

## BOOK REVIEW

*The Gaṇitasarasāṅgraha of Sri Mahāvīracārya*, with English Transliteration, Kannada Translation & Notes by Dr. (Mrs.) Padmavathamma; English Translation & Notes by Rao Bahadur M. Rangacharya, Sri Siddhantakīrthi Granthamala, Sri Hombuja Jain Math, Hombuja, Shimoga District, Karnataka, 2000, pp. LVI + 835, Rs. 750.

The publication of Mahāvīracārya's *Gaṇitasarasāṅgraha* (GSS) with an English translation and Notes by M. Rangacharya (M.A., Rao Bahadur..., published under the Order of the Government of India, printed by the Superintendent, Government Press, Madras) in 1912 was a landmark in the historiography of Indian mathematics. The GSS was unknown to modern scholarship until Rangacharya chanced upon this work in the Government Oriental Manuscripts Library (GOML) at Madras. In his introduction to the edition, Rangacharya narrates how, soon after taking over as Professor of Sanskrit and Comparative Philology at the Presidency College and concurrently as Curator of the Government Oriental Manuscripts Library, he was asked by G.H. Stuart, the then Director of Public Instruction of the Madras Presidency, to look for mathematical manuscripts of value in the library and to publish them with English translation and notes. Thereupon Rangacharya examined the mathematical manuscripts in the GOML, and found three manuscripts of the GSS. He immediately recognized the value of the work and set about the task of editing and translating it. Rangacharya was eminently qualified for this task. He was trained as a scientist and taught chemistry at several prestigious colleges before was offered the Professorship of Sanskrit at the Presidency College in 1901. For his bio-bibliographical account, see S. Ramaratnam, "Rao Bahadur M. Rangacharya (1861-1916) and

his Contribution to the Field of Indian Scientific Literature and Culture," *Gaṇita-Bharati*, 14 (1922) 50-54. While working on the translation of the GSS, Rangacharya introduced the newly discovered text to the well known historian of mathematics, David Eugene Smith. In the Fourth International Congress of Mathematics, held at Rome in 1908, Smith spoke about the GSS and announced the forthcoming publication of the edition and translation by Rangacharya; vide David Eugene Smith, "The Gaṇita-Sāra-Saṅgraha of Mahāvtrācārya," *Atti del IV Congresso Internazionale dei Matematici*, Roma 1908, vol. 3, pp. 428-431; reprinted in: *Bibliotheca Mathematica*, third series, 9 (1908-09) 106-110. Smith's lecture at Rome, followed by Rangacharya's edition and translation of the GSS introduced Jaina Mathematics to the international community of scholars and thus inaugurated the modern studies of Jaina Mathematics.

Rangacharya's edition of the GSS was soon out of print and unfortunately the Government of Madras did not reprint it again. This reviewer was fortunate to acquire an inscribed copy from an old book shop in Calcutta. It carries the inscription in Rangacharya's handwriting, dated 4.8.12. Against this inscription, the unknown recipient noted three days later in pencil "Received and acknowledged 7/8/12." After half a century, Professor Lakshmi Chandra Jain of Jabalpur prepared a Hindi translation of the GSS, which was published in 1963 by Gulabchand Hirachand Doshi of the Jaina Saṃskṛiti Saṃrakṣaka Saṅgha, Sholapur, as No. 12 of Jtvarāja Jaina Granthmālā. L.C. Jain retained the text as edited by Rangacharya together with the latter's text-critical notes, and provided an excellent translation in Hindi together with several new appendices. Jain's Hindi translation opened a new chapter in the historiography of Indian mathematics. It inaugurated scholarly writings in Hindi on Indian mathematics and inspired several young scholars to take up the study, particularly of Jaina Mathematics. An outstanding example is Anupam Jain who wrote extensively on Jaina mathematics in recent years, *vide* in this

connection, Anupam Jain and Suresh Chandra Agarwal, *Mahāvīracārya-ek Samikṣatmak Adhyayan*, Hastinapur-Meerut, 1985. The quarterly journal *Arhat Vacana*, edited by him, has been providing space for a large number of interesting studies on Jaina sciences, including mathematics.

It is indeed gratifying that Prof. Padmavathamma, Professor of Mathematics at the University of Mysore, prepared now a translation of the GSS in Kannada, the language of the region where Mahāvīracārya flourished and the language which he must have spoken. Thus the GSS has the distinction of being translated into English, Hindi and Kannada. Indeed the GSS is one of few works which did not remain confined in its Sanskrit garb for long. As early as the eleventh century, it was translated into Telugu by Pāvulūri Mallana. On this translation, see Sreeramula Rajeswara Sarma, "Pāvulūriṅaṇitamū: The First Telugu Work on Mathematics," *Studien zur Indologie und Iranistik* (Festschrift Wilhem Rau), 13-14 (1987) 163-176. Sometime thereafter Daivajna Vallabha wrote commentaries in Kannada and Telugu. The Kannada commentary is available in several manuscripts. Moreover, already in the early twelfth century, another Jaina mathematician, Rajaditya, composed in Kannada several mathematical works, including the *Vyavaharaganita* (Ed. M. Mariappa Bhat, Madras) which was published in 1955. Thus popularization of Sanskrit mathematics in local languages began quite early in the Andhra-Karnataka region.

The present edition contains the Sanskrit text of the GSS, Rangacharya's English translation, and the Kannada translation by Padmavathamma. This edition is published by Sri Hombuja Jain Math. The volume opens with the "Blessings" of Sri Devendrakiṛthi Bhattaraka, the Pontiff of the Hombuja Jain Math. The Bhattaraka compares this edition in three languages and three scripts of the confluence of the three sacred rivers at Prayāga. L.C. Jain wrote an introduction to this work, commending Padmavathamma's

translation. The Bhattaraka's blessings and L.C. Jain's introduction are printed both in English and Kannada.

In this edition, Prof. Padmavathamma, like L.C. Jain earlier, retained the text of the GSS as constituted by Rangacharya and his English translation and Notes, except in the case of chapter VIII, verses 9-11<sup>1</sup>/<sub>2</sub> where Rangacharya's translation was replaced by a more accurate translation proposed by Bibhutibhusan Datta and A.N. Singh. Besides the text of the GSS and the English and Kannada translations, the edition reproduces all the prefaces, forewords and introductions from the two earlier editions. There are two new appendices: Appendix 9 (p. 830): Researchers of *Gaṇitasarasāṅgraha*; Appendix 10 (pp. 831-834): List of Manuscripts of *Gaṇitasarasāṅgraha* available. The latter would have greatly benefitted from David Pingree's *Census of the Exact Sciences in Sanskrit*, Series A, Volume 4 (Philadelphia 1981), pp. 388-89 and Volume 5 (Philadelphia 1994), pp. 293-294.

It must have been a stupendous task to computer-typeset this large format book with more than 800 pages in three different scripts. In the main body of the work, each page contains successively six registers: (i) Mahāvīracārya's Sanskrit verses in Devanāgarī script, (ii) the same in Roman transliteration. (iii) Rangacharya's English translation (iv) Padmavathamma's Kannada translation, (v) Rangacharya's Notes in English, and (vi) Kannada rendering of the same. It is remarkable that, in spite of this complex typographical arrangement, there are very few printing mistakes.

The edition could have, however, done without the Roman transliteration of the Sanskrit. Those who wish to read the Sanskrit original can read it in Devanagari script. Moreover one basic feature of the Roman transliteration was not followed here, viz. to write each word separately except where there is a vowel *sandhi*. For example, in 1.1 नमस्तस्मै should have been transliterated as *namas tasmai*. Also the two verse halves should have been printed in two separate lines

as it was done in Devanagari. Indeed, it would have been more useful to reprint, in lieu of the Roman transliteration, L. C. Jain's valuable Hindi translation which is long out of print. Be that as it may, this Kannada translation of the GSS is a new venture in the history of Indian mathematics.

Prof. Padmavathamma deserves the felicitations of the scholarly world for this Kannada translation of the GSS. The Hombuja Jain Math must be thanked for publishing this work as an act of piety. It is hoped that soon Prof. Padmavathamma will also publish Vallabha's Kannada commentary and Varadaraja's Sanskrit commentary on the GSS. It is also hoped that Rajaditya's *Vyavaharaganita* will be reprinted one day with an English translation.

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