

Book review

Science and Civilisation in China, vol. VI, Biology and Biological Technology, part 5. Fermentations and Food Science. H. T. Huang [C. Cullen, Needham Research Institute, series editor]. 741 pages. Cambridge: Cambridge University Press. 2000. £95.00 ISBN 0 521 65270 7

The late Dr Joseph Needham's conception of this series was an enormous creative achievement, but it is unlikely that even he appreciated the extent to which his seed would grow. By the time of his death in 1995, seventeen books had been published, and the process has not slackened since. Here, as with all the works in the series, a specialist author has laboured for long years to retrieve what can be discovered of what was uniquely Chinese knowledge and practice in his field of study. Professor Huang had worked with Needham in China during the Second World War, and has been closely associated with this series and with the Needham Research Institute, Cambridge, UK, of which he was for a time Deputy Director.

This is not a comprehensive guide to the foodstuffs of China, though it does begin with lists, as near exhaustive as possible, of the grains, oilseeds, vegetables, fruits, and land and aquatic food animals available to the Chinese as they emerged into historical times. Thereafter, while it chronicles the advances in preparation technology and the changes in popularity of native foods, it does not seek to keep track of the many new foods which were introduced to China from abroad. Thus, the sweet potato, which some scholars have considered to be a very significant factor in the population explosion that China underwent from the 16th century onwards, is barely mentioned; the grape, imported as early as 100 BC, is treated much more as an example of what China did not use than it is as a positive element in the cuisine or diet; and the tomato only appears as an adjunct to spaghetti in a comparison of Italian and Chinese pasta. It is not a case of oversight, the author's task is to deal with 'things Chinese', and other works, such as KC Chang's edited labour of love *Food in Chinese Culture* (Chang, 1977), exist to supply a less narrowly focused view.

Huang has cited sources from the earliest times, but he relies particularly heavily on a 6th century work, the *Qi Min Yao Shu*, variously referred to in the book as *Essential Arts for the People's Welfare* and *Important Arts for the People's Welfare*. The *Qi Min Yao Shu's* detailed material on daily life includes agriculture, horticulture, food processing, fermentation and cookery, and provides a precise time marker for the state of these arts in early mediaeval China. Interestingly, it provides evidence that at that time the Chinese did not eschew dairy products, though as China's centre of gravity moved southwards the yoghurts and butters and fermented milk alcohols gradually disappeared from the popular diet. From later centuries there are plenty of sources (some of them written by Westerners, who were acute observers because they tended to note everything, while

Chinese authors often did not comment on things which they took for granted) charting the development of food technology in China, and Huang had no lack of information on those areas which most interested him.

Fermentation to produce alcoholic drinks took a very different direction in China from that taken in the West, where the action of yeasts on grapes or grape juice could have occurred naturally and required little intervention by man. In north China, where the grape did not arrive until perhaps two millennia after it had been domesticated in the Middle East, Huang suggests that the absence of fruit of such high sugar content meant that the substrate most readily available for a natural fermentation process was the fluffy sprouted rice and millet made vulnerable to yeasts by having been gently steamed into a congee and left to stand. In realising that the resultant mould ferment (called *qu*) could be perpetuated to make further brews, the Chinese seem to have overlooked the fact that there were two separate processes at work, the hydrolysis of the starch into fermentable sugars and the fermentation of the sugars into alcohol, and their failure to appreciate this meant a relative lack of sophistication in the development of wine-making techniques. Incidentally, Huang is happy to use the terminology of grape-wine to describe Chinese processes, arguing that while the materials and techniques were very different, the use to which the product was put was similar, Chinese *jiu* and Western wine both fulfilling the same dietary, social and religious purposes.

Soyabeans, in their natural state a rather unpleasantly flavoured crop and not easily digested, have been processed for at least two millennia by the Chinese, who have exercised great ingenuity in creating a large variety of products from them (soyabean milk, soya-milk skin, bean curd, smoked *toufu*, *toufu* 'junket' etc.), and the beans or the curd may be fermented to produce additional products, the fermentation processes being very similar to those for making wine. Huang gives in detail the various techniques and the history of their development, and as he does throughout he gives also recipes old and new for the cooking and serving of the foods he describes. In a diet which for most Chinese was low in meat protein and Ca (low exploitation of dairy products), the soyabean amply supplied the former and bean curd the latter, and as a bonus it was a crop which could produce consistently good results even from poor soil. Surprisingly, China's share of world production of soyabean has fallen since the Second World War from the highest share to just one-eighth, the USA now harvesting well over half of all the soyabeans grown in the world.

Noodles, pasta of many kinds made from wheat or rice flour, were a Chinese invention which spread to other East Asian cultures, and especially to Japan. The word *mian* (cf. *chao-mian* or *chow-mien* 'fried noodles') originally meant 'wheat flour', but gradually came to mean 'noodles' as well.

Their exportability beyond East Asia has not prospered, however, and Huang makes a convincing case that Italian spaghetti owes nothing directly to China, pasta having been known in Italy certainly over a century before Marco Polo made the first of his famous journeys to the East in the late 13th century. It is possible that Arab traders had learned of noodles through their early involvement in the northern Silk Route or perhaps through their sea-borne trade with southern China, and that they had introduced them into Italy via Sicily, but Huang is inclined to the view that they owe their existence to the Romans, and that the marked lack of enthusiasm for noodles in any other European cuisine argues for an indigenous development. The widely-held view that Marco Polo introduced them is exploded, and the legend-spinners of China and the West will all have to revise their prompt books.

The technology of tea began perhaps as early as the 1st century BC, and once again is a Chinese development. Its properties as a sleep-suppressant were well understood from the start, but it was believed to carry many other health benefits, and there has been no diminution of claims that in its green (unfermented) form it can retard the onset of cancer and heart disease, lower cholesterol levels, boost the immune system generally, reduce blood pressure, promote urination, control diarrhoea, reduce fever, and even protect the teeth from decay. And of course the effect on public health of the boiling of water necessary to its preparation as

a drink must have been a positive one. Even the poorest peasant, unable to afford tea leaves, boiled water and presented it to guests with a courteous invitation to 'Drink tea!'

Discussion of nutrition values and nutritional deficiency diseases (such as beriberi, attributed to the removal of thiamin by the over-efficient polishing of rice) occupies some of the author's attention at various points in the book, but he is most interested in the processing of food for the variety it has produced and for the problems to which the Chinese have found so many ingenious solutions over the centuries. The thoroughness of his researches have not dulled Huang's evident enthusiasm and sense of delight in his subject, and the result is not only a work of scholarship worthily taking its place in this uniquely important series, but a very readable account which will fascinate scientist, sinologist and general reader alike.

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References

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