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(fl. India, 1356)

*mathematics.*

Narayana, the son of Nrsimha (or Narasimha), was one of the most renowned Indian mathematicians of the medieval period. His *Ganitakaumudi*, on arithmetic and geometry, was composed in 1356; in it he refers to his *Bijaganitavatamsa*, on algebra (see Supplement). The *Karmapradipikā*, a commentary on the *Līlavāti* of Bhāskara II (b. 1115), is found in several south Indian libraries attributed to Narayana; but the author, a follower of Āryabhaṅga I (b. 476), may be the Kerala astronomer and mathematician Mādhava of Sāgamagrāma (ca. 1340–1425).

The *Ganitakaumudī* consists of rules (*sūtras*) and examples (*udāharanas*), which in the only edition, the two-volume one of P. Dvivedi (Benares, 1936–1942), are given separate numberings that do not coincide with the division of the work into chapters

(*vyavahāras*). In fact, the edition is based on a single manuscript which was evidently corrupt and perhaps incomplete. We do not really know in detail the contents of the *Gaṇitakaumudī*. The *Bijagaṇitāvataṃsa* is preserved in a unique and incomplete manuscript at Benares; only the first part has been edited, by K. S. Shukla as a supplement to *ntam* (1, pt. 2 [1969–1970]).

## BIBLIOGRAPHY

Various rules from the *Ganitakaumudi* are discussed by B. Datta and A. N. Singh, *History of Hindu Mathematics*, 2 vols. (Lahore, 1935–1938), *passim*; and the section of that work devoted to magic squares is analyzed by S. Cammann, “Islamic and Indian Magic Squares,” in *History of Religions*, **8** (1968–1969), 181–209, 271–299, esp. 274 ff. The algebra of the *Bijaganitavatamsa* has been commented on by B. Datta, “Narayana’s Method for Finding Approximate Value of a Surd,” in *Bulletin of the Calcutta Mathematical Society*, **23** (1931), 187–194. See also R. Garver, “Concerning Two Square-Root Methods,” *ibid.*, **23** (1932), 99–102; and “The Algebra of Narayana,” in *Isis*, **19** (1933), 472–485.

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