

Welcome to the Brewers Log, where you can research topics related to professional brewing. This section will be updated regularly by contributions from American Brewers Guild instructors and also from industry experts.

British Brewing

This first article is by Steve Parkes,
owner of the American Brewers Guild and one of the lead instructors.

"I can give you an enormous amount of tips, many tips, English tips" says John Cusak in the movie **Say Anything**.

Let's face it--brewers in England brew at home for very different reasons than brewers in the States. In the UK, take home beer is very expensive and people brew at home so that they can save some money. In this country, take home beer is very cheap, so brewers are brewing at home to improve on the quality. Of course there's more to it than that: the \$3,000 RIMS system could only have been invented--much less sold--in the USA.

The American trait of applying technology to everything has led to some remarkable innovations. The English home brewer is much more likely to be opening a can of extract and boiling it on the stove than they are likely to be worrying about excessive wort splashing causing hot side aeration. They'll be sprinkling a dried yeast sachet on top of the plastic bucket rather than doing step-up propagation on their live Belgian Abbey pure yeast culture. A friend of mine once did a survey for a national British tabloid about the various home brew kits available and concluded that they were all good if you just followed the directions exactly. In other words don't try to be creative.

An important thing to remember about British beer is that the tax or Excise Duty on beer is very high. When I last brewed in the UK more than 50% of the sales price of a cask of ale was Excise Duty. The duty is assessed directly proportionally to the beer's alcohol content. The stronger the beer the higher the tax, the more expensive the pint. This means two things, (1) that British beers tend to be fairly low in alcohol, and (2) that beers for export, which are exempt from duty, will be brewed stronger. Also, there has always been a tendency for British brewers to brew stronger beers for export so they may be more likely to "hold up to" both the long sea voyage and also the low serving temperatures encountered in "the colonies". An exciting day for me at my brewery in England was the day I managed to surreptitiously get hold of a case of beer from a famous London brewery destined for export. It had the same name on the label as their domestic product, but instead of the usual 1.055 original gravity, this stuff was 1.072. A completely different beer but labeled with the same name.

Beer Styles

Although around half of the British beer market consists of Euro style lagers like Harp, McEwans, Skol, Orangeboom, Carling Black Label and, yes, Budweiser, I will assume that you have no interest in learning how to brew them. When you think of British brewing you tend to think of the styles that are unique to the British Isles. Bitter, Best Bitter, Extra Special Bitter, Brown Ale, Mild, Sweet Stout, Scottish Ale, India Pale Ale, Old Ale and Barley Wine. I could write an essay on each individual style and fill this magazine for the next year with detailed descriptions of each special beer but for now we'll just have to satisfy ourselves with some general hints.

One thing that always interested me is the history of the style called India Pale Ale (IPA). I was always aware that British brewers of an earlier age brewed incredibly strong beers with enormous amounts of hops (the alcohol and the hops both have a preservative value) for shipment overseas. I could never reconcile this fact with the two local brewers who both offered draft IPAs that would barely survive a trip out of the county. They were both excellent refreshing "quaffable" beers although a little light in gravity. Also if I were a British soldier stationed in India the last thing I would want to drink when it's 110 degrees and 99% humidity is a 9% alcohol, 100 IBU ale. A recent conversation with a British malt salesman, and brewer, may shed some light on this dilemma. He proposed that the strong beer, which was shipped to India, was watered down with local water when it arrived, and that the early British brewers were just high gravity brewing, something that every large brewer in the world does today. I suspect that some of the concentrated beer was made available to the officers.

Another style that is often ignored is mild. So called because mild is the opposite of bitter, in the same way that sweet is the opposite of dry. They are always brewed to a low gravity, are malty and smooth and have very little bitterness.

When I brewed in England old ales were an intermediate beer between a special bitter and a barley wine. The original gravities were around 1.060 and they all had the word old in the name. I brewed Old Grumble, and Old Devil, while my friends and neighbors brewed Old Sarum, Old Thumper, and Old Timer. Old ale has also become a name for very strong beers, brewed occasionally, and designed to be aged for a very long time. Gales Prize Old Ale, Lee's Harvest and Thomas Hardy are fine examples.

An old friend of mine was once head brewer of Mackesons and told me how the finished beer was "sweetened" with lactose sugar. At the time the brewery's slogan was "a baby in every bottle," and we both knew there was no way they could use that today. Even Guinness were forced to stop saying "Guinness is good for you"

Another question I am often asked is "just how bitter are bitters?" British brewers use hops at a rate of around 1lb/ Imperial barrel, which corresponds to 1lb in 43 U.S.gallons. (Less than 2oz/5 gallon batch) The guidelines for British bitter at the Great American Beer festival calls for bitterness levels between 20 and 40 IBUs. It is apparent that a good deal of the bitter character may come from the extended running of the mash.

Another important misconception is that Scottish brewers use peat smoked malt for brewing. Only the whiskey distillers mash with peated malt. The only brewery outside North America using peated malt to brew beer was Adelshoffen in Strasbourg, France.

Malt and Mashing

One of the first considerations when brewing beers that taste just like the British beers is replicating the ingredients they are using. While, generally speaking, malts, hops and yeast available in America are similar, the differences between them are important and add up to quite large differences in the final beers. Barley varieties grown in England are grown with ale brewing in mind and have certain characteristics that go along with British brewing practice and technology. Maris Otter, Pipkin and Halcyon for example, are low in nitrogen (contribute less protein for haze formation). Golden Promise is a variety prized by Scottish brewers providing a rich malty flavor to beers produced using it. They are malted more slowly to give a more even grain to grain modification. Then they are kilned to a lower moisture content, which results in more flavor, and a malt that mills easily using a simple two roller mill. In a simple infusion mash the low moisture makes it easier to hit the correct mash temperature.

In America barley varieties tend to be grown to suit the farmer's needs and brewers invest in the technology to better utilize it. Brewers will mash using a simple single temperature infusion mash varying the temperature around 147-152oF. Colors will come from amber, crystal, chocolate, roasted malt and roasted barley, or caramel sugars added to the kettle or directly to the beer. Any pH adjustment is likely to come from calcium added to the mash, or inorganic acid added directly to the kettle. Due to the relative insolubility of gypsum and the difficulty of getting it into solution in the mash water, it is usual to add the dry gypsum to the malt as it goes through the mill.

Another area where British and American brewers differ is in the length of the mash run-off. A method of brewing known as the party gyle system is still in operation in many breweries. A single large mash tun feeds two to three kettles with wort of different strengths. They are boiled separately with different hop amounts then blended in different proportions to arrive at two or three different beers of different strengths from the same mash.

This means a couple of things. First, the mash runs off for several hours, and secondly the last runnings are often very weak (as low as 1.002) and contain a good deal of astringency. This is perhaps why English beers are a little more bitter tasting than the hopping rate may suggest. The traditional mash stand of an hour and a half is very much rooted in tradition. The brewer would start the brewing day by mashing-in very early, then would go home for breakfast and change of clothes before returning to "set taps." Water is another area where there is a great deal of variation. The water in London is hard due to the chalky soil, the water in Scotland is soft and in Burton-on-Trent the water is very high in calcium and sulfate, so the different beer styles will all require their own specific water treatments.

Hops and Boiling

Whole flower hops are much more commonly used in Britain since most brewers have not invested in whirlpools and still use the traditional hop back. This is an open vessel with screens in the bottom that uses the hop leaves to strain the wort through, much as the screens in the mash tun. Home brewers can use their mashing vessel in much the same way.

There are classic British hops, which I feel deserve "noble status." Fuggle is a mellow, well rounded variety that is ideal for a true English flavor, while East Kent Goldings is an edgier, more assertive hop that imparts a distinguished English aroma. The commonly used hop varieties have remained the same over the years but many British brewers are using American hops. I recently visited one famous real ale brewery that uses a lot of Mt Hood hops. Many British brewers will add extracts, sugars and syrups in the kettle to increase the gravity of their stronger beers. I once produced a session bitter that had 20% invert sugar (glucose/fructose mix) as part of the grist, and that was added to the kettle, where it would dissolve more easily.

Yeast and fermentation

Fermentation characteristics are a prominent part of the flavor profile of British beers. The higher fermentation temperatures, controlled early temperature rise, open fermentation vessels, yeast skimming and relatively short aging period all contribute unique characters to British beers. Yeast strains are prized for their resilience and hardiness (resistance to mutation), and for their ability to remove themselves from the fermentation when their work is done (flocculation) perhaps more than the flavors they produce. After the bulk of the sugar is converted to alcohol, CO₂ and flavor compounds, English ale yeast rise to the surface of the fermenter on bubbles of CO₂. Once there, they can be scooped from the surface, or "skimmed". This yeast is the most viable,(alive) and is prime yeast to be used for subsequent repitching. It should be relatively free of dead cells, trub and bacteria and so perhaps will need to be repropogated less often. I know of one brewery that has been using the same strain for over 200 years.

Alternatively the beer may be transferred to another vessel or "dropped" leaving the yeast behind. This allows the top crop of yeast to be mixed with some of the bottom crop. Some British breweries still use mixed yeast cultures (although this practice is not as widespread as it is in Belgium) where more than one strain is present in the pitching yeast.

Some brewers prize the flavors generated by their yeast so much that they will design a unique fermentation system to cater to their needs. Marstons in Burton-on-Trent still use the last remaining Burton Union fermentation system and Sam Smiths in Tadcaster have Yorkshire Square fermenters. The Burton union system uses a series of barrels and troughs to settle yeast that is non-flocculent, while the Yorkshire square system uses two chambered vessels and pumps to keep a very flocculent yeast in suspension.

British brewers will often find that the fermentations have to be occasionally stirred or "roused" to keep the yeast in suspension until its work is done. I remember that most pitching yeast in British breweries have a degree of contamination present. A wise old brewer once told me that at least one of the major brewers would only reject a pitching yeast if the Lactobacillus rod count was over 6% of the total cells. Viability was always high and the yeast was always stored in open buckets in a refrigerator where they would be in contact with air. Hence lag phases at the start of fermentations were usually short. This resulted in a rapid drop in pH; indeed British beers have a lower overall pH, and protection from the effects of too much contamination.

Wort was usually aerated simply by dropping it into the vessel from a great height, and yeast were often "fed" either with a commercial yeast food or by adding some yeast to the kettle during boiling. If your fermentations are sluggish and your yeast don't grow too well, then try sprinkling some dried yeast in the wort while its boiling. The cells will be destroyed and will add to the nutrients in the wort.

Conditioning and serving

Of course much of the beer produced in Great Britain is destined to be bulk conditioned, filtered, and pasteurized then kegged, bottled or canned. Some of it is filled out of the fermenter into the container in which it will undergo its maturation and then ultimately shipped to the customer and drunk from that same container. This is known as cask conditioned beer and is probably the beer style Britain is most famous for.

This beer is clarified using isinglass finings, which cause the yeast to form larger clumps that settle to the bottom of the vessel more rapidly. This rapid clarification method avoids the need for filtration, which will strip some color and flavor compounds from the beer. English beers are traditionally served at 50-55oF so the need for chill-proofing the beer is not there. The full details of cask conditioning will be the subject of another article.

Rheinheitsgebot is a German Word

Remember that Rheinheitsgebot is a German word, not only can the British not pronounce it they also don't obey it. Although one English brewer who produced a natural lager, went to the trouble of sending a sample to Germany to get it certified as "pure." As a rule though the British are quite happy to use hop extracts and essences, sugars and syrups, acids in the kettle, coloring agents, even preservatives in the beer. If your Scottish ale doesn't taste sweet then add some sugar to the finished beer, the Scottish brewers do. If you're disappointed in your ESB's hop aroma then add hop oil to the beer, a major British producer does. Make a porter by blending your amber ale with your stout. You can take some black malt and boil it in a muslin bag to make an extract that can be used to adjust the color or roast flavor of any beer.

In Closing

Although the venerable bard of beer Michael Jackson hails from the moors of Yorkshire it is important to realize that most British beer drinkers, and perhaps brewers, subscribe to the following opinion put forth recently by a former head brewer of one of the big 6 British breweries.

"I have to admit that the whole of my social background, and my professional experience, has convinced me that beer is the drink of the masses. It is not intended to be the exclusive preserve of a discerning, bibulous elite, nor savoured, knowingly and ostentatiously, by our rulers or those who would influence opinion. Even less, should the minute details of its ingredients, production, flavour, aroma, or physiological effect be the subject of prolonged, intense intellectual or sensual debate. No, beer is made for quaffing, in large quantities and often."

Or as Anheuser Busch once put it "Why Ask Why?"

The British know what their beer is supposed to taste like and enjoy it wherever they can find it.