CAMRA's

Cellarmanship

The definitive guide to storing, caring for and serving cask ale

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Words that appear in **bold** are defined in the *Glossary* on page 132.

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Preface to the sixth edition

'The cellarman belongs to the earthworm class.
He has his habitat underground, and only emerges at
intervals to receive cellar goods as they are delivered
by the drayman, or to take up supplies to the bars...
Strength is a prerequisite for a cellarman –
the weakling has no place in a cellar.'

Licensed Houses And Their Management, 1950, Caxton Press

THIS BOOK has been a lot more than thirty years in the making. The first edition, started in 1980, published in 1981, was a slender volume printed straight from my typewritten pages. Nevertheless, it was well received and in 1992 CAMRA published my revised and much enlarged second edition, which was reprinted in 1994. In 1997 a third edition, again revised and with more added material, was produced by the late Ivor Clissold, a friend and colleague, missed by all who knew him. Then I returned to the fray with a fourth edition, again revised to include new developments and reflect modern practices, followed in 2010 by a fifth, with much the same content as the fourth but with a modest degree of additional material and with some changes in emphasis, again to accommodate changing industry practices. Now this sixth edition also adds references to some more new developments. But, in this instance, they all seem to be developments no one was calling for and all likely, in my view, to be potential dead ends!

During the past 25 years the pub and brewing industry has seen more change than in the preceding century. One consistent trend has been the attempts, frequently misguided, by brewers to de-skill the art of looking after beer. Fortunately many of these initiatives that were setting off in false directions have come to nothing and there is now a general realisation that cask-conditioned beer (real ale) is a quality, craft-made product and is truly worthy of care and attention in its keeping. CAMRA has done much to foster and justify this climate. This book continues to demonstrate our duty of care for real ale.

PATRICK O'NEILL

Introduction

This book is intended to be a textbook. Its aim is neither to imbue cask-conditioned beer, real ale, with any rosy glow of nostalgia nor to put forward any polemical position. It simply recognises that caring for cask-conditioned beer, a product now almost unique to Great Britain, requires some learnt skills and techniques. However it also tries to go quite a lot further in providing the scientific reasoning backing these techniques. Although fully understanding these elements of physics and chemistry may not be strictly necessary to be a good cellarman, such comprehension will add greatly to job satisfaction and should lead to increased confidence.

At this point it should be said that in this work the words **cellarman** and **cellarmanship** together, where needed, with the personal pronoun **he** are used throughout without any implication of gender specificity but purely to avoid textual clumsiness. It must be understood that the opinions contained in the text are entirely the author's and do not necessarily reflect any specific CAMRA viewpoint. The numerous references to technical measurements involve many engineering, scientific and practical units. In general, rather than translating everything into metric units, those most commonly used in the pub/brewing trade are used with equivalents given where appropriate. For beer volumes at the customer level the Imperial pint is sacrosanct.

Brewing, as with other centuries-old, craft-based trades, has developed its own set of special terms – almost a secret language – for often quite simple and mundane things. Many of these terms will be used in this book and whenever they first appear will be emphasised in **bold** type. Although using these terms may seem to some an affectation, it does lead to precise understanding and can

avoid some real confusion. Most terms are also listed in the Glossary (appendix 5).

The worst instance of this misuse of terms is the simple word **barrel**. Throughout the pub trade this little word is under constant abuse – 'I'm just going down to change the barrel…', 'We sold four barrels of that last week!' – examples are endless. If this book could only do one thing, then correcting this sloppy use might be its most important function. It cannot be stressed too many times, the word barrel is ***not*** the general name for a container of beer, it is simply the name for one specific size, and a large, very uncommon one at that (36 gallons). The general words are **cask** for traditional beer and **keg** for brewery-conditioned beers and lagers. Nothing demonstrates a cellarman's, or any other bar worker's, lack of proper training than this verbal confusion of barrel with cask – an employer interviewing any prospective new staff member could do worse than to make the first question require a response needing this choice of term. There is more on the naming of casks in a later chapter, for now let us start a new movement: CAMRUC, the campaign for the Real Use of Cask!

Brewing real ale

WHAT IS REAL ALE? It may seem an unnecessary question in a book on cellar work, but just for any readers with holes in their knowledge, here is a brief refresher. The simple answer is that it is beer, but with certain special characteristics. So the first task is to describe the production of beer itself. Making beer is essentially a series of industrial-scale cooking operations. Four ingredients are involved – malt, hops, water and yeast – and as any good cook will know, their quality is all-important.

Malt is malted barley, supplied to the brewer by specialist maltsters (who also supply such diverse industries as whisky distillers, vinegar makers and the bakery and confectionery trades). To make malt, grains of barley are kept moist and warm for a few days, encouraging them to sprout – to start to grow as nature intended – then this growth is cut short by heating the barley in a kiln. Starting to shoot the barley seed, which is mainly a store of starch to feed the growing seedling, produces enzymes that break down starch into sugars (mainly maltose), both the sugars and the enzymes are essential to the brewer.

Hops, although green in colour, are flowers. They grow in clusters on the hop bine, a vigorous climbing plant distantly related to cannabis. These flowers and the seeds within them contain an extraordinarily complex mixture of aromatic compounds that are used to impart the unique flavour and aroma to beer. The choice of hop variety or varieties and how they are used has dramatic effects on the subsequent beer style and flavour.

Water is an obvious ingredient but in this instance its trace ingredients are the important factors – using pure distilled water would produce a totally insipid, unpalatable brew. Some hardness is needed, though not too much and less for lagers and stouts than

bitters. Some sulphate content is considered by many to be very advantageous (the ground water of Burton-on-Trent has a high calcium sulphate level, which gave Burton beers the traditional sulphurous tinge in their aroma). Bacterial sterility, although desirable, is not a big concern since all the beer is boiled before going to the fermenting vessels. However, chemical contamination can be serious – chlorinated hydrocarbons and nitrate fertiliser run-off are especially bad. As a final point it should be remembered that water used in brewing is always referred to as **liquor**.

Yeast is a fungus, an oval, single celled organism. Each cell is microscopic, only about 10μm (millionths of a metre) in diameter – to get some appreciation of this, consider that just one gram of yeast will contain over five *billion* cells! All types of ale are brewed with just one species of yeast with the scientific name *Saccharomyces cerevisiae* whilst all lagers are made with another *Saccharomyces carlsbergensis* (now often renamed *Saccharomyces pastorianus*). However, much as all dogs are of the species *canis* but have huge superficial differences all brewers' yeasts vary and many brewers guard and propagate strains that have been bred over many years.

With this set of ingredients the beer can be made. Malt is ground ('cracked' in the brewers' terminology) into a rough powder, now called **grist** that looks like an extremely coarse, wholemeal flour. A large, round vessel, called the **mash tun** is filled to a depth of a metre or more and hot liquor (at about 65-70°C) is poured in to create the **mash**, which resembles a huge vat of porridge. After steeping for an hour or two in the mash tun, the liquid, now full of sugary extract from the malt (and having acquired the name of **wort**) is strained off into the **copper**.

The copper is simply a very big kettle (it is often called the kettle in US breweries). As soon as the wort is in the copper the hops are added and the mixture is boiled very vigorously, extracting the oils and resins from the hops. At the end of the boil the liquid – now **hopped wort** – is run off through a cooler into fermenting vessels.

Once in the fermenter the initial inoculation of yeast is added, usually in the form of a large bucket of liquid yeast slurry that will have been skimmed from a previous brew. This process is known as **pitching** the yeast. The yeast finds the sugary, warm wort a wonderful medium in which to grow and it multiplies rapidly, consuming

the malt sugars and excreting its waste products, alcohol and carbon dioxide (plus smaller quantities of many other complex chemicals that add to the flavour profile of the finished beer). After a few days the fermentation slows as the sugars are used and the alcohol level builds up; within about a week the final product, beer, is ready to be racked off from the fermenter.

Only now does the production of real ale differ from any other beer. Although the main fermentation has now finished and the vast bulk of the yeast is in a frothy head on the top of the beer, the beer below still contains billions of live yeast cells. For brewery-processed beers this remaining yeast is filtered out, usually with a high-speed centrifuge, and the beer goes on to many more operations before leaving the brewery. To produce real ale a proportion of these cells must be kept alive and transferred with the beer into the casks that will eventually be delivered to the end user's cellar. These relatively few cells will continue to ferment slowly giving the famous **secondary fermentation in cask** that real ale is all about. Managing this fermentation and its effects on the beer is one of the main requirements of cellarmanship. Many chapters of this work describe these aspects in detail, and throughout the terms 'cask-conditioned beer' and 'real ale' are used interchangeably.

As well as these two paths for the newly fermented beer – racking the beer into casks or diverting it to other areas of the brewery for further processing into 'brewery-conditioned' products it is also possible that the beer can be destined to become 'bottle-conditioned' ale, usually referred to by CAMRA as **Real Ale in a Bottle**. In essence this only differs from cask-conditioned beer in the size of the final container – half pint versus nine gallons – but almost universally in modern practice there is an important extra intermediate step. The primary fermenter yeast is filtered out of the beer being bottled and is replaced with a carefully metered injection of a differing yeast strain, preferably one with the property of forming a good solid, crusty deposit in the bottom of the bottle. From the cellarman's point of view, real ale in a bottle only requires common sense: store it carefully, at cellar temperature, use it in correct date order and move it gently when it is required to go to the bar for service. One extra important precaution is to prevent any prolonged exposure to bright light; even in coloured glass a long

spell in sunlight can produce off flavours in bottled beers. Apart from this mention, real ale in a bottle is not further specifically addressed in this volume.

The only other subject to introduce is the use of the vexatious two words: **craft beer**. This is an American term, coined by the American Brewers Association (an organisation of the smaller brewers in the USA, somewhat akin to our SIBA), and in that country it has a ***specific*** meaning: beers brewed by a brewery that produces under six million (!) barrels per year, is no more than 25% owned by any giant international 'mega-brewer' and produces at least half of its total barrelage as all-malt beers. In the usage on this side of the Atlantic it has no real meaning and no connection what-so-ever with our concern in this volume, cask-conditioned beer. Unfortunately (in the opinion of many), these words have been imported into this country and seized upon by brewery marketing departments as the new fashionable phrase of the decade. There are now hundreds of beers from large and small brewers being described as 'craft beers', and although a very small number may be classed as cask-conditioned the vast majority are brewery-conditioned keg beers of one variety or another. Despite many having some quite extreme characteristics in style, strength, hoppiness, etc., not being cask-conditioned beers they are also not considered further in this volume.

Sadly, the National Press and much of the general public have confused and conflated the rise of real ale sales and the appearance of the phrase 'craft beer' as aspects of the same thing. Even CAMRA itself has not always been sufficiently fastidious in pointing out the disjunction, perhaps this work will go a small way towards rectifying this.

ETYMOLOGICAL NOTE: *CAMRA coined the neologism 'real ale' and it is now part of our language after being officially accepted by the Oxford English Dictionary. In the current full edition the entry reads:*

> **real ale**, a name for draught (or bottled) beer brewed from traditional ingredients, matured by secondary fermentation in the container from which it is dispensed, and served without the use of extraneous carbon dioxide.

Choosing the right sized cask

After a cask has been vented, settled and started in service, air is drawn into the cask to replace the beer drawn off. The oxygen in this air is taken up by the beer, causing oxygenation of flavour compounds and allowing growth of any aerobic yeasts or bacteria that may be present. Spores of these spoilage organisms are drawn in with the air and settle on the surface of the beer in the cask. The carbon dioxide, dissolved in the beer and giving it its 'condition', starts being lost through the exposed surface of the beer. All these detrimental mechanisms continue inexorably while the cask is in service, and lead eventually to beer that is flat and sour. Good cellarmanship can aim only to minimise these effects. With proper care, cellarmanship can ensure an excellent pint from start to finish of the cask.

The rates of these changes are influenced by many factors, including temperature, cleanliness, type and strength of the beer. Perhaps most important, however, is the combination of cask size and rate of beer usage.

The reason for this is that most of the changes depend upon the ratio of the volume of the beer to its surface area – the changes act through the surface but affect the bulk of the beer, so the smaller surface a given volume of beer presents to the air the longer it will last. Thus, the last four and a half gallons in the bottom of a barrel will deteriorate much more quickly than the same amount in a full pin. Figure 1 shows how the ratio of the area to volume in an emptying firkin increases dramatically over the last few pints.

It is because souring and spoilage derives from the surface of the beer and only gets down to bulk beer quite slowly that a cask can be perfect up until the last couple of pints (which is when the beer surface reaches the tap), which are suddenly 'off' and rightfully

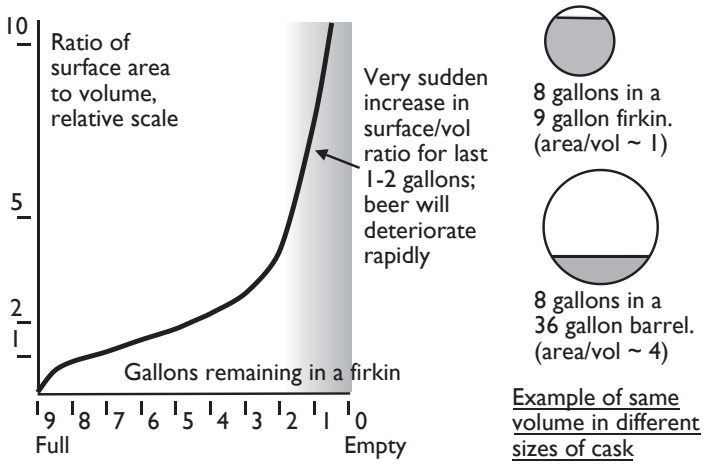

Figure 1 **Rapid increase in surface area as a cask empties**

rejected by the customer. In general, with two casks of differing sizes, emptying in the same time (i.e. at differing rates), then the beer in the larger will keep better. Conversely, when emptying at the same rate (i.e. in differing times), then the beer in the smaller will be the best.

With ordinary milds and bitters choose a cask size such that the beer lasts no more than two days. Strong bitters can stand three and barley wines or strong old ales will normally last nearly a week. High temperatures, bad hygiene and over-venting will reduce these times, while scrupulous cellar work – maximising hard spiling, keeping the air clean and the temperature correct – can extend them. The **demand valve** described in a later chapter will also extend this shelf life but their use presents other problems; the correct approach is to match the cask sizes and number of beers to the outlet's sales.

Where there are two dispense points for the same beer, it is always best to use a single cask with a double-ended tap (or a Y-connecter in the beer lines). This not only allows a bigger cask to be used up in the same time as two smaller ones but it also saves on stillage space, enabling more of the beer stock to be stillaged at any one time. The disadvantage, of course, is that both pumps go out of service at once.

Stillaging and chocking

CASK-CONDITIONED BEER has to be set up into its serving position and then left undisturbed until the cask is empty. The cask has to be supported in such a way that it does not rock or shake. The normal way to do this is to support it on three points only. An alternative system that stands the casks on end is discussed later.

When casks are being set up in some temporary location, on a floor, a table or on a bar counter, then **wooden wedges** (**chocks** or **scotches**) should be used. A suitable size is shown in figure 2.

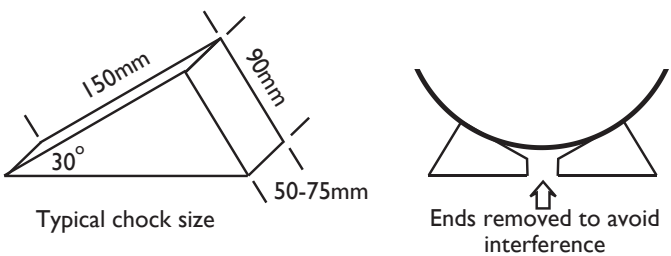

Figure 2 **Typical chock size and shape**

The wedge angle should be about 30 degrees. Chocks of this size are readily made from odd off-cuts of ordinary construction timber and should be left roughly sawn. Although smooth, hardwood wedges look far more elegant and are durable, the rough softwood variety are more functional with a better grip. The cask must be supported on three of these chocks (not four), two at the front and one at the rear. For the maximum stability and grip chocks must always be placed with their *long sides downwards* (figure 3). It is important to ensure that the cask is lifted completely clear of the

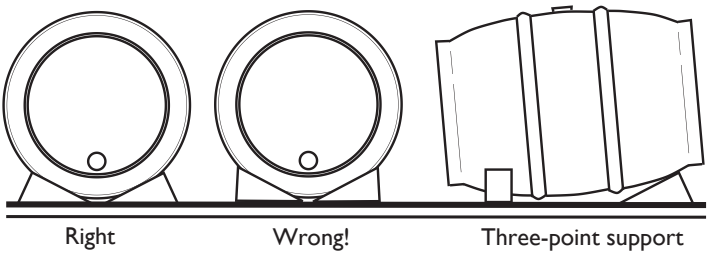

Figure 3 **Cask chocking with loose wooden wedges**

surface, to rest only on the three chocks. It can be advantageous to remove the 'nose' of the chocks to prevent the front pair interfering, particularly when chocking firkins or especially pins. When setting up on a potentially slippery surface (plastic, formica type laminates are especially bad) a cloth or bar towel should be stretched under the chocks first; of course, all of the chocks must be on the same towel so that any tendency to slip is resisted by the tension in the cloth.

For a permanent **stillage** (also referred to as the **stillion**, **racking**, **horsing**, the **thrawlls** or, especially in Scotland, as the **gauntry** or **gantry**) in the cellar or in the bar, loose wedges should not be needed. It is better to arrange the stillage with permanently attached blocks. One common arrangement is to have two substantial horizontal beams as the basis of the stillage and then to fix to the rear beam wooden blocks with circular or V-shaped cut-outs, sized to fit the radii of the casks to be used. With this system the cask still has a three-point support, at the back on the horns of the cut-out block and at the front directly onto the front beam. The levels of the beams are adjusted such that, with the casks supported in this way, they are correctly tilted for the final serving position (see the later chapter on Tilting the cask). If less tilt is required at the start, then a simple block of wood can be inserted under the front of the cask. Another common form of permanent stillage is a brick or concrete shelf around the base of the cellar wall, usually between 300mm and 450mm high and a metre or so deep. In this case wedges would normally be used as if stillaging on the floor.

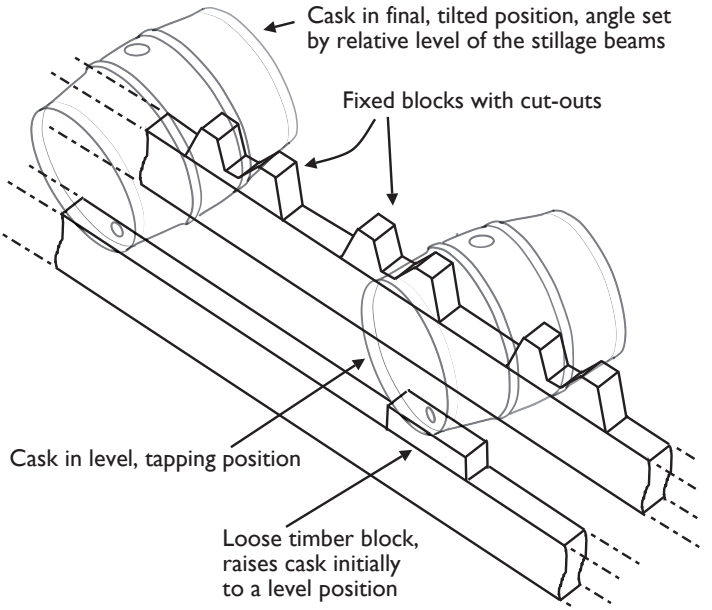

Figure 4 **Typical permanent stillage**

More and more pubs are now fitting proprietary steel stillage frameworks, frequently double height and with mechanical handling devices to load the casks onto them. These usually have auto-tilting frames (also described in the chapter on cask tilting) at each cask position. The initial capital expenditure of these systems is high, several thousand pounds for even a modest house, but the two layer type, combined with these auto-tilting devices, is a very efficient cellar solution. Another useful device from these stillage manufacturers is the individual cask frame on wheels, these help in manoeuvring casks into tight positions, particularly under obstructions.

For pump dispense, whether the casks are set up directly on the floor with loose chocks or on a stillage, take care to tap in such a way that there is a suitable easy 'lead' for the pipes – angle the outlet to one side rather than straight down, even pointing the tap straight upwards may be best in cellars below bar level where the beer lines lead out through the ceiling.

Where enough stillage space is available, casks should ideally be put into their final serving position on delivery. If this is not practicable, then the casks should be stored on their side, bung (shive) uppermost and wedged to prevent inadvertent movement. Then, when moving to the serving position on the stillage, it is best to roll the cask to mix thoroughly and reactivate the finings and then to vent on the stillage in the conventional way. However, if there are time pressures and the cask has to be vented and conditioned first and then moved for instant service, this is possible but it must be done with the utmost care, keeping the cask completely horizontal and with no sudden accelerations in any direction. Several people are needed for this delicate operation but the wheeled frames referred to above would help.