replaces *nikharvaka* by *nikharva, badva* by *padma,* and ends with *akṣitir vyomāntaḥ.* The Śaṅkhāyana Śrauta Sūtra[8] continues the series after *nyarbuda* with *nikharvāda, samudra, salila, antya, ananta* (= 10 billions).

But beyond *ayuta*[9] none of these numbers has any vitality. *Badva,* indeed, occurs in the Aitareya Brāhmaṇa,[10] but it cannot there have any precise numerical sense;[11] and later on the names of these high numerals are very much confused.

An arithmetical progression of some interest is found in the Pañcaviṃśa Brāhmaṇa,[12] where occurs a list of sacrificial gifts in which each successive figure doubles the amount of the preceding one. It begins with *dvādaśa-mānaṃ hiraṇyam,* 'gold to the value of 12' (the unit being uncertain, but probably the **Kṛṣṇala**[13]), followed by 'to the value of 24, 48, 96, 192, 384, 768, 1,536, 3072,' then *dve aṣṭāviṃśati-śata-māne,* which must mean $2 \times 128 \times 24$ (the last unit being not a single *māna,* but a number of 24 *mānas*) = 6,144, then 12,288, 24,576, 49,152, 98,304, 196,608, 393,216. With these large numbers may be compared the minute theoretical subdivision of time found in the Śatapatha Brāhmaṇa,[14] where a day is divided into 15 *muhūrtas*—1 *muhūrta* = 15 *kṣipras,* 1 *kṣipra* = 15 *etarhis,* 1 *etarhi* = 15 *idānis,* 1 *idāni* = 15 *prāṇas.* The Śaṅkhāyana Śrauta Sūtra[15] has a decimal division of the day into 15 *muhūrtas*— 1 *muhūrta* = 10 *nimeṣas,* 1 *nimeṣa* = 10 *dhvaṃsis.*

Few fractions are mentioned in Vedic literature. *Ardha, pāda, śapha,* and *kalā* denote $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$ respectively, but only

[8] xv. 11, 7.

[9] *Cf.* Rv. iii. 6, 15; viii. 1, 5; 2, 41, 21, 18; 34, 15; 46, 22; Av. viii. 2, 21; 8, 7; x. 8, 24; Pañcaviṃśa Brāhmaṇa, xix. 13, 6; xxi. 18, 3, etc. Zimmer, *Altindisches Leben,* 348, considers that it has not any definite sense in the Rigveda; this cannot be either proved or disproved. The Rv. has the phrase *śatā sahasrāṇi* several times (iv. 32, 18; viii. 32, 18, etc.) = 100,000; and *ayuta* may easily have been already specialized, though it may also have retained a vague sense.

[10] vii. 21. 23.

[11] Weber, *Indische Streifen,* I, 96.

[12] xviii. 3. *Cf.* Lāṭyāyana Śrauta Sūtra, viii. 10, 1 *et seq.*; Kātyāyana Śrauta Sūtra, xxii. 9, 1-6.

[13] *Cf.* Kātyāyana Śrauta Sūtra, xxii. 9, 1; Weber, *op. cit.,* 102, 103.

[14] xii. 3, 2, 1 *et seq. Cf.* also Taittirīya Brāhmaṇa, iii. 10, 1, 1, where a series of names of the divisions of the *muhūrta* is given, apparently as alternatives, not as successive stages (*idānīm, tadānīm, etarhi, kṣipram, ajiram, āśuḥ* (? *āśu*), *nimeṣaḥ, phaṇaḥ, dravan, atidravan, tvaran, tvaramāṇaḥ, āśuḥ, āśīyān, javaḥ*). See Weber, *op. cit.,* 92-94.

[15] xiv. 75 *et seq. Cf.* Śaṅkhāyana Āraṇyaka, vii. 20.