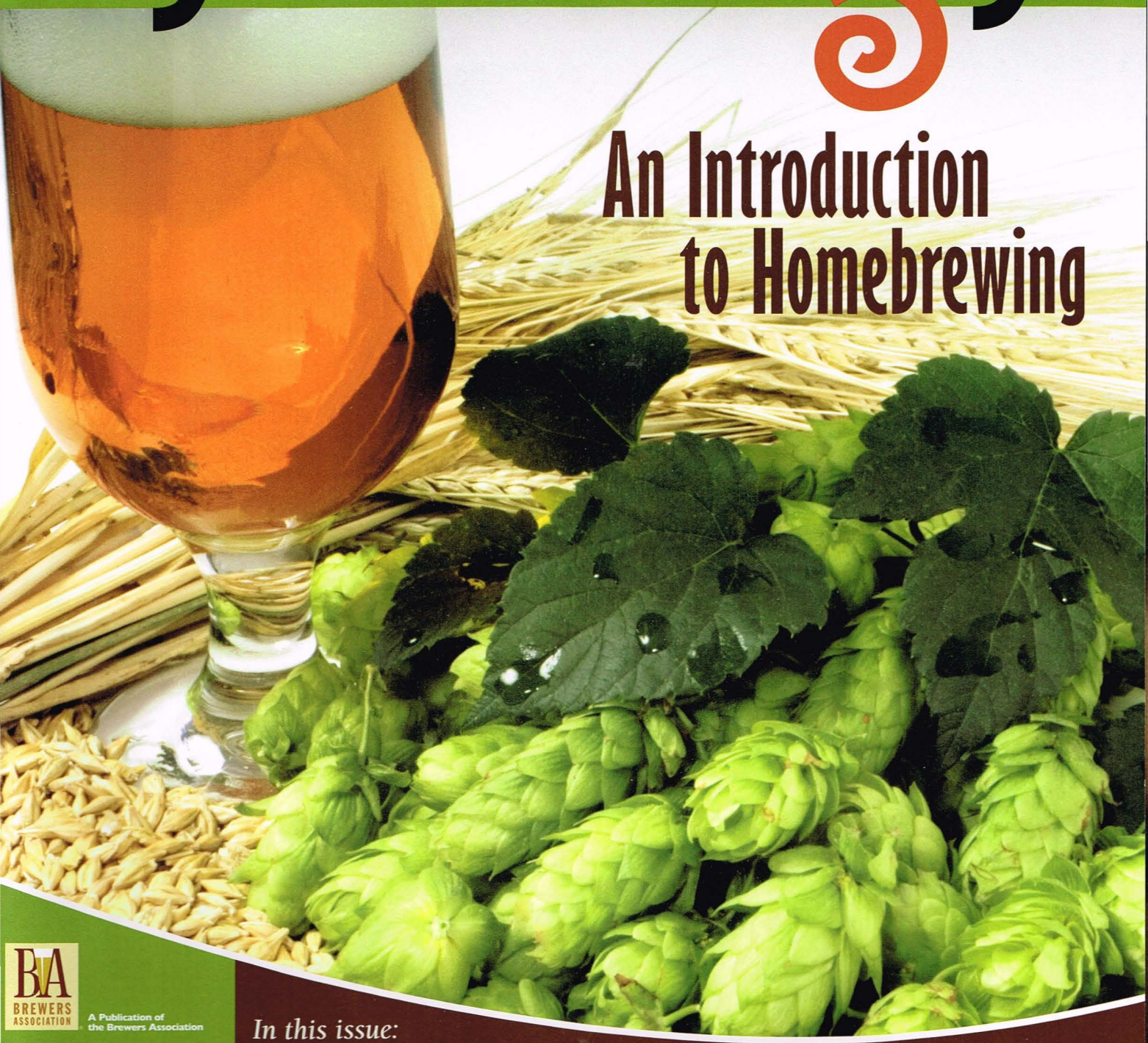
* Special Edition *

FOR THE HOMEBREWER & BEER LOVER

zymurgy®

The Journal of the American Homebrewers Association



An Introduction to Homebrewing

BA BREWERS ASSOCIATION
A Publication of the Brewers Association
www.AmericanHomebrewers.org

AHA
From the American Homebrewers Association®

In this issue:

WHAT TO BUY | HOW TO BREW | *Advice from Homebrew Guru Charlie Papazian* | GREAT RECIPES

** Compliments of your local homebrew store **

Let's Get This Party Started Right!

Specially designed fermenter? Check

Bottles? Check

Ingredients? Check

20 minute instructional DVD hosted by
Aussie movie star Paul Mercurio? Check

HOME Coopers BREW

The Coopers Brewery Micro Brewery Kit

The world's bess selling starter kit.

The only homebrewing products made by an actual brewery.

Available at fine specialty retailers and on-line at www.amazon.com or www.makebeer.net

If a glass can make a wine taste better, imagine what it can do for a great beer.

The sole focus of this glass is to maximize the flavor of Samuel Adams® Boston Lager.

-Jim Koch, Founder & Brewer

LIP
Turned outward to deliver beer to the front of the tongue, where the sweetness (malt) is tasted.

TURBULATOR
Bead inside rim creates turbulence to release flavor and aroma as beer enters mouth.

BOWL
Rounded shape collects aromas.

GRIP
The concave shape reduces heat transfer from your hand.

WALLS
Thinner walls and rounded shape maintain proper beer temperature longer.

NUCLEATION SITES
The laser etching on the bottom creates bubbles for constant aroma release.

SAMUEL ADAMS® BOSTON LAGER®

To find the new Samuel Adams® Boston Lager glass go to www.samueladams.com

zymurgy

Journal of the American Homebrewers Association®

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Brewers Association

The purpose of the **Brewers Association** is to promote and protect small and independent American brewers, their craft beers and the community of brewing enthusiasts. The Brewers Association is a not-for-profit trade Association under Section 501(c)(6) of the Internal Revenue Code.

BA Board of Directors

John Bryant, Sam Calagione, Dick Cantwell, Rich Doyle, Mark Edelson, Gary Fish, Chris Graham, Ken Grossman, Kim Jordan, Greg Koch, Nick Matt, Randy Mosher, John Pinkerton, Zac Triemert

1/09

by the American Homebrewers Association

Want to Brew Your Own Beer? Start Here.

Hello and welcome to homebrewing! This magazine is a special issue of *Zymurgy* (zī'mər jē)—a publication dedicated to the interests of the homebrewer. While this special issue is devoted to new brewers, it also includes some of our regular columns and departments. Through these, we'll tell you a bit more about the hobby, give you some recipes to try and point you toward other resources to help you learn more about the hobby and meet others who brew.

These pages contain all the information you need to get started brewing your own beer at home. We'll start by walking you through your first batch with all the details you need to make a great-tasting beer. Everything you need is contained in the section called "Brewing Your First Batch of Beer" beginning on page 18. It's easy and you'll have fun both making it and enjoying the finished product.

So, if you are standing in the homebrew store right this minute, with an itch to get started, buy the basic starter kit recommended by your store plus the ingredients given for the first recipe on page 19. Then you can go home, do about 15 minutes of reading and be ready to brew. Go ahead, do your shopping—you can read the rest of the articles when you get home!

Brew on!

Charlie Papazian
President, Brewers Association

Gary Glass
Director, American Homebrewers Association

Jill Redding
Editor-in-Chief, *Zymurgy* magazine

HOW LONG DOES IT TAKE?

Just so you know what to expect, it will be about four weeks before you can drink the beer you make. Here's a basic map of how the process works:

Brewing

- Get the equipment and buy ingredients (20-30 minutes)
- Clean and sanitize the equipment (10-15 minutes)
- Brew the beer and start the fermentation (60-90 minutes the first time)

Fermentation

- Here you just wait . . . (usually about a week)

Bottling

- Takes about an hour once fermentation is complete

Bottle Conditioning

- Here you wait . . . wait . . . wait (usually two to four weeks)
- Chill and drink your beer! (all depends: how fast do you drink?)

SPECIAL EDITION
zymurgy
(zī'mər jē) n: the art and science of fermentation, as in brewing.

COLUMNS

DEPARTMENTS

Making Your First Batch From Beginning to End

We have included five short articles to teach you the basics of brewing and help you brew your first batch. We recommend that you read the first four articles completely before you start brewing. (Hint: we have found that you can read them in about the time it takes to drink one beer.) Then when you are ready to brew, follow the instructions in each section to make sure you don't forget anything or leave out a critical step.

Additional Brewing Information

Introducing TORPEDO EXTRA IPA

At Sierra Nevada we take hops seriously, so our Extra IPA had to have the boldest hop flavors and aromas possible. After years of experimentation, we developed something we call the Hop Torpedo; a revolution in dry hopping and an invention designed to harness all of the inviting complexity that whole-cone hops have to offer.

SIERRA NEVADA BREWING CO.
Chico, CA

by Gary Glass

Welcome to Homebrewing

This special edition of *Zymurgy*, the magazine published for members of the American Homebrewers Association (AHA), is intended to be an easy-to-follow guide to launch you into the wonderful world of homebrewing! We are happy to provide this free guide to help you on your way to brewing outstanding beers at home.

The American Homebrewers Association is the national not-for-profit organization for homebrewers. The AHA is made up of thousands of members from the U.S. and around the world. I invite you to join the AHA and dive right into the fun-filled hobby of homebrewing. Your membership dollars help us to continue our mission of promoting the community of homebrewers and empowering them to make the best beer in the world. A strong AHA will ensure your right to homebrew is maintained long into the future.

The members, volunteers and staff work on two sides of homebrewing—we organize and run programs for homebrewers and we promote the hobby of homebrewing to the general public and the media. When more people are homebrewing, ingredients stay fresher in homebrew supply shops and homebrewing communities stay lively and vital.

AHA membership benefits include:

- 6 issues of *Zymurgy* magazine.
- Pub Discount Program for discounts at pubs across the U.S.
- AHA TechTalk e-mail forum and forum archive for homebrewers.
- Updates on the latest Government Affairs issues affecting your right to brew and access to your favorite craft brews.
- Access to the Great American Beer Festival Members Only Session.
- Free entry to AHA Rallies.
- Discounts on the latest book offerings from Brewers Publications, AHA National Homebrew Competition entries, and AHA National Homebrewers Conference registration.

Membership to the American Homebrewers Association is $38 for a year. This is a small price to pay for the beer and brewing education, camaraderie and fun that the AHA brings to homebrewing—a price that will soon be recouped by your Pub Discount Program benefits. There is a membership application in this issue. I invite you to fill it out and send it in or join online at shop.beertown.org to unlock the wide world of homebrewing.

Gary Glass is director of the American Homebrewers Association.

by Ray Daniels

Yes, You Can Brew Your Own Great Beer

People often laugh in disbelief when I tell them that some of the finest beers available today are made in people's homes. It's hard to believe, I know. But it is true.

I'm not saying that every homebrewed beer is a world-class concoction, but many are better than what you can buy on the shelf of your local store or from the taps at your favorite bar. If you like beer—any kind of beer—you can make it, and make it well at home.

It is legal, by the way. Jimmy Carter saw to that back in 1978. In the process, he unleashed a force that led to today's microbrewery movement as evidenced by beers like Sierra Nevada Pale Ale, Samuel Adams Boston Lager and many more.

Brewing is like many other activities that people find rewarding as hobbies: cooking, photography, gardening, home improvement, model building and car repair just to name a few. Like these, brewing produces a rewarding product—and one that reflects the effort and craftsmanship of the creator.

But some people feel that homebrewing offers even more. They find that brewing is just downright fun. It's obvious that consumption of the finished product is usually enjoyable. But those bitten with the homebrew bug relish the many opportunities it presents for creativity, culture and companionship.

Creative outlets abound in brewing. From the naming of your first beer to the design of your first recipe, you'll have endless opportunities to call the shots. Perhaps you've already got a magic name like Dick's Elixir, Whama Jama Stout or Sweet Cheeks Cream Ale just waiting for a beer that deserves it. Then, after a batch or two, you'll discover the world of offbeat ingredients that can be included in beer, from cherries to chocolate and carrots to cardamom. Once you know the basics, it's

up to you to experiment with these and many more.

Then there is the culture of beer, stretching back more than 4,000 years. This culture encompasses scores of different beer styles and sub-styles. Each has a distinct flavor—as well as a unique history. From Martin Luther and the monasteries to Martha Washington and the Mayflower, beer has been a part of man's endeavors. By brewing beer, we establish connections to the past and a heritage that we all share.

In the present day, the culture of beer traverses the world, from Prague to Portland and from Portsmouth to Peking. Each one of the thousands of beers out there has a unique flavor fashioned by its brewer. Homebrewing equips you with the knowledge needed to explore and understand these products and to talk intelligently with brewmasters about their wares.

As a brewer, you'll also take on a new identity. For starters, your beers will impress your family and friends. Also, with your brewing skills comes admission into a club of folks who love to brew—and drink—good ales and lagers. Likely as not, you'll find them meeting monthly in your own hometown. Then you will find them nearly everywhere you look: from the next locker or cubicle at work to the next barstool in a bar far from home. Among these brewers you'll find that all like to talk about your shared hobby and many are just like you—no matter who you are!

Ray Daniels is director of the Cicerone Certification Program and the author of several books on brewing.

by Professor Surfeit

Each issue of *Zymurgy* carries wisdom and advice on homebrewing from our own world-famous brew guru, Professor Surfeit (a.k.a. Charlie Papazian). Here are some of our favorite letters from this popular column. If you want to send the Professor your own brewing-related questions, see the submission information at the end of this article.

Damn the Instructions—Full Speed Ahead

Dear Professor,
I have been making beer for about a year now. I just received my first copy of *Zymurgy* and it didn't take me very long to realize that I could improve on the recipe that comes with a can of malt. Still, I have quite a large supply of malt extract on hand, so I wonder if you could suggest a better recipe than the sugar one that comes with the malt. Meanwhile, I'll continue to read *Zymurgy* and learn more about homebrewing.

Thank you,
Bill Tyson
Neaton, Texas

Dear Bill,
Well, it won't take you very long to discover that improving on the sugar recipes supplied with many malt extracts is a pretty easy thing to do. It doesn't take a whole lot of reformulation!

For starters, just substitute extract for sugar, pound for pound. That is the simplest thing you can do. If the extract you are using is hop flavored and the straight substitution turns out too bitter for you, then buy the plain, unhopped version of that malt extract and substitute that.

Don't worry too much about over-bitter beer when you first try the recipe, though. Although you are adding more bitterness by substituting hopped extract, you are also adding more body and malt.

Sweetly,
The Professor, Hb.D.

Spent Hops Can Kill Your Dog!

Dear Professor,
I am a fairly new homebrewer (four batches) and have discovered a problem that I believe you can help with. I was brewing a batch of Pilsner the other day and took two bags of hops from the wort and tossed them on the ground to cool while I put the wort into the fermenter. I noticed that my dog had swallowed the bags of hops! I called my vet and he said that it should not be a problem for the dog. I called my local brew supplier and they said the same thing. I looked up a big-time supplier online and called them and they said the dog will be OK. I was relieved.

I was online with a cigar bulletin board and posted the question for the brewers on the board. One guy said "Get your dog to the vet NOW!" He posted some articles from a veterinary journal that said hops can kill dogs. It talked about eight case studies in which six of the dogs had died. I called Animal Poison Control and they said "Get your dog to the vet NOW!" So I took him and they made him vomit, gave him charcoal and IV fluids, etc. He survived, thankfully, but the vet said it was only because I saw the dog eat the hops and we got them out before they made him sick. The hops cause "malignant hyperthermia," a sudden and almost irreversible increase in

Brewers Association PUB DISCOUNT PROGRAM

Participating Pubs

Just show your American Homebrewers Association card to your server at the pubs below and save money on BEER, FOOD and/or MERCHANDISE!

Must be 21 or older to receive discounts at participating locations. Pub Discounts are not valid with any other offers or discounts.

Benefits only apply to the card-carrying AHA member, unless otherwise noted. Some states prohibit free or discounted alcohol. Pubs must obey state law in this regard.

ALASKA

Sleeping Lady Brewing Co./ Snow Goose Restaurant
Anchorage

ARIZONA

Barley Brothers Brewery
Lake Havasu City

BJ's Restaurant & Brewery
Chandler

BJ's Restaurant & Brewhouse
Mesa, Peoria, Phoenix, Tuscon

Gordon Biersch Brewery Restaurant
Tempe

Mudshark Brewing Co.
Lake Havasu City

Old Chicago
Chandler, Tuscon

Rock Bottom Restaurant & Brewery
Glendale, Phoenix (2), Scottsdale

ARKANSAS

Boscos Little Rock Brewing Co.
Little Rock

Vinos Pizza Pub Brewery
Little Rock

CALIFORNIA

21st Amendment Brewery Café
San Francisco

American River Sports Bar & Grille
Folsom

Anderson Valley Brewing Co.
Boonville

Barley & Hops Old World Family Tavern
Temecula

BJ's Pizza & Grill
Huntington Beach, La Jolla, Laguna Beach, Long Beach, Newport Beach, Westwood

BJ's Restaurant & Brewery
Brea, Laguna Hills, Oxnard, Roseville, West Covina, Woodland Hills

BJ's Restaurant & Brewhouse
Arcadia, Bakersfield, Burbank, Cerritos, Chino Hills, Chula Vista, Corona, Cupertino, Del Amo, Elk Grove, Folsom, Fresno, Glendale, Huntington Beach, Irvine, La Mesa, Modesto, Montebello, Moreno Valley, Newark, Palmdale, Rancho Cucamonga, Sacramento, San Bernardino, San Bruno, San Jose, San Mateo, Stockton, Temecula, Vacaville, Valencia, Westlake Village

Bootleggers Brewery
Fullerton

E.J. Phair Brewing Co. & Alehouse
Concord

Firestone Walker Brewing Co.
Paso Robles

Firestone Walker Taproom Restaraunt
Buellton

Gordon Biersch Brewery Restaurant
Burbank, Palo Alto, Pasadena, San Diego, San Francisco, San Jose

Huntington Beach Beer Co.
Huntington Beach

Iron Springs Pub & Brewery
Fairfax

O'Brien's Pub
San Diego

Pyramid Alehouse, Brewery & Restaurant
Berkeley

Rock Bottom Restaurant & Brewery
Campbell, La Jolla, Long Beach, San Diego

Rogue Ales Public House
San Francisco

Russian River Brewing Co.
Santa Rosa

Santa Barbara Brewing Co.
Santa Barbara

Schooners Grille and Brewery
Antioch

Stone Brewing Co./Stone Brewing World Bistro & Gardens
Escondido

COLORADO

Avery Brewing Co.
Boulder

Backcountry Brewery
Frisco

BJ's Restaraunt & Brewery
Boulder

BJ's Restaraunt & Brewhouse
Aurora, Westminster

Breckenridge Brewery
Denver

Breckenridge Brewery & Pub
Denver

Boulder Beer Co.
Boulder

Dillon Dam Brewery
Dillon

Dry Dock Brewing Co.
Aurora

Glenwood Canyon Brewing Co.
Glenwood Springs

Gordon Biersch Brewery Restaurant
Broomfield

Great Divide Brewing Co.
Denver

Great Northern
Denver

Hops Grillhouse and Brewery
Golden, Littleton, Northglenn

Left Hand Brewing Co.
Longmont

New Belgium Brewing Co.
Fort Collins

Odell Brewing Co.
Fort Collins

Old Chicago
Aurora (2), Boulder, Broomfield, Colorado Springs (4), Denver (3), Fort Collins (2), Grand Junction, Greeley, Lakewood, Littleton, Longmont, Silverthorne, Superior, Thornton, Westminster, Wheatridge

Oskar Blues Grill & Brewery
Lyons

Pagosa Brewing Co.
Pagosa Springs

Palisade Brewery
Palisade

Phantom Canyon Brewing Co.
Colorado Springs

Pumphouse Brewery & Restaurant
Longmont

Redfish New Orleans Brewhouse
Boulder

Redstone Meadery
Boulder

Rock Bottom Restaurant & Brewery
Colorado Springs, Denver, Englewood, Westminster (2)

Rockyard Brewing Co.
Castle Rock

Rosie's Brewpub
Leadville

San Luis Valley Brewing Co.
Alamosa

Ska Brewing
Durango

Smugglers Brewpub & Grille
Montrose, Telluride

Tommyknocker Brewery & Pub
Idaho Springs

Walnut Brewery
Boulder

Wynkoop Brewing Co.
Denver

CONNECTICUT

Cambridge House Brew Pub
Granby

Hops Grillhouse and Brewery
Newington

Willimantic Brewing Co./ Main Street Café
Willimantic

DELAWARE

Dogfish Head Brewings & Eats
Rehoboth Beach

Dogfish Head Craft Brewery
Milton

Iron Hill Brewery and Restaurant
Newark, Wilmington

Stewarts Brewing Co.
Bear

FLORIDA

A1A Ale Works
St. Augustine

Big River Grille & Brewing Works
Lake Buena Vista

BJs Restaurant & Brewhouse
Citrus Park, Kissimmee, Pinellas Park, Orlando

Gordon Biersch Brewery Restaurant
Miami

Hops Grillhouse and Brewery
Boynton Beach, Bradenton, Fort Myers, Gainesville, Miami, Ocala, Palm Harbor, Pembroke Pines, Pompano Beach, Sanford

Orlando Brewing Partners, Inc.
Orlando

Ragtime Tavern Seafood & Grill
Atlantic Beach

Seven Bridges Grille & Brewery
Jacksonville

GEORGIA

Gordon Biersch Brewery Restaurant
Atlanta

Moon River Brewing Co.
Savannah

Rock Bottom Restaurant & Brewery
Atlanta

Twain's Billards and Tap
Decatur

HAWAII

BJ's Restaurant & Brewhouse
Lahaina

Gordon Biersch Brewery Restaurant
Honolulu

Kona Brewing Co.
Kailua-Kona

Maui Brewing Co.
Lahaina-Maui

IDAHO

Old Chicago
Boise (2)

ILLINOIS

Brass Restaurant & Brewery
South Barrington

Flossmoor Station Brewing Co.
Flossmoor

Goose Island Beer Co.
Chicago (2)

Granite City Food and Brewery
Cherry Valley, East Peoria, Orland Park

Mickey Finns Brewery
Libertyville

Old Chicago
Rockford

Rock Bottom Restaurant & Brewery
Chicago, Lombard, Orland Park, Warrenville

INDIANA

Barley Island Brewing Co
Noblesville

BJs Restaurant & Brewhouse
Greenwood

Granite City Food & Brewery
Fort Wayne, Mishawaka

J. Gumbo's Ale House and Grill
Indianapolis

Power House Brewing Co.'s Columbus Bar
Columbus

Rock Bottom Restaurant & Brewery
Indianapolis (2)

Upland Brewing Co.
Bloomington

IOWA

Court Avenue Brewing Co.
Des Moines

Granite City Food and Brewery
Cedar Rapids, Clive, Davenport

Millstream Brewing Co
Amana

Old Chicago
Bettendorf

Raccoon River Brewing Co.
Des Moines

Rock Bottom Restaurant & Brewery
West Des Moines

Sherwood Brewing Co.
Shelby Twp

KANSAS

Goebel Liquor (Rob's Other World)
Wichita

Granite City Food and Brewery
Kansas City, Olathe, Wichita (East), Wichita (West)

Old Chicago
Lawrence, Lenexa, Manhattan, Olathe, Overland Park, Topeka, Wichita (3)

KENTUCKY

BJ's Restaurant & Brewhouse
Oxmoor

LOUISIANA

BJ's Restaurant & Brewhouse
Baton Rouge

Gordon Biersch Brewery Restaurant
New Orleans

MAINE

Sebago Brewing Co.
Gorham, Portland, South Portland

MARYLAND
Dogfish Head Alehouse
Gaithersburg

Flying Dog Brewery/Wild Goose Brewery
Fredrick

Hops Grillhouse and Brewery
Owings Mills

Rock Bottom Restaurant & Brewery
Bethesda

MASSACHUSETTS
Boston Beer Co.
Boston

Cambridge Brewing Co.
Cambridge

Rock Bottom Restaurant & Brewery
Boston, Braintree

MICHIGAN
Arbor Brewing Co.
Ann Arbor

Big Buck Brewery & Steak House
Auburn Hills, Gaylord

Saugatuck Brewing Co.
Saugatuck

MINNESOTA
Granite City Food and Brewery
Eagan, Maple Grove, Roseville, St. Cloud, St. Louis Park

Old Chicago
Apple Valley, Blaine, Duluth, Eagan, Eden Prairie, Minneapolis (2), Minnetonka, Plymouth, Roseville

Rock Bottom Restaurant & Brewery
Minneapolis

MISSOURI
75th Street Brewery
Kansas City

Granite City Food and Brewery
Creve Coeur, Kansas City (Zona Rosa)

MONTANA
Bitter Root Brewing Co.
Hamilton

Madison River Brewing Co.
Belgrade

NEBRASKA
Gottberg Brew Pub
Columbus

Granite City Food and Brewery
Lincoln, Omaha

Old Chicago
Lincoln (2), Omaha (4)

Nebraska Brewing Co.
Papillion

Thunderhead Brewing Co.
Kearney

Upstream Brewing Co.
Omaha (2)

NEVADA
BJs Restaurant & Brewery
Reno

BJ's Restaurant & Brewhouse
Summerlin

Chicago Brewing Co.
Las Vegas

Gordon Biersch Brewery Restaurant
Las Vegas

Rosemary's Restaurant
Las Vegas

NEW HAMPSHIRE
The Portsmouth Brewery
Portsmouth

NEW JERSEY
Ale Street News
Maywood

Triumph Brewing Co.
Princeton

NEW MEXICO
Blue Corn Café & Brewery
Santa Fe

Chama River Brewing Co.
Albuquerque

Il Vicino Brewing Co.
Albuquerque

NEW YORK
Brooklyn Brewery
Brooklyn

CH Evans Brewing Co. at the Albany Pump Station
Albany

Crooked Rooster Brewpub
Watkins Glenn

Ellicotville Brewing Co.
Ellicotville

Great Adirondack Brewing Co.
Lake Placid

Hop Devil Grill
New York, New York

Lake Placid Craft Brewing Co.
Plattsburgh

Lake Placid Pub & Brewery
Lake Placid

Matt Brewing Co.
Utica

Rohrbach Brewing Co.
Rochester

Roosterfish Brewing Co.
Watkins Glenn

Southampton Publick House
Southampton

Wildflower Café
Watkins Glenn

NORTH CAROLINA
Barleys Taproom
Asheville

Hops Grillhouse & Brewery
Matthews

Rock Bottom Restaurant & Brewery
Charlotte

NORTH DAKOTA
Granite City Food and Brewery
Fargo

OHIO
BJ's Restaurant & Brewhouse
Cincinnati, Columbus

The Brew Keeper
North Ridgeville

The Brew Kettle, Taproom & Smokehouse
Strongsville

Gordon Biersch Brewery Restaurant
Columbus

Ohio Brewing Co.
Akron

Rock Bottom Restaurant & Brewery
Cincinnati, Cleveland

Weasel Boy Brewing Co.
Zanesville

Willoughby Brewing Co.
Willoughby

OKLAHOMA
BJs Restaurant & Brewhouse
Norman, Oklahoma City

OREGON
BJ's Pizza & Grill
Eugene

BJ's Restaurant & Brewery
Portland

Deschutes Brewery & Public House
Bend

Eugene City Brewery
Eugene

House of Spirits (Rogue Ales)
Newport

Laurelwood Public House & Brewery
Portland

Old Chicago
Beaverton, Gresham, Portland (2)

Pelican Pub & Brewery
Pacific City

Rock Bottom Restaurant & Brewery
Portland

Rogue Ales Brewery & Headquarters
Newport

Rogue Ales Public House
Newport

Rogue Distillery and Public House
Portland

PENNSYLVANIA
Barley Creek Brewing Co.
Tannersville

The Brewerie at Union Station
Erie

Iron Hill Brewery & Restaurant
Lancaster, Media, North Wales, Phoenixville, West Chester

Rock Bottom Restaurant & Brewery
King of Prussia, Pittsburgh

Triumph Brewing Co.
New Hope

SOUTH DAKOTA
Granite City Food and Brewery
Sioux Falls

TENNESSEE
Big River Grille & Brewing Works
Chattanooga, Nashville

Bluewater Grille
Chattanooga

Boscos Brewing Co.
Memphis, Nashville

TEXAS
BJ's Restaurant & Brewhouse
Addison, Clear Lake, El Paso, Lewisville, McAllen, Pearland, Plano, San Antonio, South Arlington, Sugar Land, Sunset Valley, Temple, Willowbrook

Blue Star Brewing Co.
San Antonio

Uncle Billy's Brew & Que
Austin

UTAH
Bohemian Brewery & Grill
Salt Lake City

Moab Brewery
Moab

Squatters Pub Brewery
Salt Lake City, Salt Lake Airport

Uinta Brewing Co.
Salt Lake City

VERMONT
Rock Art Brewery
Morrisville

VIRGINIA
Gordon Biersch Brewery Restaurant
McLean, Virginia Beach

Hops Grillhouse & Brewery
Alexandria, Richmond

Rock Bottom Restaurant & Brewery
Arlington

WASHINGTON
Washington State alcohol regulations currently prohibit the Brewers Association from promoting Washington businesses that participate in the Pub Discount Program and in most cases prohibit Washington breweries from participating in the program.

WASHINGTON, D.C.
Gordon Biersch Brewery Restaurant
Washington, D.C.

WISCONSIN
Granite City Food and Brewery
Madison

Milwaukee Ale House
Milwaukee

Northwoods Brewpub & Grille
Chetek, Eau Claire

Old Chicago
Green Bay, Madison

Rock Bottom Restaurant & Brewery
Milwaukee

Stone Cellar Brewpub
Appleton

WYOMING
Snake River Brewing Co., Snake River Brewpub
Jackson, Lander

CANADA
Cameron's Brewing Co.
Oakville, ON

body temperature that basically fries their brains and organs. I was amazed that no one seemed to have heard of this.

There is a potential danger for pet owners who might discard their spent hops in the yard or allow their pets to possibly eat the hops. I was surprised to learn that spent hops are more dangerous to dogs than fresh ones. I am contacting suppliers to ask them to include a warning in their brewing instructions. My local vet is spreading the word throughout the industry here as well.

I still find this amazing! Hops seem to be such a safe ingredient. How could a flower be so dangerous? Why would a dog eat something so bitter?

Larry Wilson
Seminole, Fla.

Dear Larry,
Thanks for the helpful warning. I did a bit of research and found this on several Web pages including http://workingdogs.com/doc0175.htm:

Hops Homulus (sic) lupulus: the spent hops from the home brewing of beer presents a new danger to dogs. Since 1994, the National Animal Poison Control Center has been consulted on five dogs, only one of whom survived. The dogs present with panting,restlessness, and signs of increasing pain. The most significant symptom is a rapid increase in temperature called malignant hyperthermia. Treatment includes gastric lavage, charcoal slurry, coldwater baths and IV sodium bicarbonate to reverse metabolic acidosis. Hops contain a variety of biologically active compounds, the most suspect however is an uncharacterized alkaloid.

Seriously,
The Professor, Hb.D.

(continued on page 32)

What You'll Need for Your First Beer

In order to make beer at home, you'll need a few items of equipment in addition to the ingredients. Some of the equipment can be found in your kitchen—things like spoons and pots. But you will need to purchase some additional items as well. Here's a list of what we recommend.

All of these items can be acquired at your local homebrew store. To find one near you, check your Yellow Pages under "brewing" or "beer."

Things you usually have already

- A stove. Running water. (You can brew without these, but it's not recommended for your first batch!)
- A pot with 1.5 gallons (5.68 to 7.57 L) capacity or more—bigger is better. (Do not use anything with visible rust on the inside.)
- Cooking spoon—plastic, wood or metal. (Again, no rust!)
- Can opener
- Measuring cup—one cup capacity or larger
- A clean cup or small bowl—used for mixing up the yeast.

Things You'll Buy From the Homebrew Store: The Basics

Most stores offer a starter kit for homebrewers that contains the basics listed below. Additional nice-to-have items may also be included as detailed in the "Options and Accessories" section that follows.

Fermenter

Usually a 6.5-to-7-gallon (24.6 to 26.5 L) food-grade plastic bucket with a tight fitting lid. The lid will have a small hole where the air lock will be inserted. Veteran brewers often use a glass carboy instead, but the recipes given in the articles that follow assume the use of a plastic fermenter.

Air lock and stopper

This allows carbon dioxide to escape during fermentation while keeping air out. You will insert this in the hole in the fermenter lid using the proper-sized stopper and then fill the air lock chamber about one-half full with water.

Thermometer

Used to check the temperature of the beer before adding the yeast and later for grain steeping or mashing.

Transfer or racking cane and tubing

Clear or white plastic cane and tubing used for transferring the beer from one vessel to another and during bottling. The cane should have a pointed thimble attached to the straight end to keep it elevated above the bottom of the fermenter.

Bottling or racking bucket

An open-topped plastic bucket used during bottling. Beer will be transferred into this bucket from the fermenter and then from here into the bottles.

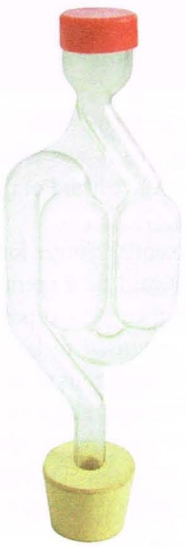
Bottle filler

A section of hard plastic tubing fitted with a spring-loaded plunger at the end. Used to transfer beer into bottles by pressing the plunger end against the bottom of the bottle.

Bottle capper

A device used to affix bottle caps to the filled bottles of beer.

Fermenter



Air Lock and Stopper

Photos by Kerry Fannon

Sanitizing agent

Your homebrew shop can recommend various alternatives or you can use plain unscented household bleach.

Bottles

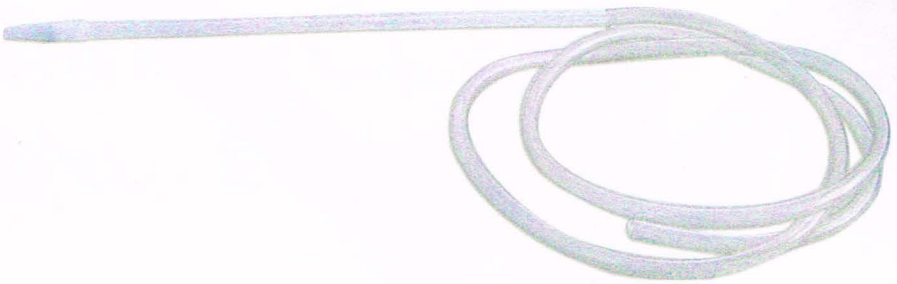
You can purchase clean, new bottles from many homebrew stores. Alternately, you can acquire empty returnable bottles and clean them yourself. You'll need two cases for each 5-gallon batch of beer.

Bottle cleaning brush

You'll need this eventually to clean your used bottles, even if you buy clean, new bottles from the store to start with.

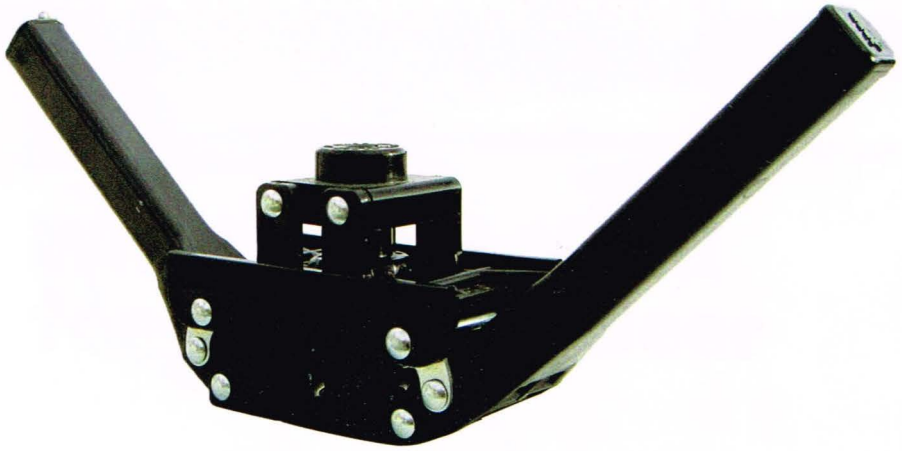
Options and Accessories

The equipment listed above will allow you to make beer, but a few additional items will make the process easier or improve the quality of your product. Some suppliers sell these items as part of a basic setup and in most cases, you will be happy you got them.



Bottle Filler

Hydrometer



Bottle Capper

Glass Carboy

Hydrometer

This is used to measure the specific gravity or density of the beer before and after fermentation. Knowing this allows you to determine the alcohol content and monitor the progress of your beer. Highly recommended.

Glass carboy and accessories

Using a 6.5-to-7-gallon glass carboy for your initial fermentation requires a bit more care and effort. One caution: do not pour hot wort into an empty glass fermenter as it may break, ruining your beer, your fermenter and your day. For each carboy, you will want a stopper, a carboy brush for cleaning the vessel and possibly a handle or web harness. You will also need a large funnel for pouring liquids into the carboy.

Bottle/Carboy washer

Makes cleaning used bottles faster and easier. These devices screw onto a faucet (usually with a simple adapter) and clean bottles with a burst of water.

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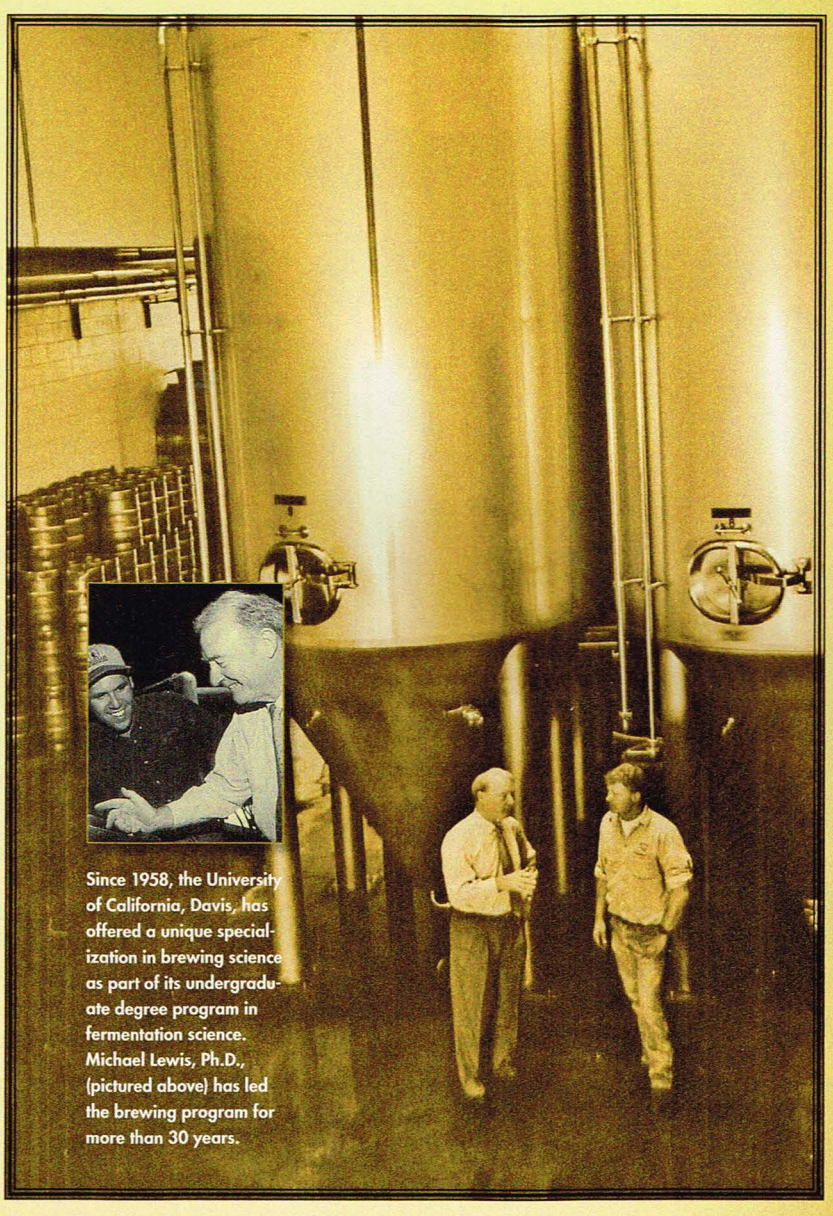
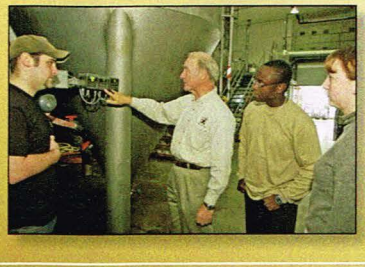
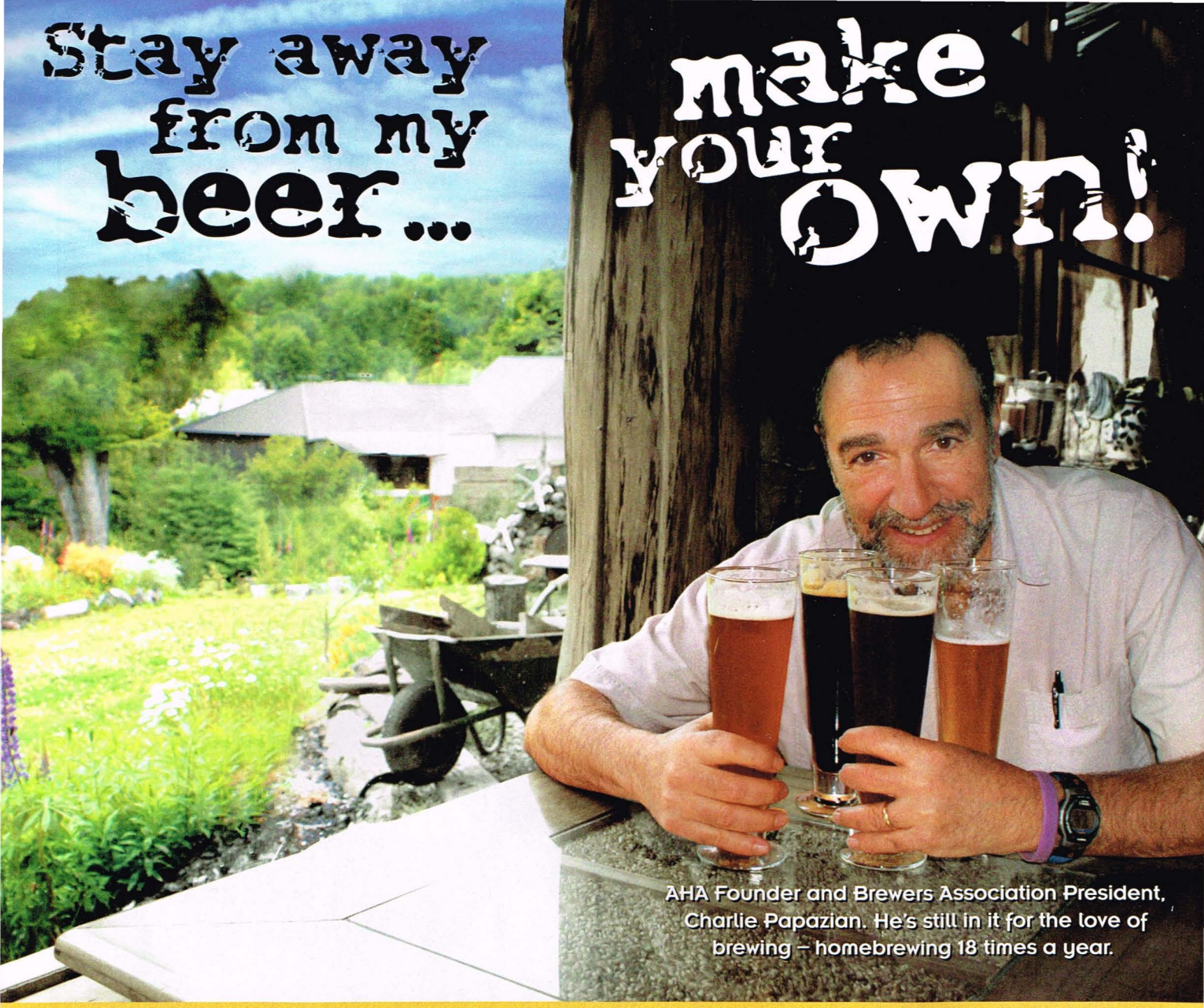


Since 1958, the University of California, Davis, has offered a unique specialization in brewing science as part of its undergraduate degree program in fermentation science. Michael Lewis, Ph.D., (pictured above) has led the brewing program for more than 30 years.



UC DAVIS EXTENSION

BREWING PROGRAMS



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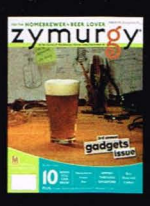

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BA BREWERS ASSOCIATION

An Essential for Good Beer

Beer is created when brewers yeast converts malt sugar into alcohol and carbon dioxide. Thus, the whole purpose of brewing is to create the perfect food for microorganisms.

Unfortunately, what is perfect food for brewers yeast is also attractive to other organisms commonly found in foods such as the bacteria that make vinegar and yogurt. Obviously, you want your beer to taste like beer and not old milk or spoiled wine. Thus, the only way to make good-tasting beer is to make sure that brewers yeast is the only organism that gets a significant chance to eat the food that you prepare for it. That's where sanitation comes in. To make sure the yeast has the upper hand, you need to clean and sanitize everything that will come in contact with the beer. (See sidebar for a list of these items.)

ITEMS TO CLEAN AND SANITIZE

On brewing day, this includes the following items:

- Fermenter
- Fermenter lid
- Air lock parts and stopper
- Thermometer
- Hydrometer
- Funnel (if applicable)
- Cup or bowl used for mixing the yeast

On bottling day, this includes:

- Racking or bottling bucket
- Racking cane and transfer tubing
- Bottle filler
- Measuring cup used for priming sugar
- Hydrometer and hydrometer jar or tube
- Bottles and bottle caps
- Any other object that comes into contact with the beer

Before each item is used, it should first be cleaned of all visible soil or residue and then soaked in sanitizing solution for at least 10 minutes. Cleaning is best done with a normal dish cleaning sponge (no scouring pads as these can scratch the surface of your equipment and provide spaces where bacteria can hide) and plenty of hot water. Then, when all of the items are clean, fill the fermenter or racking bucket with your hottest tap water and mix in the appropriate amount of sanitizer. (If you are using household bleach, 2 fluid ounces in 5 gallons of hot tap water, or 59 mL in 19 L is the normal rate. For other sanitizers, follow the package directions.) Then put all the other items that need to be sanitized into that bucket to soak. These items should soak for at least 10 minutes.

When you are ready to use an item, take it out of the bleach solution and rinse it once with very hot tap water. Other sanitizers may not require a rinse.

While you are doing all of this, think like a bug. Think about where you could hang out to avoid the sanitizer and still get into the beer, and clean those places!

By the way, if you fail to clean effectively, the worst that can happen is bad-tasting beer. There are no known human pathogens (i.e. bugs that cause disease) that can survive in beer, so you don't have to worry about poisoning yourself or your friends.

First Batch

BREW YOUR FIRST BATCH

There's (No) Trouble Brewin'

THIS IS AN AMERICAN-STYLE CRAFT BREWED PALE ALE THAT IS EASY TO MAKE AND EASY TO DRINK. IT PROVIDES AN EXCELLENT INTRODUCTION TO THE ART OF BREWING FOR THE FIRST-TIME BREWER.

Before beginning to brew this recipe, you'll need to make sure you have all the required equipment and ingredients. You should also have read the previous article on sanitation. Now, before you begin, read the whole procedure so you see how things are going to work and then you'll be ready to dive in and brew.

Ingredients

Shopping List

1 can (3.75 lb) Coopers "Bitter" Brewing Kit (includes a packet of yeast)
2 lb Muntons light dry malt extract
1 oz Cascade hops (pellets)

These items, along with the basic equipment needed, can be purchased at any homebrew store. If your shop doesn't have these exact ingredients, ask the shop staff for appropriate substitutes.

Once you have all the needed equipment and ingredients, you are ready to make the first batch. It shouldn't take more than 90 minutes from start to finish.

Procedure

A. Bring 1 gallon of water to a boil in an uncovered pot large enough to hold 1.5 gallons or more.

B. While heating the water:
1) Remove the plastic lid and yeast packet from the top of the Coopers kit. Immerse the unopened can in very hot tap water so that the thick syrup inside will soften.
2) Clean and sanitize your brew day equipment according to the directions found in our article on sanitation. (See page 17 for a list of what to sanitize.)

C. When the water has come to a boil: Turn off the burner under the pot—this will keep the extract from scorching when you add it. Next, open the can of extract and add its contents to the pot of boiled water. (Scrape out with a spatula, rinse with a small amount of hot water.) Stir the pot until the extract has dissolved. Now add the dry malt extract and again stir until dissolved. Now turn on the burner again and when this comes to a boil, add the hop pellets and boil for five more minutes. Stir vigorously during the initial boil to avoid a boil-over.

D. During the boil, fill the already-sanitized plastic fermenter about one-half to two-thirds full (approximately 3 gallons, or 11.36 L) with cold water. (See notes on page 22 if you happen to be using a glass carboy fermenter.)

E. At the end of the boil time, turn off the burner and remove the pot. The strong, unfermented beer now contained in the pot is called "wort."

F. Carefully pour this wort into the plastic fermenter containing the cold water. If your fermenter is marked in gallons, add cold water, if needed, to bring the total

MAKING AUTHENTIC IRISH STOUT

The ebony blackness of stout somehow seems to attract attention among beer drinkers and many have grown to love the flavor that goes with it. This beer moves beyond malt extract to include the use of grains in the brewing process. The procedure is still very simple and you'll love the results.

Equipment

In addition to the basic equipment used for the first batch, you will need a grain bag, approximately 7 inches by 7 inches (17.8 cm by 17.8 cm) or larger, OR a large kitchen strainer to complete this recipe.

Ingredients

1 lb pre-crushed roasted barley*

1 can (3.3 lb) Muntons Hopped Amber Malt Extract

2 pounds of light dry malt extract (Muntons or other)

1 packet dry ale yeast

*Brewing grains must be crushed before use. At most stores, you can usually buy them whole or crushed. Until you are buying a lot of grain and want to acquire your own grain mill, buying pre-crushed malt is the most convenient.

• Target Original Gravity: 1.043

Procedure

Put 1 gallon of hot tap water in the pot.

Put the crushed roasted barley in the grain bag and close securely. Put the grain bag in the water and begin heating the water on the stove. Stir every three to five minutes until the water comes to a boil. (If you don't have a grain bag, you can add the grains directly to the water and remove them later with a strainer.)

Remove the grain bag as the water begins to boil. Let the bag drain into the pot. (If you are not using a grain bag, add the grain directly to the pot before you begin heating and use a strainer to fish out as much grain debris as possible once you reach a boil.)

Once the grain is removed, allow this liquid to boil for about 15 minutes.

Turn off the burner and add Muntons Hopped Amber Malt Extract and dry malt extract. Stir until dissolved.

Turn on heat and boil for five more minutes, stirring vigorously to avoid a boil-over.

Fill the fermenter one-half full with cold water.

Turn off the burner and allow the hot wort to stand for at least five minutes before adding to the fermenter.

Add the hot wort to the cold water in the fermenter. Top up fermenter to 5 gallons (19 L) with cold water if necessary. Allow to cool to 75° F (24° C) or lower, then follow the instructions shown in "Managing Fermentation" to prepare the yeast and conduct the fermentation.

For additional recipes see "Winners Circle" on page 31.

volume to 5 gallons (19 L). Otherwise just try to leave 2 to 4 inches (5 to 10 cm) of headspace above the liquid in the fermenter.

G. Put the clean, sanitized floating thermometer into the fermenter so that you can check the temperature. Set the lid for the fermentation bucket loosely on top while the wort is cooling.

H. When the temperature of the wort drops to less than 75° F (24° C), you are ready to take a hydrometer reading and add the yeast.

I. If you have purchased a hydrometer, this is the time that you want to use it. To do this, you can set the clean, sanitized hydrometer gently into the wort. Most of it will sink, leaving a portion of the thin stem sticking out of the liquid. Give it a minute to settle and then take a reading. This is what is known as your "original gravity" or OG. For this recipe, the expected OG is about 1.046, but this can vary considerably, maybe between 1.038 and 1.058 depending upon the exact vol-

FOR PURPOSES OF THIS FIRST RECIPE, YOU CAN TAKE THE SIMPLE APPROACH TO ADDING YEAST BY SIMPLY SPRINKLING THE DRY YEAST POWDER ON TOP OF THE WORT.

ume of wort that you have in the fermenter. Don't worry too much about this, just make a note of your actual OG reading.

J. For purposes of this first recipe, you can take the simple approach to adding yeast by simply sprinkling the dry yeast powder on top of the wort. Don't worry that it appears to just sit on the top and by all means resist the temptation to stir it in. In good time, the yeast will dissolve and go to work. The next article on "Managing

Authentic German Wheat Beer (Weizen)

Those who have sampled the wonders of German brewing often come away with a love for the malty, spicy flavor of an authentic Bavarian wheat beer, known as a "weizen." This basic recipe allows you to produce that flavor right in your own homebrewery.

Ingredients

2 cans	(6.6 lb) Alexander's Wheat Extract (without yeast packet)
1 ounce	Perle or Liberty Hop Pellets
1 tube/pack	White Labs WLP300-Hefeweizen ale yeast or Wyeast 3068 Weizen Yeast (Note: If you prefer the softer flavor of American-style wheat beers, you might prefer WLP320—American Hefeweizen yeast or Wyeast 1010 American Wheat yeast instead.)

Expected Original Gravity: 1.050-1.051 for 5 gallons (19 L)

Directions

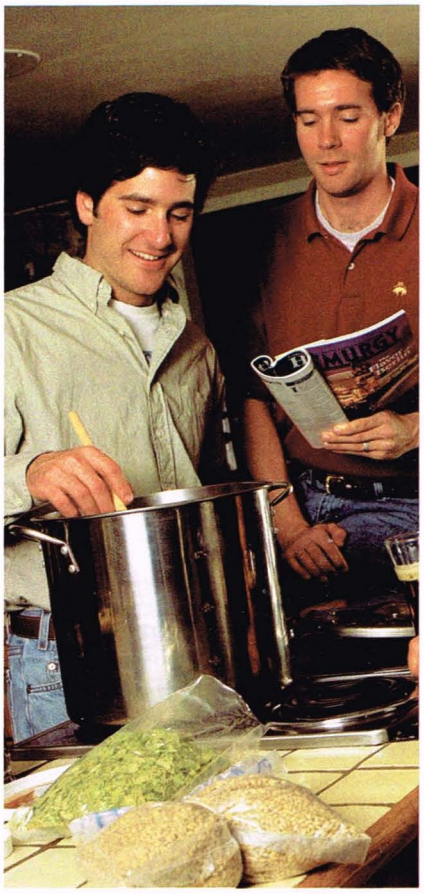
Put 1 gallon (3.79 L) of hot tap water in the pot and bring to a boil.

Turn off burner, add the malt extract. Stir until dissolved and then turn burner back on. Add the hops. Boil for 30 minutes. Stir as needed to avoid boil-over.

Fill the fermenter one-half full with cold tap water.

Allow the hot wort to stand for at least five minutes before adding to the fermenter. (If using a glass fermenter, follow instructions given on page 22 to avoid breakage.)

Add the hot wort to the cold water in the fermenter stopping up to 5 gallons (19 L) if necessary, let cool to 75° F (24° C) or lower, then add the yeast. Follow the instructions shown in "Managing Fermentation" (page 23) to monitor the fermentation.



Fermentation" has hints on other alternatives for handling yeast for future brews.

K. Once you have added the yeast, attach the lid and snap it into place. After this is done, you can attach the fermentation lock. Be sure to add a bit of water to the fermentation lock so that it will let carbon dioxide out without allowing air or wild yeast and bacteria to circulate back into the fermenter.

L. Store the fermenter someplace where the temperature will stay around 65°-75° F (18°-24° C). If you are able to control the temperature of the room, the cooler end of this range is better than the warmer end.

Your beer will stay in the fermenter for about a week. But you'll want to keep an eye on it so you know what is going on. For now, take a break and enjoy a beer to toast your hard work in your own homebrewery. When you get a chance, read the next article on managing fermentation to help you monitor and assess the progress of your first fermentation.

NOTES ON THE USE OF GLASS CARBOYS

The procedure for the first beer has been written assuming the use of a plastic fermenter with a removable top. Use of a glass fermenter will change some of the steps. First, it is not safe to pour hot wort into a glass fermenter, even when it is partially filled with cold water. Thermal expansion could cause the fermenter to break. Second, you will not be able to float your thermometer or hydrometer in the fermenter to take readings.

To adjust, you will want to cool the wort in the pot you use for boiling. When the boil is finished, turn off the burner and remove the pot. Rather than adding cold water to the fermenter, you can add cold water to the pot to help cool the wort. Add as much as the pot will hold while still being manageable. Then float your sanitized thermometer in the pot, cover it and set it in a cool place. This cool place might include a sink partially filled with ice water, a refrigerator or freezer, or even a snowy porch step or chilly basement corner. When the temperature has dropped to 100° F (38° C), it is safe to pour the wort into the fermenter and fill it up with cold water.

To take a hydrometer reading, you will have to remove some wort from the fermenter after the water has been added. Handling full glass carboys is a bit hazardous, so if you don't feel you can do it safely, it may be best to skip this step. But if you can manage it, shake or swirl the fermenter a bit to make sure things are well mixed inside and then carefully tip it enough to pour out about a cup of the wort. You may also use a "Wine Thief" to take a sample from your carboy. This wort can be put in the hydrometer tube for a reading of your original gravity or OG. (Do not return any of this wort to the fermenter or you'll risk contamination of the whole batch.)

Once this is done, you are ready to attach the stopper and the fermentation lock and place the fermenter in a suitable location for fermentation. The only other factor you'll want to consider is that glass carboys sometimes overflow during fermentation. Normally, you'll have little headspace below the neck of the fermenter, so you'll want to place the fermenter in a box lined with a garbage bag or something similar so that it will be easy to clean up any spills that may occur. (Later you'll learn how to manage this with a blow-off tube.)

Managing Fermentation, or the Art of Yeast Wrangling

While brewers like to claim that they make beer, it is actually the yeast that turn our prepared sugar solution into an alcoholic beverage. During this process we brewers mostly wait—although some amount of watching is useful as well. This article discusses fermentation and your role as the brewer. It begins by describing a more desirable technique for preparation and pitching of dry yeast and then continues with a discussion on fermentation itself. After the fermentation is over, you'll be ready for bottling.

Pitching Dry Yeast

Each time you make beer, you'll be adding yeast once the temperature of the wort drops below 75° F (24° C) or lower. While you can sprinkle dry yeast on top of the cool wort as we did in the first recipe, you'll improve the probability for success if you take a few minutes to prepare the yeast for the feast it is about to receive.

To do this, you'll run warm (about 98-100° F or 37-38° C) water into a clean and sanitized cup, bowl or measuring cup. Open the yeast packet and pour it onto the warm water without stirring. Allow the yeast to dissolve in the warm water for about 10 minutes then stir in with a clean spoon.

Once prepared, this yeast slurry can be added to the cool wort in the fermenter. Then you will attach the lid and fermentation lock. (Don't forget to put some water in the fermentation lock to serve as an airflow barrier.) Fermentation should start within 24 hours. During fermentation, you'll want to store the fermenter someplace where the temperature will stay around 65° to 75° (18°-24° C). If you have any control over it, the cooler end of this range is better than the warmer end.

By the way, if you buy a package of dry yeast and don't use it, toss it in the refrigerator until you do need it. This will help to sustain the freshness and vitality of the yeast.

Liquid Yeasts

Many homebrewers use liquid yeast

ADDITIONAL RESOURCES

Membership in the American Homebrewers Association

This includes a subscription to *Zymurgy*, discounts on beer and food, TechTalk e-mail forum, book discounts and other benefits. See www.AmericanHomebrewers.org and click "Join the AHA" or call 1-888-822-6273.

***How to Brew* by John Palmer**

A complete guide to ingredients, methods, equipment and recipes for brewing beer at home.

***The Complete Joy of Homebrewing* by Charlie Papazian**

An excellent guide to both beginning and advanced brewing techniques and the standard text for every homebrewer.

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A valuable resource for both supplies and advice–check out our AHA Member Shops page at www.AmericanHomebrewers.org or your local yellow pages.

Homebrew Digest

See www.hbd.org—a daily digest of homebrew topics ranging from simple to advanced.

preparations as an alternative to the packages of dry yeast. Liquid yeasts tend to cost more than dry yeast packages, but they can be well worth it in terms of beer quality and brewing convenience. There is a much wider variety of liquid yeasts than there is of dry yeast. Each type produces different characteristics in the finished beer and often you must use a special yeast type when you want to copy a particular commercial beer that you like.

Liquid yeasts come in packages that contain enough yeast for a 5- gallon batch. One style comes in a foil pouch. To use it, slap the pouch to break a small wort package inside and incubate the package for three hours. The expanded pack is ready to be pitched into the beer. Another brand of liquid yeast comes in a vial about the size of a small safety flare. The contents of the vial can be pitched directly into the wort.

Liquid yeast packages have a more limited shelf life than dry yeast. Liquid yeasts carry a date indicating when they were filled by the manufacturer or a best-before date.

Fermentation

If it is convenient, you'll want to check the fermenting brew every 12 to 24 hours for activity. If all goes well, you should see vigorous activity within the first day. This will be indicated by rapid bubbling of carbon dioxide out of the fermentation lock and also by the development of foam, called kraeusen, at the top of the liquid level. This is usually visible from the outside even with opaque white plastic fermenters.

Once this has happened, you know that everything will be OK. In a week or so, your beer will be ready to bottle.

If you don't see any signs of fermentation activity within the first 48 hours, there may be trouble. Generally, the best approach is to wait it out. If you've been away for a couple of days or forgot to check for activity during the first 48 hours, it may have done its thing while you were away. In this case you should still see a ring of gunk around the top edge.

If you get a quick initial fermentation (within 48 hours), you'll most likely be ready to bottle five to seven days after the brew day. Follow the instructions for bottling on page 27. If your fermentation starts more slowly, you must wait until all activity has ceased before you think about bottling. Check the fermentation lock every day or so and when you can see no more visible bubbling, wait another three to five days before proceeding to bottling.

If you fail to notice any signs of fermentation after a week, you may open the fermenter and check on things. Before you do this, clean and sanitize both the inside and outside of a measuring cup. Use this to collect about a one-cup sample of the beer or wort once you have removed the airlock and lid. Once the sample is collected, replace the lid and airlock. Now you have a sample of your beer and you can assess its condition. First, if you have a hydrometer, fill the hydrometer tube and take a reading. If the reading is at or below 1.020, then you've had a successful fermentation.

Whether you have a hydrometer or not, you can also taste the beer. If it is thick and tastes very sweet and syrupy, then it most likely has not fermented. If it has the general properties of beer (minus the carbonation at this point), then you are on the right track. In either case, don't return the sample to your fermenter—it can contaminate the batch. If you are in doubt, save the sample in the refrigerator and ask the folks at your local homebrew shop at your earliest convenience—they'll be glad to help out.

bottling

BOTTLING YOUR BEER

A FEW DAYS AFTER FERMENTATION IS COMPLETE, YOU ARE READY TO BOTTLE YOUR BEER. HERE'S A CHECKLIST OF THE THINGS YOU'LL NEED ON BOTTLING DAY.

Equipment

- Measuring cup, one cup (237 mL) or larger capacity, capable of measuring 0.75 cup (177 mL)
- Small pot for boiling water
- Racking/bottling bucket [7 gallon (26.5 L), plastic]
- Racking cane and transfer tubing
- Bottle filler
- Hydrometer (optional)
- Bottle capper

Supplies

- 50+ 12-ounce bottles
- 50+ bottle caps
- Corn sugar (purchased from your homebrew supply shop)

Overview

First, if you haven't used a bottle capper before, experiment with it a bit on an empty bottle or two. Once you've got the hang of it, just use a bottle opener to remove the practice caps from the empty bottles. (Just think, you'll soon be doing that to bottles of beer that you brewed yourself!)

Now, here's the overview of the bottling process. First, you'll sanitize everything to make sure that you will wind up with good-tasting beer! Next, you'll transfer the beer from the fermenter to the bottling bucket in order to separate it from the spent yeast and other debris. Then you add just a bit of sugar to the beer so that it will carbonate in the bottle. After that, you are ready to fill the bottles and cap them.

Throughout this process, you want to minimize splashing, foaming and aeration of the beer as this can have undesirable flavor effects. This isn't a huge deal, but just remember that "quiet is cool" when dealing with fermented beer.

Sanitize the Equipment and Bottles

The first step in bottling is cleaning. All of the equipment that will touch the beer—no matter how briefly—must be cleaned and sanitized as described in our article on sanitation. See page 17 for a list of things you need to sanitize on bottling day. In addition, all the bottles must be cleaned and sanitized as well. Fortunately, if you are using new bottles, you can usually go straight to the sanitizing step.

Racking the Beer

"Racking" is a brewer's term for transferring or moving the beer from one vessel to another. In this case, we'll rack the beer from the fermenter to the bottling bucket using the sanitized racking tube and cane. (See the sidebar on page 28 for how to start the transfer without sucking on the tube!)

To achieve racking, we'll use the magic of siphon action to move the beer. Siphon power depends on keeping the level of the hose end and the liquid in the bottom container lower than the level of liquid in the top container. Keep this in mind and adjust things during the racking process if you need to.

Put the fermenter on the counter, with the bottling bucket below it on a chair set immediately in front of the counter. (Alternately, you can put the fermenter on a chair and the bottling bucket below it on the floor.)

Now put the racking cane filled with sanitizer in the fermenter and hang the tube end below near the bottling bucket, making sure the clamp is closed. Ideally, the height of the bottling bucket should be such that the tube will rest on or near the bottom. Use a large clean, sanitized cup or bowl below the fermenter to drain the

PLEASE DON'T SUCK!

Once your beer has fermented, you'll need to transfer it from the fermenter to the bottling bucket. This will probably be the first time that you have occasion to use the racking cane and tube. It needs to be filled with sanitizer before use and then you'll need to get it full of beer so that it will flow by siphon action for racking.

When trying to get the racking cane and tubing started, your natural inclination is to stick the cane into the sanitizer or beer and then suck on the tube end to draw the beer into the tube. Bad idea. The human mouth is full of nasty bacteria—even after treatment with an anti-bacterial mouthwash. To get around this, you can fill the cane and tube once at the beginning of your day and then keep them filled with some fluid until you are done. Here's one approach.

At the beginning of the day, fill the whole racking tube and cane assembly with water. You can suck on it here if you want, but better yet, hold the open end of the tubing up against the faucet and let the pressure of the water fill the device. Then drop the cane end into your bottling bucket filled with sanitizer. Using siphon action, open the clamp on the end of the tubing and use a measuring cup or other small container to run solution through the racking cane and tubing until they are full of sanitizer. Close the clamp and throw the clamp end into the bucket of sanitizing solution along with the cane end so that both can soak.

When the soaking is done, you will have a sanitized racking cane and tube that are full of sanitizing solution. For the rest of the day, you'll want to keep that tube and cane full of liquid—that way you'll always be ready to start the flow of liquid and you'll never have to suck on the end. Voilá!

sanitizer from the racking cane and tubing to start the siphon of your beer. Release the clamp and let the sanitizer flow into the cup or bowl until you get beer coming through the end of the tube. Clamp the tube, then move the end of the tube to the bottom of the bottling bucket and release the clamp again to allow the beer to flow into the bucket. Discard the sanitizer. Try to minimize splashing by keeping the end of the tube submerged in beer.

Near the end of racking, you will want to tip the fermenter to keep the end of the racking tube submerged in beer for as long as possible and minimize beer loss. Then, as the thimble on the racking cane is about to emerge from the last of the beer, close the clamp on the tube end so that the racking tube and cane remain filled with beer.

You are now ready to prime the beer.

Priming

Right now your beer is flat; it has no carbonation. Rather than using some mechanical or industrial process to carbonate it, we will do this naturally using the fermentation power of the yeast.

When yeast ferment sugar, they turn it into alcohol and carbon dioxide. The carbon dioxide produced by fermentation inside a bottle dissolves into the beer and thereby carbonates it. Even if your beer looks perfectly clear when you rack it, it still contains enough yeast to carbonate your beer. All we have to do is add a measured amount of sugar before bottling.

The standard quantity of sugar used for priming 5 gallons of beer is 0.75 cup (177 mL). Use corn sugar (also known as dextrose) for this purpose. You should not use ordinary table sugar.

Measure the sugar using a measuring cup and then stir it into 0.33 to 0.66 cup (75 to 156 mL) of boiling water. This will sanitize the sugar solution. Once this is prepared, you can pour it into the beer in the bottling bucket. Next, take the racking cane and gently stir the beer for 30 seconds or so to

thoroughly mix in the sugar solution. Remember, no splashing! Alternatively you can add the sugar solution to your bottling bucket prior to siphoning the beer into it.

Bottling

First set the bottling bucket on the counter or a chair and make a work area for yourself on the floor so that siphon power will move the beer for you. Do not bottle on carpet as you will assuredly spill some beer in the process!

Next, arrange the bottles nearby. You may find it convenient to leave them in the case boxes to make them easier to handle.

With the racking tube clamp still closed, affix the bottle filler to the end of the tube. Now use the empty priming sugar cup to practice. With the racking cane in the beer and the bottle filler in your priming cup, open the clamp on the racking tube. Then press down on the bottle filler so that beer flows into the cup. If you want, put 6 ounces or so (177 mL) of beer into the cup and use this to measure the gravity with your hydrometer. The gravity recorded at this point is known as "final" or "terminal" gravity and usually abbreviated as "FG" or "TG." (Oh, and you can drink the beer you collect for the hydrometer reading—don't add it back to the stuff you are going to bottle.)

You are now ready to fill those bottles! Insert the bottle filler into a bottle and press it against the bottom of the bottle to start the flow of beer. Continue until the liquid level comes near the top of the bottle. As soon as you release the pressure on the filler, the flow of beer will stop. Then, as you remove the filler from the bottle, the level of beer will drop. When the filler is removed, the beer will be about an inch from the top of the bottle. Be sure to leave an inch or so of head space in the bottle to ensure proper carbonation.

At this stage, you may find it easiest to fill a whole case of bottles before you begin capping.

As you fill, keep an eye on the level of beer in the bottling bucket. When it starts to get low, tilt the bucket so that you can draw out most of the beer without sucking up any air.

Once the bottles are filled and capped, they need to rest for two weeks to a month before they'll be ready to drink. Ideally, you will keep them at room temperature, 65 to 75° F (18 to 24° C) during this time so that the fermentation and aging processes can take place properly.

It is hard to wait, but patience is usually rewarded with better tasting beer. (Of course to prove this, you might have to taste one bottle after two weeks.) If you are that anxious, go ahead and make another batch of beer so that you'll have a steady supply coming once you taste the first batch.

By the way, this is the stage where you start thinking about that old bugaboo of homebrewing—the exploding bottle. The techniques we use today make this an extremely rare occurrence. Nonetheless, it is a good idea to keep your bottled beer stored inside cardboard case boxes with the lids closed. That way, if one does happen to explode, the glass will be contained inside the box.

After the beers have aged, throw a couple of bottles in the refrigerator to chill them down. Open and enjoy.

Labeling your Brew

If you drink all of one batch before you make another, you'll never have any need to label your beers. But often batches overlap, so some system of labeling comes in handy.

The easiest is to take a felt tip marker and mark a batch number on the top of each bottle. If you want more than that, you can get some of the small, round, self-adhesive labels sold at office supply stores and affix them to the tops of the bottles. With these, you can write out some additional information including the name, style, bottling date, etc. if you want to.

Another fun thing to do with your homebrew is to have some labels made up to go on the front of the bottle. If you are artistic or have some skill with a computer, this can be easy to do. Homebrew shops often offer gummed paper that is pre-cut or perforated to produce normal bottle-sized labels. But whatever you do, remember the three most important rules of bottle labels: 1) Have fun, 2) Go wild, and 3) Show off.

Even More Brew Toys

Just about any kit or extract beer can be made using the basic equipment you buy to make your first beer. But as you advance, the following items may prove useful.

Carbon Water Filter

Carbon filtration removes chlorine from your brewing water. This is important because chlorine can form unpleasant-tasting compounds when included in your brewing water. A simple faucet-attached unit can be installed in 10 minutes without requiring any changes in your plumbing.

Large Brew Pot

Under ideal circumstances, the entire volume of wort that will go into the fermenter should be boiled. To do this, you will need a brew pot that will hold at least 6 gallons of liquid for extract-based brews. These can be $40-$180.

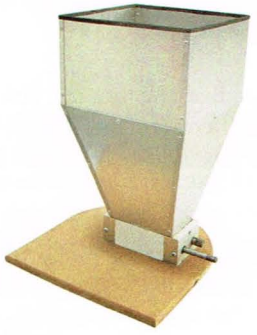
Wort Chiller

This is a long section of copper tube that has been coiled up to fit inside your brew pot. Water is run through the coil while it sits in your hot wort in order to quickly chill the wort after boiling. If the volume of wort you boil is more than 2 gallons, we strongly suggest you acquire this piece of equipment.

Wort Chiller

Grain Mill

Many homebrew shops will crush grain for you. If you want to have greater control over the crush that you get, you can mill your own. A number of grain mills designed specifically for homebrewing can be purchased at homebrew stores. These aren't cheap, with prices ranging from $85-$140.



Grain Mill

Propane Burner

Propane Burner

Few domestic stoves are powerful enough to boil 6 or 7 gallons of wort in a reasonable time period. As an alternative, you might buy a propane-fueled outdoor burner or Cajun cooker. These connect to readily available propane tanks and put out enough heat to quickly produce a rolling boil. Just remember, these burners must be used outdoors! Prices run from $50-$90.

Good Reading

If you haven't already, check out your homebrew store or shop.beertown.org to find out about books for homebrewers.

GLOSSARY

Clean—Denotes the absence of visible soil or debris.

Dry Yeast—A powdered or granular form of yeast that has been dehydrated.

FG—Final Gravity. The same as terminal gravity. A measure of the density of finished beer.

Hops—The green, cone-like flowers of a rapidly growing vine properly called Humulus lupulus. Hops impart bitterness to beer and, depending upon how they are used, can also confer a range of flavors and aromas to the finished product.

Malt—Short for "malted barley," the cereal grain from which beer is made. Raw barley is malted by wetting it and allowing it to germinate. The grain is then dried so that it can be stored and transported for use by brewers.

Malt Extract—A solution of sugars and other compounds extracted from malted barley and used in the making of beer.

Mash, mashing—A thick combination of crushed malt with hot water designed to extract malt sugars and flavors. Unlike steeping, this process strives to activate the natural malt enzymes in order to maximize the conversion of starch into sugar.

OG—Original Gravity. The specific gravity, or density of the wort prior to fermentation.

Pitch, pitching—The addition of yeast to wort to initiate fermentation.

Rack, racking—The process of transferring wort or beer from one container to another.

Sanitize—To treat with solutions that dramatically reduce the number of microorganisms present on a surface.

Steep, steeping—Soaking of crushed grains in hot water to extract flavor components.

TG—Terminal Gravity. The specific gravity of beer after fermentation.

Wort—The boiled solution containing malt sugar and hops that is cooled and pitched with brewers yeast to produce beer.

Yeast—The single-celled organisms responsible for converting sugar into alcohol and carbon dioxide during the making of beer and other alcoholic beverages.

Every year, the American Homebrewers Association organizes the AHA National Homebrew Competition, the world's largest beer competiton, in which thousands of beer entries from all over the world are judged. Awards are given to the top three entries in each of 28 style categories. Many of these recipes use malt extract and follow simple brewing procedures like those you have already learned. The following beers were brewed by people just like you, making beer at home for the fun of it—yet their finished product was rated by experienced beer judges as being the best homebrew in the country. These represent a few of the very best of the best. We hope that these gold medal-winning recipes will inspire you to try your hand at reproducing their championship creations. And who knows, maybe one day soon your own favorite handcrafted beer recipe will find its way into the elite ranks of *Zymurgy's* Winners Circle.

Spice Beer

Gold Medal
AHA 2002 National Homebrew Competition
Roger Gibson,
Liberty, MO
"Summertime Ginger Ale"

Original specific gravity: 1.028
Final specific gravity: 1.000
Boiling time: 60 minutes
Primary fermentation: 5 days at 60° F (16° C)
Secondary fermentation: 10 days at 50° F (10° C)

Ingredients

for 5 U.S. gal (19 L)

2.0 lb	(0.9 kg) extra light dry malt extract
1.0 lb	(0.45 kg) clover honey
4.0 oz	(113 g) Belgian aromatic malt
0.5 lb	(226 g) lactose (added to boil)
1.0 oz	(28 g) Spalt whole hops, 2.5% AA (boiled 45 min)
2.0 oz	(56 g) fresh chopped ginger (boiled 15 min)
	Wyeast Kolsch yeast No. 2565
2.0 oz	(56 g) fresh chopped ginger root (secondary for seven days)
0.75 cup	(177 ml) corn sugar (to prime)

Directions

Belgian aromatic malt steeped for 30 minutes from 60-150° F (16-66° C). Strain out grains, add extract, honey and lactose and boil.

Judges' Comments

"A clean beer with a touch of ginger for complexity. Missing honey character."

"A nice beer, but the honey character could be increased. The ginger buries the subtlety of the Kolsch style. Nice effort."

India Pale Ale

Gold Medal
AHA 1999 National Homebrew Competition
Jim Buckett, Chagrin Falls, OH
"Brown Bagger IPA"

Ingredients
for 5 U.S. gal (19 L)

7 lb	(3.18 kg) light dry malt extract
1 lb	(0.45 kg) 40° Lovibond crystal malt
0.5 lb	(0.23 kg) Munich malt
3 oz	(85 g) Northern Brewer hop pellets, 8.6% alpha acid, (boiled 51 minutes)
1 oz	(28 g) Cascade hop pellets, 4.7% alpha acid, (boiled 14 minutes)
1 oz	(28 g) Cascade flower hops, 5.5% alpha acid, (boiled 2 minutes)
	Wyeast No. 1028 London ale yeast

Original specific gravity: 1.060
Final specific gravity: 1.011
Boiling time: 60 minutes
Primary fermentation: 2 days at 68° F (20° C) in plastic
Secondary fermentation: 20 days at 68° F (20° C) in glass

Directions
Steep Munich and crystal malts at 165° F (71° C) for 30 minutes. Strain out grains, add extract and boil.

Judges' Comments
"Good all around."

"Very nice British style India Pale Ale. Good job."

Amber Hybrid Beer

Gold Medal
AHA 2006 National Homebrew Competition
Scott Miglin, Mt Vernon, Ohio
"Strike Team Chanukah Altbier"
Northern German Altbier

Ingredients
for 5 U.S. gallons (19 liters)

2.75 lb	(1.25 kg) Munton's amber dry malt extract
3.0 lb	(1.36 kg) Munton's dark dry malt extract
1.0 lb	(0.45 kg) 60° L caramel malt
2.0 lb	(0.9 kg) dextrin malt
1.0 oz	(28 g) Magnum pellet hops, 13.5% alpha acid (boiled 60 min.)
1.0 oz	(28 g) Columbus pellet hops, 14.3% alpha acid (boiled 5 min.)
1.0 qt	(0.94 L) Wyeast No. 1007 German ale yeast
0.66 cup	corn sugar (to prime)

Original Specific Gravity: 1.058
Final Specific Gravity: 1.020
Boiling Time: 60 minutes
Primary Fermentation: 5 days at 65° F (18° C) in glass
Secondary Fermentation: 27 days at 30 to 35° F (-1 to 2° C) in glass

Directions
Steep grains at 150° F (66° C) for 30 minutes. Remove grains, add extract and proceed with boil.

Judges' Comments
"Chocolate roastiness is a touch bigger than I wanted. Very easy to drink and enjoyable. To bring it into style more, reduce the chocolate. Also hopping would be enhanced more if it tasted German."

"Very drinkable beer. Good balance of hop to malt. I'd prefer a bit more maltiness and doing so could enhance beer within style guidelines."

Dear Professor *(continued from 11)*

Detrimental Light Damage

Dear Professor,

In recent months I have been getting increasingly paranoid about the oft-mentioned damaging effects of light on my precious inventory. Like most homebrewers, I use clear glass carboys that sit for weeks or months in my basement before I get around to bottling. When I do bottle, I tend to prefer using my large collection of half-liter Grolsch bottles because of their reusable wire and ceramic closures. (I find caps a nuisance.) These bottles are green. Although my beer is not exposed to direct sunlight, I am concerned about the fluorescent lighting in my basement, both during fermentation and after bottling. Can long-term exposure to this lighting damage the beer and, if so, what are the telltale signs?

Kent Lancaster
Ottawa, Canada

Dear Kent,

Yesiree Bob, exposure to sunlight or fluorescent light can do damage to your beer. The effect is a not-so-neat skunklike aroma. If you don't get my drift then simply put a green-bottled commercial beer out in the sun for an hour and then compare it to one that hasn't been out of the house. There's no mistake about it. Sunlight is the worst.

But cheeses, don't worry. Don't forget you're a homebrewer. There are some really easy solutions. Wrap your carboy in a towel or put a paper bag over the whole thing. Put your green bottles in a box and close it up. There are any number of things you can do to protect your precious brew.

Made in the shade,
The Professor, Hb.D.

The Professor stands ready to answer your beery questions. Stuck on a problem? Can't find an answer? Just write the Professor, Hb.D. and your question will be answered. Send your homebrewing questions to "Dear Professor," PO Box 1679, Boulder CO 80306-1679; fax 303-447-2825; or e-mail professor@brewersassociation.org.

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(makes 12 litres)
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PILS
(makes 12 or 20 litres)
A light, blond, thirst-quenching beer for every day. Original gravity: 1.042, ABV: 4.5%.

GOLD
(makes 12 litres)
A luxury, thirst quenching, pils-style beer with a full taste and a pleasant bitterness. Original gravity: 1.053, ABV: 5.5%.

ABBEY
(makes 9 litres)
Dark brown, full-bodied with a malty flavour. A divine beer requiring long maturation. Original gravity: 1.070, ABV: 8%.

AMBIORIX
(makes 15 litres)
A copper coloured summer beer with a light sourness but with a sweet aftertaste. Origi-nal gravity: 1.060, ABV: 6.5%.

DIABOLO
(makes 9 litres)
Fiery gold in colour with a soft flavour and a high alcohol content: a devilish beer! Original gravity: 1.075, ABV: 8%.

OLD FLEMISH BROWN (makes 12 litres)
A very aromatic dark brown beer, with liquorice overtones and a medium alcohol content. Original gravity: 1.060, ABV: 6%.

CHRISTMAS
(makes 7 litres)
Strong brown beer with a pleasant malty flavour: a real dessert-beer. Requires long maturation. Original gravity: 1.065, ABV: 7.5%.

GRAND CRU
(makes 9 litres)
A gold coloured beer with a subtle "herbal" aroma and a full, malty flavour with a light fruitiness. Original gravity: 1.075, ABV: 8%.

TRIPLE
(makes 9 litres)
A heavenly abbey beer: gold coloured, soft but strong with a full malty flavour. Slightly spiced and well hopped. Original gravity: 1.075, ABV: 8%.

WHEAT BEER
(makes 15 litres)
A thirst-quenching, super light, slightly cloudy blonde beer with a refreshing flavour and a marvellous aroma: A genuine 'blanche' Original gravity: 1.052, ABV: 5%.

GALLIA
(makes 12 litres)
Amber coloured beer with a noble bitterness and a soft, refreshing flavour. Original gravity: 1.055, ABV: 5.5%.

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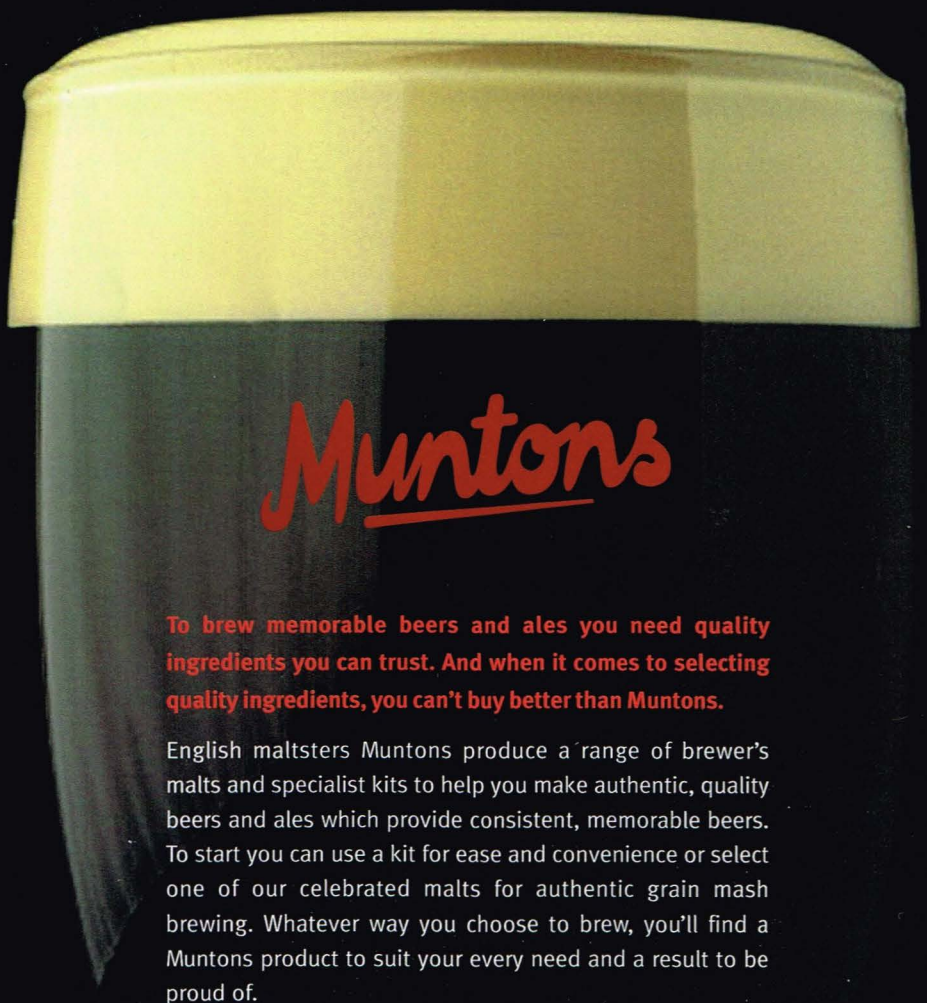

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