A matter of taste

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On Food and Cooking: The Science and Lore of the Kitchen.

By Harold McGee.

Charles Scribner's Sons: 1984. Pp.684. \$29.95.

How refreshing it is to be treated to an inspiring blend of botany, zoology, physiology, anatomy, biochemistry, and, of course, gastronomy. In his introduction to what is almost a scientific, literary and historical encyclopaedia of food and its enjoyment, Dr McGee admits to the importance of experience, intuition and a discriminating palate in preparing food, but he also asserts that "a general understanding of what is going on in the pan ... can compensate for a lack of familiarity with particular ingredients and techniques". The book is studded with examples of the beneficial intrusion of science into the kitchen, often expressed in vivid terms, such as the remark that "roast and meringue are different outcomes of the same process [but] the knowledge of protein coagulation need not diminish the pleasure in consuming a well-made roast or a meringue". McGee also reminds us that "while we may be up on Black Holes and the Big Bang and the Primordial Soup we can't explain how flour thickens soup".

Nearly four-fifths of the book is devoted to accounts of the foodstuffs that go into our diet, grouped according to their origin rather than their chemistry. Scientific explanations are interspersed with historical remarks and tips on how to avoid or rectify cooking disasters and there is no lack of debunking (or justifying, as the case may be) of culinary and dietary fads. For example the much-vaunted blessings of fibre and bran are discussed critically but with tolerance. The author recognizes the nutritional value of whole-grain bread, but also quotes the rickets epidemic in Dublin during the Second World War when rationing of dairy products led to a low calcium intake, the assimilation of which was inhibited by the high bran content of the diet.

In discussing the progress of meat from the slaughterhouse to the table, McGee emphasizes the need to keep the animal free of stress before slaughter; muscular tension depletes the glycogen supply, less lactic acid accumulates in the muscle after slaughter and the result is inferior "dark-cutting" meat. The use of tenderizers based on naturally occurring proteolytic enzymes is also described but, surprisingly, the use of the hypodermic syringe to obtain even distribution of the tenderizer is not mentioned. And although it is true that these

enzymes work faster at higher temperatures, I have found that fresh pineapple juice will tenderize pork chops at room temperature in 2-4 hours.

There is too an excellent explanation of the conflicting demands on the *rôtisseur* trying to achieve the conversion of the collagen in connective tissues into gelatin (a slow process) without drying out and toughening the muscle fibres. There is, however, nothing about the low-temperature (less than 75°C) roasting technique pioneered by Sir Benjamin Thompson, Count Rumford (1753-1814), the Anglo-American soldier, statesman and natural philosopher who was also a culinary innovator. This method works well: I proved its excellence to my own satisfaction — and, apparently, to the satisfaction of those

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who ate the joint — by roasting a 4lb leg of lamb for 8 hours in a slow oven.

McGee gives a full account of the arguments about the use of copper bowls when making meringues, culminating in a re-run of the beautiful piece of work undertaken at Stanford University by McGee and his colleagues (*Nature* 308, 667; 1984) which showed conclusively that traces of copper ions do indeed make egg-white foam more durable through the formation of a copper-protein complex. It is a pity that neither this book nor the original article indicates the minimum amount of copper needed per egg. It is bound to be very small and phials of "meringue-improvers" could be sold at a price many thousand times the value of their contents. (I found it odd, incidentally, that albumen coagulation (which occurs at around 60°C) is regarded as an essential feature of meringues; it is well known that meringues can be made at considerably lower temperatures, even at 20°C, especially if reduced pressure is used.) There are many other useful tips for the amateur confectioner; here at last, for instance, we have a clear explanation of how peppermint cream gets into the thin crisp chocolate of after-dinner mints.

It is in the chapter on sauces that the enthusiasm of the gastronome, the artistic skill of the cook and the critical approach

of the scientist shine most brightly. This is a veritable *saucier's* vade-mecum. All the traditional tricks are explained, new techniques are suggested and there is also, among other good things, a full account of the saga of the Resurrection of a Curdled Sauce Béarnaise which began in 1977 with an article in *Nature* (270, 572) by C.M. Perram, C. Nicolau and J.W. Perram.

More prosaically, in writing about food additives McGee reminds those with a taste for nostalgia of "bread mixed up with chalk, alum and bone ashes", of "greens boiled with brass half-pence" and "butter manufactured with candlegrease and kitchen stuff", practices which were prevalent in mid and late eighteenth century England. Smollet bemoaned the fact that "these enormities might be remedied, but the wise

patriots of London have taken into their heads that all regulation is inconsistent with liberty". We are better off now, inasmuch as food adulteration on the scale of the past can no longer be perpetrated with impunity, and the author illustrates, with the help of the cases of saccharin and sodium nitrite, the difficulties in arriving, on the basis of often incomplete scientific evidence, at solutions which satisfy public demand and reduce the risk to public health. Similar good sense characterizes the two brief sections "Food and the Body" and "The Principles of Cooking", though I was surprised that nowhere in the book are calories

mentioned. I should liked to have seen at least a modest table giving the values of the principal foods. This omission may have been deliberate, however, the author wanting to emphasize in this way a view, latent throughout the text and expressed felicitously at the end of the chapter on nutrition, that "Nutrition by the numbers is no guarantee of the good life and probably precludes it by overriding the calls of appetite and pleasure".

Dr McGee's book brings to mind a remark of Count Rumford:

The advantage that would result from an application of the late brilliant discoveries in philosophical chemistry, and other branches of natural philosophy of mechanics, to the improvement of the art of cookery, are so evident and so very important that I cannot help flattering myself that we shall soon see some enlightened and liberal-minded person of the profession take up the matter in earnest, and give it a thoroughly scientific investigation.

In what art or science could improvements be made that would more powerfully contribute to increase the comforts and enjoyments of mankind.

Two centuries later, with the publication of *On Food and Cooking*, gastronomes and scientists alike can rejoice that Rumford's hopes are on their way to fulfilment. □

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