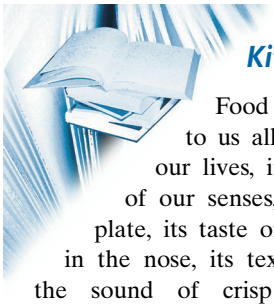

Chemistry in the Kitchen Garden

Food is of vital importance to us all. Apart from sustaining our lives, it provides treats for all of our senses, its appearance on the plate, its taste on the tongue, its aroma in the nose, its texture in the mouth and the sound of crisp food being chewed. Everyone can enjoy these sensory delights but, for the chemist, there is an added facet in thinking of how it is structured and how its various components were synthesized in the plants from which it is derived.

James Hanson is a respected authority on natural products chemistry. Those familiar with his book *Chemistry in the Garden* will know that he is also a skilled author who can convey his love of the subject and the awe which it inspires in a way that holds the reader's attention throughout.

In *Chemistry in the Kitchen Garden*, he focuses his attention on those plants that make up our diet. Although this book is a sequel to that earlier one, it maintains the high standard of the first and does stand alone. Inevitably, this means that there is some overlap in content. The first two chapters cover the basic chemistry of soil and plants and the biosynthesis of natural products. Much of this is taken directly from *Chemistry in the Garden*. There is an interesting section on the chemistry of fertilizers and how to use them most effectively, again based on chemical considerations. Typical fertilizers contain nitrogen, phosphorus and potassium. Nitrogen is the most capricious of these because of the potential for chemical change which can lead to unwanted pH changes in the soil or loss of nitrogen through aqueous run off. Compost is a natural fertilizer and its chemistry is complex. Different plants contribute to it in different ways and Hanson explains, for example, why comfrey makes an excellent contribution. The book changed my attitude to weeds. The variety of weeds which grow on a piece of land can tell us a great deal about the chemistry of its soil.

The remaining six chapters are different from those of the earlier book and offer a fascinating introduction to the chemistry of the plants we use as food. The division of subject matter of these latter chapters is very much along culinary lines, the various plants being grouped together depending on which plant part is used in the kitchen and these six chapters are packed with fascinating pieces of information. Herbs add flavor to food but also provide a variety of other benefits. Some, such as sage, have antibacterial properties and so sage stuffing was used to help preserve cold meats in the days before refrigeration. Mint components have anti-oxidant properties and so its traditional association with lamb could have developed as a means of preventing formation of off-notes resulting from autoxidation of fats. The similarity of smell between blackcurrants and cat urine is down to similarities in their chemistries.

For each plant, there is a description of its chemical composition pointing out interesting features regarding its use as a food and/or flavor and there is also a description of medicinal properties of the plant components where appropriate. There are many practical tips on gardening for those who grow their own vegetables or are thinking of doing so. These tips include advice on selection and cultivation of plants and also where in the garden to plant them. Unlike ordinary gardening books, the tips come with an explanation of the underlying chemistry and even selection of the best place in the garden to site a vegetable patch can have a chemical logic behind it.

The chemistry of onions, leeks, and garlic is dominated by that of sulfur and there are fascinating accounts of this including some intriguing and unexpected reactions which take place in the plants. Carrots and parsnips contain some very interesting chemicals, polyacetylenes, phototoxins, anti-cancer agents, and even pro-psychotropic substances. The red dye in beetroot has such a powerful chromophore that the distinctive color of the root is due to only 0.05% of the fresh weight.

Many of the natural products produced by plants have effects on insects and other plants growing in the vicinity. The chemical intricacy of the ecological balance is amazing. For example, the use of companion plants to keep food crops free from insect pests, results from use of the companion's chemical weapons against the pest.

The epilogue pays tribute to the enormous advances in understanding of plants made over the last few decades. Consideration of the challenges facing us in the future, such as the possible effects of global warming on crops, then leads Hanson into considering how we could use this understanding to develop new varieties of vegetables to secure future food supply.

Every page is full of fascinating information and it is easy to open the book at a random page and immediately find some intriguing detail. If the reader is seeking information on a specific topic, the clear layout and comprehensive index make it easy to find the relevant pages and there is a good bibliography for those who want to find out more. The book assumes an understanding of chemistry and contains a glossary of botanical terms and a phylogenetic list of the plants described.

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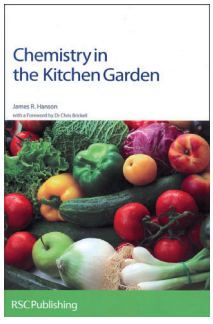

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