## Part 6: Water Treatment

Apart from lucky people who get their tap water from places like the Lake District, most brewers will find that their supply contains dissolved mineral salts of varying type and quantity. Since these have a profound effect on mashing and subsequent brewing stages, some form of water treatment is often necessary. Writers on home brewing have been largely consistent in their advice, though the depth of treatment varies enormously. H E Bravery [1] simply says that hard water is best for pales and bitters, whilst soft water suits milds and stouts. Hard water is softened by boiling, whilst he advocates proprietary 'Burtonising' salts for subsequent treatment.

C J J Berry [2] says much the same thing, but names the hard water chemicals as calcium sulphate (gypsum) and magnesium sulphate (Epsom salts). He defines 'soft' water as 'London type', containing calcium and magnesium carbonates as well as chlorides, and advocates a teaspoon of salt in each four gallons of stout or mild. Ken Shales [4] mentions the importance of pH; 5.0 to 5.2 being the optimum range, and the reaction of phosphates in the malt with calcium sulphate, to leave acid phosphates in solution. Wilf Newsome [6] spends some time discussing how different geologies affect the mineral content of waters, with particular reference to Burton, London and Dublin. The last two contain alkaline chlorides, calcium sulphate, calcium carbonate, silica, oxide of iron and magnesium carbonate, are described as 'less hard' than Burton water, and more suited to stouts, brown ales and milds.

Amongst the early writers, the most comprehensive discussion was provided by David Line [5], who devotes a twenty-page chapter to water treatment. I would recommend this as further reading for those who wish to delve more deeply. Dave distinguishes between permanent (calcium and magnesium sulphates) and temporary (bicarbonates) hardness. Only the latter is reduced by boiling. He then looks at the effects of sulphates, chlorides, carbonates (and nitrates which are undesirable). He finally gives a comprehensive table listing treatments for all types of water and for a wide range of beer styles.

Being one of the lucky recipients of Lakes water, my own treatments consist of simple additions. For bitters I use gypsum and Epsom salts. The former has limited solubility so I stir the liquor to get it into suspension before mashing. Epsom salts are highly soluble and must be used with caution - say one or two teaspoons per 4kg of malt - since they are a strong laxative! Until 1997, for dark beers and stouts, I used calcium carbonate (chalk) and magnesium carbonate, again *in* suspension, as they are even less soluble than gypsum. I also added two teaspoons of 'Lo Salt', which is a 2:1 mixture of potassium and sodium chlorides. Lagers are said to require very soft water. Lakes water straight from the tap, boiled to remove added chlorine, would fit the description exactly.

**Then, in 1997, a voice of dissent was heard.** According to Graham Wheeler [11] 'much rubbish' had been written in both home *and* commercial brewing books about the benefits of water treatment. He dismisses the notion that dark beers prefer carbonate water and pale beers prefer gypseous water as **'a myth'** and ***'a* load of old bunkum'.** He attributes the alleged link between carbonates and dark beers to the fact that all London beers were 'soured' by various wild yeasts and other micro-organisms during long-term storage in oak casks, which allowed some oxygen to permeate. High gypsum levels, as found in Burton-on-Trent produced beers, prevented these weaker yeasts from working and resulted in very stable beers, even suitable for export. Modern examples of soured beers are given as Guinness Foreign Extra Stout and Rodenbach, achieved by blending an aged and very sour beer with a fresh one.

Graham, therefore, uses the same treatment for all his beers: Two heaped teaspoons of gypsum, half a teaspoon of common salt and half a teaspoon of Epsom salts. He boils the water before the additions, but he is treating chalky water. He cites pH 5.3 as optimum for mash efficiency. However, he suggests **not** adding gypsum ***only*** if old style soured beers are the aim. ***Since 1998, I have followed this advice. Test brews of identical dark beers with both chalky and gypseous waters confirmed that the bottle life of the latter is superior over several years!*** I now make **ALL** my beers using Gypsum and Epsom Salts.

References


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| **1** ***Home Brewing Without Failures*** | **by H E Bravery.** | **Max Parrish,London** |
| **2** ***Home Brewed Beers & Stouts*** | **by C J J Berry,** | **AmateurWinemaker, Andover** |
| **4** ***Advanced Home Brewing*** | **byKen Shales,** | **Amateur Winemaker** |
| **5** ***The Big Book of Brewing*** | **byDave Line,** | **Amateur Winemaker** |
| ***6 The Happy Brewer*** | ***by* Wilf Newsome,** | ***Amateur Winemaker*** |
| **11** ***Brew Classic European Beers at Home*** | **by Graham Wheeler & Roger Protz,** | **CAMRA** |