



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2016; 2(8): 192-193
www.allresearchjournal.com
Received: 15-06-2016
Accepted: 17-07-2016

Milan Barman
M.A, M.Phil, UGC-NET), PhD
Research Scholar, Department
of Sanskrit, Assam University,
Silchar, Assam, India

A comparative study on the Sulvic and geometric terms

Milan Barman

Abstract

In this paper, we are present a comparative study on the *Śulvic* and Geometric terms. The *Śulvasūtras* are give the construction rules of the fire altars, these alters are made in bricks in very complicated shape and size. The *Śulva* was used to solve propositions about the construction of various rectilinear figures; combination, transformation, menstruation of areas and many others. So, the Seers of *Śulvasūtras* are used many terms like *Dīrgha caturasra*, *Āyāma*, *Tiryak*, *Samo caturasra*. Some geometrical terms are square, rectangle, trapezium and many more. The *Śulvic* terms are presently used in modern geometry in following way – *Samo caturasra* > square, *Tiryak* > breadth, *Āyāma* > length and *Dīrgha caturasra* > rectangle.

Keywords: Śulvasūtra, Sulvic terms, geometric terms, geometry

Introduction

The *Kalpa* is one of the six *Vedāngas*. *Kalpasūtras* are indispensable for a proper understanding of Vedic culture. They deal with Vedic *yajñas*, household life and ceremonies and the law. The *Kalpas* are framed in the form of *Sūtras*, it comprising *Śrautasūtra*, *Gṛhyasūtra*, *Dharmasūtra* and *Śulvasūtra*. The *Śulvasūtras* contain the rules for measurements and construction of fire altars and sacrificial place. The measurements were mentioned with the help of the cord (*Śulba*) i.e. *Rajju*. The duty of measuring and preparing various necessary shapes on the sacrificial ground was assigned to *Adhvaryu* and his assistants. This was भूमिति (geometry) i.e. measurement of the earth in its real literal sense. The fire altars are made in complicated shapes and sizes, and often required the use of mathematical formulas. *Śulva* was used to solve propositions about the contractions of various geometrical shapes, combinations, transformations and application of areas and volumes, squaring of the circle and vice versa; etc.¹. The *Śulvasūtras* show the earliest beginning of geometry and constitutes the oldest Indian mathematical works. Now we are showing some *Śulvic* terms which are used in modern geometry.

Geometric terms in the Śulvasūtras

In the *Śulvasūtras* there are uses of many geometrical terms. A discussion some of them, follows –

| | |
|------------------------|---|
| Akṣṇayā ² : | Transversely, diagonally; <i>rajju</i> diagonal line, a cord stretched across the |
| Aṅsa ³ : | Shoulder, two eastern corners of an oblong Vedi. The north-east corner is |
| Anīka ⁴ : | Side, front, row, edge |
| Aṅimat ⁵ : | Smaller |
| Anitya: | Gross or approximate |
| Bhūmi: | Area (BŚS.I.36) |

Correspondence
Milan Barman
M.A, M.Phil, UGC-NET), PhD
Research Scholar, Department
of Sanskrit, Assam University,
Silchar, Assam, India

¹ The cultural heritage of India, vol- VI, 1986, Calcutta.

² Ibid. I.46, "tsyākṣṇayā rajjustrikarano"

³ BŚS. I.34, "ardheanīkāṅsārtham"

⁴ Ibid. IX.6 "pūrvasminnanīke prakramapramāṇāni catvāri....."

⁵ Ibid. I.55,

| | |
|---|--|
| Caturasra ⁶ : | Rectangle or square |
| Dīrgha caturasra: | Oblong or rectangle |
| Dīrgha karaṇī: | Larger side of an oblong |
| Dvikaraṇī: | Diagonal of a square (=√2) |
| Dvistāvatiṃ: | Of double size i.e. south-western and north-western corners. |
| Iṣṭa: | At the desired point |
| Jyāyas: | Larger |
| Kaṇīyas: | Smaller |
| Karaṇī: | Arms, side of a square, rectangle etc. |
| Lekhā: | Line |
| Mānayaoga: | Measurement. (BŚS.I.96) |
| Maṇḍala: | Circle (BŚS.I.23) measuring 36 <i>aṅgulas</i> (BŚS.1.14, ĀŚS.6.22) |
| Nyañchana: | Mark on a cord required to construct a right angle |
| parikarṣaṇa: | Circle. |
| Parilikh: | To describe a circle; parilikhet, should describe a circle. |
| Pārsvamānī: | Horizontal side, longer side of a rectilinear figure |
| Prācī: | An east-west centre line of a given figure |
| Pradhi: | To four segments of a circle, circumscribing a square, adjoining the four sides |
| pramāṇa: | Measure. (BŚS.I.3) |
| Prauga: | Isosceles triangle |
| Prṣṭhyā: | A cord, back line with ties at both ends (east-west) |
| Prthu: | Broad |
| Rju-lekhā: | Straight line. |
| Samacaturasra: | Square (BŚS.I.52) |
| Sameyatām: | Intersect; <i>yatra sameyatram</i> – at the point of intersection |
| Śamyā: | Yoke-pin, a rod measuring 32 <i>aṅgulas</i> (KŚS-2.5), or a wedge of khadira wood |
| Śaṅkū: | Pole or Peg (BŚS.I.23) |
| Saviṣeṣa: | A ratio; diagonal of square divided by the side of the same square = √2 |
| Savyavṛta lekhā: | A line, that runs towards the left or north side. square or rectangle. |
| square, $\sqrt{a \frac{2}{3}} = a\sqrt{3}$, (<i>trīyākaraṇī</i> is one – third) | |
| Śroṇi: | The westward corner (s) of a rectilinear figure (BŚS.1.35), to hips of the <i>Uttaravedi</i> , |
| Tiryak: | Breadth |
| Tiryamānī: | The side giving width of a rectilinear figure |
| Trikaṇī: | It is the diagonal of an oblong with side 1 unit and √2 units = √3 units. |
| Trīya-karaṇī: | The side of a square, the area of which is one-third of the area of a given |
| Ubhayataḥ prauga: | Isosceles triangle. |
| Udak: | Directed towards the north; from south to north |
| Una: | Minus, less |

| | |
|--------------------------|---|
| Vardhayet: | <i>Uttara-aṃsa</i> and the south-east corner is <i>Dakṣiṇa-aṃsa</i> . |
| varṣiyasaḥ: | Should increase or lengthen |
| Vharaṇa: | Larger |
| Viṣkambha ⁷ : | Arrangement and measurement of space areas for fire-altars. |
| Vyāsa: | Diameter |
| Yajamāna-mātrī: | Breadth (BŚS.I.88) |
| Āvāpena ⁸ : | Measure equal to the height of the sacrifice. |
| Āyāma: | By adding, by inserting a piece |
| | Length |

Conclusion

The Seers of *Śulvasūtras* used these terms for the purpose of making the altars and subsequently contributed to a great Science which is developed in modern Geometry. In the *Śulvasūtra*, the Seers sowed the seed of modern Geometry.

Reference

1. Baudhāyana Śulvasūtram Ed, By Dr. Satyaprokash, Pt. Ram Swarup Sharma. Mahalakshmi Publishing House, New Delhi, 1980
2. Cāra Śulvasūtra (Hindi), Dr. Raghunath Purusottam Kulkarni, Mahorshi Sandipani Rastriya Veda Vidya Protisthan, 2000.
3. Kātyāyana Śulbasūtra, By SD Khadilkar, VSM, Pune, 2003.
4. Kātyāyana Śulbasūtra, Ed. By DP Kularia, Devesh. Publications, New Delhi, 2009.
5. Kātyāyana Śulvasūtra, Ed. By Sri Vidyadhara Sharma, Achutta granthamala Karyalay, Kashi, 1985.
6. Mānava Śulva Sūtram. International Academi of Indian Culture, New Delhi, 1875.
7. Creators of Mathematical and Computational Sciences, Ed. By Ravi P Agarwal, Syamal Sen K. Springer International Publishing, Switzerland, 2014.
8. Geometry in Ancient and Medieval India, Ed. By Dr. TA. Sarasvati Amma, 2nd Edition, Motilal Banarsidass Publishers Private Limited, Delhi, 1999.
9. Ancient Hindu Geometry: The science of Sulba, Bibhutibhushan Datta, Cosmo Publications, New Delhi, 1993.

⁷ BŚS.I.23 “Viṣkambhāntayoḥ śaṅkū nihanyāt”

⁸ Ibid. I.54 “dīrghacaturasraṇ samacaturasraṇ.....khaṇḍamāvāpena tatsampūrayet....”

⁶ Ibid. I.22 “caturasra cikṛṣanyāvaccikṛṣettāvatiṃ.....”