

series analysis, image processing, etc. Recently, fast direct Toeplitz solvers have been developed⁶ which require $O(n \log^2 n)$ operations. Preconditioned conjugate gradient methods have been proposed⁷ which require only $O(n \log n)$ operations and are more stable.

There have been several important developments in numerical solutions of initial value ordinary differential equations (ODEs). Special methods, which deal with ODEs having symplectic structure, have been developed over the last decade⁸. Methods which preserve phase space volume and integrals of motion have also been proposed. Taylor series methods (to very high orders) have become practical and more widely used with the advent of techniques like differential algebra. Like Taylor series methods, ODE solvers of the extrapolation type were also historically considered poor cousins of the more famous RK and Adams algorithms. General interest in extrapolation methods has been revived recently with the development of a new A -stable discretization based on the semi-implicit mid-point rule along with new order and step-size control methods⁹.

The list of recent advances in the area of numerical analysis that we have listed above is, needless to say, subjective and incomplete. However, we hope we have conveyed a flavour of recent developments in the field.

Coming to the book under review, the author has wisely decided not to write yet another cook book describing the various algorithms. There are already many such books (several of which are excellent). It is oriented towards mathematicians and those who want to understand the proofs behind various results routinely used in numerical analysis algorithms. It details some of the technical results that have been recently proved. Therefore, it provides a good mathematical base from which one can aspire to read recent research papers in the area. The book is, however, heavily biased towards solutions of linear systems. Slightly more than half of the 200-page book is devoted to this area. On the other hand, there is no mention of ODEs and PDEs! Other topics in numerical analysis like interpolation, solutions of nonlinear equations, least squares method, splines, numerical integration, optimization,

integral equations, etc. are all compressed into less than 100 pages. In this sense, there is a serious imbalance in the topics treated in this book.

The book is organized as a series of 21 lectures with 11 lectures devoted to linear systems. The book starts with an explanation of metric spaces, norms and various types of matrices. This should be useful to non-mathematicians. The book then delves into the details of solving linear systems with special emphasis on the QR algorithm. The fifth lecture deals with spectral distances, clusters, etc – topics not usually found in books at this level and presumably included because the author has contributed to this area. Standard methods like LU decomposition, Cholesky and Gram-Schmidt methods are also dealt with in some detail. The treatment of all these topics is mathematically rigorous. The second-half of the book is a compact but readable treatment of the remaining topics in numerical analysis (the glaring omission being differential equations).

To summarize, this book would be useful to readers interested in a mathematically rigorous treatment of various topics in numerical analysis (especially linear systems). However, those with interests in differential equations should look elsewhere.

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Textbook of Nutrition and Dietetics. Kumud Khanna *et al.* Phoenix Publishing House Pvt Ltd, 22 Prakash Apartments, Ansari Road, Daryaganj, New Delhi 110 002. 1997. 355 pp. Rs 155.

While nutrition is a science, dietetics is its practical application. Translation of the knowledge of nutrition into nutritionally balanced diets which are culturally acceptable and suitable for different income, age, and physiological groups, demands knowledge of disciplines such as anthropology, economics, human psychology, food chemistry, etc.

While balanced diet is important to maintain good health in healthy individuals, diet and nutrition are extremely important in the management of diseases as well. Special knowledge of therapeutic nutrition and diets is needed for the management of degenerative diseases like, diabetes, cardiovascular diseases, gastro-intestinal and liver disorders, and renal disorders. Yet, Nutrition and Dietetics are neglected fields in India.

Most hospitals in India, except a few big corporate hospitals, do not have a dietician on their staff, and many physicians do not realize the importance of therapeutic diets. In this scenario, the above-mentioned book is timely and valuable. Though primarily aimed at undergraduate and post-graduate home science students and teachers, medical and nursing students, teachers, and practitioners would also find it useful. The book is written in a simple, reader-friendly style, and hence even lay people with some knowledge of biology (or even without it), will find it helpful.

The introductory chapter is very short and discusses the scope of the book. The subject matter is presented in three units – meal planning (unit I), normal nutrition (unit II) and therapeutic nutrition (unit III), with further division into chapters under each unit. At the end of each chapter some key words and exercises are given. A common list of some important references is given at the end of the book. For many tables, the source is not mentioned beneath the table and hence the reader has to guess the source from the list of references. Some references mentioned in the text eg. Sauberlich *et al.* 1974 (page 56), do not figure in the references list. Two

BOOK REVIEWS

important and useful tables – recommended dietary allowances of Indians, and nutritive values of some Indian foods are given in the appendix – wisely the source is mentioned beneath these tables. Inclusion of a subject index would have been helpful.

Unit I provides some basic information on nutrients, their functions and dietary sources, and factors which need to be considered in meal planning. Food exchange lists based on protein and calorie contents of foods are provided. Apart from giving a table of comprehensive food exchange list which compares different food groups, (milk, meat, cereals, pulses, vegetables and fruits), separate exchange lists for different items within a food group are also given. In the exchange list for vegetables, green leafy vegetables which are richly endowed with micronutrients (vitamins and minerals) are equated with gourds because of comparable calorie content, though they are nutritionally poor. The author has of course mentioned elsewhere the need for including the green leafy vegetables, however, a note of caution regarding such substitutions would have been helpful.

A life cycle approach has been used to discuss normal nutrition. Thus in unit II, different chapters deal with nutrition in adulthood, pregnancy and lactation; infancy, childhood adolescence and old age. Physiology of growth and development and the scientific basis of the current dietary recommendations for nutrients have been discussed. Apart from giving tables of recommended dietary allowances for different ages and physiological groups, for each of these groups, food exchange plan for formulating the day's diet and sample menus have been listed. Unfortunately, all the menus described are affordable only by the upper middle-income and high-

income families. Few, middle-income families can afford more than 500 ml of milk per person and yet most menus prescribe more than this amount. Though a general suggestion has been made that those who cannot afford milk and meat can include more pulses, some effort could have been made to suggest menus for at least the low middle-income families.

Many of the dishes suggested may not be culturally suitable for most Indians except perhaps the urban Punjabis. There is frequent mention of paneer, and whole legumes like 'chana' and 'rajmah'. Green gram dal ('mung dal'), which is very easy to digest and relatively inexpensive, has not been mentioned, though sprouted whole mung has figured. 'Idli' and 'upma' – popular and common breakfast items in south India – in fact whole of India, have been mentioned just once or twice and that too as afternoon snacks. Surprisingly, dishes like 'dosai', 'uttapam' and 'aloo paratha' which are also very popular throughout India are missing. On the other hand, corn flakes, cheese sandwiches and mushrooms figure frequently. Some of the dishes mentioned are alien even to the reviewer – eg. 'eggs on birds nest' as a breakfast dish. Processed soybean (chunks and granules) are nutritious and have become quite popular even among the poor, but these have not been mentioned at all. White meat, particularly fish, is nutritionally superior, being low in cholesterol and high in *n*-3 polyunsaturated fatty acids, yet, mention of fish is missing and instead 'keema' (I assume mutton keema) is frequently included in the menu. India is a vast country and some effort could have been made to present menus catering to different regions and incomes. Apple has been mentioned more frequently compared to other more

nutritious fruits. However, a summary table giving foods rich in various nutrients has been given, and the reader is advised to be guided by that information rather than the menus suggested.

As a text book is read by people from various countries, an effort at giving the botanical names for the regional names of vegetables and some explanation for the regional dishes used should have been made. In fact a glossary of regionally used words would have been very helpful.

The section on therapeutic nutrition is useful for nutritional management of obesity, febrile illness, gastro-intestinal and liver disorders, and degenerative diseases like diabetes, cardiovascular diseases, and renal diseases. Pathological and physiological changes and in some cases even the treatment have been discussed, perhaps at greater length than needed. However, dietary management of some important nutritional deficiency disorders like anaemia, clinical forms of protein calorie malnutrition in children, and metabolic disorders like urolithiasis and some inborn errors of metabolism have been omitted.

The above criticism apart, in general, the book is well written (barring a generous mix-up between English and American spellings – a common Indian failing), and suitably illustrated. Key information has been presented in boxes to facilitate reading. Thus, this book will be a useful compendium to another recently published *Text Book of Human Nutrition*. Indian readers will find this book less expensive than the foreign textbooks published in this field.

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