Origin and History of the Hindu names for Geometry.

By Dr. Bibhutibhusan Datta, University of Calcutta.

(Eingegangen am 20. 9. 1929.)

The geometrical knowledge of the ancient Hindus can be gauged from a class of works known under the generic name of Šulba-sūtra1). There are works with that title by several ancient writers such as Baudhäyana, Āpastamba, Kātyāyana, Manu, Varāha and Vadhula. In the epithet Šulba-sūtra, the term sūtra means “an aphorism”, “a short rule”. It indeed describes the nature of the composition of the works. Hence truly speaking, it does not form an essential part of the name of the subject. In the Śrauta-sūtra of Āpastamba 2), his Šulba-sūtra is found to have been referred to as Šulba simply3). The title of the work attributed to Kātyāyana is Šulba-pariśiṣṭa (“Supplement to the Šulba”). In the introductory verses of a commentary on Baudhäyana’s Šulba-sūtra by Dvārakanātha Yajvä, the commentator says: “Desiring to give a clear exposition of the Šulba of Baudhäyana, this commentary, named Šulba-dāpiṅkā (“The Light of the Šulba”), has been made by Yajvä, the son of Bhaṭṭa”4). Similarly Sundararāja, the commentator of the Āpastamba Šulba-sūtra, has spoken of the subject as Šulba5). We have also works of later times, which are obviously based on the earlier treatises, entitled Šulba-mīmāṁsā (“Investigation into the Šulba”), Šulba-vārtika (“The Glossary of the Šulba”), Šulba-bhāṣya (“Commentary on the Šulba”), and Šulba-rahasya-prakāśa (“Divulging of the secrets of the Šulba”). Hence it is established beyond dispute that the true name of the subject is Šulba. As the Šulba is entirely


2) Āpastamba Śrauta-sūtra, xvii. 26. 2.

3) The Šulba-sūtra, in fact, forms a part of the Śrauta-sūtra.

4) The Pandit, O. S., vol. 9, 1875, p. 293.

devoted to the treatment of geometry and its application we get it that the earliest Hindu name for geometry was Sulba. In ancient India geometry was also called by the name Rajju as will be sufficiently evident from the opening sutra of the Kātyāyana Sulba-pariśiṣṭa: “Rajju-samāsaṃ vaksyāma”, or “I shall speak of the ‘Collection of (rules regarding) the Rajju’”\(^6\). In the early canonical works of the Jainas (500—300 B.C.), rajju is stated to be a branch of mathematics (Saṅkhya or “The Science of Numbers”)\(^7\). As has been observed by the commentators Śiṅgka (862 A.D.) and Abhayadeva Śūri (1050), that epithet denotes rajju-gaṇita (“Mathematics of lines”) or kṣetra-gaṇita (“Mathematics of areas and volumes”)\(^8\).

What is the origin of the name Sulba or Rajju for geometry? In Sanskrit the words śulba and rajju have got the identical significance which is ordinarily “rope”, “cord”. They then came to be used in a particular sense to denote a measure of the same name. Mention of a linear measure, called rajju, is found as early as in the Śulba-sūtra\(^9\), the Arthaśāstra of Kautilya\(^10\), and later on in the Śilpa-sāstra\(^11\). In fact in ancient India there were three kinds of measure, — linear, superficial, and voluminal — having the same epithet rajju. In the Jain canonical works, they are sometimes distinguished as sūcī-rajju (“needle-like or linear rajju”), pratara-rajju (“superficial rajju”), and ghanā-rajju (“cubic rajju”); while in the Arthaśāstra the superficial unit is called paridesa and the cubical unit nivartana. It is perhaps noteworthy that this measure is nowhere spoken of as śulba. The use of the word rajju at least in its ordinary signification of “rope” occurs as early as in the Veda\(^12\), but the word śulba does not appear there. The earliest use of śulba is found in the Śrāuta-sūtra\(^13\) and that in the ordinary sense of “rope”. The word śulba or śulōa is derived from the root śulb or śulo, meaning “to measure” and

---

\(^{6}\) The Pandit, N. S., vol. 4, 1882, p. 95.

\(^{7}\) Śīnāgā-sūtra, Sūtra 338, 747; Śūtrakṛtāṅga-sūtra, ii. 1. 154. These works with the commentaries of Abhayadeva Śūri and Śīnāka respectively have been printed and published by the Āgamodaya Samiti of Mehesana.


\(^{9}\) Āpastamba Śulba-sūtra and Māṇava Śulba-sūtra.

\(^{10}\) Arthaśāstra of Kautilya, edited by R. Shama Sastri, Mysore, 1919, p. 107.

\(^{11}\) See Mānasāra, Mayamata, etc.

There is difference of opinion about the exact length of the measure rajju. According to the Arthaśāstra one rajju is equivalent to 40 cubits whereas according to the Śilpa-sāstra 32 cubits make one rajju.

\(^{12}\) Rg-veda i. 162. 4; Atharva-veda iii. 11. 8; Śatapatha Brāhmaṇa i. 3. 1. 14.

\(^{13}\) Āpastamba Śrāuta-sūtra, i. 4. 10; i. 5. 12; i. 6. 1. 6; xi. 3. 1. 1; etc.; Kātyāyana Śrāuta-sūtra i. 3. 14. 20.