

Raising a glass to ale

Beer: Tap into the Art and Science of Brewing

by Charles Bamforth

Plenum: 1998. Pp. 245. \$27.95, £18.50

John Postgate

Wild yeasts are abundant in nature, finding the sugary substrates they favour in fruit juices, the sap of many plants, nectar and honey. It is not difficult to guess how people acquired, early in human history, a taste for such fermented liquors as wines, cider and mead: their crude equivalents would have appeared spontaneously, ready for the potential brewster to discover, imitate and adapt to the liking of her family group. But how anyone came to develop (over 8,000 years ago, it seems) as complicated a beverage as beer, which is the fermented extract of a partly germinated grain, taxes even a Darwinian imagination, accustomed to contemplating the evolution of complexity.

Charles Bamforth has a stab at an explanation — that beer arose as an offshoot of baking technology — but the bulk of this entertaining and informative book is concerned less with historical matters than with the aforesaid complexity: the production of beer today. In outline, beer is made by allowing barley to germinate, so that hydrolysis of its storage polysaccharide, starch, begins. Germination is then halted by drying, and the nascent seedling is milled and extracted with hot water. This extract, rich in sugars, dextrans and residual biochemicals, is fermented with carefully preserved strains of yeast. Various filtration, heating, chilling, sedimentation, clarification and maturation steps are involved, and flavourings, notably hops, may be added. The ultimate product is then barrelled, bottled, canned or otherwise packaged for marketing.

Bamforth, who is deputy director of the United Kingdom's Brewing Research International (the erstwhile Brewing Industry Research Foundation at Nutfield in Surrey), takes one gently through every facet of contemporary brewing in what is a triumph of user-friendly exposition: he writes in an unpretentious but authoritative mid-Atlantic style; he assumes very little background knowledge; and if too many details seem to be piling up, he has some anecdote or aside with which to recapture one's attention. He comes across as an amiable guide conducting one around a site he knows well and loves. Some scientific and technical terminology is inescapable, but Bamforth is careful to explain such terms at first mention, and provides a comprehensive glossary at the end. There is also an appendix, which amplifies a few scientific concepts that would have been too much of a digression in the main text.



Thirsty? The UK's taste for real ale has refreshed the brewing industry.

Apart from his central theme of mainstream brewing, Bamforth deals with all sorts of related topics. For example, he explains how a widgeot makes beer from a can taste like proper draught (I think it does, by the way; I dutifully tested an example); that brown bottles preserve beer better than green or clear ones (they inhibit a deleterious photochemical change); that a few centuries ago, hops were regarded as wicked and pernicious adulterants of good ale; that Budweiser includes rice in its malt; that the famous catchphrase "Guinness is good for you" is no longer legal; and that both ancient Egyptian and genetically engineered beers have been brewed recently.

Bamforth maintains that brewing has become an interdisciplinary science, drawing from chemistry, engineering and microbiology. I cannot for a moment agree with this proposition, even in the light of his masterly account; to me, brewing remains manifestly an art. Certainly an enormous amount of science has stemmed from it; the contribution brewing research has made to analytical chemistry, biochemistry and microbiology is inestimable, and much basic science of universal importance has emerged from such laboratories as Nutfield or the Carlsberg Institute. Science, too, has had an enormous

impact on the technology the modern brewer or maltster can command. But it is the experience, intuition and judgement of the brewer that counts.

Brewing beer for a mass market has become so sophisticated that in the United Kingdom — and this reflects a worldwide trend — the 6,477 independent breweries that existed in 1900 had dwindled by 1980 to 191. Since then an emergence of small, specialist breweries brought the number up to 499 by 1996, helped no doubt by an expanding market for 'real ale' (not that the mass-produced beverage is in any sense unreal!).

Bamforth's book is an ideal introductory work for anyone entering the industry, whether in brewing itself, in brewing research, as a publican, in marketing, or in supply areas such as hop or barley farming. It is also excellent for students of applied microbiology and bio-engineering. But its easy style ought also to attract a wider audience: technical and scientific journalists will find it immensely helpful, and it would make enjoyable holiday reading for microbiologists, chemists, engineers and, of course, the average beer drinker. □

John Postgate is emeritus professor of Microbiology at the University of Sussex, Brighton BN1 9RH, UK.