

The Measurement of Time as in SreemadBhagabatam

Abhijit Sen

Department of Physics, Suri Vidyasagar College, West Bengal, INDIA

&

Dinesh Kumar Das

Department of Sanskrit, Suri Vidyasagar College, West Bengal, INDIA

Abstract

Long ago, more than three thousand years before Christ, the famous ShreemadBhagabatam reports on a classification and unit of time that surprisingly matches with our present day usage to a very large extent. Not only that, times much smaller than our unit 'second' of today was in use. This article attempts a comparative study between the two.

The Text & Discussion

Our discussions begin with a quotation from the famous sage Maitreya[1]:

CharamahsadwisheShanaamanekahasangjutahsada |

ParamaNuhsavijneyahnriNaamOikyavramahjatah | |

Meaning that [2]

The ultimate building block, which is indivisible and the fundamental constituent of matter, is called the "ParamaaNu" or 'atom'. It always exists as an invisible identity, even after the dissolution of all forms. The material body is a combination of such atoms, but it is misunderstood by the common man. Matter consists of the most fundamental particle called 'ParamaaNu'. This is something that modern day science also says. From Dalton's Atomic Theory we get the same picture.

But today we know that atoms are not indivisible. They have an underlying structure. Nevertheless, for our usual everyday world the basic fundamental nature remains the same as stated in the 'SIOka'.

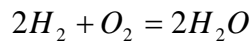
ShreemadBhagabatam moves on to describe the fundamental nature of 'ParamaaNu' as a particle. It is said that there are times when they do not combine, but it is these 'ParamaaNu's which combine or add up to form the variety of existing matter [3]:

Sataebapadaarthasyaswarupabasthitasyajat |

Kaibalyangparamamahaanabishe Shahnirantarahl |

This is exactly what modern science echoes. We know that atoms combine to form molecules. For the elements similar atoms combine to form molecules of that element like $H + H = H_2$

Again different atoms combine to form molecules of compounds like



This is what ShreemadBhagabatam says.

Time is defined in ShreemadBhagabatam following the movement of the atomic combination of bodies [4]. In the remaining part of the SIOka, the potency of the Omnipresent Almighty is stated.

Ebong Kalahapianumitahsouxhsmyesthauye cha sattama |

Sangsthaanabhuktyaabhagabaanabyaktahbyaktabhugbibhuh |

The time taken by the sun to cross an atomic dimension is taken to be the atomic time scale [5]. The concept of something called the 'great time' is also stated which is not of interest to us presently.

Sa kalahparamaaNuhbOijahbhungteparamaaNutaam |

SatahabisheShbhugjastusa kala paramahaan |

At this point Shreemad Bhagabatam tries to define [6] the smallest visible dimension. Normally atoms are invisible. But at times we can 'see' a conglomeration of them. If we see light entering through an open window we sometimes see numerous tiny particles streaming upwards. These are actually hex atoms, formed by three double-atoms (molecules) which in turn is made up by two joining atoms. We call these hex atoms as TrasareNu.

ANurdvouparamaaNUsyattrasarenuhtrayahsmrritah |

Jaalarkarashmyabagatahkhamebaanupatannagat ||

These hex atoms or 'trasareNus' tend to combine with one another. The time required to join three 'TrasareNus' is called a 'Truti'. The time equalling hundred 'Trutis' make up a Bedhah and three 'Bedhah' add up to make a 'Laba'. The 'SIoka' says [7]

TrasarenNutrikangvungktejahkaalhsatrutihsrritah |

ShatavaagastubedhahsyaattOihtrivihtulabahsmrritah ||

As far as modern day clocks go, a 'truti' equals $8/13500$ seconds = 5.926×10^{-4} seconds or 0.5926 milliseconds, a 'Bedha' equals $8/135$ seconds = 0.059 seconds and a lava equals $8/45$ seconds = 0.178 seconds [8].

Continuing along the time scale, three Labas add up to make a NimeSha, three NimeShas make a 'KShana', five 'KShanas' give a 'KaaShTha' and fifteen 'KaaShTha' form a 'Laghu' [9].

NimesHahtribalahjneyahaamnaatastetrayahkShaNah |

kShaNaanpanchabiduhkaShThanglaghu ta dashapancha cha ||

Mathematically a 'NimeSha' equals $8/15$ seconds = 0.533 seconds, a 'KShana' equals $8/5$ seconds = 1.6 seconds and a 'KaaShTha' equals 8 seconds and a 'Laghu' is equal to 8 minutes.

Moving on, fifteen 'Loghus' add up to a 'NaDika' or 'DaNda', two 'NaDikas' give a 'Muhurtam', six or seven 'MuhUrtas' make up a 'Prahar' or one fourth of a day or night [10].

LaghUnibaisamaamnaataadaShapancha cha naaDika |

TedvemuhUrrtahpraharahShaRyamhsaptabanrriNaam | |

In modern language a 'naDika' or 'DaNda' equals half an hour or 30 minutes, a 'Prahara' is equal to 3 hours. The remaining part gives units just as we use today, hence we do not repeat it.

Four 'Praharas' make up a day, so do a night. Fifteen day-nights give a 'PakSha' or fortnight. Two such fortnights give a month [11].

YaamaahchatvaarahchatvaarahmarrtyanaamahanIubhe |

PakShahpanchadaShaahaaniShuklahkrriShNah cha maanada | |

This goes on to add [12]

TayOhsamucchayOhmasahpitriNangtadaharrniSham |

DvoutabrrituhShaRayanangdakShiNangchOttarangdibi | |

Meaning that two 'PakShas' add up to give a month and that equals a day and a night in 'PitrrilOka'. Two months make up a season and six months for the duration of solar travel in one direction.

Finally it is said that two solar travels in opposite directions form a day and a night for the Gods. This equals a year for humans. The humans live for a hundred years [13].

AyanechaahanIpraahuhbatsarahdvaadashasmrritah |

SangbatsarashatangrriNaangparamaayuhnirUpitam | |

Conclusion

As we saw in the article the ancient text speaks of time with remarkable accuracy. The deep insight into the matters is mind boggling. We as Indians can indeed take pride in our old and rich ocean of knowledge.

Reference

1. Sloka 1, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 403 (In Bengali), Bhaktibedanta Book Trust, 2012
2. <http://vedabase.net/sb/3/11/en>
3. Sloka 2, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 404 (In Bengali), Bhaktibedanta Book Trust, 2012
4. Sloka 3, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 404 (In Bengali), Bhaktibedanta Book Trust, 2012
5. Sloka 4, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 404 (In Bengali), Bhaktibedanta Book Trust, 2012
6. Sloka 5, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 405 (In Bengali), Bhaktibedanta Book Trust, 2012
7. Sloka 6, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 406 (In Bengali), Bhaktibedanta Book Trust, 2012
8. Discussions after Sloka 14, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 411 (In Bengali), Bhaktibedanta Book Trust, 2012
9. Sloka 7, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 407 (In Bengali), Bhaktibedanta Book Trust, 2012
10. Sloka 8, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 407 (In Bengali), Bhaktibedanta Book Trust, 2012
11. Sloka 10, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 408 (In Bengali), Bhaktibedanta Book Trust, 2012
12. Sloka 11, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 409 (In Bengali), Bhaktibedanta Book Trust, 2012
13. Sloka 12, SrimadBhagabat, Third Canto, Part 1, Chapter 11, Page 409 (In Bengali), Bhaktibedanta Book Trust, 2012