

# The Basics of Water

Of the four ingredients of beer, water makes up the greatest portion of the physical product. By weight and by volume, plain old H<sub>2</sub>O constitutes more than 90 percent of the average beer.

Thanks to advertising for the mass market beer brands, most Americans believe that water is a critically important ingredient in beer flavor. Furthermore, most people think that only “pure” water makes good beer. Let’s look at the subject of water for a minute in order to better understand its importance in beer.

First of all, the term “pure water” can have a couple of meanings. On one level, people connect purity with safety and potability. They expect that “pure” water will be free of dirt, bacteria and dangerous chemicals. In the U.S., all drinking water generally achieves this standard.

On a higher level, “pure water” can mean “nothing but water.” This is tricky since every natural water source — and virtually all the water we drink — contains small quantities of dissolved minerals. This includes things like calcium, magnesium, sulfur and chloride. These elements give water its hardness and even very soft water will have *some* mineral content. To get water that has no mineral content requires some form of serious treatment such as distillation.

It turns out that using “nothing but water” (e.g. distilled water) for making beer doesn’t work very well. Many parts of the brewing process require the natural minerals found in water. Without these minerals, the biochemistry of brewing and fermentation simply won’t function properly.

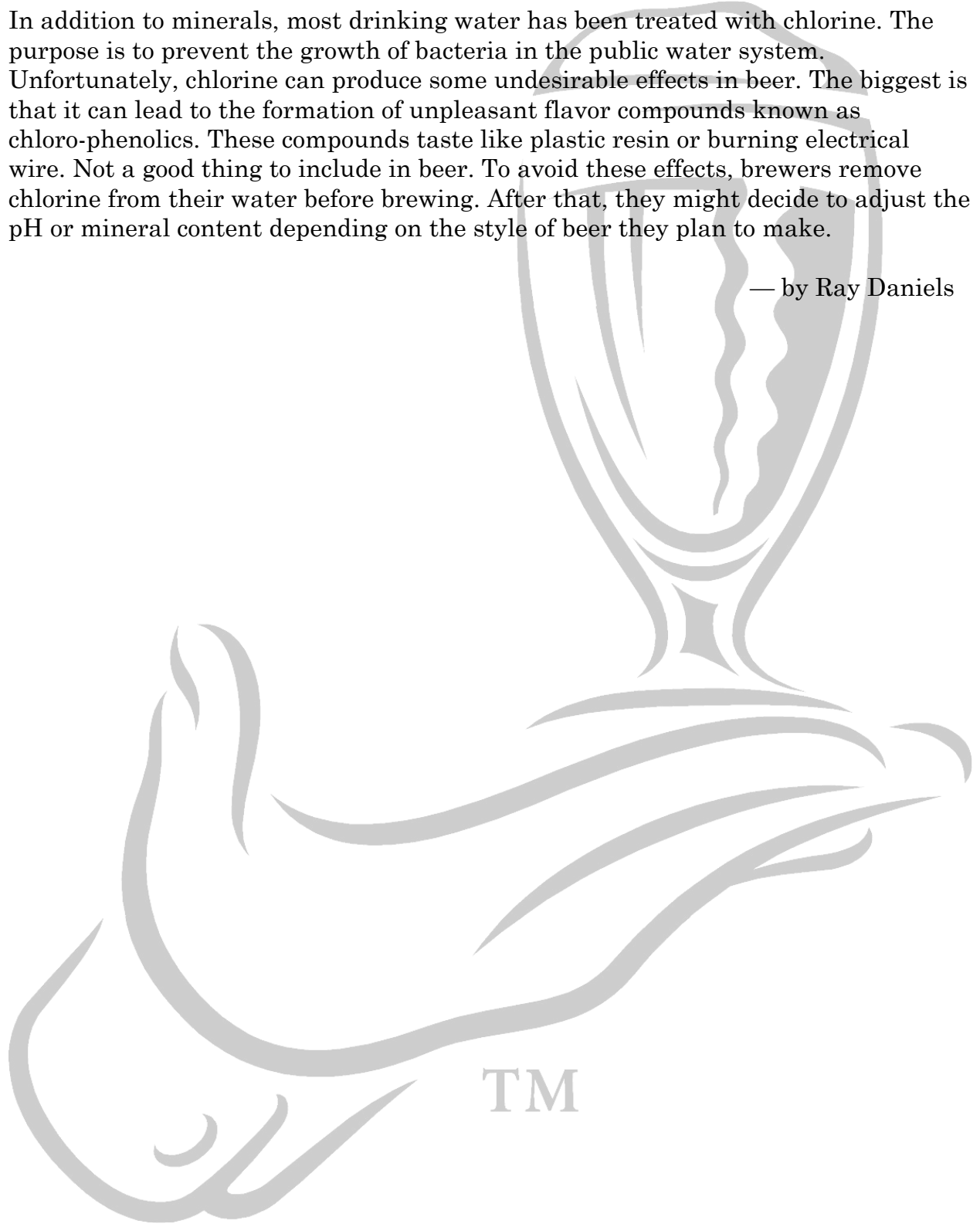
We can learn a lot about brewing water by looking at the great brewing centers of the world. Munich is famous for dark lagers; Pilsen for light lagers. On the ale side, the cities of London, Burton-on-Trent and Dublin are best known. Of these five, four have water with moderate to extreme hardness. Only Pilsen (in the Czech Republic) has very soft water.

So what does this tell us? First, that great beer can be made with virtually any type of potable water, from very soft to very hard. Second, it tells us that very soft water (the closest thing to “just water”) was not used for making most of the world’s great beer styles.

Finally, we see that different types of water are used in making different types of beer. This indicates that water minerals have an impact beyond mere chemistry — that they also affect flavor.

In addition to minerals, most drinking water has been treated with chlorine. The purpose is to prevent the growth of bacteria in the public water system. Unfortunately, chlorine can produce some undesirable effects in beer. The biggest is that it can lead to the formation of unpleasant flavor compounds known as chloro-phenolics. These compounds taste like plastic resin or burning electrical wire. Not a good thing to include in beer. To avoid these effects, brewers remove chlorine from their water before brewing. After that, they might decide to adjust the pH or mineral content depending on the style of beer they plan to make.

—by Ray Daniels



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