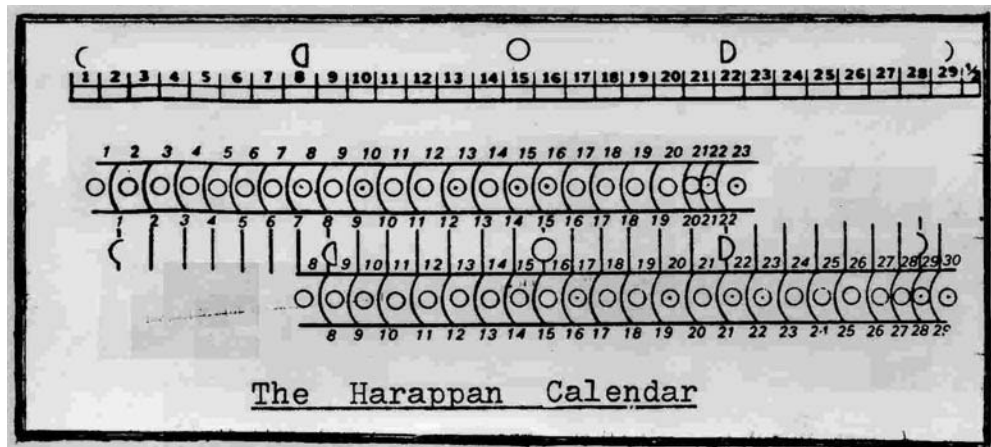


Harrappan Lunar-Tithi Calendar_Brij

Harrappan Lunar-Tithi Calendar: After discovery of Indus Culture (1921-22) addition of Indus Inch by Sir Mortimer Wheeler and Daya Ram Sawnhey, has added newer dimensions to flourishing period of people of Indus river and Harrappa Civilisation. Several among the sites that mark the growth of this great civilization were: Jhukar (now Sakhar), MOHENJO-DARO, Lohumjo-Daro, Kotdiji, Chanhudaro (All in Pakistan); HARAPPA, Kalibangan, Rupar, Alamgirpur, Surkotada and LOTHAL (on the bank of Sabarmati river merging into Arabian Sea). It is a misfortune that an independent civilization that's trading ties with Arabian countries and the West are not denied, BUT remain buried in history – pending decipherment of the language of Indus people. How could they be without the count of 'passage of time', astronomical expertise or/and calendar?



EJH Mackay discarded the 'glut of ivory rods' found at Mohenjo-Daro – now lying scattered among many museums – ONE among these object, square in section 0.6 centimetre diagonal and exactly 10.2 centimetre in length was found at Mohenjo-Daro. This was carefully and ingeniously studied by Dr. Walter Fairservis (Jr.) of the American Museum of Natural History, New York. He concluded this ivory rod to be the Harappan calendar, recording constant observation of lunar cycle resulting in recognition that ONE day in each 30 should be halved, to bring Harappan lunar month in line with true lunar month of $29 \frac{1}{2}$ days. The Indus people (of Harappa) could predict: What day of the month even with, cloud covered, monsoon skies was it? HD Sankhalia, I. Mahadevan, and PN Oak have made some contributions in this area. I, had some interesting information exchange with Derek Winder, while on Calndr-L listserv.

My 'V-Tithi & Metonic Cycle': During my discussions with Calndr-L group, I pointed to a 'unique value' for Tithi duration of 138W/965 (i.e. 966/965) and processed several other values:

- (a) $966/965 = 1.0010362694300518134715025906736$ days;
- (b) $19\text{-yr}/6932.5 = 1.001024392892295564370717634331$ days;
- (c) $235 \text{ lunation}/6932.5 = 1.0010369088135593220338983050847$ days; and
- (d) $2\text{Lunation}/59 = 1.0010369088135593220338983050847$ days.

19-years = 6939.601603725839 days; and 235 Lunation = 6939.68837035 days. On a close examination, I find 'ratio Tithi of 138W/965' can be fixed at 1.001036269430052 day. *This I believe was the Tithi value used by Indus people since 6932.5 of such durations made up for closer to 235 lunation.* It may be observed 6932.5 Tithi/phase of value 138W/965 = 6939.6839378238342 days; about 10m_d 64s_d (6m 23s) away from 235 Lunation (6939.68837035 days)!

This revolves around: *What value of tithi/phase we use: "138W/965, 19-years/6932.5 or 235 lunation/6932.5" which are all within compromisable range of days vs Tithi? OR shall we go with value 1Tithi = 1.001036269430052 day?* This work to Mean Lunation of

29.530569948186534 days. I may NOT BE MISLEADING, intellegentia to conclude that Harappan calendar was marked to 'this Tithi duration'?

X- or T-Unit (& z-unit): In my, <http://www.brijvij.com/XorT-units-5x47lunation.doc> I called sub-unit of a 'tithi as: **1 T-Unit (T/138) = X-Unit = 1741 s_d**'; where s_d is 'decimal second equal to 36% of SI-atomic second', explained at: <http://www.brijvij.com/Brij.d-sec.sd.doc> and <http://www.brijvij.com/clockface-n-earth.doc>. During my discussion with Karl & Calndr-L, need for a smaller sub-unit, contemporary to early civilizations, had been felt — like the z-unit = 1/168th of X- or T-unit i.e. each z-unit = 10.3627 s_d (i.e. 1/168th of Tithi/138). Thus, in ONE 'ratio Tithi of 1.001036269430052 day' there are (138*168=23184 z-units), that can define Mean Lunation and Metonic cycle to better precision. [Note: 4*4*7*9*23 =23184 z-units. The 24-hour day =23160 z-units; 1 Hour =965 z-units].

1 Tithi =138*168=4*4*7*9*23 =23184 z-units =24.02487 Hours (24^h 01^m 29^s.5337)

1 Day = 24 Hours =23160 z-units

1 Hour =965 z-units

1 Minute =16.0833..3 z-units

1 decimal minutes (m_d) =9.65 z-unit

1 Second = 0.2681 z-unit

1 Decimal Second (s_d) =0.965 z-unit

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