



Back to basics - tasting

Talking to CBA groups this year a common theme emerges. Bill Cooper in Scotland: "We'd like to do more tasting and judging, but don't think we've got the technical skills". Greg Pittaway in the Midlands: "I've read a brilliant article by Sean Franklin which explains the fundamental link between tasting skills and making better beer". Will Hanrott in Oxford: "How can I identify faults in my brewing process from the taste?" Meanwhile the Northern Craft Brewers have introduced regular tastings and the Solent Beer Brewers are looking at what they can learn from the US Beer Judge Certification Program (BJCP).

That's why, in this issue, we look at the options for better tasting and we also feature that article by Sean. Most readers will know that Sean is the founder of Rooster's Brewery in Knaresborough and is keen to encourage craft brewers, as a sponsor of our Derby festival. Sticking with Roosters, Ralf Edge brewed his prize-winning 'Tongue in Cheek' stout there and has set pen to paper to draw out some of Rooster's philosophy on making better beer.

Our other theme this month is Old British Beers, a topic of perennial interest. If you want to know more, Factsheet No 6 from Janette contains ten pages of articles brought together from previous Brewer's Contacts. And finally, many thanks to our authors and particularly the members of the Midlands Craft Brewers who have provided rather more than half of the content of this issue.

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These kids of today!

A rather disheartening conversation with a reader informed us that young people aren't interested in making things any more – beer in particular – and spend their time lounging on the sofa watching DVDs.

Here's one lounging on a stool watching the level while filling a cask with beer he has brewed.



Daniel Cramp (22) began home brewing in late 2005, entered his 'Tavern Ale' in the CBA 10th Anniversary festival and won first prize in the stronger bitters category. He is now brewing at Derby's Danelaw Brewery, and his own recipe has been brewed there. In his spare time he's keen on railway photography and, oh yes, he's chair of CAMRA's Derby branch. And here he is at GBBF serving a beer he brewed.



Paul Martin, joint founder of Danelaw (with Steve Twells) looks well pleased with his young protégé.



Seventh National Craft Brewing Festival

18th November 2006 at the Robin Hood Inn, Sutton

Full details from Cheers Winemaking and Brewing, 94 Prioory Road, Cheam, CM3 8LN tel: 020-8644 0934 or look under events on the Cheers website.

<http://www.cheerswinemakingandbrewing.co.uk/>

...see you there!

Better beer through taste training – David Edge

It all began with a question in an internet discussion – “my beer smells astringent – help!” How, I wondered, could a beer smell astringent, any more than it could smell purple or a semitone flat? Astringency is an aspect of mouthfeel, not aroma! Yet people gave advice, (sparge less etc) on the basis of this plainly wrong diagnosis!

Tasting beer and thereby identifying how to improve it is one of the most fundamental skills a brewer can possess. In descriptive tasting the intention is to describe the smell of a wine, say, in everyday terms so a purchaser can match it to their taste or a menu. The purpose and language of forensic tasting is another matter – we need a common understanding of what constitutes ‘astringency’, ‘autolysed’, ‘diacetyl’ or ‘horse blanket’. Only once we’ve cracked that can we advise on eliminating or enhancing these characteristics.

So how do we do it? Oddly enough, the CBA’s charter talks about facilitating contact, home brewing clubs, a journal, information, high quality supplies etc, but is strangely silent on taste training – or is it? James’s original vision was of lots of little beer circles, and it was implicit that a beer circle was a fairly local outfit that met roughly monthly with the main task being tasting and feedback on members’ beers. However CBA’s regional groups haven’t turned out quite like that – the wide areas covered discourage monthly meetings. Tasting is not always a big item on the agenda. Many members feel they don’t have the skills – although some are too modest.

So what do you do if you don’t have a beer circle or tasting programme and want to start one?

- Who might be interested? You’ve got the contact list. There are quite a few pockets of members close enough to get together, informally at first. Three or four people is a good start. The lists now shows people’s interests, although we are adding them as people renew in case corrections are needed. If you don’t have an up-to-date list ask Janette. You can ask for a copy of our factsheet which gives advice on the practicalities of setting up a craft brewing group, culled from the experience of the Midlands and other groups.
- You can contact the nearest group and visit them for a couple of meetings to see how they’re conducted. But if, for example, you live in Liverpool the nearest circle we know of is in Nottingham! Most groups are listed on the website, but if there’s nothing suitable call us – one or two groups don’t want to be listed, but welcome CBA members.

If you are going to evaluate beer, you do need to keep good records. Let’s mention Peter Fawcett’s secret weapon – his brewing log sheet. It has two entries not always found on such things: “What did I set out to do?” and “What should I change next time?” - questions we should all ask every time we brew.

A couple of books will help:

- *Evaluating Beer* is a detailed and rather technical book from Brewers Publications, the publishing arm of the American Homebrew Association. There is a degree of repetition because it is a collection of papers rather than a book with a single author. Nonetheless it’s the best available resource for the craft brewer.
- *Judging Wine and Beer* is the handbook of the (UK) National Guild of Wine and Beer Judges. A lot of the content deals with judging procedures rather than sensory evaluation and of course wine is featured more than beer, but at £2 (including postage, from Janette), can you go wrong? There is also useful guidance on faults in *Wheeler*, and indeed most introductory home brewing texts.

OK, you now have some *knowledge*; what about *skills* in tasting and drawing out and giving feedback. Now while the latter can be acquired through any social encounter (where did I go wrong?) the tasting is a technical skill that is difficult to acquire through self-study. So you now need to find somebody local with experience.

A beer judge would be a good start. Qualified beer judges have not only the sensory skills to identify faults and features in a beer, but the brewing knowledge to help you remedy or exploit them. However they can be hard to find. Some competitions and festivals welcome seekers after knowledge to work as stewards with a judge – but check with the organisers and make it clear you want to learn about tasting, not just to polish glasses. There is a ‘stewards should be seen and not heard’ school of thought! However, it can be extraordinarily difficult to find out about such competitions although those we know about are on our website under ‘Festivals and Shows’. If you would just like to know a bit more you are particularly welcome to steward at CBA festivals, if you let us know in advance.

How about joining a CAMRA tasting panel? Their job is to provide the beer descriptions for the Good Beer Guide and to nominate beers for the Champion Beer of Britain competition and its winter equivalent. There are panels all over the place and I don’t know of any overwhelmed with volunteers. Regional co-ordinators are trained by Keith Thomas of Brewlab; they train tasting panel chairs who in turn train local panel members. Keith also does some local training too. However, while CAMRA people will have good descriptive skills, they may not necessarily have either the brewing knowledge or diagnostic skills for faults; their job is to evaluate good beer, on the basis that defective beer in a pub is usually a cellar problem. Nonetheless there’s an opportunity here to get together with like-minded people and learn to identify astringency, autolysis and acetic acid even if you probably won’t meet horse blanket!

Given the travel problem it is worth considering looking for formal training to plug the gaps, perhaps at a weekend. Both Brewlab and Brilliant Beer can run half-day tasting courses. I attended a pair of Brewlab half-day introductions to home brewing and to tasting and learned more in that day than in any year since. The cost would be around £20-£25 per person for a reasonable-sized group.

Many micro-brewers are not 'airing cupboard enthusiasts', but brewers who at the end of a successful career in major breweries went back to their roots. They will have been trained in tasting and may well be happy to pass their knowledge on.

If you've got some people who already have reasonable tasting skills, perhaps from wine or whisky, the Brewlab Tasting Kit provides samples of the technical aromas like diacetyl that are harder to find. The kit costs £82.25 which is not expensive for group use, but note the shelf life is about a year. The kit is also used by CAMRA panels. There's also information from the US Beer Judge Certification Program (BJCP) on doctoring beer to create reference flavours at <http://www.bjcp.org/study.html#drbeer>

The BJCP has also prepared a study guide and there are one or two people in the UK who could present their course if there was interest – Ant Hayes will be writing about that in the next issue.

And at GBBF, a new initiative between CAMRA and the brewers was launched called, errr, *Cyclops*, which aims to provide concise descriptions of beer to try and help those unfamiliar with real ale in the way wine rating systems do. So tasting seems to be the flavour of the month (sorry).

There's more information on our website – see *Training and Tasting* and *Local Groups*. However, if you're interested in improving (or offering) your tasting skills, why not call me for a chat on 01332 347601?

And for those already on the path to enlightenment:

- If you are a trained taster or beer judge, please do mention it in your membership record.
- If you are running a competition or festival that welcomes new people and gives them the opportunity to learn, let us know and we'll publicise it.

Tasting Beer – Sean Franklin

Tasting skills are fundamental to those involved with beer. Tasting covers every sense/sensation that gives a clue to what's happening in the glass. We use our senses of touch, feel, taste, the olfactory (smell) sense, chemical sense, sense of sight and on and on. I taste because it's fundamental to knowing whether or not I'm making the beer taste profile I think the customer wants, and it monitors my brewing performance.

How do you do it?

First. Know the objective. Technicians look for beers with no faults. Brewers look for consistency and conformity to the house/beer style. Competition judges look for the beers that conform to the beer style guidelines set out by the competition organisers. Then they look for the best quality within the guidelines. Tasting for pleasure, for ourselves, is easy - do we like it or not. Subjective decision. No argument. Professional beer tasters taste beer objectively, against objectively set, predetermined criteria. What are the perceived aromas, does the sweetness conform to spec? It sounds clinical, but it gets results.

Second, believe. The truth is that in beer there are the same components (particularly in the hops) that make fruits, flowers and spices and all the rest smell as they do. So before you pick up the glass, start believing that beers can taste of anything. From TCP to elderflower through citrus tastes of oranges and grapefruit to toffee to cardboard - anything. Once you open your mind to this possibility you're on the right track.

Third, Concentrate. The impressions that come to you are so fleeting that if you don't concentrate you'll miss them. The reward for the concentration is that you'll start to

record impressions that you've missed 'til now. Different hops smell of different fruits. To a degree this depends on the yeast the brewer uses. In Anchor Liberty and Pete's Wicked Ale there is an orangey, almost floral aroma. In the Pete's there is a slight chocolate malt flavour. Both beers have a long finish (see later). Hops usually provide the fruit smells in beer, particularly citrus types - grapefruit, lemon, orange. Some hops have floral aromas. Dry hopping beers in cask provides a different sort of flavour - pungent and spicy.

Take descriptive notes of what you taste. Nothing complicated. A simple 'descriptive' tasting sheet would have the following headings down the left hand side:

- *Visual appearance* can include colour; colour intensity; colour nuance. Foam head retention. Clarity and even fluidity.
- *Smell* could be expanded to Aroma type (fruit, floral etc.,). Complexity. Intensity. Faults.
- *Taste* splits into first impressions. 'Balance' of primary tastes. Length of primary taste. Flavour is the same split as for aroma.
- *Finish* is just measured as either short or long.
- *General comments* can give a mark for commerciality or aesthetic quality or some comments on the beer's conformity to style.

This can be expanded out depending on the level of detail you want to include.

Some say beer taste is due to hops, some say malt, some say yeast, some say water, some say process. But if the

brewer understands the ways each of the above controls taste then he, the brewer, is in control. That control demands an understanding of beer fundamentals and plenty of tasting practice.

OK. Go and buy a bottle of beer. Don't worry if the aromas in the beer you decide to taste are not obvious. Just keep trying beers until you find one worth tasting. Something aromatic like Anchor Liberty or Pete's Wicked Ale. (or perhaps Meantime's IPA and Porter, available from Sainsbury's – James) Choose a place to do the tasting. Somewhere you feel comfortable, not too smelly, not too noisy or colourful. Open the bottle and pour.

Clarity

Pick up the glass and look at the beer. Is it clear or just slightly hazy. Beers that are not clear are always judged more critically than clear beers. In the main customers (wheat beers and unfiltered or unfiltered beers apart) like them clear at the point of sale.

Colour

Note the colour. Is it yellow or straw coloured? Has it a copper hue? Again the eye overrules the palate. As much as poor clarity causes the taster to be more critical, an attractive colour does the opposite. Pale colours come from beers that have been made from straight pale ale malt, or wheat or rice (in the USA). Darker beers use darker malts. The most commonly used - crystal and chocolate - give a darker colour and a toffee (or chocolate) flavour to the beer. Malts give mostly burnt smells. Aromas of coffee, Ovaltine, plain chocolate, Parma violets, toffee and caramel all come from the malts.

Taste

Now taste the beer. The primary tastes; sweet, salt, bitter and acid, are each perceived in fairly specific areas on the tongue. Sweet-perceiving taste buds are at the tip of the tongue, so we pick up sweetness first. Bitterness comes last with these buds at the back of the tongue. Salt and acid tastes are sandwiched between at the sides and in the middle. This passage of the primary tastes is called the 'taste evolution'. Look for 'balance'. Primary tastes that don't overawe each other. Carbon dioxide plays a part hiding the sweetness and accentuating the bitterness slightly. Some Belgian Lambic beers break all these rule but score because of the interesting journey they've forced upon the taster.

Aromas

There are eight categories of smell : Fruity, flowery, burnt, spicy, balsamic, vegetal, woody and chemical. If you can't zoom in on the exact smell first go, try slotting it first into one of the above categories. If you want more ideas have a look at a beer 'flavour wheel'. (There's a link to one on our website under Training and Tasting - Ed.)

Off smells

A host of them. Hydrogen sulphide, diacetyl (butterscotch), ethyl acetate ('solvent'), sweaty smells, TCP, musty, papery, acetaldehyde (green apples), skunky,

metallic, cheesy, dimethyl sulphide (DMS for short, means any cooked veg smell). All brewers are taught to recognise them - often to the exclusion of learning about the flavour positives - those attributes that make a beer hard to put down. Some smells have double standards depending on the beer style. The buttery taste of diacetyl is (just) fine in an ale but no good in a lager. Hydrogen sulphide is supposed to be alright in Burton beer (I think not, I don't go around sniffing drains for pleasure*) but not OK anywhere else. Ethyl acetate is fine in a Belgian beer but nowhere else. Their problem is that they mask other more pleasant aromas. Sometimes they might add to the complexity of the aroma - but seldom.

*It takes all sorts. Einstein, disguised as Robin Hood... went out sniffing drainpipes and reciting the alphabet, according to Bob Dylan in *Desolation Row*. Ed.

Aroma vs flavour

Aromas are perceived via the olfactory zone. The olfactory zone sits up under the eyes and just behind the top of the nose. Much of the confusion about 'taste', 'aroma' and 'flavour' is centred on the fact that this olfactory area can be accessed in two ways. First, via the nose. Take a sniff of anything and the smells are sniffed up the nose and pass over the entrance to the olfactory area. This is 'aroma'. The other way is via a rear passageway in the mouth leading to the olfactory area that is opened each time we swallow. The aromas in the mouth are pushed up and over past the olfactory area. The confusion lies in the fact that the primary tastes are perceived at the same time so there's a lot to sort out in a very short time. These impressions lumped together are called the 'flavour'. You can separate the primary tastes (and other mouth perceived sensations) by holding your nose while tasting. The aroma portion that you lose while holding the nose is called the 'mouth aroma'.

When the beer is swallowed the 'finish' starts. Note down how long the 'primary tastes' last in the mouth. Then note how long the aromatics last. If its more than a minute, that's a good sign. Does the aromatic part of the flavour shut off like a door slamming. (Bad sign)

Quality

Quality beers must engage the interest of the consumer. 'In mouth entertainment' is what the brewer must offer the customer. Beer is an alcoholic product wrapped up in a taste package that must appeal to the consumer. How colourful, intense and lasting this taste package is, will govern who drinks it and more importantly the price at which it might sell.

Commercial Quality

For ordinary UK bitter the commercial level quality can be defined as an absence of faults from start to finish. Not much flavour to shock. No overriding primary tastes like too much bitterness or sweetness. No aromas out of place, no phenolic smells, or ethyl acetate; no overt diacetyl etc. It should have nothing to take it outside the style

guidelines clearly set by the consumer test marketing taste profile. This is commercial quality.

Aesthetic quality

Because the 'taste' of a beer is perceived over a period of a few seconds or minutes (if we include the aftertaste), tasting is an experience. How interesting and pleasant the brewer makes this experience for the consumer determines the quality of the product. At best it should give them a sense of wonder, nothing less. Complex (and usually expensive) perfumes can do it on smell alone. Quality wines do it on smell and taste. Paintings do it with depth and complexity. You might think this is fanciful but beers can do it. The Timothy Taylor's Landlord of my youth was one of the most exiting taste experiences I have ever had.

Knowledge in Knaresborough – Ralf Edge

Once you've tasted, you need to apply brewing knowledge to actually produce better beer. Ralf Edge spent a day brewing at Roosters after winning our 2005 National Competition and reports on some of the techniques that the Franklins apply to produce their beers.

Sean's holy grail in terms of beer quality is the length of taste in mouth. He can't get more than 2-3 minutes, which hardly compares with a good espresso which lasts an hour or two, but is rather better than a certain East Anglian brewery where the aftertaste of the beers lasts not a single second!

Another cornerstone is product consistency. If you want to improve from batch to batch you have to be sufficiently consistent that the difference between batches is due to the change you made and not just random variations. Examples at Roosters are that the pale malt content is split 50/50 between Fawcett's and Warminster Maltings to reduce the impact of batch variations. Spices such as coriander and cardamoms are frozen to ensure their flavour remains constant. Maybe the malt trick is impracticable at home, but the spice one isn't.

However, it's not just a question of blindly following the recipe; you need to understand the few primary things that determine the result. Sean proposes the following analogy – suppose you're making roast chicken, you might well select a high-quality bird. However for chicken korma your attention might be elsewhere – on the rosewater for example.

So when adapting my stout recipe Sean was confident he could replace Northdown hops with Challenger and the yeast with his own, but needless to say, the treacle could not be substituted. If brewing a pale ale however, the yeast and hops would be of primary importance. For the pale ales that Roosters is famous for, brewing liquor is also key and each beer has its own water treatment. (This contrasts with Castle Rock where the brewer claimed, when we visited in 2004, that more than one treatment was a recipe for slip-ups!)

One or two tips which aren't quite orthodox. It is often claimed that all-malt worts don't require yeast nutrient.

Citrusy grapefruit overlaying bitterness with a tangerine aromatic on top. Allan Hey's Landlord was Leonardo stuff. Hop Back have made some lovely beers. So have Durham brewery. I once had two great pints of Marston's Pedigree in Burton on Trent 20 years ago. Stunning beers are made. If Taylor's hadn't been there perhaps we at Rooster's wouldn't have tried to make the beers we have. Good beers are a thing of wonder.

We wondered about the suitability of quoting US ales as examples, but understand that they are available in the UK, while corresponding examples of widely available, consistent UK 'Real Ales in a Bottle' were harder to come up with.

However Roosters add Murphy's Yeast Aid to the copper and this is no doubt a product of experience – and it's an easy experiment to conduct at home to see if it works for you. The temperature of sparge liquor is kept to a maximum of 70°C – again, worth a try.

Sean provided some advice on faults. Once the craft brewer has achieved a consistent and reliable technique the most common faults are dimethyl sulphide (DMS), diacetyl and lactic sourness.

DMS is more a characteristic of lagers as it is driven out of pale malt by the kilning. It can rear its ugly head for two reasons – an insufficiently vigorous boil; or slow cooling, that is to say, taking more than an hour to get below 70°C.

Diacetyl – a butterscotch flavour – may result from poor nutrients in the wort or yeast abuse.

Finally lactic sourness comes from bacteria and good cleaning and sanitation is the defence.

So thanks to Sean, Sam and everyone at Roosters for providing me with an opportunity to learn from top-class craft brewers.

A new course!

Apart from Cheers' course in Sutton there's been little available for the brewer wanting to start mashing, so we're pleased to report that there is now a 2-day home brewing course in Brighouse, West Yorkshire. The cost is but £35 per person including lunches. Accommodation is available nearby at £32 per night B&B.

The course is aimed at both the beginner wanting to get in to home brew and to the experienced kit brewer who would like to advance into full mash brewing. It includes hands-on and theory tuition.

Contact: Brian Reeves, 62 Sefton Avenue,
Hove Edge, Brighouse HD6 2NA
tel: 01484 723651 mobile: 07973 909672
email: BReeves452@aol.com.

The next course is on the 16th and 17th September.

Producing Quality Mild Ales at Home – Peter Fawcett

I've set out this article in an attempt to revive interest in the production of good quality mild beers of modest gravity. The definition of Mild Ale is "lightly hopped" (See CBA Factsheet No 6 on Old British Beers). It has nothing at all to do with strength, so they can of course be brewed at any gravity you choose. However I will concentrate here on low- to medium-gravity beers corresponding to good commercial examples.

Milds range in colour from black through dark brown to pale amber. Malty and possibly sweet tones dominate the flavour profile but there may be a light hop flavour or aroma. Slight diacetyl (butterscotch) flavours are not inappropriate while alcohol levels are typically low. Pale milds have a lightly fruity aroma and gentle hoppiness.

When I started brewing thirty years ago the very first mashed beer I made was a dark mild based on a recipe from Dave Line's "Big Book of Brewing." Whilst only achieving a gravity of 1.029 (the target was 1.038!) the beer was at least drinkable. Since those days my beers have gradually improved, helped mainly by the high quality of the raw materials that are now available to craft brewers - which was certainly not the case when I first started out! For those just starting to make full mashed beers, a dark mild would indeed be a good choice as any imperfections in technique or materials are not quite so evident as in pale or bitter beers.

The milds I brew usually have an OG of 1.034 – 1.041 and are designed to be quickly produced requiring only very short maturation periods and indeed are often ready to drink only 12-15 days after mashing. I'll deal first with the ingredients then outline production methods.

Malts and Adjuncts: I favour mild ale malt as a base but often substitute Maris Otter pale if I run out. The mild ale malt is slightly darker than the pale (about 6-7 EBC) and is specified as being slightly higher in enzyme and nitrogen content, which could be handy if you use a lot of adjuncts. Slightly darker malts are also now available such as Munich (15 EBC) or diastatic amber malt (50 EBC). I find the latter most useful and versatile. Using one or a blend of these, say to provide up to about 20-30 % of the total grist will give a fuller, richer flavour as well as increasing the colour. I now avoid darker amber and brown malts for mild ale as they can impart a harsh flavour to the beer, unless matured for a month or two, which is not appropriate here. For light- to medium-coloured milds these malts alone should suffice, but smaller quantities of other varieties such as Carapils or crystal can be used say at about 4-6% of the grist to provide small variations in flavour and increase head retention. The Carapils will add a slight sweetness whereas crystal malt (typically 120 EBC) will impart a slight toffee flavour. As for the darker milds, I also add chocolate malt and roast barley at about 4-6% each of the total grist, or black malt can be substituted for the roast barley. If you wish, you can use adjuncts at the rate of 5-

10% of the grist; for example flaked barley will increase both body and head retention and may be considered suitable for these lower gravity beers.

Hops: I prefer English varieties such as Fuggles, Northdown and Challenger, with Bramling Cross or Styrian Goldings sometimes used for finishing. Delicately flavoured continental hops are not appropriate for this style of beer although I suppose you could substitute American varieties if you like their rather distinctive flavour. As for the hop rates, these should be less than for bitter beers of similar strength. In commercial samples there are considerable variations in hopping rates, for example Kimberley Mild (1.035) has 19 units of bitterness whereas Holts (1.033) has an astonishing 30 units, which hardly qualifies it for the category, although an excellent beer. Now 19 units of bitterness (IBUs) would, by my reckoning, require 48g of 5%AA hops in a 25-l brew. My own hop rates may lean towards the higher side but it is my belief that small-scale brewers do not utilise hops as efficiently as large breweries, so we do need to use a little more.

Water: If you treat your water for brewing pale beers - for example with Brupaks CRS (Carbonate Reducing Solution) - remember to reduce the amount used (by up to a half) for the darker milds. This is because the roasted malts are slightly acidic and will contribute to a pH reduction of the wort. If you have moderately soft water (water report gives total alkalinity as HCO₃ of 50-150mg/l) I wouldn't use any treatment for dark milds. If your water is very soft (less than 50mg/l alkalinity), ½ to 1 teaspoon of calcium carbonate would be beneficial. This salt must either be mixed in with the grist or stirred into the mash; it will not dissolve separately in water. For medium to lighter milds I suggest substituting calcium chloride for about half the gypsum which will assist in promoting palate fullness rather than the drier flavour produced by gypsum alone, which is more appropriate to pale and bitter beers.

Yeast: Many craft brewers use Safale S-04 dried yeast for their beers and this would be an excellent choice for our home brewed mild ale. It possesses low to medium attenuation properties and flocculates very well to the bottom of the tank at the completion of fermentation. This strain needs plenty of oxygen so make sure you aerate the wort well before pitching the yeast. I've also used Danstar Windsor dried yeast successfully for dark milds; this strain is also of low attenuation; it works rapidly and does not need so much aeration. However it does not settle (flocculate) as well as Safale and will usually need fining to clear the beer. Danstar Nottingham has also successfully been used although this will attenuate further and produce a drier beer. As for liquid yeasts, there is a far wider choice and I have successfully used White Labs WLP013 (London), Wyeast 1968 (Special London) and Wyeast 1318 (London III) amongst others for this style.

General Notes on Production: I mash for about 90 minutes with a liquor to grist ratio of approximately 2.3 l/kg. I aim for a mash temperature of 64–65°C from a strike heat of 71-72°C. Many brewers mash at higher temperatures, but here we are aiming for a quick maturing beer, so ideally use low to moderate attenuating yeasts. Thus, the sweetness is provided by unfermented sugars rather than dextrins.

I boil for 65 minutes with the main batch of hops added 5 minutes after the wort is boiling when hopefully any free chlorine remaining has been boiled off. Any finishing hops are added about 5-10 minutes before the end of the boil. I don't generally use any copper finings for these low gravity beers as I find that clarity isn't a problem, and used in excess they can deplete the wort of valuable nutrients needed to enable a good fermentation.

As soon as the hops have settled, the wort can be cooled to ideally 18-22°C by whatever method you use, then aerated and the yeast pitched. The FV should be covered until fermentation is active then it should be loosened to allow undesirable volatiles to escape. Most dried and liquid yeasts will throw a head for a few days, which will subside as the fermentation progresses and will settle on the bottom of the FV when fermentation is nearing completion. A notable exception is Wyeast 1318 (London III) which should retain the head throughout and will need to be skimmed off after completion which (as with other yeasts) should be confirmed with a hydrometer. These beers will normally attenuate to 1.008 – 1.012 depending on the yeast strain used. If the gravity is much above this after three days try rousing the yeast off the bottom with a paddle or stirring the head back in if the yeast is settling out on the surface. When you are satisfied the fermentation is complete (usually after about 4-5 days at the above temperatures) the beer can then be racked into a secondary vessel with an airlock for a few days to let more yeast settle out. Alternatively it can be left in the FV (which should by now have been completely covered with a lid) for a couple more days and racked directly to the keg or pressure barrel. If you wish to complete the fermentation in a single vessel then I would advise using yeast that settles (floculates) quickly. If possible, lower the temperature gently to 15°C for the final two days before kegging to assist the yeast in settling out on the bottom (or on the top where it can be skimmed off).

Priming Sugars: Several commercial breweries that produce mild (yes there are still a few about!) prime their beers when filling the casks. Sometimes the mild is the only beer to be primed as was noted when the Midlands CBA visited the Grainstore Brewery in Rutland. As these beers are often consumed “young” the priming sugar may have only partly fermented, adding some sweetness to the palate that many drinkers including myself find desirable in the style. As for the type of sugars used, I prefer a third each of cane sugar (Tate & Lyle), corn sugar (glucose) and malt extract boiled in a little water to sterilize or you could just simply use cane sugar alone as most craft brewers do.

After the primings (and finings if desired) have been added keep the keg at about 12-15°C (ideally) for five to six days and then the pleasure is yours!

Recipes: Here are two that I've brewed a couple of times in the past year that I've re-formulated to a 25-l batch size. I've assumed a mash efficiency of about 80%.

(1) London Dark Mild O.G. 1.038

- 2.75kg Mild ale malt
- 750g Diastatic amber malt
- 115g Roast barley
- 95g Chocolate malt
- 38g Northdown 7–8% alpha acid, 60 min boil
- 20g Fuggles 4–5% alpha acid, 5 min boil

Prime with 60–70g of sugar(s)
Brew as described in the General Notes above.

(2) Light Amber Mild O.G. 1.041

- 2.75kg Mild ale malt
- 1.00kg Diastatic amber malt
- 175g Carapils malt
- 60g Fuggles 4–5% alpha acid, 60 min boil
- 20g Bramling Cross 5–6% alpha acid, 10 min boil

Prime with 60–70g sugar(s)

Note: These recipes were designed for beer that is destined for kegs or pressure barrels without long conditioning periods. However if you are intending to bottle most of your mild, perhaps also with a view to entering competitions, you may possibly need to reduce the hop rate slightly. This is because any residual sugar will ferment out during the longer conditioning period, and the beer may otherwise finish a little too dry.

These two beers have been popular with friends and fellow brewers and can of course be fine-tuned to your personal preferences by perhaps adjusting the hop rate slightly; I'm sure they will at least provide a good starting point. Finally call your mild anything you like when you serve it to friends! Mild has suffered from a “cloth-cap” image in the past few decades and has even been dubbed “the beer that dare not speak its name.” However I've noticed that where a mild has been re-named, for example Elgood's Black Dog, Hooky Dark or Moorhouse's Black Cat, sales and distribution seem to have increased with the new image. This can only be hopeful for the continued production and enjoyment of this formerly very popular style of beer in the future.

Brown Ale – the drink of our fathers

In the next issue we propose to feature brown ale. If you have something to contribute, please contact the Editor.

What Goes Down at The Vanquish Brewery Needingworth, Cambridgeshire

Martin Richardson

As Martin Richardson arrived for the festival with his beer he was in a panic – "I've tasted my beer again and it's gone off!". That didn't stop the judges awarding the Midlands second place in the Inter-Regional challenge for his pale ale and highly commending his stout. Here he describes his brewery and his brewing techniques.

Burco boilers can be a very low-cost entry solution for anyone starting out in the brewing game, and the convenience of stainless steel, combined with 3 kW of electric power, make them ideal brewing vessels. If you keep an eye on the second-hand small ads in your local free papers you will eventually spot one, usually for less than £20. I have been fortunate enough to acquire five over the last few years and have successfully changed the cumbersome tap arrangement to quarter-turn stainless-steel taps which are suitable for incorporating copper slots by careful application of standard brass fittings and a hack-saw. For those who don't use Burcos, they are internally all stainless steel, unless you buy a really old one. I did once own one made from aluminium and wondered why my beer always tasted like chewing on a nail (which I don't do regularly!).

About a year ago I decided to reduce the amount of lifting and moving by installing my square 40-litre Burco wash boiler (cost - £10) on the inside wall of my garage to act as a hot liquor tank (HLT). A hole was cut in the outer body using an angle grinder to strap on a standard cylinder thermostat to control the temperature. This is quite poor and I have to keep an eye on it. Fluctuations of 65-80°C are normal and I have to resort to manual boosts, or accept cool-down periods just prior to mash-in or sparging.

A 15-mm cold water pipe was plumbed-in from the outside garden tap up to the top of the HLT, with a separate stop-cock in the line and a stainless steel showerhead at the entry point to the tank.



I used to pre-boil the liquor but it just made my beer taste harsh. David Edge recommended acid treatment instead, and in this hard-water district, 300ppm of bicarbonate can be reduced to an acceptable level with low-level acid treatment. Phosphorus is almost non-existent in the supply and is apparently beneficial to fermentation so consequently using phosphoric acid looked to be a very good option for bicarbonate reduction and pH correction. David also suggested a showerhead arrangement can remove chlorine through its spraying action, which is needed if I do not pre-boil. Use of acid converts the bicarbonate into CO₂ rather than forming a precipitate, which avoids sludge forming in the bottom of the HLT so no need to clean it out so regularly. I have found that adding 15 ml of 75% phosphoric acid to 40 litres of liquor reduces pH from around 8 to about 6.2.

I spent many an evening reading up on pH and decided not to worry about mash pH but concentrate on the starting liquor. I had read in a few publications that the lower the mash pH the better, so my idea was that provided the liquor starting point is low the outcome should be reasonable (*The judges seemed to think rather better than 'reasonable'! Ed*). I think I may have been just lucky in matching the treatment to my brewing technique this time. I have made both light and dark beers using this as a standard technique and never seen another harsh-tasting brew since. I do however plan to investigate mash pH when I can convince myself that purchasing a pH meter is a sensible way forward.

I removed the old Burco tap from the HLT and replaced it with a 15-mm tank connector, suitable for joining to a 15-mm outlet pipe. This pipe is then teed to separate



15-mm and 10-mm copper pipes with quarter-turn taps. The 15-mm line is used to 'fast' dump the main liquor into the mash tun and the 10-mm pipe runs to Phil's sparge arm.

Unfortunately the

40-litre HLT can't quite do the 30-litre mash quantity as about 5 litres get left behind in the tank, just below the tap level. I have to top it up during the 90-minute mash and add more acid. I have another square Burco available to mount side-by-side to the existing one for when I scale up to a 50-litre brew length in the coming months. This will allow me to fill a firkin. I have also recently installed a sink unit just below the HLT, which is fantastic! No more in-and-out to the kitchen with sticky wet feet, to my wife's applause! Potentially, at maximum power, three 3-kW boilers (two HLTs plus boiler) running flat out can draw 37 amps so I have wired in a separate fuse to ensure I don't blow the ring main. In practice though about half this power is used.

I use a standard fermenting bin for the mash tun, with a home-made 22-mm slotted copper manifold in the bottom. The manifold is connected to a standard plastic boiler tap with a small off cut of flexible hose I acquired from a fish tank shop. It fits very well and simplifies the connection process as you don't need to screw the strainer onto the plastic tap. The tun is wrapped in hot water cylinder insulation during the mash and usually it can hold 66°C ±2°C over 90 minutes. I have recently purchased a 50-litre version of the Spedding Thermobox "Mega-Tun" from EBay (*see BC March 2006*) for £50 that will form part of my up-scaling plans this summer.

I mix ½ tsp. gypsum and ½ tsp. CaCl into freshly pre-crushed grist (from H&G) prior to mash-in and this is then mashed for 90 minutes using a 2.3 l/kg liquor to grist ratio. I then recirculate 2-4 litres of wort at



which point the wort is generally clear. I then slowly run off approximately 50% of the wort into an F44L Burco boiler, which contains a 15-mm hop strainer (manifold) in the bottom, prior to sparging.

The 50% liquor out point is checked via a sight-glass tube connected to a secondary tap on the side of the mash tun.



The boiler tap has been converted with a ¼-turn tap and a 15-mm brass tank connector. The outer nut had to be sawn down to make it thinner, so that enough thread protrudes to hold the tap in place. A long clear plastic pipe is attached to the mash tun outlet tap to prevent splashing into the

boiler. As the level rises in the boiler I turn the mash tun tap to raise the end of the pipe just proud of the surface of the wort. Sparging is carried out usually with the plastic lid on. I have drilled out a thick wooden block to support the arm and this sits on top of the lid level with the hole in the lid. The 180-mm sparge arm rotates at about 30 rpm and I can obtain 30 litres of wort in about 45 minutes, provided I compensate for reducing flow as the level falls with the tap on the HLT. The boiler is switched on to 80% power on when the element is covered, which is one setting below maximum power on the Burco simmerstat controller.

The main boil is tricky as I have to move it outside. My wife helps to carry it over the garage door threshold and I use a trolley to move the boiler around the garden. Main hops go in as soon as the froth starts to form, which I tend to skim off. This was a recommendation from a brewer from many years ago but I can't remember why. (*Tim O'Rourke advised against in "To skim or not to skim". Readers can find the article via Brewer's Contact on the website or ask for Factsheet No 5 – Ed.*)

Scaling up this year to 50 litres is going to mean a rethink, but I've been inspired by a recent visit to Terry Cooper's brewery in St Neots. Terry graciously took me in for a brewing day revealing his closed lid ex-keg boiler design. His approach would allow me to boil indoors using a wall fan extract. I recently, and cheekily, went to a local keg storage yard and managed to scrounge a keg for this purpose; it's amazing what you can get if you ask (especially late on a Friday afternoon!)

I have not yet moved into recipe formulation; I just follow standard recipes from Wheeler books. I'm inconsistent regarding final hops; they generally go in for the last 15 minutes, along with the Irish moss, but I have never been happy with the hop aroma, so attention is required here. When the boiling is complete, I dump in the cooling coil and attach it to the tap for an hour until it reaches about 30°C. I found that using a standard purchase cooling coil takes a lot longer to cool down than I expected and I am thinking about increasing its size. (*If you gently move the coil during cooling, this will take 20 minutes – Ed.*) I am also considering going water-friendly by installing a pump to direct coil water to and from a 200-litre water butt. I do not brew enough to warrant directing the water back to the HLT.

The boiler is finally lifted onto a high trolley and the wort is transferred, via a long hose, into a 75-litre stainless steel fermenter. Once in the FV, the wort is aerated using a 2µm steel air stone for up to one hour prior to pitching in dry yeast straight from the packet onto the foam. I tend to use Safale S-04 or Nottingham yeasts, which typically attenuate 1040-1050 OG brews down to 1010 and 1014 respectively. A good head has normally formed by the morning after, without any stirring in. I always drop the wort into an air-locked plastic fermenter after 2-3 days, when it has attenuated to 1020-1025. The fermentation continues for one week or so before the beer is transferred to a plastic keg. I tend to not prime unless the condition is non-existent after a week or so in the keg. If it is quite flat I add a few teaspoons of glucose powder and shake it up.

My immediate plans now involve good bottling practices, modifying a fridge for fermentation, upgrading to a Spedding Mega-Tun, modifying the 75-litre FV into a boiler, boiling indoors, boosting HLT capacity and having a dabble at recipe formulation. In reality my wife will probably pare this down to performing a few brews for the summer BBQs and ensure that the home DIY gets done!

In the beginning was the wort– *Graham Barthorpe*

Not strictly accurate but I had to start somehow!!

I made my first homebrew back in 1970. At the time I was a Marine Engineer in the RN, building a submarine up in Barrow in Furness. I recall that the only reason for starting was because "it was the thing to do" A few pints down the pub then back home to whoever had some beer ready. It was quite a sophisticated brew, 4 lb hopped malt extract, 4 lb of sugar and sprinkle the yeast on top, ferment for four days, keep for a week and then drink. Truth is it was not uncommon to dip your pint pot into some still fermenting brew when supplies were running low. We also took a course in hangover management.

As you can imagine, craft brewing was not the topic of the parties, but at least it captured my imagination enough for me to continue brewing after I left the navy. I believe the book I was using was by David Line and so I was able to progress from the top of the cooker to a boiler and real hops and malt extract.

I don't really remember what prompted me into full mash, but I do recall a homebrew shop somewhere near Bradford, run by a chap with a German sounding name. He advertised all this equipment for making "real beer" and lots of ingredients that I didn't know existed. He explained a lot, sold me some more books and away I went rejoicing. I wasn't too happy some months later when he went out of business owing me some £40 for equipment.

Up until this point I had been brewing in something of a vacuum, except for the homebrew shops (my local was a wine fanatic) I never got to talking to anyone about brewing. I knew loads of drinkers but no brewers! Then I read an article by a fellow called James McCrorie who invited anyone interested in setting up a homebrew association to contact him. From that first contact in 1995, the rest, as they say, is history.

Having just looked back through Vol 1 Issue 1 of Brewers Contact, I see that the criterion for being a Founder Member was to subscribe to the "start up fund". James must have bankrolled that first issue. About 100 people had expressed an interest by this time, which gave the concept enough momentum to carry on. I spoke to James a few times in the early days but actually met him for the first time at Olympia when the CBA had a stand, or was it at Sunderland on a weekend brewing course. Whichever, we seem to cross paths at least annually.

Had it not been for the CBA I guess I would still be brewing in a vacuum, but just as drinking beer is a great social activity, talking about making it is almost as enjoyable. Now I can do that almost when I want.

Here's to the next ten years!

This article arrived just too late for the tenth anniversary special – Ed.

A new Wheeler?

Fifteen years or so ago, Graham Wheeler set out to write the definitive guide to British homebrewing and succeeded. His book, "Homebrewing – the CAMRA Guide" is still the most authoritative guide to mainstream British craft brewing, although it is now out of print. We hear that copies have been changing hands for between £50 and £100 on the Internet! It's the book we recommend everyone reads; the foundation of modern homebrewing in the UK, describing straightforward brewing techniques derived from the best British commercial practice that have set many a successful brewer on their way.

However, some things have changed since those days, for example new equipment and ingredients (eg Cornie kegs, picnic cooler mash tuns, better yeast, lots of malts and hops, no-rinse sanitisers) are available. Some of the dreadful ingredients that Graham rightly criticised have disappeared, partly as a result of his campaigning. The transfer of scientific brewing knowledge from commercial brewing to house brewing has refined our understanding (eg keep dried yeast in the fridge). We also just seem to be more sophisticated these days. For example in those days the prevailing orthodoxy was that general-purpose hops like Challenger were a jack of all trades; master of none. And then Coniston's delightful (in cask anyway) Bluebird was developed to stun palates with 100% Challenger hops.

Well that's a few of my comments - but what else should a new edition of *Wheeler* contain?

CAMRA is now keen to republish Graham's work, beginning with the recipe book *Brew your own British real ale at home*. With that out of the way, the main book would be republished. Graham would appreciate some input from members. He believes that the following topics should be added to a new edition,

- basic microbiology, at least showing how to prepare and streak out a petri dish.
- beer colour
- hop utilisation
- the science of water treatment
- more on beer styles.
- more on cellarmanship.

as well as the hardware and ingredients mentioned above. So any ideas for additional content, or are there aspects of the book that you believe require correction? Please send suggestions (and offers of help) to David Edge (same address as Janette).

If you have a spare copy of Wheeler, let us know and we'll offer them to members in need – Ed.

Scottish Craft Brewers at the CAMRA Edinburgh Beer Festival June 06 – Bill Cooper

The Scottish Craft Brewers had their usual stall at the CAMRA Scottish Beer Festival, held in the inspiring Assembly Rooms in Edinburgh. We have become a regular feature and I am sure we would be missed if, for any reason, we were unable to be present. Even during the trade session, where brewers and publicans get a preview, people were coming to the stand to talk about our beers they had tasted in previous years. This is a remarkable tribute to the quality of our products.

This year we asked members to brew something a little out of the ordinary to give punters a change from the popular beer styles available commercially. Les Howarth, our webmaster, repeated his smoked Guinness from last year, harking back to the early days of the brew when the malt would have been kilned over smoky wood fires. Les had people disputing whether the current version was just as smoky as last year. I picked on a similar theme with a porter allegedly dating back 300 years, for no better reason than that James McCrorie had given me a parcel of smoked malt from Bamberg which needed to be used. I called it *Balerno Reekie* for reasons that would be well understood in this city. It occurred to me that provided the beer was reasonably tasty, no-one could know, nor probably would they care whether the beer was anything like an early porter, but they seemed to accept the idea readily. It can't have been too bad because Bill Clopine of Yellowstone Valley Brewing, Houston, Texas asked for the recipe. Aled Murphy probably had the most distinctive brew, (no change there then) with his generously-spiced and citrusy wheat beer, suitably cloudy of course. Kenny Mowbray, our membership secretary, also had a coriander-flavoured golden ale. Ian McAnally, our one member who can consistently repeat a brew accurately, gave us a blend of two of his 'house' beers, merely to enable him to fill a cornie in time for the show. There were some among us who thought the blend was better than the individual beers, but then Ian never fails to produce palatable beers. All in all we had nine cornies of different beers on offer, a very good effort by the members and it was great to see so many of them at the stall. Many thanks to all who provided beers and gave their time to manning the stall. I hope the

excellent appreciation by the punters was a good reward for their efforts. Particular thanks go to Davy Martin of Edina Homebrew for all his work in storing and transporting the beers and for providing the stall with examples of brewing ingredients and accessories.

John McGarva, our member who now runs the Tryst Brewery, invited Davy Martin, Ian McAnally and me to act as judges in the Small Independent Brewers Association (SIBA) competition, held on the first day of the festival, a new experience for Davy and me. We were each allocated to separate panels of judges. Ian had dark beers; Davy, strong ales and I had half the entry for bitters. All our panel had to do was identify the two top beers, which would be judged against the top two from the other table. Two of the eight beers stood out as not being up to standard, but it was difficult to say whether the defects were down to the brewers or the way the beers had been looked after since leaving the breweries. I thought two of the beers were ahead of the rest and the remaining four very close to each other in quality. But there was a wide range of opinions round the table, which consisted of a well-known local pub manager, a beer writer, a commercial brewer and various CAMRA nominees. The CAMRA judging sheet with guidance notes, was clear and sensible. But the experience reinforced my view that home produced beers can readily hold their own with the best commercially brewed beers. At the end we were delighted to hear that John McGarva had won a Gold award for his "Brockville Dark" and a Bronze for his "Carronade IPA" Well done John.

A good example of craft brewers working with CAMRA, tasting, sharing and learning together. Have any other members or groups got such links? How can we make the most of our CAMRA connections?

For those who don't know, Edinburgh is often called Auld Reekie, which is Scots for Old Smoky. The etymology is similar to 'Rauch'.

Books and articles on the history of brewing – James Sumner

For a good general overview of the history of brewing, start with

- Cornell, Martyn (2003) *Beer: The Story of the Pint*. London: Headline. Covers the whole history of beer in a single volume, mostly from a British perspective. Anecdotal and quite popular in tone, but draws on much deeper primary research than most similar books (see in particular Cornell's new findings on the porter creation myth.) Unreferenced, although the individual chapter bibliographies allow most sources to be traced. The book can usefully be read in conjunction with an older, but still valuable, work:

- Corran, HS (1975) *A History of Brewing*. Newton Abbot: David & Charles. Likewise a survey of the whole known history, similar in geographical scope; more focused on technical matters, and probably of slightly more interest to craft brewers (some process descriptions are given.) Corran was for several years archivist at Guinness's Dublin brewery, and made use of some materials which have since been entirely unavailable.

Fully-fledged academic histories tend to cover shorter historical periods in more detail. For the shift from medieval to modern, see:

- Bennett, Judith (1996) *Ale, Beer and Brewsters in England: women's work in a changing world, 1300-1600*. Oxford: OUP. Some discussion of brewing practice, but most concerned with the status of the brewsters (female brewers, who dominated the trade in the fourteenth century) and how it was lost.

The single best source on the emergence of large-scale industrial brewing, covering the heyday of the London-centred porter industry and the importation of natural-philosophical methods — and probably the most impressive history of brewing *ever*, despite its age — is Peter Mathias' 600-page work of economic history:

- Mathias, Peter (1959) *The Brewing Industry in England 1700-1830*. Cambridge: CUP. Mostly addresses economic concerns — taxation practices, pricing of raw materials, supply routes etc — but also develops ideas about the status of porter as a technological product, plus details on the thermometer, hydrometer and attemperator, the rise of adulteration around 1800, and the legal and social status of beer.

A useful short article which extends and revises some of Mathias' ideas about porter-brewing is

- Macdonagh, Oliver (1964) "The origins of porter," *Economic History Review* 16, 530-535. See also Cornell (above) on this topic.

Mathias' book inspired a later volume, commissioned by the Brewers' Society as a companion-piece covering the later period:

- Gourvish, TR, and RG Wilson (1994) *The British Brewing Industry 1830-1980*. Cambridge: CUP. Also written from an economic standpoint, but, reflecting its period, tending to focus on marketing and mergers as opposed to material supply. The important changes in Gourvish and Wilson's period include the shift from London to Burton and the provinces and from porter to pale ales, but there's relatively little here about production.

There is still no strong, in-depth survey of practice in Burton and other English provincial centres such as Tadcaster. Scotland is better covered:

- Donnachie, Ian (1979) *A History of the Brewing Industry in Scotland*. Edinburgh: John Donald.

Source texts from brewing history

The first detailed manual on brewing in the English language was William Ellis' anonymous *London and Country Brewer* of the 1730s. This was followed, at first very occasionally but with increasing frequency, by similar works giving directions on brewery operations, sometimes with recipes. Here I have only listed a few which are readily available, thanks to Raudins Publishing's reprint service (www.raudins.com).

- Combrune, Michael (1762) *The Theory and Practice of Brewing*. London. Combrune's earlier *Essay on*

Brewing (1758) is the first known brewery text to recommend the thermometer, but is a theoretical work giving little practical guidance. The 1762 volume contains most of the material from the *Essay* and adds much information on Combrune's schemes for producing porter, Burton ale, small beers and other varieties, with thermometric values.

- (1768) *Every Man His Own Brewer*. London. Anonymous work showing some influence from Combrune, with descriptions of brewing practice and many recipes. Available from Raudins in a single volume with the 1802 work of the same name.
- Child, Samuel (1802) *Every Man His Own Brewer*. London. Notorious short pamphlet proposing a scheme for brewing on a small scale at home, with recipes including many additives widely perceived at the time (and in some cases now) to be highly dangerous. Available from Raudins in a single volume with the 1768 work of the same name.
- Brande, W (1830?) *The Town and Country Brewery Book*. London. Strange but fascinating volume from the unknown Brande, mixing material borrowed word for word from the century-old *London and Country Brewer* with up-to-date, but apparently half-digested chemical theory. Many recipes.
- Roberts, W H (1837) *The Scottish Ale Brewer*. Edinburgh. Written at a time when the 'Scottish system' and 'English system(s)' of brewing were understood as very distinct, Roberts' book is one of our main sources on Scottish practice. Written late enough to have a focus on systematic analysis, which is conducted on many specimen beers.

James Sumner is a lecturer at the Centre for the History of Science, Technology and Medicine, University of Manchester, and has a PhD on quantification and industrialisation in British brewing around 1800 from the University of Leeds. He is currently researching and publishing in the area, and may be reached via his website at www.jbsumner.com.

This article has been abridged. The full version, which also includes brewery records, the consumption side (pubs) and bibliography is contained in Factsheet No 6 'Old British Beers' which contains several articles to complement the Durden Park Books.

Don't think that these are obscure academic texts, it took me five minutes to discover that our public library has Corran, Mathias and Gourvish & Wilson via their website. They have Cornell too, which is still in print – Ed.

Boots Aluminium Pressure Barrels

John Alexander noticed Ron Allison's fond reference to these in the last Brewer's Contact. He has one too, but lacks the necessary o-ring – can anyone help?

Technical considerations for brewing Old British Beers – David Edge

A lot of interest in brewing Old British Beers has arisen from the books published by the Durden Park Beer Circle. Some of our favourites come from these hallowed pages – but they can be technically demanding. This article contains tips that I learned the hard way.

The beers have a very different taste spectrum to those found in pubs today. The old IPA recipes require huge quantities of copper hops by modern standards, followed by a couple of years maturing for the bitterness to fade and be replaced by a refined hop flavour. Apart from IPAs, hopheads may be disappointed initially, but the roast and malt flavours offer a new world of experience. It's hard to imagine wine buffs sticking to white wine, so why not try the darker side? Look at the proportions of darker malts in recipes and start with those best suited to you palate. Those with lots of roasted ingredients require, like the IPAs, long maturing and this means your sanitation needs to be good. Given the strong flavours of these beers you might consider brewing smaller batches than usual.

Malts

There is a lot of information on malt, historical and modern, in our Factsheet No 9 *Malt*. A wide range is now available (including a 50 EBC amber, brown and smoked) to home brewers in the UK from Brupaks stockists. Their list is available on our website under 'Supplies' and is included with the Malt factsheet. Low Colour Maris Otter malt at 2½-3 EBC is available from Hop & Grape and corresponds to the white or East India malt used for original IPAs. The Durden Park books sometimes call for 'Carapils'. This refers to a light-coloured (30-40 EBC) crystal malt that is now known as 'Caramalt' or 'British Caramalt'. This is because the 'Carapils' trademark owner, Weyermann of Bamberg, put its foot down. Their Carapils® proper is a very pale (3-5 EBC) crystal malt.

Mashing

Amber malts can produce a very dextrinous wort and if you usually 'mash hot for flavour' at 67-68°C you should consider mashing at 64°C with the amber ale recipes. Also note that modern diastatic amber malt at 50 EBC is **not** 'near enough' to pale amber at 30 EBC so mix in an appropriate proportion of pale, or even lager malt to balance the colour and flavour and to provide more diastatic power. If you do not regularly do an iodine test for starch conversion you should certainly do so for beers with lots of amber malt. Finally, not everyone likes the flavour of amber malt, which has been described as 'biscuity' - you may wish to start with recipes containing a smaller proportion.

Another reason to avoid mashing hot is that beta amylase activity is reduced in stiff mashes due to 'product inhibition'. Beta amylase is the enzyme that converts dextrans to maltose; without it you'd have a very 'chewy' low-alcohol beer. In a thick mash, it just looks at all that maltose and decides it has done enough. To brew beers at 1070 and above stiff mashes (or long boils) are required. However I suggest that you keep mash thickness above

2.2 ℓ /kg until you are confident and move them down in stages. Our experience is that below 2 ℓ /kg they don't convert – you may, of course, have more success.

Efficiency

High gravities mean lower mash efficiency unless you make a table beer with the second runnings as brewers of old did. However the recipes are based on old brewery records so you may do better. Our 63/- oatmeal stout came out as 78/-, so you may wish to recalculate the recipes for your system. However note that as gravity rises, mash efficiency will fall. As a starting point you could knock off 10 percentage points off efficiency at 1070 and 20 at 1100.

For the strongest beers you need a stiff mash and can't sparge unless you are prepared to boil for hours. However, if you're not a purist you can add some malt extract to the copper to achieve the desired gravity and volume. In such strongly-flavoured beers it is unlikely to be detectable.

Hopping

Alpha acid levels have been rising so you need to allow for this if your Fuggles or Goldings are far from 4½ and 5½% alpha acid that the recipes are based on respectively.

Fermentation

Yeasts for brewing old British beers need to be able to cope with high alcohol levels. If you normally brew beers of around 5% ABV don't go straight to a 10% recipe – work your way up, as successful fermentation of high gravity worts takes practice (and maybe a spot of yeast nutrient). Amber malts can produce worts that are not particularly fermentable. Therefore if you are using a dried yeast we recommend Nottingham and suggest a starter or two 11-g packets for a 25- ℓ batch.

If you're using a liquid yeast choose one with good attenuation and alcohol tolerance. White Labs' WLP099 'High Gravity' is not a good choice as, while it can cope with high alcohol levels, it will not ferment maltotriose and will leave a very sweet beer if used with amber malt unless used in conjunction with an enzyme. For beers of 10% and above, you can add 'champagne' yeast at bottling – 1 g per five litres will suffice. This will increase condition and also provide a drier finish. However older beers could be sweeter than today. Corran (see above) quotes the following figures from 1804:

	OG	FG	Apparent attenuation	ABV
Strong ale	1110	1052	53%	7.8%
Common Ale	1075	1025	65%	6.6%
Porter	1071	1018	75%	7.0%
Table Beer	1040	1004	90%	4.7%

Commercial products

If you'd like to try before taking the plunge, some historical ales are being brewed commercially. Most are 6-8% IPAs, but others are available, notably from the Garston and Pitfield Breweries.

Book Reviews – Les Howarth

Principles of Brewing Science, 2nd edition, George Fix, Brewers Publications (1999) ISBN 0-937381-74-8 \$29.95
Brewing, Ian S. Hornsey, RSC Paperbacks, (1999) ISBN 0-85404-568-6

Dave Line once wrote that brewing was an art rather than a science. He has a point, but the fact remains that science is a powerful tool for improving the understanding of processes such as brewing and assisting with solving problems, thereby improving technique and the quality of the resulting products. The presentation of potentially complex scientific concepts to a non-technical audience is never an easy task. The author walks a tightrope between presenting too much information that risks overwhelming and confusing the reader or “dumbing down” too far so we have an easy read that conveys no useful information. For the first in this occasional series of book reviews I have decided to review these two books together since they both attempt to do much the same thing and describe the science behind brewing.

Principles of Brewing Science was written by the late George Fix, primarily trained as a mathematician. It is published by a sister organisation of the American Homebrewers Association and is clearly aimed at home brewers as well as professional brewers. On the other hand, the author of *Brewing*, Ian S. Hornsey, is a botanist and microbiologist as well as founder and partner of the Nethergate Brewery in Suffolk. Since this book is published by the Royal Society of Chemistry and it is aimed primarily at professional brewers and students of brewing science one might expect it to be a somewhat “heavier” read than the George Fix book. However, that’s not the case and that both authors do a good job of walking the “tightrope” of readability vs. information.

Principles of Brewing Science is a highly regarded book and it certainly gives a very useful description of the science of the brewing process. I like the way Fix describes the science and makes clear the implications for the brewer. This book is full of information of interest to the brewer and the explanations of why we should oxygenate the wort prior to pitching the yeast, for example, should help to improve the brewer’s technique. I therefore have no hesitation in recommending this book.

In general, Ian Hornsey’s *Brewing* assumes that the reader has a slightly higher scientific knowledge than Fix. As well as going into a little more depth than Fix, Hornsey also covers a wider scope and also discusses the history of brewing-related science. It is aimed at the commercial brewer but is potentially useful for craft brewers.

The real test of these books for me is whether they can answer a craft brewer’s questions and provide effective solutions to problems. To check this I assessed how effective these books were at addressing two issues raised on the Scottish Craft Brewers news group recently. The first of these related to the contribution that late addition hops made to the bitterness of a beer. Fix gives several references to “late-hopped beer” in his index which direct you to pages where he discusses evidence for the impact of late hops on flavour and some discussion of hop

chemistry including cohumulone levels. I didn’t find this of much help beyond inferring that early hop addition produced a more pleasant bitterness. Given the cohumulone clue, the index led me to a discussion of alpha acids where it is revealed that cohumulone is both the most soluble and provides the least pleasant bitterness of the alpha acids. The link between the cohumulone levels and hop variety supports the theory that cohumulone level (rather than total alpha acid content) determines whether a given hop variety is best added at the start of the boil for bittering or later as an aroma hop. So Fix had the information even if it wasn’t immediately accessible. In Hornsey I found it even more difficult to find the necessary section and it was the cohumulone entry in the index that finally led me to it (which isn’t much use unless you already know the answer to the question you are asking). This led to a much more detailed description of hop chemistry that fails to mention the higher solubility of cohumulone. In fact, the detailed studies of the three hop varieties used by Nethergate (Fuggles, Challenger and Styrian Goldings) seem, at first sight, to contradict the Fix theory! Challenger with “22% cohumulone” is used as a general purpose hop while Styrian Goldings with “28% cohumulone” is used for aroma. It is only when I realised that the cohumulone was presented as the proportion of total alpha acid (6.5-8.5% and 4.0-6.0% respectively) that this data made sense to me. So, for this question, I found that Hornsey failed to provide an effective answer.

The second test question relates to water composition. Fix gives a very thorough explanation of aqueous salt chemistry but no practical explanation of how to alter your liquor composition. I found Hornsey’s shorter description of the effects of water composition to be slightly more user-friendly.

In summary, if you want scientific answers to your brewing questions then the Fix book will do a good job. If you want a more detailed description of the science and its history without such easy answers to questions then I can recommend Hornsey.

Craft Brewing Radio - Julian McIlroy

Readers may be interested to learn of craft brewing radio which comes from northern Queensland in Australia. The programmes are accessed over the Internet at <http://radio.craftbrewer.org/> by downloading or type the url <http://tss.oz.craftbrewer.org> into an iPod or Podcast application. The broadcaster is Graham Sanders and his mate Ian - both extremely knowledgeable. They encourage craftbrewers from around the world to contact the program, and you can hear yours truly interviewed in one of the May 2006 editions where CBA and BC are discussed (there are usually two episodes per month). It won’t be everybody’s cup of tea, but I thoroughly enjoy it and always look forward to the next programme.

The things you do for a BEER – Trevor Perryman

So, it came to pass that I was sitting with my wife in our rented flat in Subiaco, Perth, Western Australia, in that hot, dry summer of 1974. Landing in Perth on a spring day with little money, £20 left in our pockets (newly wed). Water was all we could afford. Now after 3 months into the drought with temperatures hovering at 30°C and above every day, my mind was onto sinking a bevvy or two. Not being able to buy a beer, my continued thirst got me thinking. Something about the flat we were renting was nagging my subconscious. The previous beer-swigging tenants rather than disposing of their beer cans in the usual way, had stacked them from floor to ceiling on every wall in every room. It was a work of art the Edinburgh Festival would have been proud to host. Recycling was a swear word then so no refunds on cans were forthcoming. No money and our washed clothes just half-inched off the communal washing line.

Desperation had sunk in. Having brewed beer in UK, it had crossed my mind to buy a kit and start the process; but I knew of no yeast that could contain itself in that environment. Visions of exploding bottles of beer with the contents running off the stacked cans and my wife communicating in her most delicate manner, made me hesitate. Wise man, I hear you say. Well, I'm not beaten that easily. How do you get a beer without making it, stealing or coercing your fellow brethren to buy you one? I slept on it. Inspiration is a funny thing, not that it has often happened to me, of course. Slumped in my chair, in the lounge looking at the deco art form, it occurred to me that there seemed to be a predominant colour in the arrangement of said beer cans. I concluded that this must have been the favourite tippie from the previous tenants. On closer inspection of the cans, I noticed a picture of a black swan on the side and a slogan about "the best beer in the world". Mmmmmmmmm??

At 6 am the next day I was standing outside the gates of The Swan Brewery, beside the Swan River, with an inclination to go for a swim rather than apply for any work. This is when the aroma of malt and hops hit me full in the face and memories of my beer brewing experiences back home forced me to focus on the task in hand.

"Pommie r u?" Well just a bit, slight European blood topped up in the past in 1066 no doubt. "You start at 6 and finish at 2.30 Mon- Fri" I'm in. Just like that. No CV. No interview. They had no idea what a pest I'd be when they took me on. So, I imagined lengthy, cushy chats about brewing techniques with the Head Brewer and Director. Next I was beckoned down into the bowels of the brewery. "Is this where the Head Brewer lives?" "No! This is where you work, in Dispatch; and the Head Brewer is not a Head Brewer he is a first rate chemist with a PhD!" Gulp. How's my GSE in chemistry going to come across here? Out of depth, comes to mind.

So here I was placing beer cartons onto pallets from a conveyor belt that seemed to get tweaked up in speed every 15 minutes. The sorcerer's apprentice crossed my mind but no time to think, just work. At 8 am precisely the belt stopped. My nearest colleague waved to follow him upstairs for smoko. "20 minutes you've got so don't waste any of it." Sure I could drink a cuppa or two and have a snack in that time I thought.

When I reached ground level, a schooner (¾-pint glass) was thrust into my hand and I was told to stand in a line that disappeared around the corner. A few minutes later I was at the

head of the queue and looking down the barrel of a gun. A beer gun. Let me explain. This Australian adaptation allows the beer to be dispensed further away from the cask than a bar-top font and can be passed from glass to glass more accurately and at full flow. I seem to recollect that the barman had an elastic band around the trigger. I was looking at my co-workers for inspiration on how to drink a cold beer at 1°C while walking to the back of the line to start the process again. I was now consuming at an unaccustomed rate. A few warm beers down the local pub in the evening were just not the same. I stood my ground as a true Brit and continued in the procession until a horn sounded and the bar shutters were slammed down tight. The four times I went around that circuit equates to 3 UK pints. Famine to feast in my reckoning. I must have had a real thirst to quench that quantity of lager. I enquired about breakfast, "No time for that, your next break's at 11.30.am". Phew! My stomach was just beginning to warm up and repeating on the carbon dioxide. Still, never look a gift horse in mouth (Mother's words of wisdom).

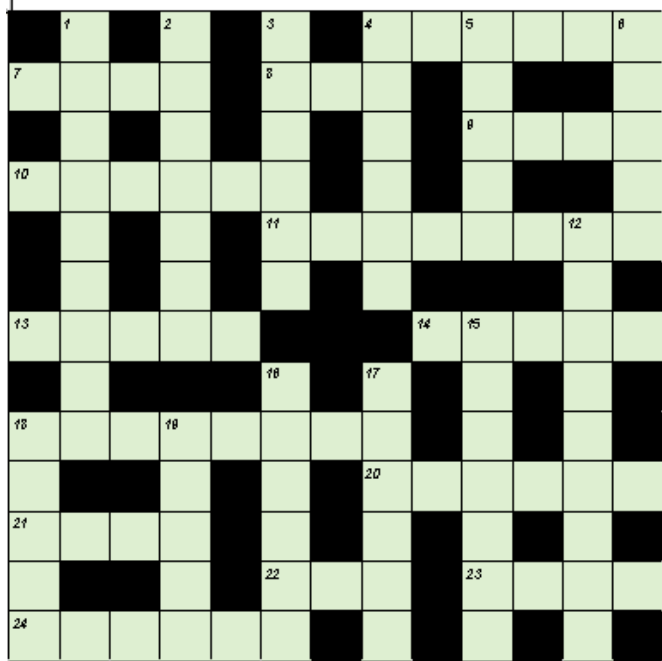
Back to work and the cartons had seemed to become lighter and the stacking a little fraught. You won't be interested in my bladder, but at that moment I can assure you I was getting urgent messages from it to act quickly. Next to the conveyor belt was a Big Red Button and I assumed it was for occasions like this, never having worked on a production line before. I pressed it and to my delight the belt stopped. Off to the loo I gladly went. Ten minutes later I returned. There seemed to be a problem around my work area as a group of men had assembled. Never there when you want them, I thought. A Union man was in confrontation with the Dispatch manager. When I appeared they stopped talking and I was ushered into an adjoining office. Expletives to an Australian seem to come naturally with the odd noun and verb thrown in for good measure and it took me a little time to comprehend I was in a deep quagmire. It was the depth I was worried about. I had with one finger stopped the whole production of enough Swan Lager (maybe not such a bad act) to keep a small Out Back town hydrated for a week. I could sympathise with them on that one.

The lager, with some blarney thrown in for good measure, saved any bloodshed. Mine I'm thinking. Think on your feet (Father's words of wisdom). At the second smoko I managed to lag behind a bit and only drank two glasses of beer. Any less and it was certain I would have copped abuse from my Aussie mates for not keeping up with them. Pommie wimp, puff, etc, I couldn't believe that I was deliberately shunning free beer. To stand beside some of these characters of 18-stone plus, made my 10-stone frame feel like a mere shadow.

After my first day's work (drink) I felt the worse for wear. My clothes smelt of hops, my breath of malt and alcohol. My wife was not amused. Still, I had a day's pay to buy her some clothes to soften the blow. Sometimes you get the feeling you are just not wanted. The next day I was promoted to the bottling department on the second floor. Upward and onward say I. The foreman of the bottling line was a 6'6" bronzed Aussie, built like the proverbial brick dunny and a proud one at that. I had not the slightest intention to annoy this character. All that was about to change...

There are links to the Swan brewery today (it's now a restaurant) and to its history on the website under Our Journal - Ed.

Crossword – Colin Merry



CLUES ACROSS

- 4 Church follows heavenly body for conversion to sugars (6)
- 7 Wake up to circulate liquid (4)
- 8 Mash doesn't run off with a complete system (3)

- 9 Charge is around on these particles (4)
- 10 Drum for boiling wort? (6)
- 11 Hop's stem-producing roots (8)
- 13 Can is assembled by Robert in Liverpool (5)
- 14 Chiefs lay on beer (5)
- 18 Could relief be arranged for ale longevity (4,4)
- 20 Saturated sugar solutions confuse spy, sure mostly (6)
- 21 Stirred ale ends with first kilo of escaping liquid (4)
- 22 Whiskey-making cereal (3)
- 23 Exchange of bad jokes heard in maze (4)
- 24 Verily a pig's accommodation with ascomycete flavour (6)

CLUES DOWN

- 1 I hear you had food at 10 o'clock to reduce specific gravity (9)
- 2 Nitrogen containing organic compound arranged to ripen (7)
- 3 Steers around the acid-alcohol products (6)
- 4 Much effort made to filter off yeast type (6)
- 5 Confused, I am on acid to produce protein (5)
- 6 They become draff (5)
- 12 Spend more to convert starchy part of grain (9)
- 15 Concentrate on malt or hop to take it out (7)
- 16 Apple-like taste caused by dry ice mixture (6)
- 17 A sailing tun? (6)
- 18 Inside label lying on body is part affected by beer consumption (5)
- 19 Mash tun devices to make your arm strong? (5)

Website News – David Edge

The website has received quite a bit of attention. I've *tried* to make it look better and be easier to use. Few people were looking at 'Resources' so I've restructured that.

Internet Groups such as *UK Homebrew* now have their own section; Ingredients, useful stuff and suppliers are now all in **Supplies**. We have listed a handful of good suppliers that we know from personal experience or recommendation – but there must be more, surely! Please recommend other shops and give us an idea of what they're good at. The new section **Technical** has relatively little material, but at least it's more obvious what's there. If you have any suggestions for other material and links, let me know.

Book reviews have been dispersed into the sections where they belong, so reviews of recipe books are in the new section on **Recipe Design and Recipes**; while brewing science books are in Technical. If you'd like a full set of

book reviews, ask Janette for CBA Factsheet No 4. The reviews from Brewer's Contact are supplemented by some taken with permission from Gillian Grafton's pioneering **UK Homebrew (1998)** website.

We tried to republish that site with Gillian's encouragement, but soon found that while some material was still very useful, some was rather dated. So I'm sorting out the material and integrating it into the main site starting with **Recipes** and book reviews. The stuff I'm still working on lurks in 'Resources', for the curious or nostalgic.

A new section on **Training** (*ie learning to brew*) and **Tasting** (*learning to brew better!*) provides book reviews, sources of courses and links to other organisations.

Links to sites mentioned in this issue are on the website under *Our Journal*.

Editor: Graham Kingham
Crossways Park, West Chiltington,
West Sussex RH20 2QZ
hestia.kingham@bigfoot.com

Publisher: James McCrorie
82 Elmfield Avenue
London SW17 8AN
020 8675 0340

Membership Secretary: Janette Edge
49 Belper Road, Derby DE1 3EP
01332 347601
membership@craftbrewing.org.uk

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