops, 4.8 percent alpha acid (60 minutes)
- 1/4 ounce Eroica hops, 10.4 percent alpha acid (20 minutes)
- 1/2 ounce Cascade hops, 6.7 percent alpha acid (two minutes)
- 1/2 Tettnanger hops, 3.5 percent alpha acid (two minutes)
- 1 teaspoon crushed clove
- 5 3-inch cinnamon sticks, crushed
- 2 teaspoons allspice
- 6 ounces ginger root
- 12 ounces honey
- 6 ground orange rinds
- Wyeast No. 1007 liquid yeast culture
- 3/4 cup corn sugar to prime

- Original specific gravity: 1.088
- Final specific gravity: 1.027
- Boiling time: 60 minutes
- Primary fermentation: seven days at 64 degrees F (18 degrees C) in plastic
- Secondary fermentation: 15 days at 64 degrees F (18 degrees C) in glass
- Age when judged (since bottling): nine months

Brewer's specifics

Mash grains at 154 degrees F (68 degrees C) for 50 minutes. Sparge with 4 gallons 170-degree-F (77-degree-C) water. Boil spices for 20 minutes.

Judges' comments

"Strong malt sweetness balanced by bold expression of spices. Good balance. Might be interesting with more hop flavor and aroma; OK as is."

"Hard to pick out individual spices. Too many different spices, beer lacks clean flavor. Try to isolate flavors. Very good."

"Nice balance of malt, hops and herbs. Ginger nicely subdued. Lingering sharp spiciness. Delicious, nice subtle blend of spices — not easy to do."

"This is so complex — almost like a mild barley wine. I was looking for something distinct from each spice. This is very big and very creamy."



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GERMAN-STYLE ALE



Second Place

Bruce Cornell

Baton Rouge, Louisiana

"Xmas Eve Kölsch"

Kölsch

Ingredients for 5 gallons

- 4 pounds Alexander's pale malt extract
- 2 pounds American Eagle light dry malt extract
- 1 pound Munich malt
- 1/4 pound crystal malt
- 3/4 ounce Perle hops, 6.8 percent alpha acid (60 minutes)
- 1/2 ounce Perle hops, 6.8 percent alpha acid (30 minutes)
- 1/2 ounce Tettnanger hops, 4.2 percent alpha acid (two minutes)
- Wyeast No. 1007 liquid yeast culture
- 3/4 cup corn sugar for priming

- Original specific gravity: 1.048
- Final specific gravity: 1.024
- Boiling time: 65 minutes
- Primary fermentation: four days at 72 degrees F (22 degrees C) in plastic
- Secondary fermentation: 13 days at 72 degrees F (22 degrees C) in glass
- Age when judged (since bottling): six months

Brewer's specifics

Steep grains at 160 degrees F (71 degrees C) for 30 minutes.

Judges' comments

"Dry, bitter finish, medium bitterness. Deep golden color too dark for style. Hoppy aroma, too hoppy for style. Very good."

"Very little hop or malt flavor. Slight sour aftertaste. Could use more hops."

"A little sweet, but dry finish. Pleasantly complex flavor that is hard to pin down. Very drinkable with a catchy flavor."

"Green, seaweedy. Lingering graininess. Good bitterness level and dryness."

"Malt OK; good conditioning, good balance."



MUNICH HELLES



Second Place
Keith Weerts
Windsor, California
"Munich Pils"

Ingredients for 5 gallons

- 4 pounds Klages malt
- 6 pounds Belgian Pils malt
- 1/4 pound dextrin malt
- 34 grams Saaz hops, 3.2 percent alpha acid (60 minutes)
- 5 grams Saaz hops, 4.9 percent alpha acid (30 minutes)
- 22.6 grams Saaz hops, 3.2 percent alpha acid (15 minutes)
- 5.7 grams Saaz hops, 4.9 percent alpha acid (15 minutes)
- 5.7 grams Saaz hops, 4.9 percent alpha acid (finish)
- Wyeast Bohemian liquid yeast culture
- force-carbonated

- Original specific gravity: 1.049
- Final specific gravity: 1.015
- Boiling time: 90 minutes
- Primary fermentation: 11 days at 48 degrees F (9 degrees C) in glass
- Secondary fermentation: 18 days at 34 degrees F (1 degrees C) in glass
- Tertiary fermentation: 20 days at 33 degrees F (1 degree C) in stainless steel
- Age when judged (since bottling): three months

Brewer's specifics

Mash grains for 90 minutes at 156 degrees F (69 degrees C).

Judges' comments

"Sour aroma and rich sweetness would limit me to one or two pints. Would be dynamite if it were a bit drier and fermented cooler."

"Slight oxidation and some mash oxidation/harshness. A little over-carbonated and too bitter."

"Very full and intense malt flavor, DMS quite heavy even for style. This beer is tasty and pretty much in style. Body too full for style."

"Nice flavor, slightly overhopped for style which left the beer marginally balanced, but very good overall."



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|------------------|-------|-------|------------|-------|
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| Alc /vol | | 5 | 5.8% | 6.5 |
| IBU | | 40 | 52 | 65 |
| Color | | 8 | 8.7 | 14 |
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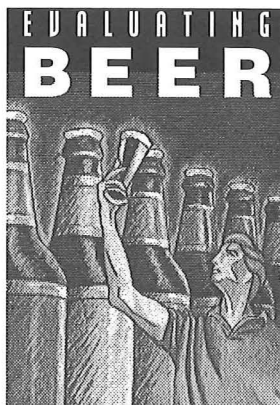
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ENGLISH-STYLE PALE ALE



Third Place
Matt Hussey and Casey Lott
Portland, Oregon
"Welsh Hat Gathering IPA"
India Pale Ale

Ingredients for 5 gallons

- 7 pounds Steinbart's light malt extract
- 2 pounds U.S. two-row malt
- 2 pounds 40° Lovibond crystal malt
- 1 ounce Centennial hops, 11 percent alpha acid (60 minutes)
- 3/4 ounce Willamette hops, 7 percent alpha acid (30 minutes)
- 2 ounces Cascade hops, 6 percent alpha acid (five minutes)
- 3/4 cup corn sugar to prime
- EDME dried ale yeast

- Original specific gravity: 1.064
- Final specific gravity: 1.016
- Boiling time: 60 minutes
- Primary fermentation: seven days at 65 degrees F (18 degrees C) in glass
- Secondary fermentation: 10 days at 60 degrees F (16 degrees C) in glass
- Age when judged (since bottling): six months

Brewers' specifics

Steep grains and extracts at 150 degrees F (66 degrees C) for 60 minutes.

Judges' comments

"Right on! Well-balanced. All traits individually form excellent IPA."

"Needs a little more bitterness. Aftertaste a little harsh. Very drinkable."

"Could have more bitterness and more alcohol for an IPA. Not quite dry enough. Body a little thin."

"Needs more malt and alcohol for style. Very good beer."

"Hop bitterness appropriate, could use more hop flavor, alcohol level okay."



BOCK



Alan Barnes
Nashville, Tennessee
"Super Bowl Bock"
Helles Bock

Ingredients for 5 gallons

- 9 1/2 pounds Klages malt
- 1/4 pound crystal malt
- 1/2 pound CaraPils malt
- 1 ounce Perle hops, 6.2 percent alpha acid (60 minutes)
- 1 ounce Saaz hops, 3.2 percent alpha acid (five minutes)
- Wyeast No. 2206 liquid yeast culture
- 1 1/2 cups dry malt extract to prime

- Original specific gravity: 1.060
- Final specific gravity: 1.010
- Primary fermentation: 30 days at 58 degrees F (14 degrees C) in glass
- Age when judged (since bottling): 17 months

Brewer's specifics

Mash grains for one hour at 154 degrees F (68 degrees C).

Judges' comments

"Slightly stale, slight diacetyl. Good color. Malt flavor could be more pronounced. You hit the style just great."

"Perhaps slightly overcarbonated. Nice sweet malt dominates flavor. Hops balance malt nicely. Cut back on bottling sugar. Very nice beer."

"Nice malty feel. Good balance of malt and hops. A pleasant, drinkable beer with no serious flaws. Good brewing technique and control."

"Though a little thin, the beer has a very nice hop-malt balance. Well done."

"Good malt sweetness. Very clean, nice balance. Maybe just a bit dark."

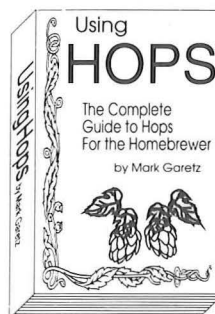


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VIENNA/MÄRZEN/ OKTOBERFEST



**Second Place
John M. Roberts
Jamaica Plain, Massachusetts
"The Hunt for Red Oktoberfest"
Märzen/Oktoberfest**

Ingredients for 6 gallons

- 8 pounds Munich malt
- 5 pounds Klages malt
- 1/2 pound crystal malt
- 1/2 pound wheat malt
- 1 ounce Saaz hops, 3.1 percent alpha acid (60 minutes)
- 1 ounce Saaz hops, 3.1 percent alpha acid (30 minutes)
- 1/2 ounce Hallertauer hops, 2.9 percent alpha acid (10 minutes)
- 1/2 ounce Hallertauer hops, 2.9 percent alpha acid (dry)
- Wyeast No. 2206 liquid yeast culture
- forced carbonation

- Original specific gravity: 1.056
- Final specific gravity: 1.010
- Primary fermentation: 14 days at 52 degrees F (11 degrees C) in glass
- Secondary fermentation: 21 days at 35 to 40 degrees F (2 to 4 degrees C) in glass
- Age when judged (since bottling): three months

Brewer's specifics

Mash grains at 152 degrees F (67 degrees C) for 20 minutes. Raise temperature to 158 degrees F (70 degrees C) for 30 minutes. Raise to 168 degrees F (76 degrees C) for five minutes.

Judges' comments

- "Slightly overhopped. Very nice malt, alcohol appropriate."
- "Malt is a bit low and hops a little high. Very drinkable beer, very nice. Misses the style a bit but tasty."
- "Very clean, could use more malt and less hop flavor."
- "Needs more toasted malt nose. Too much hop nose. Very clean."



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SCOTTISH ALE

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Jerry S. Dahl
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"Hop Scotch Ale"**

Ingredients for 5 gallons

- 13 pounds Klages malt
- 1/2 pound crystal malt
- 1/2 pound toasted Munich malt
- 5 ounces Munich malt
- 4 ounces black patent malt
- 2 1/5 pounds Premier dark hopped malt extract
- 1 pound brown sugar
- 1/2 ounce Willamette hops, 4.2 percent alpha acid (60 minutes)
- 1/2 ounce Cascade hops, 5.7 percent alpha acid (60 minutes)
- 1/2 ounce Bullion hops, 10 percent alpha acid (30 minutes)
- 1/2 ounce Willamette hops, 4.2 percent alpha acid (30 minutes)
- Wyeast No. 1056 liquid yeast culture

- Original specific gravity: 1.092
- Final specific gravity: 1.025
- Boiling time: 60 minutes
- Primary fermentation: 28 days at 75 degrees F (24 degrees C) in glass
- Age when judged (since bottling): 14 months

Brewer's specifics

All grains mashed for 1 hour 45 minutes at 150 degrees F (66 degrees C).

Judges' comments

"Some tang, but super malt! Shazam! Marry me."

"Great malt flavor, just a bit cidery. Good balance. My Scottish ancestors are smiling over this one."

"Very rich malt, excellent roasted quality, some sweetness, very good finish. A really good beer."

"Molasses, toffee flavor, rich malt, a bit syrupy."

"Alcoholic. Licorice in finish, molasses lingers in the finish. Nice hopping and balance."

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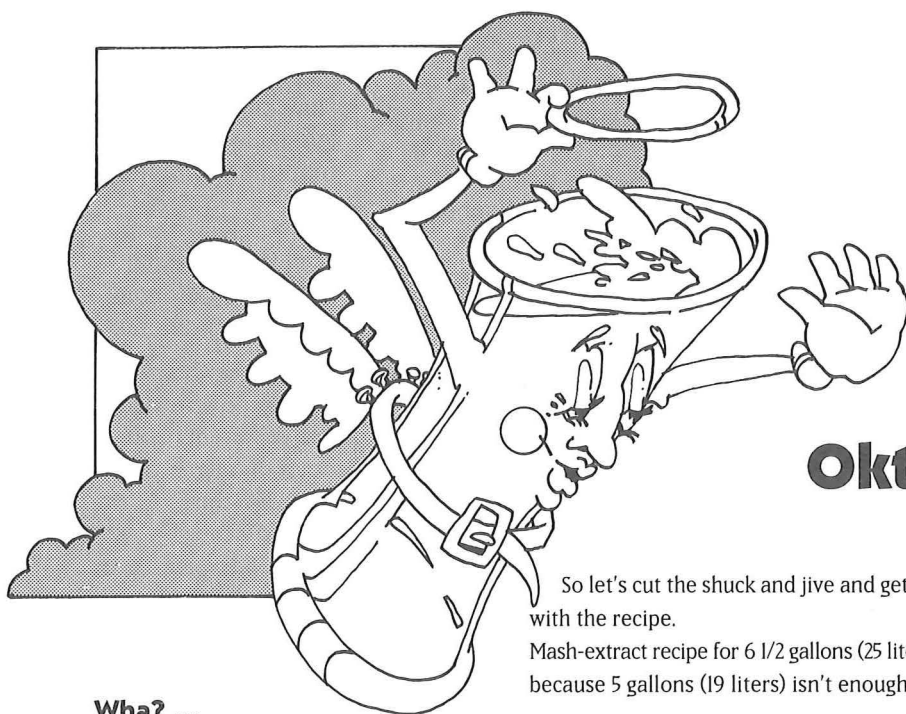
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WORLD OF WORTS

Charlie Papazian



Here to Heaven

Oktoberfestwine Ale

Wha? ... Oktoberfestwine Ale?

No, I haven't gone bonkers. It's just that I have found the sublime and it appears to be a direct connection from here to heaven. I really appreciate the rich malty tawny character of German-style Oktoberfests, while at the same time knowing a barley wine ale made in the style of a superstrength Oktoberfest would suit my fancy. Rich, malty, amber-hued with a distinct character of German hops and a hint of American Cascade for a German-British-American hybrid. Sure, there are a lot of hops in this recipe, but because of the richness and abundance of malt the overall bitterness is subdued.

This sipping brew has 9 1/2 percent alcohol by volume. As with every single homebrew you've made, this too should be brought out for special occasions. It ages well. Bottling to within one-half inch (1.2 cm) of the crown cap will minimize the effects of oxidation. Oxygen-absorbing Pure Seal Caps® are also recommended to help extend freshness.

So let's cut the shuck and jive and get on with the recipe. Mash-extract recipe for 6 1/2 gallons (25 liters) because 5 gallons (19 liters) isn't enough.

For the mash

- 3 pounds (1.4 kilograms) crushed pale malt
- 1 pound (0.45 kilogram) crushed Munich malt
- 1 pound (0.45 kilogram) crushed Vienna malt
- 1 pound (0.45 kilogram) crushed crystal malt
- 1/2 pound (0.23 kilogram) dextrin malt (light crystal or CaraPils)

Add to the mash runoff

- 13 pounds (5.9 kilograms) light dried malt extract

And boil with hops:

- 36 Homebrew Bittering Units, 4 ounces (114 grams) of 9 percent alpha-acid rated German Northern Brewers whole hops for bittering

- 6 Homebrew Bittering Units, 1 1/2 ounces (43 grams) of 4 percent alpha-acid rated German Hallertauer whole hops for flavor
- 1 Homebrew Bittering Unit, 2 gallons (7.6 liters) prechilled water for primary (see note below)
- 7/8 cup (207 milliliters) corn sugar for bottling
- ale yeast (American ale Wyeast No. 1056 is recommended) with a healthy and vigorous starter

- Original gravity: 1.098 to 1.102 (24.5 to 25.5 °Balling)
- Final gravity: 1.028 to 1.034 (7 to 8.5 °Balling)

Use a step infusion mash to mash the grains. Begin by adding 6 1/2 quarts (6.2 liters) of 130-degree-F (54.5-degree-C) water to the crushed grain, stir, stabilize and hold the temperature at 122 degrees F (50 degrees C) for 30 minutes. Add 3 1/2 quarts (3.3 liters) of boiling water, stabilize the temperature at about 148 to 152 degrees F (64 to 67 degrees C) and hold for about 60 minutes. Temperature may

be allowed to drop from 152 to 148 degrees F (67 to 64 degrees C) with no worrying.

After conversion, raise temperature to 167 degrees F (75 degrees C), laut and sparge with 3 gallons (11.4 liters) of 170-degree-F (77-degree-C) water. Collect about 4 gallons (15.2 liters) of runoff, add the malt extract and bittering hops then bring to a full boil.

Boil for about 90 minutes. When 20 minutes remain add six HBUs of flavor hops. After a total wort boil of 90 minutes turn off the heat and add one HBU of aroma hops and let steep two to three minutes before straining and sparging into a sanitized fermenter to which you've added 2 gallons of water. It helps to prechill the water to 33 degrees F (1 degree C) before adding it to the fermenter rather than simply adding warmer tap water.

Note to advanced brewers: because of the high density of the boiled wort it is very difficult to calculate the exact bitterness of this recipe in terms of International Bittering Units. A rough approximation would be from 55 to 70 International Bittering Units.

Primary ferment with ale yeast. Rack your brew after primary fermentation into a secondary fermenter and ferment to completion.

Prime with sugar and bottle when fermentation is complete.

Let age at least three or four months in the bottle before sampling. Heaven can wait, but when this brew is ready you'll feel the connection from here to heaven. I guarantee it.

HOME BREW BITTERING UNITS

Homebrew Bittering Units are a measure of the total amount of bitterness in a given volume of beer. Bittering units can easily be calculated by multiplying the percent of alpha acid in the hops by the number of ounces. For example, if 2 ounces of Northern Brewer hops (9 percent alpha acid) and 3 ounces of Cascade hops (5 percent alpha acid) were used in a 10-gallon batch, the total amount of bittering units would be 33: $(2 \times 9) + (3 \times 5) = 18 + 15$. Bittering units per gallon would be 3.3 in a 10-gallon batch or 6.6 in a 5-gallon batch, so it is important to note volumes whenever expressing bittering units.



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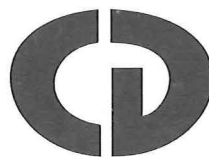
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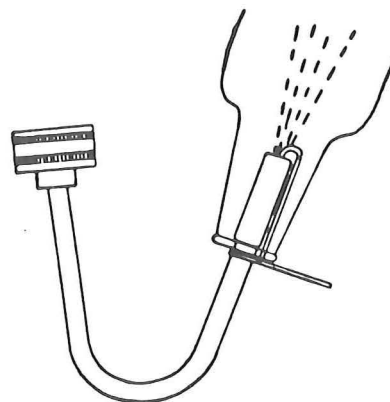
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Professor Surfeit

DEAR

P R O F E S S O R

Mostly Malt

Dear Professor,

I am a recent addition to the world of homebrewing, but I already believe I have found a lifetime hobby. I am the resident hall coordinator for Dorchester Hall at St. Mary's College of Maryland. My staff and I decided at the beginning of the year that it would be fun to brew our own beer. Honestly speaking, it has turned out better than we had imagined. We have had a considerable degree of success with the Superbrau malt and have brewed Canadian lager, amber and dark.

Could you give us young brewers a few insights into homebrewing that would further us on our way? Do you have any malts that you recommend? Also, how does the Superbrau truly measure up compared to other hopped malts?

I appreciate the time you would take to help us relax and have a homebrew!

Sincerely,
Allen Cosentino
St. Mary's City, Maryland

Dear Allen,

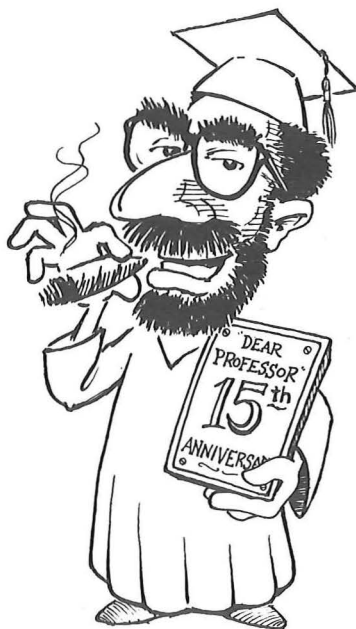
Taste is in the mouth of the beholder. There are hundreds of malts from which to choose. Which is best or better? I wouldn't dare give you my opinions, because even I haven't tried them all. What I would recommend is to look up prize-winning recipes and see what the judges have to say about the brew. Remember, good malt does not a great beer necessarily make, but it can be a good start.

I also recommend you look at the labels of the malt you buy. Some malt extracts are not all barley malt. Some list barley, malt and

others list barley malt. There is a difference. "Barley" can refer to barley syrup that is enzyme-produced barley sugar, not malt. Some labels will list glucose, corn syrup, caramel and hop extract. If you experiment with these kinds of malt, note whether you like the character. If you don't, then switch to all barley-malt extracts. If you like them, then stick with them. Generally speaking, all-barley malt extracts tend to experience healthier and more complete fermentations — and better tasting beer in my opinion. Except (there's always an exception, isn't there?) when you want to brew a lighter bodied American-style lager beer when the use of corn or rice will add to that particular character.

Remember, young brewers grow up to be old brewers. And old brewers have the option of being wise.

Wise and wizen,
The Professor, Hb.D.



Cheap Chills

Dear Professor,

During the eight years I have been brewing (I don't count two batches I made in garbage cans in the early '70s) and reading *zymurgy*, I have seen many strange, complicated and expensive devices for chilling wort, most of which I am sure work effectively. However, I have never seen anyone suggest the simple inexpensive method that I use with great success.

My wort chiller consists of three two-liter soft-drink bottles (the kind without the black plastic bottoms) that have the labels and all glue removed. I also recommend plastic bottle caps be used instead of metal. I clean and sanitize the bottles and fill them with 85 percent water, cap and freeze.

When I am ready to chill my wort, I remove the bottles from the freezer, resanitize the exterior, rinse very well and place them in the wort. It chills the wort in about 20 minutes. More bottles may have to be used if you boil the entire batch. After chilling, I rinse the bottles and return them to the freezer.

It's cheap, but effective,
Joe Fezio
Mandeville, Louisiana

Dear Joe,

Terrific idea. Just continue to stress that sanitation, sanitation, sanitation. Freezers and refrigerators are wild with beasts. Thanks for the tips.

No frills,
The Professor, Hb.D.

Great Gypsum!

Dear Professor,

Mostly I've been relaxing and enjoying homebrew, but the more I read your fine publication, the curiouser and curiouser I get over the eight teaspoons of gypsum called for in Papazian's Dark Sleep Stout. According to "Beer from Water" (*zymurgy* Winter 1991 Vol. 14, No. 5), that's 472 ppm calcium and 1,136 ppm sulfate. What's the scoop?

A curious but still relaxed backdoor brewer,
Rick Pauly
Charlottesville, Virginia

Dear Rick,

Good call. I know about that recipe and talked to Papazian about the huge amount of gypsum. He said he has personally brewed every recipe in his book. They come right out of his brewing log. He noted that despite all theory, this beer created a lot of smiles and pleasure for many of his friends, so he decided to include the recipe as he brewed it.

I know Charlie and he does a few other things that totally baffle me. He told me that he has a culture of yeast that he has been using for nine years and never has cultured it on a slant. He keeps it under beer all of the time in his beer fridge. He even told me he didn't feed it for a whole year and it still cultured up and brewed a great beer. That's baffling because all the books say yeast won't survive unless you feed it. Well, whatever he does, it works. I guess the final word is whether the beer tastes good. I've had his Dark Sleep and, well, it is good.

But if you can't relax with eight teaspoons of gypsum, like he says in his book, substitute your own inclinations and relax, have fun, have a homebrew.

Not bent,
The Professor, Hb.D.

Beer Slush and New Math

Dear Professor Surfeit,

Thank you for your letters with answers on (most) of my questions. I think I have found the answer to the question: At which tem-

perature below 0 degrees C I must worry when I store my beers outside? In *Handbook for the Study of Malting and Brewing Technology* by Gilbert Baetsle, a professor in Gent, Belgium, I found a formula for calculating the freezing point of beer: $-(0.42 \times A + 0.04 \times p + 0.2)$ degrees C, where A = alcohol content by weight (w/v percent) and p = original gravity in w/v percent. For a German vollbier, Pilsener type (original gravity = 12 percent (close to degrees Plato) and 5 percent alcohol by volume = 4 percent alcohol by weight), it will be: $-(0.42 \times 4 + 0.04 \times 12 + 0.2) = -2.36$ degrees C or -19 degrees F. Because my beers are almost never below 6 percent alcohol by volume, I only get worried when the outside temperature gets lower than -19.3 degrees F.

Greetings,
Hans Aikema
Netherlands

Dear Hans,

What a great bit of information. Thanks, I appreciate your passing it on and think readers of *zymurgy* will as well. Adios amigo.

Not too cool,
The Professor, Hb.D.

Not Oakey Dokey

Dear Professor,

Santa brought me a new five-gallon oak cask for Christmas to use in my beer making. This cask is made from American oak, which I understand will give off more flavor than European oak. Is there any way I can condition my cask to make it acceptable for homebrewing? I would also be interested in getting another cask made from European oak. Do you know of any source in the United States for these?

Best regards,
Clint Corwin
St. Charles, Illinois

Dear Clint,

Almost any homebrew supply store that also deals with winemaking supplies can get an oak barrel for you. That should be no problem. Using oak barrels for storing beer can

be tricky business. Traditionally in England and old America oak barrels were lined with brewers pitch and in England they still are. Having your beer face-to-face with new oak would make a mighty oakey beer. From what I have tasted and from the experience of others I don't recommend exposing your beer to new oak. The beer becomes unpalatable.

If your oak barrel is a wine barrel, this is a problem as well because they are not designed to hold pressure or dispense beer. Problems, problems, who's got the problems. So I'd recommend using your oak barrels for wine or mead and do so with care and information from winemaking experts.

Not oak hey,
The Professor, Hb.D.

U.K. O.K.

Dear Professor,

For the past year or so, I have tried a variety of homebrew concoctions desperately trying to brew Bass Pale Ale. Admitting my failure, I am now turning to you for your expertise. I am an extract brewer — I steep specialty grains but do not mash.

Your help would be greatly appreciated. Thank you in advance for your time and consideration. I look forward to hearing from you soon.

Brewingly yours,
Ronald Jantz
Reisterstown, Maryland

Dear Ronald,

There's Bass Pale Ale bottled, exported and enjoyed in America and then there's Bass on draft in America and then there's Bass Pale Ale on draft and bottled in the U.K. Each, I think, is distinct. So describe to me what flavors you wish to get.

In the meantime I'd recommend using some good liquid English ale yeasts and using the lightest of the light extracts and adding about one to 1 1/2 pounds of light crystal malt to the batch. And be sure to use English-grown hops such as Fuggles or Kent Goldings for best results.

See U.K. later,
The Professor, Hb.D.

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New Product descriptions are submitted by manufacturers and distributors and are printed here for reader information. These claims are made by manufacturers and/or distributors and do not imply testing by *zymurgy*. For more information, contact Linda Starck at (303) 447-0816.

Yeast Life Jacket

The Yeast Life Jacket, a wet suit jacket for a five-gallon glass carboy, is new from Beer By You. It is made out of one-fourth-inch neoprene wet suit material and is covered on both sides by nylon, making it durable and waterproof. It is machine washable and has a heavy-duty zipper.

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For more information on the Yeast Life Jacket, contact Beer By You on CompuServe at 71521, 3727, or call (818) 718-2739, or write to 350 Island View Circle, Port Hueneme, CA 93041. Manufacturers suggested retail price is \$47.95.

The Carbonator

A new product from Benjamin Machine Products addresses the problem of easily and accurately carbonating homebrew. The three-sixteenth-inch diameter in-line (or pin-point) Carbonator provides accurate and complete carbonation of beer, soda and mead. The Carbonator is intended for use with homebrew-type kegging equipment to carbonate the beverage as it is transferred between kegs. It can also be

used in conjunction with a filter system to produce a completely finished beer in a short period of time.

Manufacturers' suggested retail price is \$69.95 plus postage and handling. To order call or FAX Benjamin Machine Products at (209) 523-8874.

Beer Siphon Kit

Lowenbitter Brewing Supplies has developed a siphoning kit for homebrewers that helps reduce the risk of beer contamination. The Sucking Thing is made of a bulb suction pump, plastic body and hose barb that attaches to a racking hose. All parts are removable to facilitate cleaning.


The suction created by the pump eliminates the need to start the siphon by sucking. The Sucking Thing reduces the risk of contamination and is safe to use when transferring boiling wort. Once the siphon is started, remove the pump and rack the beer normally.

Manufacturer's suggested retail price for The Sucking Thing is \$12. Available through Lowenbitter Brewing Supplies in Ukiah, Calif. To order contact Mark Lowe, inventor and brewer, at (707) 468-8366.

Glatt Malt Mill

Glatt Machining has introduced a hand-cranked adjustable roller mill with a hopper capacity of 2 1/2 pounds. The Glatt Malt Mill can handle two-row, six-row, crystal and wheat malts with an adjustment of the rollers. The cracked malt can be collected in any receptacle that is placed under the dump chute. Suggested retail price is about \$80 and dealer inquiries are invited. For the name of a dealer near you or for more information write to Glatt Machining, 920 Stanley Dr., College Place, WA 99324, (509) 529-2084.

Bottle Washer

Fermenthaus has developed a bottle washer to address the "water hammering" problems with household plumbing resulting from inadequate valve control, restriction of water flow because of valve actuator design and the safety concerns relating to lead-solder joints in what is a high-temperature pressurized vessel. The Fermenthaus valve design and position results in water flow being controlled prior to entering the washer tube, which means the tube is not pressurized when off and yet allows 100 percent flow when fully on. The suggested retail price for the Fermenthaus bottle washer is \$20. To order contact Fermenthaus at Box 4220, Victoria, B.C., Canada V8X 3X8, (604) 386-1023, FAX (604) 386-9733. 

zymurgy inadvertently printed incorrect prices for G.W. Kent's Yeast Lab Liquid Yeast Cultures in New Products, Fall 1993 (Vol. 16, No. 3). G.W. Kent does not sell directly to homebrewers, which was incorrectly implied in the information published. For information on this product, contact your retailer directly.

The phone and fax numbers for HopTech were transposed. To reach HopTech, call (510) 736-2350, FAX (510) 736-7950.

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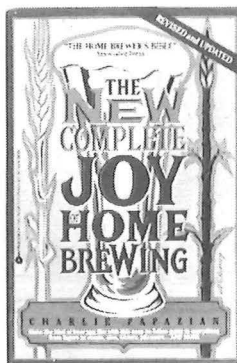
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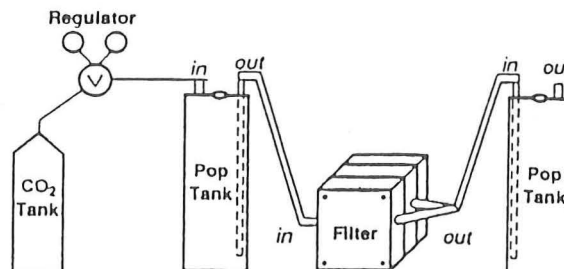
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THE BEST FROM KITS

David Coy

I like to brew. No, I *really* like to brew. And after drinking a couple of pints of my latest, I even find that I like the scrubbing and sanitizing and cleaning and sanitizing and washing and sanitizing that accompany brewing tasty homebrew. What I really enjoy about homebrewing, though, is the opportunity to share the experience. Whether bringing beer to the local homebrew club, sharing a pint with neighbors, or sitting down with my wife for a quiet pint in the evening, beer tastes best when shared with friends.

For us, brewing is a family affair. Usually our first step is to prepare a yeast starter. We almost exclusively use liquid yeast cultures and our experience with some of the beers brewed for this article won't be convincing us to go back to dry yeast any time soon. To build up a proper yeast count, we generally can 27 to 34 ounces of wort (see recipe below). The activated yeast pouch is then added and allowed to grow for one to three days. This is my three-year-old daughter's favorite part as we usually pour off any excess sweet wort into small bottles that my daughter gobbles up as if it were candy.

Yeast Starter

For 1 quart of yeast starter

- 1/2 cup light dry malt extract
- 2 tablespoons corn sugar

Bring about 1 quart of water to a boil and add the dry extract and corn sugar. Boil for five to 10 minutes to coagulate protein in the extract. After boiling, force cool (I usually set the pan in a sink with very cold water). Once cooled, pour off 27 to 34 ounces of the cleared extract into your starter jar (Erlen-

meyer flasks work great). The remaining extract can be added to the small "snack" jars mentioned. "Can" the extract by placing the jars or flasks in a boiling water bath for 20 to 30 minutes. Canning time varies with altitude, 20 to 30 minutes works for me at a mile above sea level. *Do not tighten the lids yet — you can blow the jars up!* Follow proper canning methods. After canning, place lids or a cotton stopper in the necks covered with aluminum foil and allow to cool. You will have sterile, ready-to-inoculate wort that can be saved in your refrigerator until one to three days before brewing. I usually use mine within the week. The small jars are ready to enjoy as soon as they are cooled.

Brewferm Christmas

These Belgian kits are becoming very popular and all seem to produce unique beers. According to the information packet, this is the strongest of their kits.

Recipe for 1.8 gallons

- 1 can (3.3 pounds) Brewferm Christmas kit
- 7 grams dry yeast included with kit
- 1/8 teaspoon red Irish moss
- OG: 1.060
- FG: 1.022

I added the extract to 1.8 gallons of boiling water and boiled for 15 minutes with the red Irish moss (a finely powdered Irish moss available at some homebrew shops). The beer was force-cooled and the rehydrated yeast added. The finished beer was dark brown with a brown, long-lasting head. It was full-bodied with an intense malt flavor and aroma. Bitterness was appropriate, but



on the slightly sweet side. I assume that the yeast is fairly attenuative, so I was surprised at the relatively high final gravity. This kit would provide an interesting base for experiments and would definitely make a good beer if fermented with a clean lager yeast.

Glen Brew Chairmans Trophy Bitter

Kudos to Glen Brew for providing a seven-pound beer kit that forgoes the common suggestion to add refined sugar. The label states that the beer's original gravity will be 1.044 and it wasn't too far off. The "secret brewers yeast" provided with the kit, however, seems to offer little to the beer's quality.

Recipe for 6 gallons

- 1 can (7 pounds) Glen Brew Chairmans Trophy Bitter kit
- 1 ounce Kent Goldings pellet hops
- 1 10-gram packet of "secret brewers yeast" (included in kit)
- 1/4 teaspoon red Irish moss
- OG: 1.042
- FG: 1.008

My wife and I brewed this beer by adding the 7-pound kit to 6 gallons of boiling water and boiling with the Irish moss for 15 minutes. The finishing hops were added during the final five minutes of the boil. The beer was then force cooled with an immersion wort chiller and the rehydrated yeast added.

Fermentation was quick and fairly attenuative. The finished beer was a deep amber color with slightly red highlights and a tan head that collapsed fairly quickly. The beer had a noticeable caramelized malt aroma and a distinct yeast bite that I fear will not age out. The beer also had a noticeable green-apple aroma and flavor. Although the beer had a nice "session beer" gravity and balance, I fault it for a wild yeast infection.

Young's Heantun Ales City Bitter

My wife, Cherri, chose to brew two versions of City Bitter, one mostly following the kit's instructions and one hopped up.

Recipe for 6 gallons (kit's instructions)

- 1 can (4 pounds) Young's Heantun Ales City Bitter kit
- 3 pounds Wine & Hop Shop Gold Extract Syrup (substituted for sugar)
- 1/4 teaspoon red Irish moss (15 minutes)
- Wyeast No. 1056 liquid yeast cultured to yield 3 2/5 ounces of yeast slurry
- OG: 1.044
- FG: 1.012

Boil the extract kit and extract syrup with 6 gallons of water for 15 minutes. Force cool with an immersion wort chiller and pitch the yeast from a 34-ounce starter. Fermentation was quick and fairly attenuative.


Recipe for 6 gallons (hopped-up version)

- 1 can (4 pounds) Young's Heantun Ales City Bitter kit
- 3 pounds Wine & Hop Shop Gold Extract Syrup (substituted for sugar)
- 1 ounce Morris Hanbury Kent Goldings hop plugs (60 minutes)
- 1 ounce Morris Hanbury Kent Goldings hop plugs (30 minutes)
- 1/4 teaspoon red Irish moss
- Wyeast No. 1056 liquid yeast cultured to yield 3 2/5 ounces of yeast slurry
- OG: 1.044
- FG: 1.012

Boil the extract kit and extract syrup with 6 gallons of boiling water for 60 minutes. After boiling, force cool with an immersion wort chiller and pitch the yeast from a 34-ounce starter. Fermentation was quick and fairly attenuative.

Both beers were very drinkable with a clean satisfying taste. They were a copper color with deep red highlights. The head was tan to brown and long-lasting. Clarity was good but the hopped-up version was noticeably clearer, no doubt benefiting from the longer boil. The beer brewed to the kit's instructions was nicely bal-

anced in bitterness but lacked the hop flavor and aroma of the hopped-up version. Proving that the importance of a clean, vigorous yeast starter and that a woman's touch is often magical, the hopped-up version was clearly the best of all the beers brewed.

David Coy, the 1993 education coordinator for the Great American Beer FestivalSM, is a mathematics teacher, news editor for *The New Brewer* magazine, avid homebrewer, tireless daddy and stunt kite enthusiast in various orders of importance, depending on the time of the year and which deadline is approaching. 

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REVIEWS

Brew Magic RIMS

RIMS stands for recirculating infusion mashing system. The fundamental ideas were developed by Rodney Morris, a noted brewer and microbiologist. His overall concept, described in several publications including *zymurgy* Special Issue 1992 (Vol 15, No. 4), is truly remarkable. First of all, his concept directly addresses many problems found in conventional homebrew mashing systems such as chronic low yields, poor grain mixing and turbid runoffs. Moreover, his system addresses these problems in a highly original way. I am not aware of anyone, commercial or amateur, who considered a continuously circulating mash during the saccharification rest. That is the heart of Morris' concept.

Shortly after the early articles on RIMS appeared, many people started to build versions in the one-half to one-barrel size range, brewing volumes that are finding widespread favor with equipment-oriented homebrewers. I did not get the opportunity to taste beer made by all of these systems, but the ones I tasted were very disappointing. Morris' prototype did make good beer, but it was much smaller. It is hard to characterize the various defects encountered, but the overall malt character of each was less than ideal, often with an out-front grain astringent tone. In each case the brewers told me they got better results with their stovetop mashing systems.

It was in this context that I met Conrad Keys of Houston, Texas. At the 1991 Dixie Cup he informed me that he had designed a new and improved RIMS system. I was very skeptical and tried to talk him out of it. The main reason for doing this review is to "eat corn"



in public, for he was able to do what I thought was impossible. This became clear Aug. 29, 1992, when Morris and I were invited to Houston to witness a full one-half-barrel brew with Keys' new system. We were simply astonished.

The first things I noted were the controllers. Electronics is one of Keys' strong suits, particularly in dealing with the non-linear effects inherent in the circuits. The result is a totally automated system with which the brewer can exert precise control. The mash was started at 125 degrees F (51.5 degrees C) and held for 30 minutes. This was followed by a transition to 154 degrees F (68 degrees C) at the classic monotone rate of 1 degree F per minute. The circulation was started at this point, and much to my surprise not only was there no frothing or foaming but there weren't even air bubbles present. Later analysis of the finished beer indicated that there was no hot-side aeration during the recirculation. In fact, the beer was exceptionally smooth with a mellow malt flavor. Morris brought a refractometer to monitor the increase in specific gravity throughout the duration of the mash. It peaked 10 minutes into the rest at 154 degrees F (68 degrees C) and conversion, as determined by the iodine test, was obtained after 15 to 20 minutes. The ultimate yield was a whopping 72 percent, or 34.5 pints per pound per gallon.

The end of the mash was followed by one of the clearest runoffs a brewer could want.

This has always been a strong point of all the RIMS previously built. At the end of the day Morris told me this indeed was the best realization of his ideas.

Sabco Industries has produced half-barrel systems that are 100 percent 304 stainless steel and the workmanship is first rate. The system itself has a highly attractive and professional appearance. For more information and prices contact Sabco Industries/Sav-A-Barrel Corp., 4511 South Ave., Toledo, OH 43615, (419) 531-5347 or FAX (419) 531-7765.

—George Fix

Quoin Industrial's Party Pig™

The Party Pig™, manufactured by Quoin Industrial of Golden, Colo., is one of the most innovative products to hit the homebrewing hobby.

The Party Pig™ system is composed of three assemblies. The Pig is a 2 1/2-gallon cylindrical PET container with rounded ends (see photo) that holds 2 1/4 gallons of homebrew. A valve assembly attaches to the mouth. The pressure pouch is the fulcrum of the whole system. The plastic pouch containing bicarbonate of soda and citric acid is inserted into the container to provide pressure for dispensing the beer.

Thinking about the Party Pig™ as a big bottle is probably the best way to visualize how the system works. Sanitize the Pig and valve assemblies just as you do bottles. Prime beer as usual and siphon into the PET container to the fill mark (about 2 1/4 gallons), then insert the pressure pouch directly into the beer (it is presterilized at the factory). Bolt the valve assembly securely into place

and you're ready to roll. Insert a squeeze bulb (sold separately) into the valve assembly and pump a few times to prime the pressure pouch. That's all there is to it. A tray and harness are included that allow you to conveniently carry your Pig. When the Party Pig™ is assembled it really *does* resemble a pig.

Here's how the Pig works, and why it is a clever, innovative product. The chemicals in the pressure pouch mix together once the Pig is primed, producing CO₂ gas. The pouch expands continually as the beer is dispensed through the tap, which keeps it under constant dispensing pressure until you are out of beer — the pouch having expanded to fill the PET container. Your naturally conditioned beer is kept fresh and ages just like an ordinary bottle of beer.

Once you are out of beer, you simply unbolt the valve, puncture the pressure pouch to release the gas, yank the pouch out of the container and throw it away. You use a new pouch for each batch of Party Pigged beer. Everything else is reused.

The Pig was originally developed by a team of Coors engineers. Coors decided to discontinue the research after investing several million dollars in the Pig's development. Quoin Industrial, recognizing the value the Pig could have for brewpubs and homebrewers, subsequently took over product development.



The Pig works like a small keg but without the hoses, tanks, regulators and soda kegs. If bottling has started to bore you and you don't want to invest in a full keg setup, the Pig is a great way to go. It fits in a refrigerator so you always have cold beer "on tap." I experienced no leakage problems, or any other problems for that matter, while using the device. This is an excellent product at a reasonable price.

Manufacturer's suggested retail price for a Party Pig™ kit that includes one PET bot-

tle, valve assembly, tray, strap and two pressure pouches is \$37.50. For more information, call or write Quoin Industrial, 401 Violet St., Golden, CO 80401; (303) 279-8731.

—James Spence

Beer Ball System

Various kegging systems were reviewed in *zymurgy* Special Issue 1992 (Vol. 15, No. 4). There, and in a previous issue (Vol. 14, No. 3), an Edme dispensing system utilizing tiny CO₂ cartridges was criticized because of leakage and cost considerations.

One of several systems for dispensing from a beer ball, Marc C. Fritz Inc. developed its own version of a cartridge injector system. Designed specifically to address prior concerns of leakage, the new product leaks neither gas nor beer.

Being able to obtain a non-leaking system does not mean that all of your problems are solved, however. The instructions emphasize that priming sugar should be reduced and that the first portion of the batch should be dispensed under its own primed pressure. If the gas cartridge is injected before adequate beer has been drawn, poor gas utilization will result as well as excessive foaming. Achieving the proper balance among priming materials, CO₂ injection points and the needs of different beer styles will take some experimentation.

The problem of leakage apparently has been solved but cost considerations remain. With a manufacturer's suggested retail price of \$79.95 for the complete bulb injector system, there is no question that initial costs are significantly less than systems using new stainless-steel soda tanks and five-pound CO₂ tanks and regulators.

Less clear are the trade-offs between these low initial costs and the moderately high costs of the non-reusable puncture caps and the disposable gas cartridges. Based on the manufacturer's estimates and my own experience, I would expect these costs to exceed \$3 for either a 2 1/2- or five-gallon batch.

Individual brewers will have to weigh the advantages of the low initial costs of this system against the per-batch costs of the consumables. Additional considerations will be the availability of used beer balls or of used

equipment suitable for soda keg systems.

Manufacturer's suggested retail price for the complete injector system is \$74.95, this includes a 2 1/2- or five-gallon ball, batch latch resealing mechanism, complete bulb injector tap and dispensing hose. For more information contact Marc C. Fritz Inc., 11 Market Street, Potsdam, NY 13676; (800) 762-2560.

—Chuck Keiper

Brewing the World's Great Beers

Dave Miller's new book, *Brewing the World's Great Beers* (Storey Publishing, 1992), is the latest comprehensive how-to-brew book. Miller's approach may surprise those who are acquainted with his previous works, *Home Brewing for Americans* (Amateur Wine-maker Publications 1981) and *The Complete Handbook of Home Brewing* (Garden Way Publishing, 1988). In contrast to the relatively technical character of those works, this is a user-friendly guide that will go over well with brewers who might be intimidated by *The Complete Handbook*.

Brewing the World's Great Beers is written with the assumption that the reader is a beginner to the hobby and provides at the outset a good solid review of basic how-to information. Miller's emphasis throughout is more on the "how-to" than on the "why" of brewing — less theory and more practice. He addresses everything from simple extract brewing to all-grain brewing, draft systems and filtration.

The book is divided into five chapters covering a range of topics and techniques. Despite the division of the discussion into varying levels of brewing practice, the presentation is well-organized and Miller manages not to repeat information or return to previous topics more than necessary.

Miller's approach to recipe formulation is elegant and simple. Rather than present a range of recipes within each brewing style, he provides sample extract and grain recipes for each of a number of different styles of beer and notes in his initial discussion of recipes that "Any published homebrew recipe should be regarded as a starting point. Once you try it, you will probably want to adjust it to suit your own taste." My own experience as a

homebrew retailer is that new brewers almost always need a bit of this sort of encouragement to experiment. With a grouping of well-formulated recipes to use as guidelines for each style of beer, a new brewer is put in the best possible position to exercise some creativity.

This is an excellent book, suitable for any brewer but most especially for those who are more interested in brief, concise descriptions of how to get the job done than in theory-bound explanations. You don't need to be a technophobe to enjoy this clean, uncluttered approach to brewing technique.

(*Brewing the World's Great Beers* by Dave Miller, Storey Publishing, Pownal, Vt., 1992, publisher's suggested retail price: \$12.95).

—Kurt Denke

The Great Beers of Belgium

Where do you find more beers after you've written *The World Guide to Beer*? Belgium, of course, and so Michael Jackson has, in an exhaustive but exhilarating tour of the world's most diverse and unique brewing nation.

Jackson begins with separate chapters on beer and each of its ingredients, including the fruits and spices that often grace Belgian beers. Such is his skill as a writer that he can make even the knowledgeable reader see water, grain, yeast and hops as if for the first time. Then follow detailed chapters on the beer styles: lambic, gueuze, krik and framboise, fero and mars, white beers, brown beers, red beers, saisons, Belgian ales, Trap-pist beers, abbey beers, golden strong beers and then, regional specialties, as if what has gone before was not special enough.

Each beer is described in tasty detail: "This beer has an alcohol content of 5.2 by weight, 6.5 by volume. It has a reddish dark brown color; a soft body; and a palate that is malty and chocolatey, with hints of banana and passion-fruit toward a dry finish."

Find out why Rodenbach is so good with prawns and learn the identity of the gentleman on the label of Rodenbach's Alexander. Walk through breweries that are centuries old, into monasteries that are closed to the

outside world. Come out to a small village on the edge of a forest where the people of Brussels like to come for a Sunday stroll and finish with a glass of gueuze.

For those with a passport, there is a list of restaurants and bars featuring large selections of Belgian beers, starting in Belgium but also including the Netherlands, France, England and a few cities in the United States.

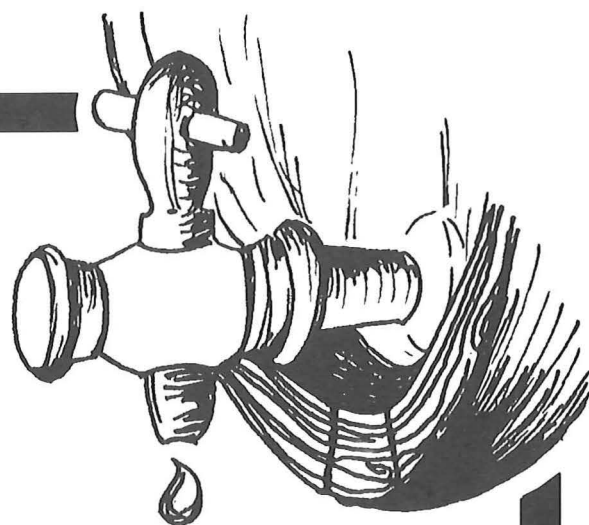
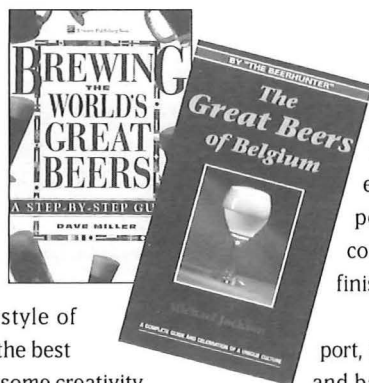
The Guide is 270 pages long with superb

color photography on almost every page. It's a joy to read, a must for anyone who enjoys Belgian beer and is further proof that Michael Jackson truly is the Bard of Beer.

(*The Great Beers of Belgium: A Complete Guide and Celebration of a Unique Culture*, by Michael Jackson, CODA, 1991; publisher's suggested retail price: \$24.95.)

—Kihm Winship

This article is available in Library 13-AHA/*zymurgy*/Clubs on CompuServe's Beer and Wine Forum as RVWSWI. N93.



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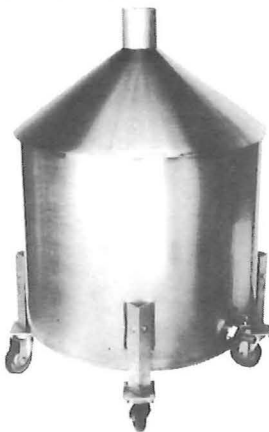
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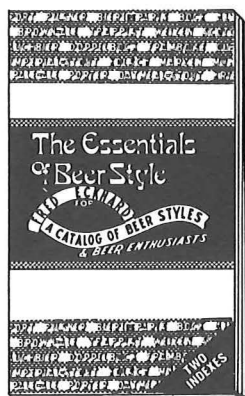
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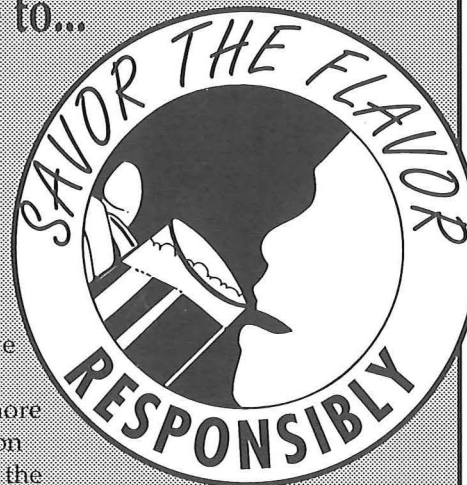
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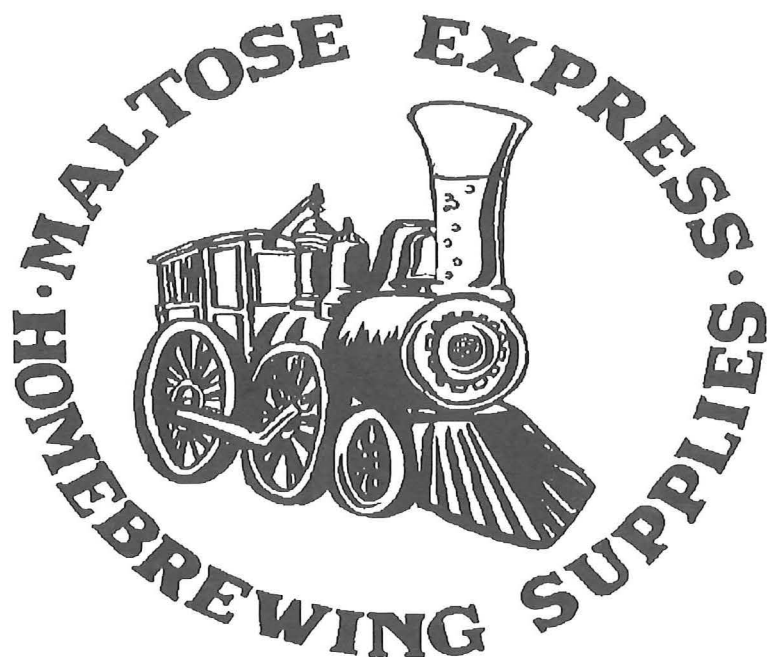
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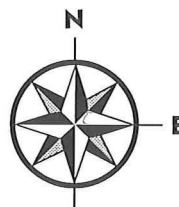
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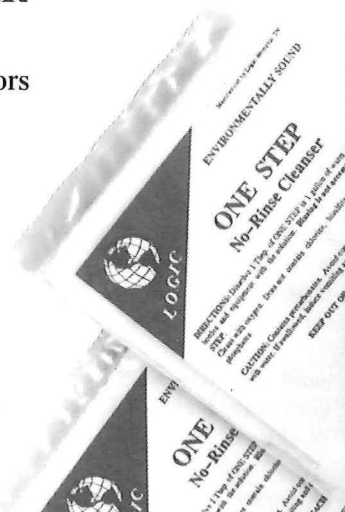
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HOMEBREW CLUBS



James Spence

Chicago Beer Society Creates Midwest Invitational Brewoff

By Ray Daniels

If your homebrew club is like ours, it attracts an eclectic group of characters. Each brings a special point of view on brewing — and life — that enriches our activities. Scarcely a meeting goes by where our unique group chemistry doesn't dredge up some wild-eyed homebrew fantasy. The thing starts as an innocent comment, a joke, a jest. But those within earshot can't leave it alone. It grows, it adds unnatural appendages and eventually takes on a life of its own. Soon it becomes a shared dream, a beery fantasy in which all can partake.

One recent fantasy was the incredible Beerplex and Homebrew Mall. Located on 10 acres on the north side of Chicago, Beerplex would contain a variety of craft-beer outlets and brewing resources. Among these would be a brew-on-premises facility, a special clubhouse for CBS members, beer bars with taps by the hundreds and abundant supplies of inexpensive and exotic brewing ingredients: the freshest hops, the choicest grains and even a dozen types of honey for those whose minds meander toward mead.

Occasionally, our fertile fantasies launch ventures into the real world where daylight, sentient sobriety and real-life budget limitations startle most ideas into an early death. But, from time to time, a good idea passes this gauntlet of nastiness to make a healthy transition from wort to beer for the surprised and pleased consumption of our members. When this happens our club

grows, our members enjoy and some small part of the universe becomes a better place to live for an evening or two.

Such was the case with the Midwest Invitational Brew-Off. Like most good ideas, it came into this world immediately after the words, "Hey, wouldn't it be neat...?" Tim Norris hatched this one up as a sort of beer Olympics. "At the next beer event, let's give a bunch of brewers the same ingredients and same equipment and see who can make the best beer."

What is a brewoff, you ask? Well, here's how it worked for us.

As hosts of the Midwest region of the AHA National Homebrew Competition, we always feel an obligation to entertain the judges and stewards who come to town to help with first-round judging. While our local beer scene offers great variety, it's a bit scattered and not entirely amenable to group tours on a Satur-

day night. So we seized the brewoff idea as a unique way to entertain our guests after a day of judging.

With judging scheduled for the second weekend in June, our planning began in February. Our homebrew committee decided on a bill of desired ingredients for the brewing challenge. It included some pale malt, some malt extract, specialty grains and an eclectic mix of hops. Christopher Nemeth accepted the task of scrounging these ingredients from area suppliers and set to work.

The committee decided to have invited and open categories in the competition. The invited brewers were picked from among the best brewers we knew in the Midwest. Some were picked because of their successful competitive record while others were included just because we felt they consistently make some of the best beer around. The invited brewers received the ingredients free in exchange for their willingness to brew the beer and get it to Chicago for the tasting.

Anyone else who wanted to participate in the brewoff could do so through the open category. These brewers had to purchase the specified ingredients from one of the local homebrew shops in order to enter.

When tasting day came, all 10 of our invited brewers delivered a beer as promised and we had four brews in the open category. This gave us nearly 70 gallons of beer for an enjoyable evening of quaffing by a crowd of about 110.



Brewoff winners receive congratulations, from left to right, Dennis Davison, Milwaukee Beer Barons; Tim Norris, Chicago Beer Society; Michael Pezan, Brewers of South Suburbia; and Ray Daniels, Chicago Beer Society.



CBS members enjoy brewoff tasting. From left to right are Jack Forbes, Rose Forbes, Steve Pawschke and Kerry Ito.

The ingredients for the brewoff included the following:

- 5 pounds Belgian Pilsener malt
- 2 pounds CaraVienna malt
- 1 pound Special B malt
- 1 pound mystery mix
- 1 pound dark grain mix
- 3 pounds Munton & Fison's light dry malt extract
- 2 ounces Cascade hops
- 2 ounces Perle hops
- 2 ounces Willamette hops

Brewers were not told the identity of the mystery mix nor the dark grain mix until after the competition. The mystery mix included rolled oats, rye and CaraPils malt, while the dark grain package had equal parts of chocolate malt, black patent malt and roasted barley.

Rules for the brewers included the following:

(1) Brewers must produce five gallons of finished beer. (We instituted this rule so all of the beers would be within a reasonable range of original gravities.)

(2) Brewers may use any part or all of the ingredients provided. They may not add any other hops or any additional fermentable materials such as honey, fruit or grains.

(3) Brewers may add spices and herbs as they desire. (We used this rule to introduce some variety in the beers produced. In the end, only one brewer took advantage of this opportunity.)

Chicago Beer Society asked that the beers be presented in soda kegs if possible, and all of the entries were served this way. At the time of the tasting, each beer was assigned a number and hooked up to CO₂ and a tap.

The tasting was on Saturday evening af-

ter a day of first-round judging for the AHA National Homebrew Competition. Those attending received a card listing the style of each beer and providing space for notes, scoring and a vote for their favorite.

The event began with a one-hour stand-up tasting and continued for another hour during dinner. At 9 p.m. we collected the ballots and tabulated the results while Pierre Celis of Celis Brewing in Texas gave an after-dinner talk.

We awarded our first prize, a Mega Magic Mash Mixer, to Michael Pezan of Brewers of South Suburbia (BOSS) for his India pale ale. Second prize was a Grand Glorping Scoop awarded to Dennis Davison of Milwaukee's Beer Barons for his Oktoberfest. Both entries were exceptionally good beers, as you can imagine. They would have to be to beat out the all-star cast of brewers who participated.

Following is a complete list of the brewers and beers.

Invited Brewers

| | |
|-----------------------|----------------------|
| Tony Babinec | Strong Porter |
| Jackie Rager | Pout (Porter/Stout) |
| Dick Van Dyke | Robust Porter |
| Ray Spangler | Kentucky Common |
| | Sour Mash Ale |
| Mark Richmond | Ohio Imperial Porter |
| Rob Reed | India Pale Ale |
| Brian and Linda North | Texas Brown |
| Dennis Davidson | Oktoberfest/Märzen |
| Randy Mosher | Dunkel White Beer |
| Rob Drouth | Dark Lager |

Open Brewers

| | |
|---------------|--------------------|
| Michael Pezan | India Pale Ale |
| Ray Daniels | Robust Porter |
| Joe Perillo | American Brown Ale |
| John Dalton | Munich Dunkel |

We want to thank the retailers and suppliers who contributed ingredients for the brewoff. In addition, we owe special thanks to all the brewers who contributed their time and efforts to brew with a challenging combination of ingredients.

Now that the dust has settled from a busy summer, we are planning the next Midwest Invitational Brew-Off for next April. Anyone who wants information on entering or attending should contact Ray Daniels at (312) 665-1300.

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The Beer Chasers, c/o Ron Strobel, 19555 W. Bluemound Rd., Suite 36, Waukesha, WI 53186, (414) 789-0555.

If you want to register your homebrew club with the AHA, send a brief letter about your club including the same kind of information you see here to James Spence, AHA administrator, PO Box 1679, Boulder, CO 80306-1679, phone (303) 447-0816, FAX (303) 447-2825, CompuServe 70740,1107.

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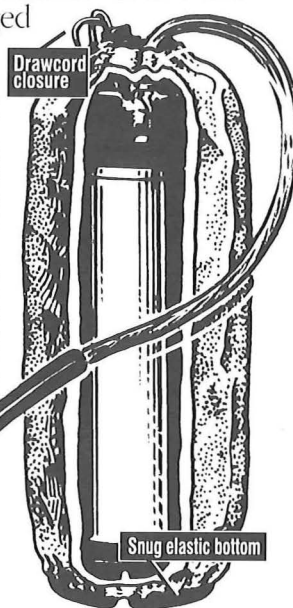
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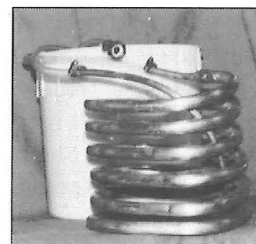
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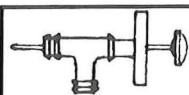
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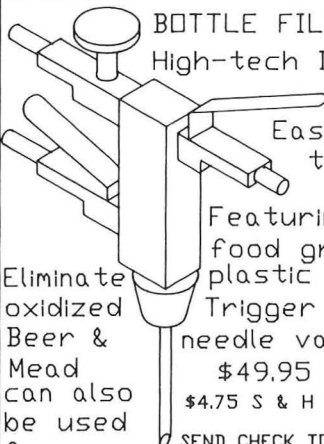
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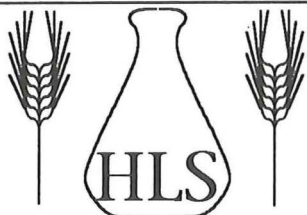
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LAST DROP

Why Cookies with Beer is a Bad Idea

By Jerry Olton

"Cookies and beer go great together," Peggy said as she pried the cap off a bottle of winter ale. The hiss of air startled her cat, a gray tabby named Shadow, who arched her back, hissed once herself, then stalked warily into the living room.

Peggy poured the beer into a frosty mug. "I always love to sit in front of a fire at Christmas and have cookies and beer," she said. "It's kind of a tradition for me."

She handed me the mug. It had maybe half an inch of head, crowding the rim but not going over. The beer was a light amber color and the aroma reminded me of hazelnuts. When I took a cautious sip, the bitter tang of hops hit my tongue first, then the smooth malt beneath it. One thing was certain, Peggy knew good beer.

She poured one for herself, then picked up the basket of cookies from the counter top. They were white sugar cookies cut into the shapes of stars, angels and Christmas trees and covered with colored icing.

We settled into the loveseat in front of the brick fireplace with the cookies between us.

"Dig in," she said, picking up an angel and biting off its head.

Dubiously, I selected a star — the smallest of the cookies — and put an eclipse into one of the five points. It wasn't bad. In fact, it was kind of good, even when I chased it with a swallow of beer.

"It's all right," I said, surprised.

Peggy grinned.

I chased another bite with beer. The sugary cookie and the smooth beer went together perfectly.

"That's really strange" I said. "Everyone knows cookies and beer don't go together. I wonder why that is?"

I finished my star and picked up an angel, but it slipped from my fingers and splashed into my beer. "Ah, hell," I said, fishing it out while Peggy laughed. I held the dripping angel over my mug and bit into one wing, but the soggy texture and foaminess in my mouth was awful.

I swallowed it in one gulp, chased it with a healthy slug of beer and said, "Don't dip them." I realized the rest of the angel was dripping on my pants so I tossed it into the fire.

The wet cookie landed on the lowest log, hissed for a moment, then with a flash that startled me, it burst into flames.

"Look out!" Peggy shrieked, leaping from the loveseat and grabbing the ash broom. She swung it at the cookie angel, which had toppled off the log and was now rolling and flapping toward the front of the fireplace.

When it dodged the broom, I realized it was alive, or at least ani-

imated. It flapped its wings furiously, but I'd bitten a big chunk out of one wing so the cookie angel couldn't get any lift. It gathered itself up for a leap, and, still flapping and burning brightly, jumped from the raised hearth to the carpet. Before we could move to stamp it out, it darted under the loveseat, leaving a trail of tiny burning footprints.

An instant later we heard a terrified yowl, and Shadow came streaking from underneath the loveseat, fur puffed and tail smoking from where the angel had nearly lit it afire. The angel darted after her, chasing the screeching cat around the room.

"Stop it!" Peggy shouted. "It's trying to burn Shadow!"

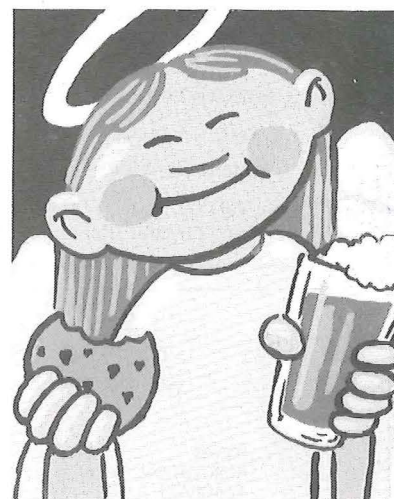
I briefly considered dousing it with my beer, but abandoned that idea immediately. It was the beer that had started the whole problem. I looked around for something to use, but Peggy beat me to it. She snatched up the fire extinguisher, yanked the pin and sprayed white foam into the space between piano and wall where the cat and burning angel had disappeared. Steam and smoke belched out from the gap and, with a howl of terror, Shadow made a dash for the bedroom.

The angel got a few feet down the hallway, sputtering sparks and smoke, but Peggy sprayed it and it sizzled out. While she sprayed the trail of flame leading from the fireplace to the piano, I went over to the angel and nudged it with my toe. Even as I bent to see if there was something I could do to revive it, it shimmered with inner light and slowly faded into nothing.

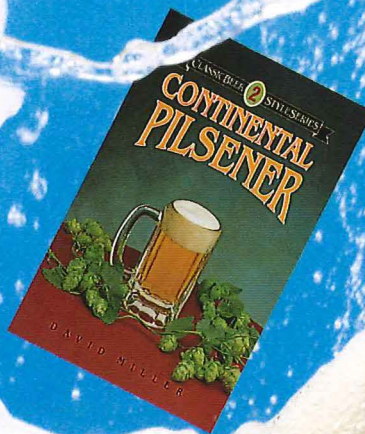
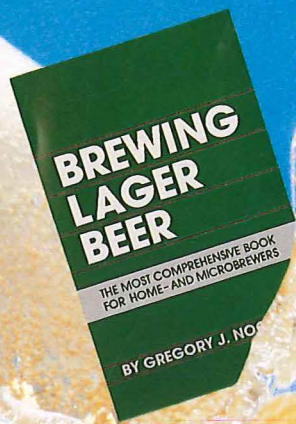
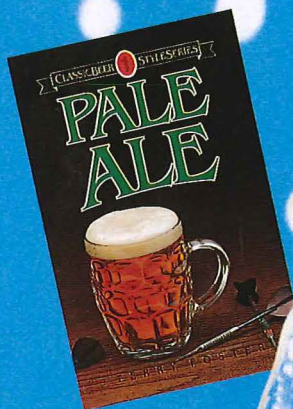
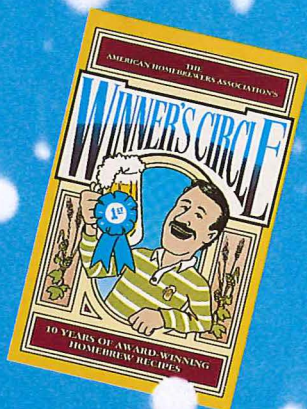
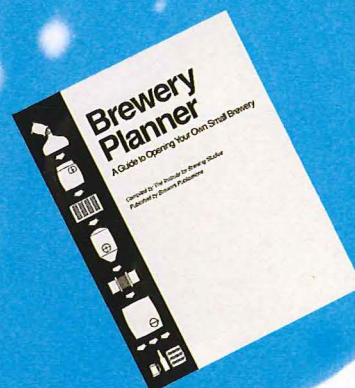
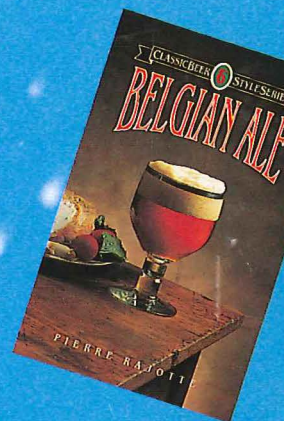
Peggy said, "I guess now we know why cookies and beer aren't such a good idea."

I nodded and looked at the overturned basket of cookies on the floor in front of the fireplace. "Whatever you do," I said, "Don't toss a star in there."

Jerry Olton is a science fiction writer, with more than 40 stories and three novels published to date. He and his wife, Kathy, have been brewing for nearly 10 years and enjoying cookies with their brew all along, never knowing how closely they were flirting with disaster.



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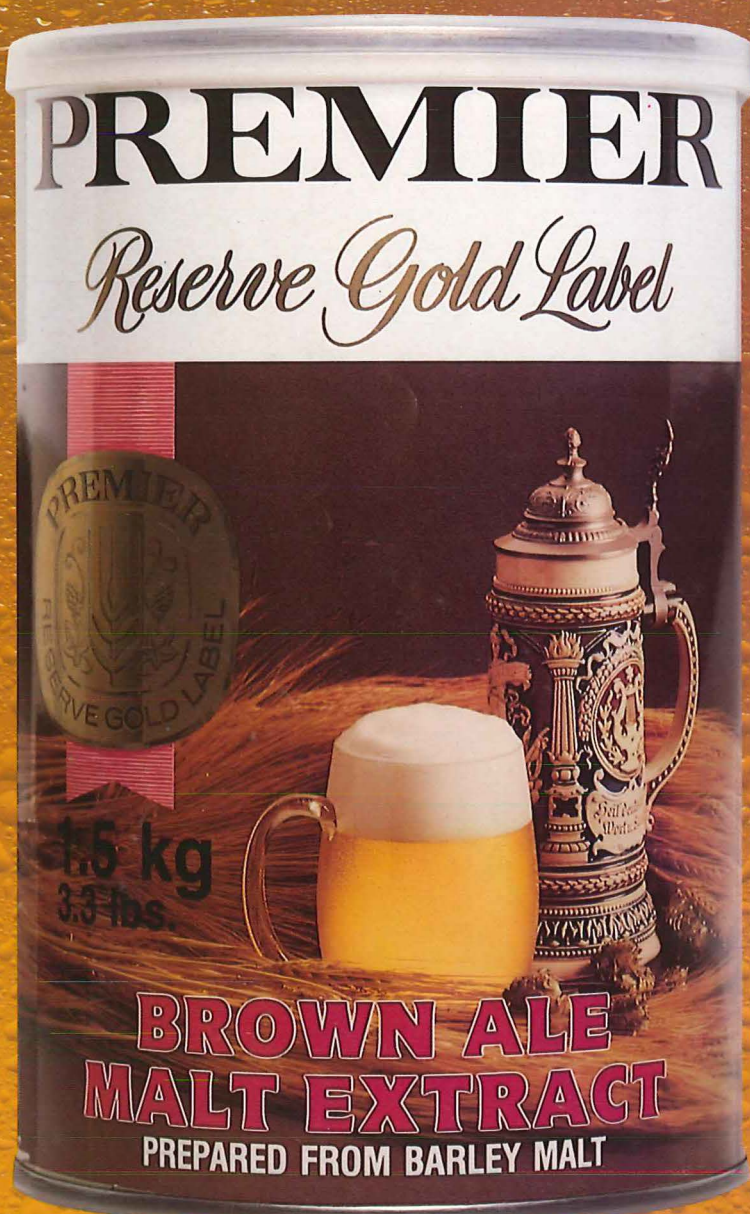
The times were simpler when the roaring 20's were coming to an end and we were just beginning. America has changed a great deal over the past three generations—many businesses have come and gone, but we have endured. Why? Because we put you first by giving you what we believe is the best product of its kind in the market.

You've wanted quality at a fair price (the best value) and we've delivered. You've asked for selection (the best variety) and we added new flavors. And you have demanded the best ingredients so you have the same great taste and color, batch after batch, and we've given it to you.

Yes, we have changed...but we have only done so to fulfill your needs...to give you the best. And we have been rewarded with longevity that makes us one of the oldest manufacturers of malt products in America.

So, if you already use Premier Reserve Gold Label beer kits we say "Thank you!" And to those of you who haven't tried them—the time has never been better for you to find out why we call these products Reserve Gold Label.

SHOWN ACTUAL SIZE

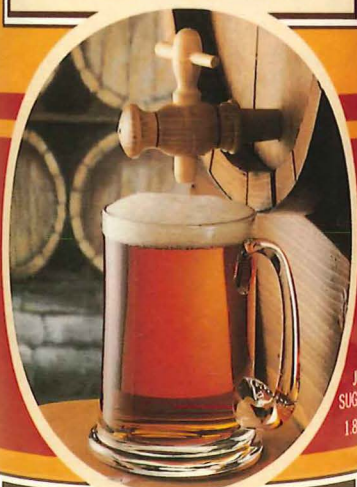


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