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Sl.No.	TITLE	Registration	©Date Registered
1.	Metric Second	Literary: L.5996/72	27 October 1972
2.	Metric Mathematical Tables	Literary: L.6009/72	29 November 1972
3.	Evolution of Metric Time Concept	Literary: L.6010/72	29 November 1972
4.	The Metric Calendar Year	Literary: L.6126/73	26 March 1973
5.	Systeme Internationale d'Unite's (redefined)	L.6439/73	05 December 1973
6.	Metre and The Indus Inch	Literary: L.6632/74	24 April 1974
7.	The Metric Philosophy	Literary: L.6705/74	25 May 1974
8.	The Absolute Pi or (π)	Literary: L.6843/74	19 November 1974
9.	Harappan Culture – an Exposition	Literary: L.6877/75	24 January 1975
10.	Metric Standards In Unified Technology and transition problems during transfer	Literary: L.7109/75	04 August 1975
11.	TIME: to think Metric	Literary: L.7364/76	05 April 1976
12.	ONE World (Metric) Flag	Literary: L. 8097/79	24 November 1977
13.	Decimalisation of Time of the Day	Literary: L. 14266/94	25 October 1994
14.	e-BOOK (in PP), E-mails & Calendar Reform	1621/05 – CoL	02/14 Nov. 2005

PATENT – Government of India PATENT OFFICE; Patent # 138508/72 dated 27 December 1972 (Government of India, Patent Office 'release No. A 007625 dated 25 September 1976').

PARLIAMENTARY QUESTIONS:

- **DECIMAL SYSTEM OF CALENDAR**

Lok Sabha Question # 8100; Answered by Shri Jagjivan Ram (Minister of Defence, Government of India); 1974 April 25

- **METRIC CLOCK/CALENDAR DEvised BY IAF ENGINEER**

Parliamentary Question # 10066; Directed to The Prime Minister of India; Answered by Shri Shivraj Patil; Minister of State for Science & Technology; 1983 May 04

PUBLISHED CONTRIBUTIONS OF BRIJ BHUSHAN VIJ ON REFORM OF METRIC TIME / CALENDAR WORK (1970-71 onwards)

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AND *Government of India PATENT OFFICE; Patent # 138508/72*
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Power Point presentation Slides (1 thro 60)

Slide 1. Brij's e-Book

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(OUTPUT of Research & Contributions – 1971.....)

– a Surest, Easiest & Cheapest way out.

(Family Photograph)

Slide 2. GAYATRI MANTR (photo)

Let Noble Thoughts come to us from ALL DIRECTIONS.

METRIC *is the Universal measure*

of Time

Slide 3. **TIME & Calendar Reform**

It's possible! says Brij Vij.

Slide 4. **METRICOLOGY**

(A TERM COINED IN 1971 – Brij)

is the science of
METRICATION (the SI-Units)
& Metrology

(Weights & Measures)

E-mail: <metricvij@hotmail.com>

Slide 5. **Calendar Almanac – an insight into**

Metricology & Geometry

for the purpose and development of

a possible World Calendar,

calculations by

Brij Bhushan Vij

and Genesis slides/plates by

Derek Winder.

Slide 6. **Metric is:**

what is related to METRE

– the unit for LENGTH

(or else it is non-metric).

Slide 7. **The Pi (π) Factor**

By definition, the value for Pi (π) is the ratio between the circumferences of the circle to its diameter; it *must be* represent-able in the form a/b and also define the angle radian, which by definition is: ' the arc-angle formed at the center (of a circle) by arc-length equal to the radius of the circle', for Pi (π) to be meaningful, and fit into the equation: a circle has

2π radians. A study of all known values for Pi (π) reveal that the radian can be fixed at 570 . 2958 (570' 17" 44.88") and the value for Pi (π) =100000/31831 (exactly). This when run in a computer repeats all by itself after 5244th decimal place.

This can be expressed as: $\pi = 100000/31831$ (exactly)

$$= 3 + \frac{1}{7 + \frac{1}{15 + \frac{1}{1 + \frac{1}{2 + 1/2}}}}$$

=3. 14159 15302 69234 39414 40733 87578 14708 93154 47205 55433
 38255 16006 40884 67217 49238 16405 39097 10659 42006 22035 - 100

 66460 36882 28456 53608 11787 25142 15701 67446 82856 33501 -5200
 93207 87911 15579 15239 86051 33360 56045 99290 000* * * * *
 (The value repeats all by itself after 5244th decimal place...)

– BRIJ BHUSHAN VIJ

Slide 8. **Pi (π) – through the Ages**

(Table of Pi values – used by man)

Slide 9. **TIME – the Question: Why NOT METRIC?**

(Plate: The QUESTION – Why NOT Metric?)

Slide 10. **Nautical Mile vs Nautical Kilometre**

0.9144 m =1 Yard = 0.8223399705005 m'
 1.609344 km =1 Mile =1.4473183480809 km'
 39.370078740157" =1 Metre (m) =1.0936132983377 Yards
 43.777514521259" =1 Metre New (m') =1.2160420700349 Yards
 0.6213711922373 mile =1 kilometre (km) =0.899321 927494 km'
 0.690932994338 mile =1 kilometre new (km') =1.11194886884 km
 (TWO GLOBES – Defining Nautical Mile vs Nautical Kilometre)

Slide 11. **Definitions**

TIME UNIT: DECIMAL SECOND (sd) – is the time interval between any TWO events that take Place during the fraction 1/240000th of the atomic day (of 86,400 atomic seconds) and correspond to 3309347437.2 periods of radiations of cesium-133 atom, at defined hyperfine levels, when the atom is at rest. **This is 36% of the SI-second;** or 1/87658125.52075th of the modern astronomer’s mean tropical year measured at the epoch, basis VSOP82, AD 2000.00. **LENGTH UNIT: Metre New (m')** – Distance ONE METRE (m') shall be 1/100000th of ONE Degree (1/10⁵th of ONE Degree (pi/180) arc Angle; while ONE NAUTICAL KILOMETRE (nkm') is the surface distance on Earth made by one minute (1/100th of 1°) of arc-angle at its center. **This is 1.11194886884 times the length of presently used – METRE, unit of length;** and is the distance traversed by light, in vacuum, during the time interval, 1/8508060427625436.2 95815th of atomic year, basis VSOP82'; as related to 1/97059575.22th of the decimal second.

– Brij Bhushan Vij

Slide 12. **The 12/24-hour CLOCK**

(CLOCK FACE Showing 100 decimal minutes, alongwith 60 to the HOUR)

Slide 13. **The NEED – Experimental value**

The cgs/MKS/MKSA or even the SI-second used only the multiples, and sub-multiples of the time unit- second (s), whenever decimal parts of time were required to be used. Is it, therefore, not ripe for Decimalisation of Time of the Hour and be linked with arc-angle?

The New Time Interval, Decimal Second (s_d): A method for defining a fixed ‘Blip or tik’ unit based on the SI second is under consideration. A blip may be designated, as from the fixed second (f_s) by consideration that there are 86400-atomic seconds during the day, and there are 240000 decimal seconds in a day/chron.; and if day distribution is made into 1000000 (10^6) blips using the new time interval, decimal second (s_d); each blip is thus 0.24 decimal seconds, and may be expressed as $tt0-10 ffs_d$; and $tt10-$ to be 100th marker ($ff s_d$). This is 100000 (10^5) ‘Blip or tik’ from fixed Decimal Second. The chron, that is The Decimal Second (s_d) fixed from ‘atomic second’ shall be likewise designated as $T- s_d$ (equal to $1/240000$ th of atomic day).

DURATION of time INTERVAL: The SI-atomic second is the duration of 91926 31770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium -133 atom.” (SI 2.1.1.3). From this, a ‘BLIP’ fixed to form the ‘interval’ for Decimal Second (s_d) would be derived from $[91926 31770 \times 0.36 = 33093 47437.2]$ or 33093 47437.2 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the Cesium-133 atom, per SI 2.1.1.3 (subject to calculation or application of measure being validated). Alternately, one ‘BLOP’ or ($tt-10$) $ffds$ ($3.6 s_d$) would be 33093474372 periods per SI 2.1.1.3 (subject to calculation or application of measure being validated).

– metricvij@hotmail.com

Slide 14. **Axial Spin around itself**

*Since ‘ $1/100^{TH}$ of one degree’ ($Pi/180$) is to be the Nautical Kilometre; length distance METRE can be seen as $1/100000$ th of one degree (or $1/10^5$ th of arc-angle ONE degree). ‘Metre New (m’) is the distance traversed by light, in vacuum, during the time interval, $1/97059575.22^{TH}$ of the decimal second (also see Definitions)’. As the Earth ‘spins’ in its axis, ‘local time’ at any point East or West of ‘Date line or Zero longitude’ can be determined as six and two-third ($6+2/3$) decimal minute (as against 4 solar minute) per degree longitudinal transit across the Sun to account 2400 decimal minutes (against the present 1440 minutes). The face of clock, however, shall also show 25 minutes (during the transitional phase) where present clocks show 15-minute marks i.e. for a time span of 5 minutes (or as at ONE o’clock position) the equivalent time would be *eight and one-third ($8+1/3$) decimal minutes*.

Simply by adding the additional graduations reading 100 division (along with present 60); any child can **KNOW TIME IN DECIMAL MINUTES** after the hour on multiplication the position of minute hand with $5/3$ (or 1.67), to read DUAL TIME, without really buying a NEW CLOCK (see clock diagram).

Slide 15. **It is important to link Unit for TIME with unit for LENGTH via arcANGLE.**

It is easy to see 24-hour CLOCK, using 100 minutes \times 100 decimal seconds (i.e. 240000 decimal seconds – each of 36% of SI-second). The EARTH is considered, a hypothetical sphere of radius 6371 km; and Metre New (m’) defined as: * $1/100$ th of arcAngle $Pi/180$ (ONE DEGREE)*; also to define:

Nautical Kilometre New (nKm') – as the surface distance on Earth made by arcAngle 1' (one decimal minute) at centre of Earth; like the present 1/60th of arcAngle (pi/180 – one degree) to represent ONE Nautical Mile of 1852 m, which can be eased out.

Slide 16. **Month Names and Durations**

– KEPLER's 2nd LAW

LENGTH OF SOLAR MONTHS reckoned from Vernal Equinox (March 21/22)

MONTH	RASHI	Degree	DURATION	Decimal Hrs
March/Caitra	Mina/PICES	330 to 360	29 ^d 23 ^h 18 ^m .9	719.314999
April/Vaishakha	Mesha/ARIES	000 to 030	30 ^d 11 ^h 25 ^m .2	731.407999
May/Jyashta	Vrsha/TAURUS	030 to 060	30 ^d 23 ^h 29 ^m .6	743.493331
June/Asadha	Mithuna/GEMINI	060 to 090	31 ^d 08 ^h 10 ^m .1	752.168333
July/Sravana	Karkata/CANCER	090 to 120	31 ^d 10 ^h 54 ^m .6	754.909999
August/Bhadra	Simha/LEO	120 to 150	31 ^d 06 ^h 53 ^m .1	750.885000
September/Asvina	Kanya/VIRGO	150 to 180	30 ^d 21 ^h 18 ^m .7	741.311666
October/Kartika	Tula/LIBRA	180 to 210	30 ^d 08 ^h 58 ^m .2	728.970000
November/Agrahayana	Vriscika/SCORPIO	210 to 240	29 ^d 21 ^h 14 ^m .6	717.243333
December/Pausa	Dhanu/SAGGITARIUS	240 to 270	29 ^d 13 ^h 08 ^m .7	709.144999
January/Magha	Makra/CAPRICORNUS	270 to 300	29 ^d 10 ^h 38 ^m .6	706.643333
February/Phalgun	Kumbha/AQUARIUS	300 to 330	29 ^d 14 ^h 18 ^m .5	710.308333
			<u>365^d 05^h48^m.8</u>	

Slide 17. **Brij's SEVERAL ATTEMPTS**

(Metric, Sidereal or Decimal Calendars)

1. A World Calendar for All Ages (1970-71): The year was divided into twelve months of four (4) quarters, each quarter of 13-weeks or 91 days; the 365th day of the year was named 'World Saturday' and during 'leap years' the 366th day was to be called a 'Leap Sunday'. These two (2) days were suggested to be observed as 'cease-fire Days' by all nations on Earth.

(Refer The Sunday Tribune, Chandigarh; 1971 June 06).

Slide 18. **2. Metric Norms for Time Standard (1971-73)**

'What happens if time standard went metric, I argued'? The metric clock could have 100 metric seconds to the metric minute; 100 metric minutes to the metric hour; and 10-metric hours to the day or night period i.e. the metric day to have 20 metric hours. This could also mean FIVE weeks to a month and 10-months to the year. Format of TWO half years of 182 days or 26 weeks each, with alternating months of 37 and 36 days had their names after the planets in the Solar System, receding away from the Sun. The last month was, however, named after the naturally occurring element, Uranium. A Descending Order time representation for instant retrieval had been proposed. The 365th and the 366th days of the year shall be 'World Saturday and the Leap Sunday'. Conventional and metric (Dual) time scales were suggested.

(Refer The Standards Engineer, Bureau of Indian Standards, New Delhi; V5 N4; pp. 58-62; (1971).

Slide 19. **3. The Metric Second and Decaday World Metric Calendar (1973-90)**

A prototype of the First Metric Watch with *changed gear ratio* to read 10-metric hour day or night was no scientific breakthrough; but it went ahead to show that there was a possibility. Attempt to *define The Metre (1973)* – unit of length – *via the velocity of light*

and to link The Metric Second (for time & angle) to define The Nautical Kilometre led this author to ponder over the format of a Decaday World Metric Calendar.

The suggested year was to be TWICE the duration of tropical cycle divided into 73-Decadays (i.e. 73 x 10 days). Each metric day was split into 20h_mx100mmx100sm and a FIVE day interval marked the 'Quinto-day or 10⁶ million metric seconds (sm). Three additional days Sigma (S-day), Alfa (a-day), and Beta (b-day), were proposed between Thursday and Friday to make the decaday. First day of each sub-week i.e. Sunday and Sigma (S-day) were to be the rest days, during each 'Quinto-day span'. All necessary mathematical tables and Astronomical data for computation, in relation to the 'NEW' time interval, for inter-calary requirements of Sun-Earth-Moon and other planets had been worked. A 4-metric year 'saros or quantum of time' constitute 2920 metric days, which being in close conformity with 99 Lunation's (2919 'tithi' or phases) and 107 sidereal revolutions (2889 'nakshatra' or asterisms) of the Moon. More so, this period accounted for 2929 sidereal revolutions of the Earth in 2921.0025642 metric days.

(Refer news and views in media during 1973-1992 and my TWO books:

(1) Towards A Unified Technology (1982); and (2) The SI Metric Units (1984).

Slide 20. **4. Tropico-Sidereal World Calendar Year (1992—)**

No attempt had ever been made to use the duration of a Sidereal day, for civil use. Apparent motions of the Sun play a significant role in recognizing the solar day, but astronomers disregard it in favor of using the 'sidereal day'. The sidereal day is then converted, to suit the UT 'time scale' for civil use, along with UT-1 and UT-2 scales. *The duration of the Tropical (cycle) year is 365.24219878125 solar days. And, using the time shown by a 'sidereal clock' of 24h_S x 100m_S x 100s_S i.e. the sidereal day, this shall work to 366.242198943 sidereal days which happen to be exactly one day over the day count in terms of 'solar days' in a tropical year. It is easy to account or convert completed number of 'solar to sidereal' days or vice versa, using the following multiplication factors:*

One solar day = 1.0027379097 sidereal day;

One sidereal day (d_S) = 0.997269565982 solar day;

Moon's Lunation Period = 29.6114408554 d_S;

Moon's sidereal revolution = 27.3964652406 d_S;

– Brij Bhushan Vij

Slide 21. **Tropico-Sidereal Consideration**

Human activities on Earth are linked to the apparent solar day. A need does exist to review: 'what basic reference point be established wherefrom, *all other terrestrial and astro-planetary data* or other parameters need be reworked?' There is also the need to decide upon the choice of using the 'solar day or the sidereal day' to revise the Calendar, basing **decimalised 24-hour clock using Sidereal Day**, the 'Sidereal Second (symbol, s_S)' could be defined as:

'1/240000TH of the sidereal day or 0.35901704375 of the SI-second'.

During one sidereal day, the motion of travel of:(a) Earth around the Sun =0.982956 degree or1.01733944151 degree/d_S; (b) Moon around the Earth =12.157463 degree/d_S; (c) Sidereal motion of Moon =13.140381 degree/d_S

Reference: The Tropico-Sidereal Calendar; Standards India; V6 N4; pp.110-114; (1992) Bureau of Indian Standards, New Delhi.

Slide 22. **5. CALENDARS TO HAVE EVERY 6TH YEAR A LEAP WEEK (1991- 92....)**

On removing ONE day from the month – July, making it of 30 days (during all years); and shifting this ONE Day to the month February, I make these of 30 and 29 days respectively. Also, by reducing the month – December to 30 (+1) days BUT keeping 31st day OUTSIDE of calendar format, all Normal Years are in TWO halves of 182 days each. All Years divisible by Six (6) shall have an Additional (53rd) Leap Week, to be called Keplers' Leap Week of the Year ****' with 371-days. Thus, numbers of days in each month are:

First Half Year: January (31), February (29), March (31),
April (30), May (31), June (30) =182 days; &

Second Half Year: July (30), August (31), September (30),
October (31), November (30) and December (30) days =182 days.

On modifying the Gregorian Calendar may SKIP the 'Leap Day once every 128-years, using divide by 4 plan (instead of skip during 100/ 400th years); OR adopt Leap Weeks, using divide by six (6) scheme with 896-years/159 LWs or 834-years/148 Leap Weeks.

AUTHOR

Slide 23. **VIJ's Gregorian Rhyme Calendar**

This 52-week or 364 day calendar has four (4) equal quarters, two (2) equal half years, and uses the month-names as of the current Gregorian calendar. The distribution is:

January (31d), February (29d), March (31d); April (30d), May (31d), June (30d);
July (30d), August (31d), September (30d); and October (31d), November
(30d), December(30+1d).

This extra day (December 31) is placed OUTSIDE of calendar format as a WORLD DAY; BUT counted within the YEAR unless LEAP WEEKS scheme of [896-yrs/(149+10) Leap Weeks (or 834-yrs/(139+9) Leap

Weeks) are used]. The calendar can be seen at:

http://the-light.com/cal/bbv_greg-rhymecal

LEAP DAY Rule gets modified to add Leap Day between JUNE 30 and July 01, every FOUR (4th) years, and SKIPPED during 128th years, replacing the current 100/400-year Leap Day Rule; OR account a LEAP WEEK, once every sixth (6th) – divide by six YEARS, as per 896-year Rule (using 149 (normal) +10 (intercalary); or 834-yrs/ (139 (normal) +9 (inter-calary) Leap Weeks.

Slide 24. **Placing Leap Weeks on Divide by SIX (Rules), using 896-years/159 Leap Weeks**

It is proposed to modify the current **Gregorian Calendar** from divide by 4/100/400 'LD skip Rule'; to DIVIDE by four (4) and SKIP LD if year is **divisible by 128**. Since duration of 24-hour Day is maintained (except that 'further decimalisation of Time of the HOUR/DEGREE) are resorted; and ALL luniSolar calculations hold good astronomically with 24h x 100m x 100s (or 24h x60m x60s) clock. However, Leap Day accounting can be modified from the present DIVIDE by four-years (to accommodate Leap Weeks) has been replaced with DIVIDE the year number by six (6); to have a FULL WEEK inserted as Keplers' Leap Week of the YEAR XXXX as 53rd Week during which it occurs. ALL normal years have only 52-weeks (364-days), while Years with Leap Weeks have 371 days. Other than 149 Leap weeks, using divide by SIX (6) Rule – 10 Additional Leap Weeks need be inserted, during each 896-year span. TEN 896-year cycles, with year numbers to carry Kepler's Additional Leap Weeks are shown.

Reproduced from: Indian Journal of History of Science, 29(3), 1994; NEWS; Decimalisation of Time; Indian National Science Academy, New Delhi; pp.491 – 494.

EXTRACT from: Page 494

“An 896-year span shall have 327257.01010776 days*, to account 159 ‘leap weeks’. Other than all years divisible by six (6), only 10 inter-calary leap weeks need adjustment at a frequency of every 90-years the first (3) years later (i.e. during 93rd year) and the last (3) years earlier (i.e. during 87th year), if 896th year itself happen to be divisible by six (6).”
 *Calculated on Y1900 =365.242198781 days]

– Brij Bhushan Vij

Slide 25. **KEPLERS’ Inter-Calary 896-Years/159 Leap Weeks Cycles:**

Years other than those DIVIDED by six(6) when KEPLERS’ Additional LEAP YEARS i.e. (53rd Week) also fall

ROW # :	1	2	3	4	5	6	7	8	9	10
1st Row:	-3327	-3237	-3141	-3051	-2955	-2865	-2769	-2679	-2683	-2493
2nd Row:										
3rd Row:	-1467	-1377	-1281	-1191	-1095	-1005	-0909	-0819	-0723	SKIP
4th Row:	-0639									
5th Row:										
6th Row:	1221	1311	1407	1497	1593	1683	1789	1869	1965	SKIP
7th Row:	2049	2139	2235	2325	2421	2511	2607	2697	2793	2883
8nd Row:	2979	3069	3165	3255	3351	3441	3537	3627	3723	3813
9rd Row:	3909	3999	4091	4185	4281	4371	4467	4557	4653	SKIP
10th Row:	4737	4847	4923	5013	5109	5199	5295	5385	5481	5571

Based on Works of: © BRIJ BHUSHAN VIJ

Slide 26. **PRECESSION of Equinoxes**
 (Plate of Precession)

Slide 27. **Rate of Precession**

Since the center of Sun does not always cross the equator at the same equinoctial point, each year the Sun crosses the equator about 50- seconds ($Y_{2000}=0.013966486^\circ$) of arc-angle, west of the point where it crossed the year before – or 1° in 71.59997153 years. If Sun and Moon were the only influences on earth’s precession: the vernal equinox would move $50'' \cdot 27935 + 0.000229 T$ per year, where T is number of years after AD 2000 of arc. But, other planets also exert a pull that cause an eastward movement of $0.1''/\text{year}$ – called planetary precession. *This means that it will take $25775^y 361^d 11^h.97585916$ for the precession of equinoxes to take one full circle, at current rate of precession.*

Slide 28. **The NEW RHYME**

(to remember NUMBER of Days in the YEAR)

To remember ‘NEW’ scheme for number of days in each month:

The New Calendar Rhyme:

Thirty days July, September;
 April, June, November, December;
 All the rest have thirty-one;
 accepting February alone:
 Which hath but twenty-nine, to be
 (in) fine;
 Till leap year gives the whole week
 READY:

Is it not time to MODIFY or change
 to make it perennial, Oh Daddy!

And make the calendar work with Leap Week Rule!

And, in Hindi:

Tees Din July, September;
 April, June, November, December;
 Baqie Sab ke Ek-Aur Tees:
 Sirf February ke Ek-kum Tees;
 Har Cheh-saal baad EK Leap-ka-Saal
 Aawaye
 Usmen POORA EK SAPTAH aur
 Badhawaye

AUR, Leap Week calendar ka
 ‘Prayog Karein’.

Jan(31); Feb(29); Mar(31); Apr(30); May(31); Jun(30) [+Leap Day]
Jul(30); Aug(31); Sep(30); Oct(31); Nov(30); Dec(30 (+1WorldDay)
(365th day of Year is World Day, kept outside of Calendar).

Slide 29. **VGRCalendar Rules (as proposed)**

The Bonavian Civil Calendar does not use the Gregorian cycle. Instead, it uses an 896-year cycle, equivalent to a Julian calendar modified so that years divisible by 128 are not leap years. A year has a leap week if and only if *it is divisible by 28 but not 896 or has a remainder of 5, 11, 16 or 22* from dividing by 28. Its new year varies about 2 weeks against the seasons. Brij Bhushan Vij has proposed an 834-year cycle, where a year has a leap week if and only if *it is divisible by six or is one of nine additional years per 834-year cycle*. See his MS Word document for a table of these additional leap years. Each of these additional leap years occurs either 90 or 96 years after the previous such year and all have odd numbers divisible by 3.

– Entry: **Wikipedia Leap Weeks**

Earlier Contributions:

My works, prior to joining 'Calindr-L listserv' on 128-years modifying the Century Leap Day Rule (from ignore Leap Day count during 100th BUT count during 400th-years) using *divide by 4 plan – **changes to ignore Leap Day ONCE in 128-year cycle; and the 896-years/159 Leap Weeks cycle, on DIVIDE by SIX (6) Rule***. This remains ignored –why?

– My mails to experts refer.

Slide 30. **RULES COMMON TO Brij B.Vij's Proposed VGRCalendar PLANS**

Rule 1: The day that is 10 April 2005 in the Gregorian Calendar (JD 2453471), has the following date: 'Sunday - Kali5106-W00-00)/D-101 2005 April 10'.

Rule 2: This date is the new year of the Kali year. The number after Kali is incremented whenever the month and day on the end of the date becomes April 10. **At PRESENT**, I would rather leave Kali Era dates to be known as (Gregorian: G+47 i.e. January 01 + 47 = February 17/18); AND from (VG Year: (April 10) D101 – 52 = D49 (i.e. February 17/18). 2005 February 18 is 5th Lunar Tithi/Phase after Full Moon, as such cannot form the basis for CALENDAR. However, 2005 April 08/2060h (decimal) had a 'Solar Eclipse'.

Rule 3: The figures after the Kali year (W00-00) refer to a count of weeks and days of week both from 00, starting on the Kali New Year. Days of the week are Sunday for 00, Monday for 01 to Saturday for 06 and form the first part of the date.

Slide 31. Rule 4: The year month and day number at the end of the date is called the Vij-Gregorian or VG date. It arises from a year divided into months with number of days thus:

January 31	February 29	March 31	April 30,
May 31	June 30	July 30	August 31
September 30	October 31	November 30	December 30.

This accounts for 364 days (or 52 weeks). Additional days are added according to rule 7 of the plan, as Leap Days or as Keplers' Leap weeks.

Rule 5: Each month and day number in the VG date has the same day of week regardless of year or plan. To ensure this, the additional days defined in rule 7 of the plan need not be counted in rule 3 and so may be outside the week. Examine Rule 7 of the plan that takes care, to specify this.

These additional days shall be called 'World Days (for December 31) BUT placed before January 01; and 'Leap Day of Year XXXX' placed between June 30 and July 01, on Calendar following *Divide by four (4) 128-year plan'; OR add the Keplers' Leap Week on *Divide by six (6) along with additional inter-calary Leap Weeks, as per plan 896-yrs/159 LWks or 834-yrs/148 LWks.

Slide 32. **Rule 6:** The year number in the VG date is incremented when the month becomes January. The Day count preceding it becomes D-001 and is then incremented daily to provide a count of the number of days from January 1 in the VG date. The DATE of this first day (i.e. W00-00) is (JD 2453471), to define first day, that is called 10 April 2005 in the Gregorian calendar. I leave it for **calendar experts if YEAR start is made on December 21/22**. In fact, Julian Day count can be taken care via Gregorian Calendar; BUT count of Astronomical Atomic Days for VGRCalendar – especially the ‘World Day (Thursday) & Leap Day (Thursday) – placed outside of VGRCalendar format – Plan A) or Kelpers’ Leap Weeks (on divide by six PLUS the Additional Leap Weeks – Plan B) is of importance. As a consequence of Rules 1, 4 and 5 all VG months begin on the following days of the week every year in both plans, of VGR Calendar. These are:

January Friday (05);	February Monday (01);
March Tuesday (02);	April Friday (05) - 10th on Sunday
May Sunday (00)	June Wednesday (03)
July Friday (05)	August Sunday (00)
September Wednesday (03)	October Friday (05)
November Monday (01)	December Wednesday (03)

Removing July 31 (of Gregorian Calendar) and inserting this DAY as February 29th (after February 28th); VG Years are in FOUR equal quarters, each of 91-days or 13-weeks. The 365th day (December 31) remain ‘outside BUT part of VGRCal format’; unless Divide by SIX (6) Leap Weeks with ADDITIONAL Leap Weeks are used.

Slide 33. **WORLD DAY AND Leap Day/Week**

Rule 7(A): In addition to the 364 days specified in rule 4, there is an additional day at the end of December and in Leap Years at the end of June. To comply with rule 5, these days are outside the week. The week and day count defined *in rule 3 is suspended for these additional days*. **The additional day at the end of June is called a Leap Thursday that (come between Thursday and Friday), UNLESS ‘Year Start is shifted to January 01 or December 21/22’ – when the day sequence shall change, as in VGRCalendar.**

Rule 7 (B) – Years with Leap Weeks: In addition to the 364 days specified in rule 4, some years have a leap week of 7 additional days added as a separate month after VGR during December. **The count of weeks and days of rule 3 is continued across this leap week (which runs from Friday to Thursday); after the month of December, BUT before start of the month January (counted Friday (05) thro Thursday (04), during Years XXXX.** THIS 7-day ‘separate month/week’ be called ‘Keplers’ Leap Week of the Year XXXX, as placed and defined.

Slide 34. **Determining Leap YEARS (without or With Leap Weeks)**

Rule 8A: The leap years are those years whose VG year number is divisible by 4, but not divisible by 128 (as suggested by Karl). I, however feel, this might lead to a confusion later - unless taken care of. **Since year 2000 had a ‘leap day’ [(Y - 80)/128] is divisible by 128; as such Year 2048 i.e. [(Y - 80)+128], leave NO remainder. This shall be a normal ‘Non-Leap day Year’: as also Years 2176, 2304, 2432, 2560, 2688, 2816 (in blocks of 128-years) are NON-Leap Day Years.** PROVISION may be considered to ‘count elapsed days – like JD count – between any two Dates of VG years, unless it is automatically taken care of during JD count marking VG Years.

Rule 8B (896-years/159 Leap Weeks): A year whose VGY number is divisible by 6 has a leap week. Other than these, the following 10-VGY year numbers, also have the Keplers’ Leap Week of the Year XXXX (during Y2049th thro Y2945th) - 2049, 2139, 2235, 2325, 2421, 2511, 2607, 2697, 2793, 2883. These blocks repeat during every third 896-year cycle, since the last of these years has its number divisible by six (6),– already has a leap week. **This**

rule does not add a leap week to such a year, ensuring that it has just one leap week. Note that the leap week cycles repeat once every $896 \times 3 = 2688$ years, because 896 is not divisible by six (6). In these 2688 years there are $2688/6 = 448$ leap weeks by rule 8B. There are 30 listed by rule 9B, but one of these already has a leap week by rule 8B so only 29 arise from rule 9B. This makes a total of $448+29=477$ leap weeks, which is exactly 159 leap weeks per 896 years.

The alternative to above – **834-YEARS/148 Leap Weeks**: There are years in addition to those in rule 8B that have a leap week. They have the following VG year numbers: 2049, 2139, 2235, 2325, 2421, 2511, 2607, 2797, 2793 –thus synchronising START YEAR at 2049th (for all options above). These repeat in an 834-year/148 Leap Weeks cycle. Note that 834 is divisible by six (6). This enables the alternative rule to be simpler. The leap weeks repeat every 834 years with $834/6 = 139$ leap weeks by rule 8B and 9 by rule 9B. This alternative ensures that the New Year varies over the seasons by just 2 weeks. POINT to consider between ‘seasons drift’ and long-term accuracy of Mean Year favour tilt towards 834-yrs/148 LWks. Brij’s 896-yrs/159 LWks scheme is also 7×128 -year cycle; and recommended for continuation of VG Year count as at Rules 4, 5 & 7A. BUT the final choice is left for astronomers/Calendar people to decide – the better choice!

– Brij Vij & Karl KEV Palman

Slide 35. **ONE CALENDAR 3-OPTIONS**

(VG294 using 293-yrs/302*12 Lunar Years)

This simplest 3-options ONE CALENDAR suggest (to use Gregorian calendar) by shifting July 31 to the month February as of 29 days; and keeping December 31 OUTSIDE of calendar format:

- (a) Leap day is inserted after the month June but before July, using divide by four (4) rule on modification of 4/100/400 rule to **4/128-year scheme**;
- (b) The period 1.242189669781 day over 364-days is accumulated and planned to introduce **Keplers' Leap Weeks of Year XXXX** as per 896-years/159 Leap Weeks Plan, or 834-years/148 Leap Weeks Plan; or
- (c) use VG294-years ($364 \times 294 = 107016$ days) - NO LEAP DAYS or LEAP WEEKS, in 293-years/302 Lunar Years.

– BRIJ BHUSHAN VIJ

Slide 36. **Lunar Calculations** (Tithi/Phases of Moon)

Based on 2 Lunation/59th, the Ratio Tithi/Phase = $138W/965$ day; 138 weeks approximate to 1930/59 lunation = 32 lunation & 21 Vij tithi's; and also 4071 weeks to 965 lunation. This gave rise to Brij inventing a T-unit such that: 1 Vij tithi = 138 T-units (each T-unit of 1741-decimal second). ONE lunation = 4071 T-units; and by this approximation:

1 week = 965 T-units.

Lunar Fractional day, $26/49 = 0.5306122449$; AND, Solar Fractional day, $29/32 = 0.90625$. Also, $[26/49 + 29/32 = (26 \times 32) + (29 \times 49) / 49 \times 32] = 2253/1568$; to give Mean Year = [Solar month of $(29 + 26/49 + 29/32) \times 12 = 12 \times [30 + 685/1568] = 365.24234693877551$ days.

Thus, I suggest, ONE sIrT-unit = $[685/1568 \text{ day}] / 1741 = (104847 \text{ ds} / 1741) = 60.22225087623$ T-unit. This gives, ONE solar month of $[30 + 685/1568 \text{ days}] = 68.67153284671533$ sIrT-units.

Also, One solar month = $365.242189669781 / 12 = 30.4368491391484167$ days OR 4195.7747234 T-units. Mean Difference (days): $(30 + 685/1568) - 30.4368491391484167 = 0.00001310575$ d (0.000157269 d for Mean Year).

NOTE that: Current Length of Year = 365.242189669781 days; & Mean Synodic (Lunar) month = 29.5305881 days.

– Based on E-mails between Brij Vij and (Karl Palman & Calndr-L)

Slide 37. **Special UNITS – T-Unit, X-Unit & slrT-Unit**

– refers to mails exchanged with Karl KEV Palman & Calndr-L group

ONE T-unit = $T/138 = 0.00725388601 \text{ d} = 1740.93264248705 \text{ decimal second}$, Or, (X-Unit = 1741 sd). I have attempted to show durations for other units linked to

year/week/day/hour/minute in terms of X or T-Unit multiples. Also, see:

< http://www.the-light.com/cal/bbv_lunislrXorT-Units.doc>

1 T-Unit, also X-Unit is (ratio Tithi/138) = 1741 sd;

1 Decimal minute = 0.06 X; 1 Hour = 5.744 X; 6 Hours = 34.4643 X;

12 Hours = 68.9285 X; 24 Hours = 137.8571 X; One Week (7-days) = 964.9994 X;

52 Weeks (364-days) = 50179.9692 X; 53 Weeks (371-days) = 51144.9686 X;

ONE Year = 365.242189669781 days = 50349.2966805 X-units;

417-years = 20995657 X-units; 834-years = 41991313 X-units; &

896-years = 45112970 x-units. It may not be difficult for *Astronomy experts* to see through the utility of 'T-units'

that link Moon's motion with the motion of Earth and Sun for 'Ephemeris Astronomy and Calendar construction'.

ONE slrT-unit = $[685/1568 \text{ day}]/1741 = (104847 \text{ ds}/1741) = 60.22225087623 \text{ T-unit}$. This gives, ONE solar month of $[30+685/1568 \text{ days}] = 68.67153284671533 \text{ srIT- Units}$ (see also Lunar Calculations).

Slide 38. **THE Mohenjo-Daro BATH or Observatory**

Was it a community swimming pool or an astronomical OBSERVATORY, as I perceived – examining physical dimensions as projected by Sir Mortimer Wheeler?

(Plate Indus Inch & Mohenjo-Daro Bath)

Slide 39. **The Harappan Calendar**

(Plate of Harapan Calendar)

Slide 40. **HOW to:**

By combining Time, Space, Mass and Energy ALL (!) things via Metre New (m') can be measured, optimised and *form* the Universal Measure of TIME

– Derek Winder/Brij Vij.

Slide 41. **Slides by DEREK WINDER**

(SLIDES: Day 1 thro Day 8)

Derek Winder took upon himself the pain to examine my 'concepts' as they developed since my study of: *What happens if time standard went METRIC (1971). Derek's valued suggestions and Karl KEV Palman's probing made me improve upon my calculations to SHOW – Calendar Reform was a reality in offing, with its deeper roots in Indus Civilisation of Mohenjo-Daro times; and equally deep were the links in Genesis thoughts of the West. Often I pointed, this as the **cause that needs remedy** rather than creating walls among fellow beings – humanity, leading to the need for ONE WORLD CALENDAR.

– **BRIJ BHUSHAN VIJ**

Slide 42 (Day 1 thro Day 8)

Day-1 Genesis

Slide 43.

Day-2 Genesis

Slide 44.

Day-3 Genesis

Slide 45.

Day-4 Genesis

Slide 46.

Day-5 Genesis

can transit in $(142+141+142+141+142+141 +142 = 991 \text{ weeks})$. It may be interesting to observe that 'Lunation count (for luni-solar adjustments) in terms of 141 week (groups - 2.702316512 year)' shall go a long way. The day is NOT far away, when it could be divided into 10/20 or 12/24 hours to represent day (or/and night) spans, using sub-divisions of the hour-minute-second - to include 'metric or decimal' time scale.

128-years cycle could follow: [19,19,19,33,19,19]; [33,33,29,33] or may be 128-years cycle of [33,62,33] find better and interesting result, while symmetrical placing. A Mean lunar month of 29.53058156 days would result on reducing 8 decimal minutes from mean year of value 365.25 days, when used along with ratio (19/235) as: Mean lunation $= (365.25 - 1/300) \times (19/235)$.

My working of 19-year Metonic cycle using $5 \times 47 = 235$ lunation may result in exact fit, and avoid use of inter-calary lunation to merge with 33-year 'solar cycle' as $47, 47, 47, 47, 32, 47, 47, 47, 47 = 408$ lunation. Also, 33-year (12053 days) solar cycle, with solar motion of 0.98564672695594-degree per day, make interesting link, with 408 lunation if we resort to 19-yrs/235 lunation as:

$(33+A)+(33+1)+(33+1)+(33+1)+(33+1)+(33+1)+(A+33)+(33+1)+ (33+1)+ (33+1)+ (33+1)+ (33+A)$ i.e. $12 \times (33+1) = 408$ lunation $= [19\text{-yrs or } 235 \text{ lunation}] + [14\text{-yrs or } [(33+1) \times 5 + 3 \text{ extra lunation (A)}]$.

– BRIJ BHUSHAN VIJ

Slide 53. Nakshtra/Asterism–Ratio Value

$1/27^{\text{th}}$ of Sidereal Moon $(27.321661\text{d})/27 = 1.01191148...1481 \text{ day}$. Earth has (mean sidereal day): $86164.0905382 \text{ seconds} = 23\text{h } 56\text{m } 4\text{s}.0905382]$. NOTE, Nakshatra/Asterism of ratio:

$849/839 = 1.011918951132$ is a practical value to use.

Using 896-years/159 Leap Weeks:

Mean Year = $7 \times (52 + 159/896) = 365.2421875 \text{ days}$; &

On using 834-year/148 Leap Weeks:

Mean Year = $7 \times (52 + 148/834) = 365.242206235 \text{ days}$.

360-degree = 12 Zodiacs (30-deg each);

27 Nakshatra (each of 13.3...33 degree). Thus,

ONE Zodiac $= 30/13.333333 = 2.25000005625$ Nakshatra.

Slide 54. UNIVERSAL DECIMAL CODE

(Where EAST MEETS WEST)

INDO-WEST COUNT for LARGE-n-SMALL QUANTITIES/NUMBERS

Assigned Value	Unit Name	Proposed Value
$10^{24} =$	yotta [Y]	$= 10^{30} = 1 \text{ 0000 0000 0000 0000 0000 0000}$
$10^{21} =$	zetta [Z]	$= 10^{25} = 1 \text{ 0000 0000 0000 0000 0000}$
$10^{18} =$	exa [E]	$= 10^{20} = 1 \text{ 0000 0000 0000 0000}$
$10^{15} =$	peta [P] (Arbud)	$= 10^{15} = 1 \text{ 0000 0000 0000}$
$10^{12} =$	tera [T]	$= 10^{12} = 1 \text{ 0000 0000 00}$
$10^9 =$	giga[G] (Crore)	$= 10^{10} = 1 \text{ 0000 0000 (thousand million or billion)}$
$10^6 =$	mega [M] (Lakh)	$= 10^5 = 1 \text{ 00000 (a million)}$
$10^3 =$	kilo [k]	$= 10^3 = 1000 \text{ (a thousand)}$
$10^2 =$	hecto [h]	$= 10^2 = 100 \text{ (a hundred)}$
$10^1 =$	deca [da]	$= 10^1 = 10 \text{ (ten)}$
	U N I T	
$10^{-1} =$	deci [d]	$= 10^{-1} = 0.1 \text{ (a tenth)}$
$10^{-2} =$	centi [c]	$= 10^{-2} = 0.01 \text{ (a hundredth)}$
$10^{-3} =$	milli [m]	$= 10^{-3} = 0.001 \text{ (a thousandth)}$
$10^{-6} =$	micro [μ]	$= 10^{-5} = 0.00001 \text{ (a millionth)}$
$10^{-9} =$	nano [n]	$= 10^{-10} = 0.00000 00001 \text{ (a thousand millionth)}$
$10^{-12} =$	pico [p]	$= 10^{-12} = 0.00000 00000 01$
$10^{-15} =$	femto [f]	$= 10^{-15} = 0.00000 00000 00001$
$10^{-18} =$	atto [a]	$= 10^{-20} = 0.00000 00000 00000 00001$
$10^{-21} =$	zepto [z]	$= 10^{-25} = 0.00000 00000 00000 00000 00001$

(Reference: Book Towards A Unified Technology by – BRIJ BHUSHAN VIJ (1982))

Slide 55. **THIS is India's contribution –**
as a dedicated investigation of
WHY IS WORLD TIME still non-METRIC?

My approach for REFORM satisfy the 'impacts feared towards COST that may need be incurred 'if and when' the change need be brought about;

- (a) No change to 7-day Sabbath cycle;
- (b) No change to 12/24-hour clock face;
- (c) **No/or minimal change to Gregorian calendar format;**
- (d) No major change to mathematical/trigonometric functions; and
- (e) availability of the most easily adaptable scheme with least possible changes – to get the **surest, easiest and cheapest** transitional proposal

(– **BRIJ BHUSHAN VIJ (1971 thro.....)**)

Slide 56. (Flt Lt BB Vij) Photo (**It is possible –**)
to see through and be the BRIDGE between
India's glorious past of Indus Civilisation
and reason beyond cultural binds for
Socio-Scientific &
Politico-Economic REFORMS.

Slide 57. **IMPORTANT**
MODIFY THE TEXT YOU GOT
(if you consider contents misleading)
and send to experts & friends
with intimation to this author <metricvij@hotmail.com>
for **GETTING improved feed back.**

GOOD LUCK

– *Brij Bhushan Vij*

IT IS YOUR TURN TO
make Time/Calendar

REFORM – a reality.

Slide 58. **YOU CAN BUY A BOOK**
to spend time
BUT NOT KNOWLEDGE

ACKNOWLEDGEMENTS:

BASED on my contributions since 1971, on the possibility of **CALENDAR REFORM** (Metrication of Time of the Day/Hour), I have openly discussed my **WORKS** with experts on usma@colostate.edu (since May 2002); and [CALNDR-L @ECUMAIL7 .ECU.EDU](mailto:CALNDR-L@ECUMAIL7.ECU.EDU) (since July 2002).

My thanks are **specially due to Derek Winder, Karl KEV Palman** for intimate probing my mind to check my works and calculations, in the interest of Calendar Reform. Thanks are also due to **EXPERTS/ astronomers** like Tom Peters, Victor Engel, Lance Lathem, Amos Shapir, Villas Marcos, Prof Irv Broomberg, Aristeo Fernando, John Hynes, Shriramana Sharma and a host of others who responded to my thoughts/E-mails – in good taste – in the hope that 'impediments observed during early attempts on Calendar Reform by League of Nations & United Nations Educational & Social Cultural Organisation, consider

to revoke the necessity for ONE WORLD CALENDAR (Time & arc-Angle inclusive) via Earth dimensions & Nautical Astronomy.

– Brij Bhushan Vij (Deewali – Amavasya : 2005-11-02 CE 01:24)

Slide 59. **DEDICATION**

Mind enlightenment remained a dream unrealized for my father late Shri Kundan Lal Vij, expired 1966 January 14, to see me educated.

My children, Munish/Monica/Rajnish remained deprived of the comforts that I lacked to provide – knowing I had entered a path of NO RETURN, in my search for truth and knowledge.

I dedicate, material gains – if and when they come – to judicious use by my children and grand children: Natasha/Paarth/Vedant & Vanshikha or their lineage, for their education of mind & soul; and to create a family trust to HELP THE NEEDY, for their technical excellence.

20051031

Brij Bhushan Vij – Author

Slide 60.

END OF SLIDES & EXIT