mation on the plant resources of the region. The complete Prosea handbook series includes 20 volumes divided by commodity groups such as Edible Fruits and Nuts (No. 2), Vegetables (No. 8), Cereals (No. 10), the Medicinal and Poisonous Plants [No. 12(1–3)] etc. Plants covered in the most recent volume 12(3) are considered to be the least important in the sense that less is known or reported about the plants, their medicinal proprieties and their phytochemistry. However, it may be from these plants that new biological activities or phytochemical agents are to be identified. Over 500 different species are discussed, bringing the total to 1290 species in the complete three-volume set.

A brief six-page introduction outlines conservation aspects of medicinal plants and discusses the need for conservation, germplasm collections, cultivation and breeding and the wise use of medicinal plants. The main body of the text follows the previous two volumes and is a compilation of the selected plant genera/species in alphabetical order. For each genera there is the listing of the origin and geographic distribution, uses, properties, botany, ecology, management, genetic resources, prospects and literature; followed by the selected species providing scientific names, known vernacular names, plant distribution, general observations and literature references. Each entry is an attempt to compile both local knowledge and published scientific research in an encyclopedic format. Generally, much less is known about the plants discussed in this volume and the entries are brief compared to those of volumes 12(1–2). The last section of the book includes a listing of other medicinal and poisonous plants from the region that have not been included in volumes 12(1–3), but may be found in one of the other Prosea series under their primary commodity group and a complete listing of the literature, glossary of terms, sources of illustrations, indices of compounds, pharmaceutical terms, scientific names and vernacular names and general cross index of species, genera and families for all three issues of volume 12 is included at the back of the book.

As with the previous two issues, the book will find its usefulness has a handbook, providing information for researchers, educators, health professionals, extension and commercial users. I congratulate the Prosea Foundation for the completion of the work. The three-book set should be highly valuable and I would liken it to my copy of Kingsbury's "*Poisonous Plants of the United States and Canada*" for those in the South-East Asia region.

Backhuys Publishing distributes the blue cover hardbound book and paperback versions will become available in two years from the publishers or for those in developing countries it can be obtained at a reduced price directly from the Prosea Foundation (PROSEA Network Office, PO Box 3322, Bogor 16122, Indonesia).

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Nutraceuticals
Lisa Rapport, Brian Lockwood; Pharmaceutical Press, London, 2002, 184 pages, ISBN 0 85369 503 2, £29.95 ($49.95)

This relatively short book (163 pages) aims to evaluate the literature on a selected number of nutraceuticals. The authors have directed it primarily to pharmacists and medical practitioners, with the hope that the general public will also find it of interest. Many of the chapters originated in the *Pharmaceutical Journal*, and so may be already familiar to the reader.

There are 10 chapters in the book, with eight covering a range of nutraceuticals. Chapter 1 is a very readable and interesting general introduction that sets the scene of nutraceuticals (also called phytochemicals), including a discussion on whether such compounds are foods or medicines and the regulatory implications of any health claims made by manufacturers. It also discusses the need for trials to verify claims that such compounds can prevent or treat diseases. The following eight chapters describe individual nutraceuticals, with frequent reference to the literature, typically up to 2001. The eight nutraceuticals reviewed are glucosamine, octacosanol, proanthocyanidins and grape products, lycopene, carnitine, flaxseed and flaxseed oil, melatonin, and finally ornithine alphaketoglutarate. The authors have deliberately avoided vitamins, minerals or amino acids as they believe these to have been well documented elsewhere.

Typically, each of these eight chapters included the chemical structure of the nutraceutical, a brief description of its chemical properties, possible mode of action and bioavailability. These chapters are written in a style that does make easy reading. Inevitably, the authors have to conclude that many of the health claims made for these compounds are not fully founded in scientific terms, and frequently conclude that more trials are essential. I looked with particular interest at the chapter on lycopene. It does, in fact, include comments on β-carotene and other carotenoids and the possible benefits to the treatment of CVD and macular degeneration. The title of the chapter should have reflected this point. However, the text (with 36 references) covers most of the issues.

This chapter did highlight, for me at least, one of the problems in reviewing the literature on nutraceuticals. These compounds can be purchased from health food stores as supplements, typically in tablet form, but are also in the diet normally. Evaluating the literature on their benefits is, therefore, very complex and imprecise, as the source and amount of the nutraceutical can vary significantly between individuals, depending on their diet. Is such a compound more effective when ingested in a food or as a supplement? Is one route more bioavailable than the other? What about the potential interactions of nutraceuticals between each other? In most cases we do not know, nor do we understand enough about the amounts needed for health benefits. Much needs to be done before such questions can be answered.

In summary, the authors have made a good effort to cover a selected range of nutraceuticals. The book will be of interest to those in the field, although the general public may be hesitant to purchase it at £29.95 and hope that the public library will stock it.

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Pectins and their Manipulation
G.B. Seymour and J.P. Knox (Eds.); Blackwell Publishing, Oxford, 2002, 262 pages, ISBN 1-841-27228-0, £79.00.

This is a valuable, eclectic collection of essays on diverse aspects of pectins and, to a more limited extent, their manipulation. In most chapters, useful methodological tips are provided, drawn from the authors' extensive experience. The articles are, without exception, packed with useful facts, figures and references, yet they are not merely telegraphic txt msgs but thoughtful discussions in which points of view are expounded. It is very helpful to have these authors' pectic philosophies assembled in one concise volume.

Pectins, major components of the primary cell wall in all land plants and charophytes, are not simply—as sometimes portrayed—α-(1→4)-linked, partially methylesterified polymers of galacturonic acid. They are now known to be a continuum of inter-linked domains whose chemical structures are summarised by Schols and Voragen in Chapter 1, including homogalacturonan (HG), rhamnogalacturonans (RGs) I and II, xylogalacturonan and type-I arabinogalactans (AGs). Mohnen's chapter on biosynthesis also starts, refreshingly, from the premise that HG, RG-I and RG-II are linked together during synthesis. More controversially, Schols and Voragen suggest that type-II AGs, better known as the carbohydrate moieties of arabinogalactan-proteins, are also pectic.

Mort takes an appropriately critical look at the evidence for cell wall models, and especially the putative covalent cross-links between cell wall polymers, including pectins. His scepticism is welcome, and should serve to highlight the current paucity of unambiguous evidence. Curiously, however, he concludes that there is a clear-cut example of a covalent cross-link between polysaccharides in the cell wall—provided by Ishii's tantalising isolation, after Driselase-digestion of bamboo cell walls, of a pair of xylan-derived trisaccharide molecules cross-linked by a diferuloyl group. Mort's scepticism lapsed here: such a fragment could equally have been isolated from a looped xylan chain in which the diferulate bridge was intra-polysaccharide rather than inter-polysaccharide. 'Xylans are rigid; they wouldn't easily form loops', I hear you say. True, but newly synthesised xylan chains are in the order of 10^6 Da (roughly 2–3 μm long) and fit into Golgi vesicles that are roughly 0.1 μm in diameter, so intra-polysaccharide looping seems highly plausible.

Mohnen updates a compendium of data on pectin biosynthesis (sub-cellular localisation, synthesis and transport of sugar nucleotides, and the properties of polysaccharide synthases) based on her other recent reviews in *Comprehensive Natural Products Chemistry* vol. 3, and in *Phytochemistry*.

Jarvis gives a customarily thoughtful essay on the biophysical properties of pectins. His account goes well beyond your money's worth for a review article: indeed it presents a helpful and original analysis of what happens when non-covalent pectic junction zones are *mechanically* stretched, as must occur in a growing plant cell wall. 'Pectic gels under stress' is a recurrent theme in this chapter, drawing further attention to the importance of defining the covalent linkages between pectins and other wall polymers—the latter possibly acting as handles for pulling at pectic chains.

Knox provides a summary of immunological methods, many of them emanating from his laboratory, for localising and possibly quantifying particular pectic domains at the microscopical level. Their distribution varies in parallel with changes in cell proliferation, expansion, maturation, differentiation, and separation. Several micrographs illustrate examples, though unfortunately not in colour.