

BOOK REVIEW

Medicinal Values of Indian Spices, A.K. De (Ed.), pp. 119, Books for all, New Delhi 1997, Rs. 45

This book containing ten papers authored singly or jointly by sixteen persons, is based mostly on papers presented at a National Symposium on Medicinal Values of Indian Spices in the Department of Biochemistry of Calcutta University in 1993.

The Editor has preferred to put the 10 papers in two groups. The first group, *Medicinal Value of Spices* has following six papers :-

1. The Traditional Use of Spices as Medicine and Home Remedies.
2. Medicinal Uses of Chilli.
3. Blend from Spices and its Medicinal Values.
4. Medicinal Values of Capsicum and its Gastrointestinal Effect in Man.
5. Effect of Fenugreek Seeds on the Serum Cholesterol Level of the Normal and Hypercholesterolaemic Subjects.
6. Therapeutic Uses of Some Important Spices and Rethinking on it.

The second group, Identification, Cultivation and Production of Spices has following four papers.

1. Status of Spices Production in India.
2. Deterioration and Contamination in Spices.
3. Quality Control, Standardisation and Analyticals of Spices and Condiments.
4. Indian Spices Plant *Murraya koenigii* Spreng Introduces a new chapter of Bioactive Alkaloids.

Two papers (1.1 and 1.6) on traditional and therapeutic uses of spices provide a brief review of household remedies based on 38 spices. Some of these spices are commonly found in all Indian homes, like coriander, cumins, garlic, curryleaf, long and black pepper, ginger, cardamoms, turmeric, fennel, clove and cinnamon. Many remedies, like use of fennel as carminative, of ginger in cough, and of black pepper in nausea are widely known.

The paper on medicinal uses of Chilli provides a table on chemical constituents of the fruits, as also structure of some constituents. Some data in this paper is from original research work of the editor

(A.K. De) and his teacher (Prof. J.J. Ghosh). One paper emphasises on proper blending of various spices, while another highlights the use of fenugreek on serum cholesterol, and formation of bile in the liver.

One paper provides data on area under cultivation of various spice-yielding crops; it provides useful information on some varieties improved by researchers in ICAR, and also on quantities exported. The paper on contaminants provides review of main pests and pathogens of spices, and some control measures. The paper on quality control and standards for various spices also has useful data.

The last chapter on the chemistry of one spice plant namely the curry-leaf is again based mainly on the research work of the author (Dr. D.P. Chakraborty).

The presentation of the subject matter is satisfactory. But, the English rendering, syntax, grammar and sometimes spellings have much to be desired. At places even the meaning is not clear. A few instances are: on p. 5 'Why women likes it?. conjunctivities,' heated and *molished* (perhaps means massaged); on p. 7. ginger juice mixup with onion juice also gives *relieve*; on p. 10 'People may apply turmeric pasted with banana plant (core portion) and the *outcome* juice is famous for *blood sugar recovery*; on p. 11 *it is fried in hot*, made *dust* and *drink* with hot water, and on p. 29, 'a good spice-blend should be *sub-let* in its impact.

On the whole, for the price, the small book has useful information.

S.K. Jain

(2)

Studies in Indian Mathematics : series, pi and Trigonometry (in Japanese) , T. Hiysashi, T. Kusuba & M. Yano, Kōseisha Kōseikaku, Tokyo 1997, pp 537, Appendices.

During the past fifteen years or so, a number of highly significant contributions to the history of Indian astronomy and mathematics came from Japan, the credit for which goes to Professor Michio Yano, Professor of Sanskrit at the International Institute of Linguistic Sciences of the Kyoto Sengyo University, and the circle of his colleagues and pupils.

Professor Yano received his initial training in history of astronomy from Professors Otto Neugebauer and David

Pingree, at Brown University, Providence, USA, in the early seventies. Besides bringing out many a valuable study in English on the history of mathematics and astronomy from Sanskrit and Arabic sources, Yano rendered several Sanskrit texts into Japanese : Āryabhaṭa I's *Āryabhaṭīya*; Nīlakaṇṭha's Commentary on the *Āryabhaṭīya (Gaṇitādhyā)* ; *Carakasamhitā (Sūtrasthāna)* ; and Varāhamihira's *Bṛhatsamhitā* (the last one jointly with his pupil Ms. M. Sugita).

Equally commendable is the fact that Professor Yano inspired several of his students to study Sanskrit texts on astronomy, mathematics and Āyurveda. One such student, Takao Hayashi, proceeded to Brown University to study with Professor David Pingree from 1979 to 1982 and obtained his Ph. D. from Brown in 1985 for his thesis on the Bakhshālī Manuscript (*The Bakhshālī Manuscript : An Ancient Indian Mathematical Treatise*. Groningen Oriental Studies, Volume XI, Groningen 1995). Now Professor of History of Science at the Science and Engineering Research Institute of the Doshiba University, Kyoto, Hayashi published the first ever Japanese translation of Bhāskara's *Līlavatī* in collaboration with Professor Michio Yano. His *Introduction to Indian Mathematics* (in Japanese) is the most definitive account on this subject.

Dr Takanore Kusuba (now with Osaka University of Economics) also studied with Professor Pingree and obtained his Ph. D. from Brown University for his thesis entitled "Combinatorics and Magic Squares in India: A Study of Nārāyaṇa Paṇḍita's *Gaṇitakaumudī*, chapters 13-14" (Ann Arbor 1994). Another member of this circle, Mr Setsuro Ikeyama is now doing research at Brown on Pṛthūdaka's Commentary on the *Brāhmasphuṭasiddhānta*. While these scholars specialised in the history of Indian astronomy and mathematics, Mr T. Yamashita is pursuing the study of Āyurveda. He studied with Professor Jan Meulenbeld at the University of Groningen in The Netherlands and is now preparing a critical edition of the *Bhelasamhitā* at Kyoto under the guidance of Professor Muneo Tokunaga. Incidentally, Prof. Tokunaga

performed the gigantic task of digitalising the entire texts of the *Mahābhārata* and *Rāmāyaṇa*, which are now available on the Internet. In addition to the scientific texts mentioned above, the *Āpastamba-Śulva-Sūtra* was also translated into Japanese, by Professor Y. Ikari. Thus Jpn has the rare distinction of producing a considerable number of translations of Sanskrit scientific texts in the recent past.

Mention must also be made of Dr. Yukio Ohashi of Tokyo, who studied with Professor Kripa Shankar Shukla at Lucknow and earned his Ph.D. on "A History of Astronomical Instruments in India" in 1992 from the University of Lucknow. Some chapters from his thesis have already appeared in the IJHS (vols 28 and 29).

The three scholars Hayashi, Kusuba and Yano jointly produced a number of papers on Indian mathematics. The present work by these scholars is an important landmark in the historiography of Indian mathematics. The work, divided into five chapters, is written in Japanese. The authors, however, have provided a detailed table of contents in English, from which one can see how valuable these contributions are for the history of mathematics in India, especially of the Kerala school. Therefore, the table of contents is reproduced here in a slightly abridged form.

Chapter I : Mādhava's Method for Calculating the Circumference of Circle (pp. 1-65). There are three sections in this chapter. 1. Introduction, 2. Japanese Translation of Śankara's *Kriyākramakarī* on *Līlavatī* 199; 3. Commentary (*Līlavatī* 199; Various Values for π ; Mādhava's

Method 1, Mādhava's Method 2; Formulas Derived from Method 2; Improvement of the Value of the Circumference Obtained).

Chapter II : Japanese Translation of Nīlakaṇṭha's Commentary on Āryabhaṭīya 2.7, 10-12, and 19-22 (pp. 67-247). There are the following four sections: 1. Introduction; 2. Circle and Sphere (Area of a Circle and Volume of a Sphere; Pi : Ratio of the Circumference of a Circle to its Diameter); 3. Trigonometry : Calculation of Sines and Sine-Difference (*Jyācchedavidhāha* : A Graphic Method for calculating Twenty-Four Sines; A Rule for Sine-Difference) ; 4. Mathematical Series (Sum of an Arithmetic Progression; Period of an Arithmetic Progression; Second-Order Sum of a Natural Series; Square Series and Cubic Series).

Chapter III : Mathematical Series in India (pp. 249-299) has four sections. 1. Introduction; 2. A Brief History; 3. Classification of Formulas (Natural Series, Arithmetic Progressions, Geometric Progressions, Partial Sums of Arithmetic and Geometric Progressions, Formulas involving both Arithmetic and Geometric Progressions, Geometric Expressions of Mathematical Series, Fibonacci's Series and its Generalisation, Power Series Expansions of Trigonometric Functions by the Mādhava school) ; 4. Examples Given in Sanskrit Works (Natural Series, Arithmetic Progressions, Geometric Progressions, Other Series).

Chapter IV: Approximations to Pi in India (pp. 301-398). There are five sections. 1. Introduction, 2. A Brief History; 3. Various Approximations to Pi; 4 Discovery of $355/113$ and Reaction to it in India; 5 Bhāskara II's Calculations of the Surface

and Volume of a Sphere (Japanese Translation of *Golādhyāya*, *Bhuvanakośa*, 52-61, and Commentary).

Chapter V: Trigonometry in India (pp. 399-421) with the following seven sections. 1 Introduction; 2 Prehistory; 3 Āryabhaṭa I's Table of Twenty-Four Half-Chords; 4 Varāhamihira; 5 Brahmagupta; 6 Bhāskara II's Sine-Derivation; 7. Interpolation Methods (Arithmetic Mean; Second-Order Interpolation by Brahmagupta; Bhāskara; Mādhava).

These five chapters are followed by seven meticulously prepared appendices: 1 Chronological Table of Sanskrit Works and Authors; 2 Bibliography; 3 Abbreviations; 4 Sanskrit Texts; 5 Glossaries of Mathematical Terms (Japanese-Sanskrit and vice versa); 6 Indexes (Authors, Titles, List of Quotations by Nīlakaṇṭha and by Śankara); 7 Table of Contents in English. Of these, Appendix 4 is certainly very important. It contains the critically edited texts (on the basis of fresh manuscript material) of the *Kriyākramakarī* on *Līlāvati* 199 and the *Yuktidīpikā* on Chapter 2 of the *Tantrasaṃgraha*.

This excellently produced volume is a precious gift to India in this Golden Jubilee Year of her Independence, and the three scholars and the publishers deserve our warmest thanks for this endeavour. However, very few in India will be able to read the Japanese of this volume. Fortunately, through the initiative of Professor Pingree, an English translation is being prepared at Brown by Mr. Setsuro Ikeyama. It is hoped that the English version will be published in India so that it is accessible to many Indian readers.

-- S. R. Sarma