Home brew your own beer

By Richard Blunt

I've been a food professional for 30 years and a home brewer for 12 and I've come to the realization that a home brewer's relationship to his craft is similar to that which a master chef has with his own. For both, the quality and balance of ingredients, along with attention to details of time and temperature, will consistently produce a quality product. However, it is also possible to get very different results from the same balance of quality ingredients, time, temperature, and equipment both intentionally and unintentionally. Success at both of these fine arts requires a refined and educated palate, intuition, and a great deal of patience. Of course you already possess these talents; if you didn't, you wouldn't be reading my columns.

Is home brewing legal? You bet it is. The bill to repeal federal restrictions on home brewing was passed by Congress in November 1978 and was signed into law by President Carter in February 1979.

Is it safe? With all of this malt juice, yeast, and sugar lying around unrefrigerated, can you get sick? Die? Relax, you're not going to get sick or die from bad beer. There are no known dangerous micro-organisms that can survive in any form of beer solution—and your alcoholic brother-in-law's brain doesn't count. But the lack of sanitation, while brewing, will produce some nasty tasting drink.

In this issue's column, I'm embarking on a two-part series to show you how to make a good home brew. My intention is to introduce you to home brewing in a way that will help you get over that intimidating "what do I do next?" hump. I'll bring you to the point where you can brew the beer or ale that suits your taste and change it as your tastes change. Believe me, there's plenty of room for change when you are brewing your own.

And what a list of choices you have. At this writing there are over 20,000 distinctly different types of beer known. A quality beer can be flavor enhanced by much more than the usual method of altering the hops. For example, almost any fruit

that you can think of may be used as a flavor enhanser. Cherries, raspberries, peaches, currents, apples, pears, and blueberries all contribute a unique essence to a beer or ale when used properly. Ever imagine what a robust brown ale would taste like with the subtle fiery overtone of your favorite chile pepper? Anaheim, jalapeno, seranno and szechwan are just a sampling of the variety of peppers that can offer different flavors and heat sensations to your beer.

In the my last column I wrote about a wide variety of flavor enhancers. If you haven't read it yet, I suggest you do so now and, while you're reading, think beer and let your imagination take over. (Do this in private; drooling in public can be embarrassing.)

Do you like the flavor of smoked food? If you have a smoker of any kind, you can enjoy the unique smokey flavor of hickory, apple, or mesquite woods in your favorite beer. There are even formulas for brewing stout with your favorite coffee bean. None of this is new; folks have been brewing beer with flavor enhancers for years and, as a home brewer, you can brew the beer that suits your tastes. Gone will be the days of changing your tastes to suit the products that giant brewers make available and you will not pay fifteen dollars a six pack to get the high quality brew you want.

Sound interesting? Well, grab a jug of your favorite brew, sit back, relax, and read on. It is possible that in 30 days your favorite brew will be one that made yourself.

Elements of brewing

Broken down to its basic elements, brewing beer is a very straight forward craft. The first stage is called malting; it is the most complicated part of the whole process. Take comfort in the fact that malting is done by the pros because it requires very specialized equipment and exact temperature control. Without getting too technical, here's what they do. Whole grain, usually barley, is soaked in water until it starts to sprout and produces an embryonic plant inside the grain called the acrospire (please ignore cute little names like this, unless you want to try and impress someone). The sprouts are allowed to grow for a

predetermined length of time. Then they are dried in a large kiln. The kiln temperature is raised a little at the end of the process to complete the malting. The resulting grain is called malted barley—or just malt—by insiders like you and me. The inside of each grain now is full of a special starch that is essential in the brewing process. Of course, just like anything else there are complicated terms like degree of modification, modifying enzymes and malt proteins. Consult your local maltster or wizard for more information.

The next step is to convert the starch to a sugar syrup called sweet wort (pronounced wert). This process is called mashing. During mashing, the grain is cracked and steeped in hot water at controlled temperatures. (You don't have to know about mashing now. I'll cover it in more detail in the next column.)

The sweet wort is then carefully strained from the grain hulls and the hulls are washed with hot water to remove all of the sweet wort. This process is called sparging.

We make flavored wort by bringing the sweet wort to a boil and adding a measured amount of flavor enhancer, e.g, hops, herbs, fruits, etc., or any workable combination that suits your taste. This is usually called bitter wort because the traditional adjunct at this point is hops, which have various degrees of bitterness depending on the type of hop. Not all beers and ales, however, are bitter tasting. More about this later.

Once flavored, the wort is strained to remove the hops or other flavor enhancers, then cooled. Yeast is then added (insiders call this pitching) and the wort is allowed to ferment at controlled temperatures. Alcohol is produced during this phase. This is called primary or fast fermentation. After fermentation activity slows down, the brew is siphoned into another container where fermentation continues at a slower rate; this is called the secondary fermentation.

At this point of the fermentation the brew is bottled or casked for aging. It acquires natural carbonation during this time. For proper flavor, carbonation, and clarification, ales require four to five weeks of aging; lager type brews require from three to six months.

The last stage hardly requires mention—enjoy, enjoy, enjoy.

Before we get into the how-to part of this column, I would like to make one very important point: Brewing beer and ale is a chain reaction of invisible activity in which each circumstance affects all that follows. What I'm saying is that everything you choose to incorporate into a batch of brew, whether it be an ingredient or a production technique, will have profound effects on the subsequent brewing process and will determine how your brew tastes. This starts right from the beginning when the maltster is malting the barley. The temperature of the kiln and the length of time the barley is left in the kiln determines if the resulting malt will be suitable for a British ale or a German lager. The quality and variety of hops or other flavor enhancers will also color the end result. Different yeasts will contribute different flavors depending on the balance of other ingredients. The level of sanitation you employ can determine if a beer is even worth drinking. As I said before, there is no chance of getting sick from home brewed beer, but there are some bacteria that can turn a first class brew into a sour ugly mess. None of this will happen if you pay attention to what you doing and sanitize, sanitize, sanitize.

Equipment

What special equipment do you need to make this whole thing happen? I'm going to suggest you buy the best equipment you can afford. The better the equipment the better the brew. It's that simple. Here's a list of essential equipment to brew a standard five gallon batch of beer or ale:

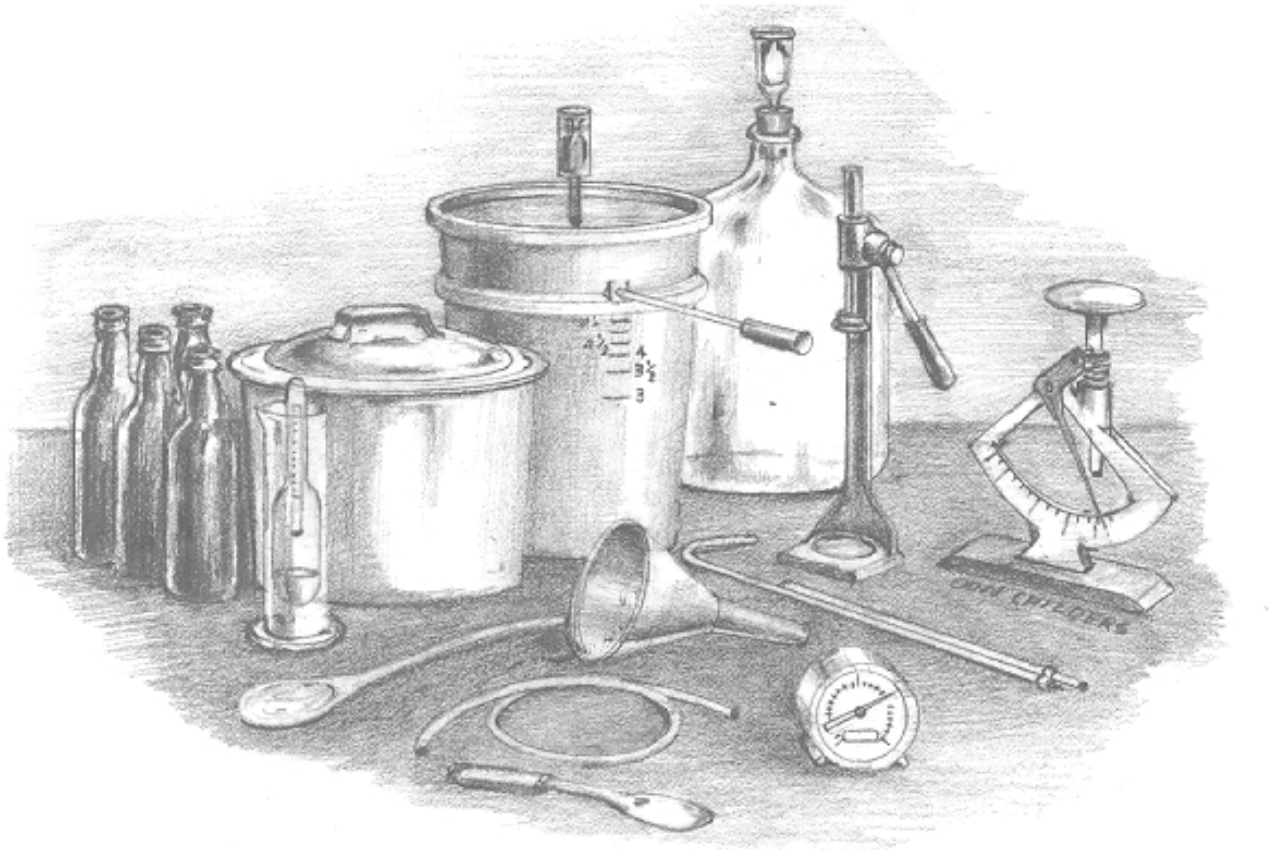
One **six to eight gallon stainless steel or enamelware pot** for boiling the wort along with the hops or other flavor enhancers. The stainless steel is expensive—about $150 for the eight gallon size with cover—but you'll never have to buy another. An eight gallon enamelware pot can be purchased at most discount stores for much less money. And, if you're lucky, you may find a used beauty at a swap meet or in a thrift store. But these large pots are only necessary if you are planning to make whole grain beer. So, until you're ready to do that, hold off buying the pot and, if you want to skip making your own wort, a three or four gallon enameled canning pot will do the job.

One **primary fermenter**. This is a heavy duty NEW 10 gallon plastic trash bucket with a tight fitting lid. Do not be tempted by cheap bargain models. You need heavy duty plastic to hold up to the hot liquid that you will be pouring into it. If you do not trust what you see in the stores, call the nearest home brew shop. They'll have what you need.

One **secondary fermenter**. This is a five gallon glass (or plastic) carboy that can be purchased at your local home brew store or bottled water company.

One **fermentation lock**. This devise will keep ambient air away from the beer during secondary fermentation. You also need a **rubber stopper** with a hole in it that fits the stem of the fermentation lock, and which is also the proper size to fit into the neck of the carboy. Your home brew shop has all of this.

One **six foot length of 3/8 inch clear plastic hose**.



Basic brewing equipment. Background from left to right*; bottles, sample jar with hydrometer, 6-8 gallon boiling pot, 10 gallon plastic fermenter with lid and airlock, 5 gallon carboy with airlock, bottle capper, postal scale.* Foreground from left to right*; wooden spoon, 3/8" plastic hose, stainless steel spoon, plastic funnel, racking tube, thermometer.*

One **racking tube**.

One **bottle filler**.

(These last three items are a must for siphoning beer from the primary to the secondary fermenter and for filling bottles without contaminating the beer. Your local brew shop will have all of them.)

One **hydrometer with test jar**. More about this later.

One **postage-type scale** that will measure in ¼ ounce increments. This is for accurate measurement of hops and other flavor enhancers.

One **10 pound household** scale for measuring grains.

One **food thermometer with a range of 32º to 212º F**.

One **large plastic funnel**.

One **straining bag**. This is for filtering the hot wort after boiling.

One **large wooden spoon** for hot liquid.

One **large plastic spoon** for stirring hot and cool liquids.

One **bottle washer**—a must for sanitizing bottles, and it is available at home brew shops.

Sanitizer to keep those ugly little bacteria under control. Everything that touches your beer must be sanitized. I use a bleach (chlorine) free sanitizer called B-Brite, which is sold at most home brew shops.

60 **returnable-type 12 ounce beer bottles**. CAUTION, do not use twist off threaded neck bottles.

One **bottle capper**.

One gross of new and unused **bottle caps**.

One good **notebook** for keeping records of what you do.

I know, I know, you're grumbling to yourself about what a pile of special equipment this is. Well then, take up another hobby like fly fishing and, to make it interesting, try tying your own flies. Send for the Orvis catalog. Then come back and see what a bargain home brewing is—and brewing beer you won't get your feet wet.

Ingredients

Let's talk about some of the ingredients you'll be working with to make your first batch of first class brew.

Yeast. Beer is fermented with two types of yeast. There is top fermenting yeast which is used to ferment ales. This yeast rises to the top of the

wort during fermentation and is best employed at room temperature (55º to 75º F). These temperatures create an active and rapid fermentation. Then there is bottom fermenting yeast which is used to ferment lager type beers. This yeast will usually settle to the bottom of the wort during fermentation, and is best employed at cooler cellar temperatures (40º to 60º F). Of course, because it is working at cooler temperatures, it ferments much slower than its warm weather cousin.

The important difference between these two types of yeast is their ability to ferment sugars. Insiders like you and I call this process attenuation. Both of these yeasts will ferment maltose (simple malt sugar), but top fermenting ale yeast will not ferment dextrins (complex malt sugars). This means that a beer made with the same ingredients, but fermented with ale yeast, will have more dextrins than if it were fermented with lager yeast. This brew will have more body and a sweeter taste which is characteristic of ale. Lager yeast will ferment more dextrins resulting in a lighter tasting and drier beer. You can have some real fun with all of this. Take your favorite ale recipe and ferment it with lager yeast at a slightly cooler temperature, and serve it to your friends on a warm summer day. The comments will make you feel like a master brewer.

Yeast is the ingredient that finally determines what the flavor your beer will be. Very early in the fermentation cycle, before any alcohol is produced, yeast goes through a phase called respiration. During this phase the yeast starts to metabolize and produces carbon dioxide, water, and some very distinct flavor characteristics. The two characteristics that seem to noticeably affect the flavor of the finished brew are esters and diacetyl. Esters are fragrant chemicals, and they impart a fruity aroma to beer. Depending on the type of yeast, temperature of fermentation, balance of other ingredients, and other conditions, these aromas can be described as apple, banana, strawberry, or raspberry to name a few. The next time you open a fresh bottle of your favorite ale or beer, gently pour it into a glass or mug and give it a sniff. Concentrate, because the most prominent aroma will be the hops. The fruity esters are much more subtle. Next taste the beer as if you were sampling a $200 bottle of fine wine. You will taste a very subtle buttery or butterscotch-like flavor. This flavor is the result of the diacetyls. The longer a brew ferments the more this flavor is reduced, so it will be more prominent in full bodied ales than in aged lagers. This is because lagers take longer to ferment. I mention this only to further illustrate that the quality of your ingredients and the care that you exercise incorporating them into your beer can have a noticeable effect on the finished brew.

Sugar. As a home brewer the sugars you'll encounter most often are maltose and dextrose. There are other sugars that you will have the occasion to use as you advance, but we'll talk about those later.

Maltose is a simple sugar produced during the mashing process (conversion of grain starch into sugar) and is easily fermented by yeast. During mashing, malt starch produces two chemicals—alpha amylase and beta amylase. Alpha amylase converts the starch into complex sugars called dextrins which are not easily fermented by yeast. So, the beta amylase then converts most of the dextrins into maltose. When you get good at this whole thing, you will be able to control the amount of these sugars produced by carefully adjusting the temperatures of the mash at the right time.

Dextrose is a sugar that is derived from the conversion of corn starch into sugar. To make things simple, let's refer to it as corn sugar from here on. Corn sugar is also easily fermented by yeast. This is the only refined sugar that I suggest you use in your brew at this time. Your local brew shop will have plenty in stock.

Hops. The flavor, aroma, and bitterness that has become the signature of most beer and ale is the result of hops. Hops have been used as an adjunct in beer for over a thousand years. Before the days of refrigeration, hops were used as a preservative in most beers. As time went on, it was discovered that hops offered many more advantages when incorporated into any type of brew. Hops also aid in clarification, eliminate undesirable proteins, stabilize the flavor of the beer, and promote good head retention. Bitterness, flavor, and bouquet are the three hop qualities that should concern you at this time. There is a very exact science that explains the qualities of hops and how to use them to get the amount of bitterness, hop flavor, and bouquet in your beer that best suits your taste. This science will be covered in more detail in my next column.

In the recipes included this month you will be working with a variety of hops at various stages of the brewing process. Each hop is labeled as bittering, flavor, or finishing (bouquet). To extract the alpha and beta bittering acids from hops, they must be boiled in the wort for at least 30 minutes.

How bitter is bitter?

Hophead brewing scientists have developed an answer to that question

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by using mathematics to develop the International Bittering Unit (IBU for insiders like you and me). One milligram of isomerized (two similar chemicals working together) alpha acid in one liter of beer equals one IBU. In theory, the more IBUs, the more bitter the beer will taste. Determining the amount of a particular hop to use in five gallons of wort, to achieve a desired amount of bitterness, can get quite involved. But before you get nervous, take comfort in the fact that great home brewmasters like Charlie Papasian and the late Dave Line, two of the best brewing writers around, have sifted through all of this science and shared with us some very easy to use formulas that make this IBU business less of a problem. Most quality home brew shops also help by stating the percentage of alpha acid (bittering acid) content in all the varieties of hops that they sell.

With this little bit of information you can easily determine how bitter your beer will be. Papasian offers a formula that I often use. For example, let's say I decide to make an ale that calls for 2 ounces of a hop that has 5% alpha acid, but all I have available to me is a hop that is stated as having 8% alpha acid. The result of this formula is called Home brew Bitterness Units (HBUs to insiders like you and me). The formula states that, HBUs = alpha acid of hops X ounces of hops. So what does all of this mean? The recipe is calling for 2 ounces of hops at 5% alpha acid which is 2 X 5 or 10 HBUs. So, if I want to know how many ounces of hops at 8% I should substitute, I simply divide the 10 HBUs by 8, which represents the 8% alpha acid, and I get 1¼ ounces of the 8% hops. Being able to derive this kind of information is important because inadequate attention to hop rates can result in incorrectly balanced beers and friends who are trying to think of a nice way to tell you that they would rather be drinking a Bud Light. But remember, as an American you are used to lightly hopped beers, so be conservative with your hop rates—at least until your taste buds tell you to move up.

Extracting bitterness from hops requires boiling but boiling greatly reduces hop flavor and aroma. So, at the end of the boiling process, adding a small quantity of hops and letting them soak in the cooling liquid for 45 minutes or so will replace much of the flavor lost during the boil. And, if you become a certified hophead, as many home brewers are, adding aromatic finishing hops during secondary fermentation will add a nice hop bouquet to your brew. Once again, use caution and don't over do it. There is much more to a good beer or ale than hop flavor and aroma.

Hops can be purchased in several forms, the most popular are loose leaf hops, hop plugs, and hop pellets. Loose leaf hops are the whole hop flower that has been dried and sold in four or eight ounce bags. Hop plugs are the whole hop flower pressed into ounce plugs and foil wrapped in vacuum packs and sold 10 plugs to the pack. Hop pellets are whole leaf hops that have been pulverized by a machine called a hammer-mill. The pulverized hop is then squeezed into a pelletizing machine and compressed into pellets. Here is a partial list of the varieties of hops available to the home brewer today.

Fuggles: Low bitterness, high aroma, traditional British ale hop. (Only the British could have come with a name like fuggles.)

Cascade: An all purpose hop—medium bitterness, fruity aroma.

Bullion: Mostly used as a bittering hop, very little aroma. Alpha acid 8 to 9%.

Cluster: Another bittering hop, very little aroma and flavor.

Goldings: Aromatic ale hop, low bitterness. Alpha acid 4 to 5%.

Hallertauer: Traditional German lager hop with spicy flavor and aroma but low bitterness.

Bramling Cross: Another ale hop used to enhance flavor and aroma.

Galina: Bittering hop. They don't come with much more bite than this. Alpha acid 12 to 13%.

Mt. Hood: An American grown hop, developed to resemble the German Hallertauer.

Saaz: Classic lager hop grown in Czechoslovakia. Low bitterness, alpha acid 4 to 5%, spicy in flavor, with an aroma that, in my opinion, is not matched by any other hop.

This will give you an idea of the variety of hops available to you as a home brewer, and this is only a partial list.

If you've read this far, stay with me awhile longer. A few words about water and it will be recipe time.

Water differs

The Burton area of southwestern England was always famous for its wonderful pale ales, London for its dark beers, and Dublin, Ireland, for its stouts. Why did these areas produce these special beers that could not be duplicated anywhere else in the world? The answer is in the water. In each of these areas the water is perfectly suited to produce these types of beer. So, as you can imagine, the importance of water cannot be understated because beer is nearly all water.

The mineral content and the flavor of the water used for brewing beer are important considerations and it is possible to go into endless detail on the subject. I won't. But, since the condition of the water only becomes significant when you are brewing

all-grain beer, I've saved most of this science for the next column.

We'll be using quality malt extracts to produce our first batch of brew, which eliminates cracking and mashing the grain then having to sparge the grain to extract the sweet wort. The malt extract manufacturer has done all of this for us. They have treated the water used to make the malt and any beneficial minerals added remain in the malt extract. At this stage it is safe to say that if your water supply does not have large dissolved amounts of sulphur, iron, or bicarbonates, and tastes good, then you can brew with it. You can get all the information about your water—to find out if it's soft or hard—for free from your local water authority. However, if you have any reason to doubt the condition of your water supply, use bottled water.

What is soft water? What is hard water? Good questions. A simple way you get the answer to that question is to take a shower. If your soap (not the detergent bars, but real soap) lathers quickly and easily, you probably have soft water. If it has trouble lathering or will not lather at all, you have hard water to some degree. This is because the ability of soap to lather is affected by the mineral content in the water. Low mineral content, easy lathering; high mineral content, hard or no lathering.

Your water company will give you a number that will be expressed as total hardness, which is the measure of bicarbonate, magnesium, and calcium ions expressed in parts per million (ppm). An ion is an atom that was neutral and calm until somehow it found itself in water and became electrically charged by losing or gaining an electron, and is now dancing around in solution looking for something to attach itself to.

0 to 50 ppm is soft water
51 to 110 ppm is medium hard
111 to 200 ppm is hard

I think it is best that we start with soft water and add a little hardness, if required, with the addition of a measured amount of magnesium sulphate (epsom salt). This will give you the best chance of success with your first brew.

Most beer recipes will give you number designations at the beginning of the recipe, to tell you how much sugar should be dissolved in your unfermented wort, and how much should be left after fermentation is complete. This number is called specific gravity. The first number is O.G. or opening gravity (before fermentation). The second number is F.G. or final gravity (after fermentation).

Specific gravity means density, and the amount of sugar dissolved in your beer solution will determine how dense it is. The hydrometer measures this density. "How?" you ask. A long time ago it was determined that the density of water at a specific temperature would be represented by the number 1.000. Any solids, such as sugar dissolved in the water would increase the density. This increase is measured by the hydrometer, and is represented as specific gravity. Example: If you float a hydrometer in a sample of wort and it reads 1. 060. This means that your wort is 1. 06 times heavier then the same volume of water at the same temperature. The opening gravity of your wort will be denser than the gravity after fermentation is complete. This is because the yeast has consumed most of the sugar and converted it to carbon dioxide which escapes and alcohol which is dissolved in the water.

If you buy a hydrometer and find out that it has three scales when you get home, don't get shook up. This is a triple scale hydrometer and the other two scales will be of use to you someday. (Of the other two scales, one is a balling scale and the other is a potential alcohol scale. I'll explain them in my next column. If you get curious before then, read the directions that come with the hydrometer.)

The recipes

Well, it's recipe time. Refill your glass, if you have to, and relax.

The recipes I'm offering are not mine. They were formulated by a Master Chef of Home Brewing, Joe Marleau. Joe is the owner/operator of Cellar Home Brew in Seattle, Washington. Normally I don't present recipes in my column that have not been formulated, at least in part, by me. However, these recipes are worthy of exception and I feel that they will be a great reward to you.

Joe has been serving the needs of dedicated home brewers from the same location since 1971. He demonstrated this service and his incredible knowledge of brewing one evening in December of last year. You see, I wanted to create some good ale recipes using malt extracts to make the bitter wort. Malt extracts are easy to use and, unlike a few years ago, they produce a first class ale that rivals and often surpasses ales made with whole grain recipes. My problem was that I'd never used a malt extract and creating a reliable recipe with an ingredient that I have never used gives me hives. So, I called Dave Duffy, the publisher of *BHM*, to see if he had any suggestions to help me out of my dilemma. He suggested that I look in the classified ad section of his magazine under brewing supplies. I did, and found an ad headed, "Beer, Brew it Yourself." I'd never consulted with anyone for technical assistance before, so I was nervous, and felt a little foolish. But after a few minutes on the phone with this guy, I realized I was dealing with a real master, and I very quickly

relaxed. We had a long and very productive conversation. The result of that conversation is the three first class ale recipes that follow.

Each of these ales has a very distinct and enjoyable character of its own. But the most important thing for you to understand is that they're easy to make. So, sit back, relax, and learn how to do it. There's no room for nervous students in this class.

The production procedure is the same for each of these ales. So, to keep it easy, I'm going to first give you a brief description of each ale. I'll then list the ingredients for each recipe. After that, I'll present the common production procedure used in all three of them.

Extra special bitter

This is a real London Brew Pub style ale. The Geordie malt syrup that is used in this recipe is hop flavored by the manufacturer. Oops, I should have said hop bittered; to get hop flavor and aroma in any beer or ale you must add it yourself. That is what Joe has done in this recipe. One ounce of Tettnang hops added after the boil will give this ale a real subtle flowery aroma and its taste hints of a medium bodied German lager. The one ounce of Fuggles or Willamette hops added during the boil slightly increases the bitterness to balance with the medium body of the ale. The eight ounces of English Crystal malt added for a short time at the beginning of the boil supports the body and adds a wonderful copper color. Do yourself a favor, make this recipe first. It is quick and easy and, in my opinion, it's the most satisfying beer a home brewer can make. I shared my whole grain version of this ale with Dave Duffy and John Silveira—the senior editor at *BHM*—about ten years ago and they still talk about it today. Need I say more?

- 1 can Geordie Scottish Hopped Malt Syrup
- 3 lbs. Munton and Fison Amber dry malt extract
- Specialty Grains—½ lb. English Crystal Malt (crushed)
- Water salts—2 tsp. Burton water salts
- Boiling hops—1 oz. Fuggle or Willamette hops
- Finishing hops—1 oz. Tettnang hops
- Yeast—1 pkg. dry ale yeast
- Yeast nutrient—1¼ tsp. yeast nutrient
- Priming Sugar—¾ cup pure corn sugar (available at all home brew shops)

What is crystal malt? This is one of those cute little tricks developed by the pros that makes brewing so interesting. It is simply green (not completely dried) malted barley that is mashed (starch converted to sugar) inside the grain then toasted at controlled temperatures to a desired color: light, medium, or dark. As the mashed barley is dried and toasted the sugars inside the grain set to a hard crystal, thus the name crystal malt.

Burton water salts? A composition of water hardening salts that in theory will condition your brewing water (soft water) to duplicate the water of the Burton area of southwestern England.

Yeast nutrient? This, in theory, does the same for yeast that multivitamins are said to do for humans. There are different opinions on whether this is necessary with malt extract beers and ales, but it will do no harm to use it.

Export lager

This is a close cousin to what was once known as California Common Beer which is best defined as beer fermented with lager yeast but at ale yeast temperatures. This beer is best represented today by the Anchor Brewing Co. in San Francisco, under the name Anchor Steam Beer. Joe's version of this beer is not as aggressively hopped as the traditional version, and does not have as much residual sweetness, which is not necessary because of the reduced hop rate. This beer is golden straw in color, similar to Pilsner Urquell. I like to sip a beer like this while I am reading Nimzovich's concept on collective mobility of the passed pawn for the ten thousandth time. After I finish reading, I call Silveira, that guy at *BHM*, and announce my next move. He says something like checkmate. I hang up the phone and pick up the book again to figure out what it is that I keep missing. At least I have a good home brew while he's probably drinking Crystal Lite.

- 1 Can Cooper's Hopped Malt Syrup
- 3 lbs. Munton and Fison Light Dry Malt Extract
- Specialty Grains—½ lb. German Light Crystal Malt (crushed)
- Water Salts—None
- Boiling Hops—1 ounce Tettnang Hops
- Finishing Hops—1 ounce Hellertau Hersbrucker hops
- Yeast—1 pkg. dry lager yeast
- Yeast Nutrient—1¼ tsp yeast nutrient
- Priming Sugar—¾ cup pure corn sugar

Seattle style bitter

This is a real ale lover's brew. I'm an ale lover and I'm also a hophead (I love the taste, aroma, and bitterness of hops). This ale has a noticeable bitterness which is well balanced by the citrusy aroma of Cascade Finishing Hops and the subtle sweetness and body contributed

by the Crystal Malt. Don't let the term "bitter" steer you away from this fine ale. The giant breweries have been trying to manipulate the taste of beer lovers in this country since the end of Prohibition. They have been marketing an endless stream of tasteless formulas that are little more then Mountain Dew mixed with alcohol. What a shame. Try this one, and you'll get a real lesson in how a well balanced beer should taste. This ale also has a medium amber color that adds a visual delight to the whole experience.

- 1 can Alexander's Pale Malt Syrup
- 3 lb. Munton and Fison Light Dry Malt Extract
- Specialty Grains—1 lb. German Light Crystal Malt (crushed)
- Water Salts—1 tsp. gypsum
- Boiling Hops—1½ ounce Eroica or Chinook Hops
- Finishing Hops—1½ ounce Cascade Hops
- Yeast—1 pkg. dry ale yeast
- Yeast Nutrient—1¼ tsp yeast nutrient
- Priming Sugar—¾ cup pure corn sugar

Brewing procedure

As promised, what follows is the procedure to brew all of the recipes.

Special equipment:

1. Grain bag—makes adding and removing specialty grains from the wort easy.

2. Hop bag—smaller version of a grain bag. Can be used for boil hops and finishing hops.

Special ingredient:

Irish moss—A dried seaweed that will help produce a clear wort by removing unwanted proteins from the wort during the boil.

Method:

1. Place two gallons of brewing water into a four or five gallon enameled or stainless steel pot; place the pot on the stove and add the specialty grains that have been placed in the grain bag. Bring this water to a boil. As soon as it boils, remove the grain bag. Boiling specialty grains for any length of time will contribute a bitter, grainy taste to the finish beer. While you're waiting for the water to boil, open the malt syrup and place the can in hot water; this will make it easier to remove the syrup from the can.

2. After removing the specialty grains, remove the pot from the stove and add the malt syrup and dry malt extract. Stir the mixture thoroughly and return to the burner. Continue to stir the wort until it comes to a boil again. Reduce the heat a little to prevent overboil but maintain enough heat to keep the wort at a controlled boil.

3. Now, add the yeast nutrient, water salts, and boiling hops. I suggest using the hop bag, it'll save you a lot of time. After 10 minutes of boiling, remove two cups of wort and place in a sanitized stainless steel or plastic bowl, cover with plastic wrap and allow to cool. Continue to boil the wort for another 50 minutes. Total boiling time one hour. During the last 15 minutes of the boil add ½ tsp. of Irish Moss to the wort.

4. To make the yeast starter: In a sterilized bowl sprinkle the dry yeast over a cup of warm water (90° to 100° F), cover and set aside for 15 minutes. Next add the two cups of wort that has been cooled to 90° F, cover and set aside. (Remember, anything that touches your beer from here on must be sanitized.)

5. After your wort has boiled for one hour, remove the hop bag, and replace the spent boiling hops with the finishing hops. Put the hop bag back into the wort and continue the boil for five more minutes. This gives the beer its hop aroma. Remove the pot from the heat, cover, and let it cool for 20 minutes.

6. Pour three gallons of cold water into the **sanitized** primary fermenter, fitted with the **sanitized** strainer bag, then pour the wort into the primary fermenter. Top up the fermenter to 5 gallons with cold water. Cover the fermenter and cool the wort to 80° F as quickly as possible. This is where I usually check the specific gravity of the unfermented wort, but I do not recommend that you attempt this procedure until you acquire a little more experience. The less you disturb the wort from this point on, the less chance of contamination.

7. When the wort is cooled to 80° F, add the yeast starter (this is called pitching by insiders like you and me) and cover the fermenter with a lid fitted with a fermentation lock. Read the directions that come with the fermentation lock before using.

Congratulations you have come a long way. But stay with me a little longer, you're almost there.

8. Place the primary fermenter in a cool (not cold) spot away from light and excessive heat variations. A clean corner in your cellar, or a closet in an unused room, or any other quiet corner will do. The ideal temperature range is between 60° and 75° F.

9. Primary fermentation has now begun. During the next 24 to 48 hours fermentation will build to active peak. A thick layer of foam will cover the brew. You may notice some dark, ugly, grayish stuff on top of this foam. Carefully remove this stuff with a **sanitized** plastic spoon as soon as possible. Try to minimize the exposer of the wort to the air by not disturbing the white foam.

10. Primary fermentation will abate and the white foam will disappear in 2 to 4 days—or sooner depending on the type of yeast. So, it's important to pay attention and check the progress of your fermenta-

tion regularly during this period. As primary fermentation progresses, the foam will become less dense looking and the bubbles will become bigger. This is a sign that fermentation is slowing down and the head will very quickly disappear.

11. When the head has fallen, it is time to siphon the beer into the secondary fermenter. Place the primary fermenter on a chair or counter, remove the lid and siphon the beer into the **sanitized** secondary fermentor using your racking tube and hose assembly which has also been **sanitized** (Fig. 1). I suggest you ask your home brew supply shop for a complete racking set up which includes racking tube, plastic hose, bottle filler, instructions, and more. Be careful not to disturb the sediment at the bottom of the primary fermenter.

12. After racking is complete, place a cork fitted with a fermentation lock in the neck of the secondary fermenter. Set the fermenter in a cool place and allow secondary fermentation to begin.

13. Secondary fermentation allows the beer to settle and partially clarify under sterile conditions. Your beer can be left for a month under these conditions before bottling. Since all three of these brews are ales and do not require extended aging, I suggest that you do not leave your beer in secondary ferment for longer than two weeks.

14. Carbonating and bottling: All home brewed beer is naturally carbonated. All bottled beers produced in this country by the giant breweries are pasteurized and artificially carbonated.

A. To carbonate your beer, first make the priming solution by mixing ¾ cup of corn sugar with two cups of water. Bring the solution to a boil, remove from the heat and cool to 80° F. When the solution is cool, carefully pour it into the clean and **sanitized** primary fermenter (Fig. 2). Set the secondary fermenter containing the beer on a chair or counter and siphon the beer back into the primary fermenter. Be careful not to splash. At this stage of the game, microbes in the air are real enemies to beer.

B. Wash, **sanitize**, and rinse 50 bottles. Rinsing will be easy if you use the bottle washer. Drain as much water from the bottles as possible. They sell a contraption in home brew shops called a Bottle Drainer to help with this process. However, a little patience can save you twenty bucks.

C. Place the fermenter containing the beer on a table or counter. Arrange your bottles below so that filling will be as easy as possible.

D. Fit the **sanitized** bottling attachment to the racking hose and carefully fill each bottle leaving one inch of air space at the top (Fig. 3).

E. Place a **sanitized** bottle cap on each bottle and cap with the bottle capper.

F. Label the bottles and place them back into the case.

G. Store your beer in a quiet corner, away from light. Ideal storage temperature is 55° to 65° F.

Now, you must hurry up and wait. In about a week your beer will show signs of clearing as the suspended yeast starts to settle to the bottom of the bottle. This settling should be complete in about two weeks and you will have 45 to 50 bottles of clear brew with about ½ inch of sediment at the bottom.

What next you ask? Do I really have to answer that question?

Here's a tip. When drinking a home brew, always pour it into your favorite glass or beer stein. Pour slowly and try not to disturb the sediment on the bottom of the bottle. It won't make you sick, but it will cloud up your beer if disturbed too much.

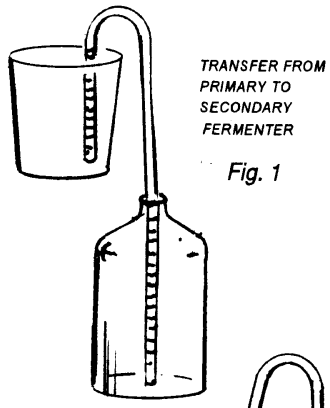

Fig. 1

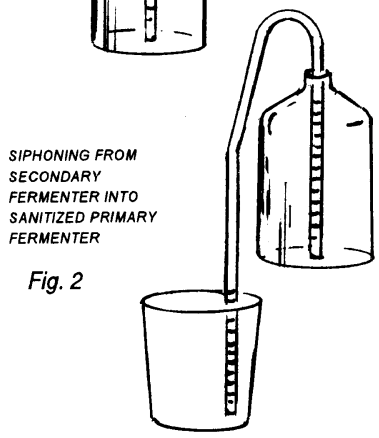

Fig. 2

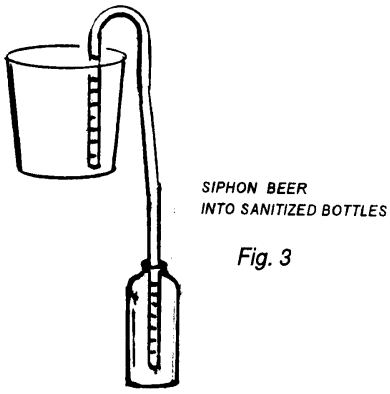

Fig. 3

Well, that's it for now. In the next issue, I'll discuss how to make beer from whole grains. Also, we'll examine, in more detail, how to use your hydrometer and other equipment. Until then, grab a home brew, sit back and enjoy yourself. You deserve it. Δ