

On Time and Calendar: Calculating the Millennium

by M G Mostafa

Understandably, the approach of the Third Millennium generated a great deal of excitement and expectations all around the globe. Apart from the fact that a millennium, like a century, is a convenient unit of time, it has no special significance — physical, religious, or otherwise. It has no magical attribute, either for good or for evil.

ONCE an expatriate Indian accosted an English gentleman in a London street and inquired, "Excuse me, Sir, what is time?" Unaware of the nuances of the English language, the inquirer expected the Englishman to tell him the time of the day. However, the Englishman, steeped in Formalism, interpreted the question in a literal sense. Puzzled, he looked at the questioner for a few seconds and then replied, rather gravely, "Well, that is a very deep, philosophical question." Leaving aside the comic aspect of the situation, it must be admitted that time is indeed a very intricate concept.

While one facet of human consciousness is the awareness of time, the meaning of the word, time, cannot be distilled into a neat verbal definition. Time seems to flow or pass, or else people seem to advance through it. But the nature of this passage or advance appears to be mysterious; it in fact transcends human understanding. Further, did time have a beginning or does it have an end? According to cosmologists, the universe is expanding with the galaxies receding from one another, and the universe as it is known originated in a primeval explosion, called the Big Bang, at a date of the order of 15x10^9 years ago. This could be regarded as the beginning of time. There is no unanimity among scientists as to whether time will ever come to an end. In revealed religions, such as Islam, Christianity and Judaism, the Day of Judgment marks the end of time.

Although defining time presents formidable problems, measuring it in terms of days, months, and years, is a relatively simple matter. Even primitive societies measured time in these units in order to regulate their civil life and religious observances. The device, known as a calendar, by which time is divided into convenient units to meet society's needs continues to play a vital role in the modern world also. The basic unit of computation in a calendar is a day, measured from midnight to midnight in the West. In the East, however, the day is often measured from dusk to dusk or from dawn to dawn. The seven-day week owes its origin partly to the Babylonian belief in the sacredness of the number 7, and partly to the importance of Sabbath in Jewish life. The month (moon) is based on the lunation, that period in which the moon com-

pletes a cycle of its phases, from New Moon to New Moon. This is called the synodic month. This period lasts approximately 29.5 days, and most early calendars were, essentially, collections of months — a collection of 12 consecutive synodic months forming a year (lunar).

The duration of the lunar year is 354 (29.5x12) days, while the mean solar year, the period taken by the earth to make a complete revolution round the sun is 365 days. To be more precise, one synodic month amounts to 29.53059 days, whereas the solar year (the mean tropical year) amounts to 365.242199 (almost 365.2) days. Consequently, a calendar based on lunar months is not suitable for determining the seasons which are a solar, not a lunar, phenomenon. To make matters worse, there is no simple relationship between the two numbers, 29.5 and 365.2, and neither is composed of a complete number of days. Hence, in order to compile a calendar that keeps in step with the moon's phases or with the seasons it is necessary to insert days at intervals; such additions are known as intercalations.

The Julian calendar introduced by Julius Caesar in 46 BC achieved this objective to a large extent. This is a solar calendar, and the length of the solar year is taken as 365.25 days. Further, 11 months of 30 or 31 days and the remaining month of February contains 28 days in common (365.25) years, and 29 days in every fourth year (a leap year, of 366 days). The intercalation of a "leap day" every fourth year was intended to maintain correspondence between the calendar and the seasons. However, the solar year comprises precisely 365.242199 days, slightly less than 365.25 days, resulting in an error of 11 minutes 14 seconds per year. This error amounts to about 8 days in 1000 years.

By the middle of the 16th century the Julian calendar became increasingly out of phase with seasons. At this stage, Pope Gregory XIII effected some reforms in the Julian calendar to correct the error that had accumulated. The Gregorian calendar stipulates that no century year is a leap year unless it is exactly divisible by 400. A further refinement, the designation of years exactly divisible by 400 as common (not-leap) years, will keep the Grego-

rian calendar accurate to within one day in 2000 years. Mathematically speaking, these successive refinements constitute what is called an iterative process. The Gregorian calendar is the one that is almost universally used today.

The Muslim Era (Hijra), a lunar calendar, introduced by Hazrat Omar (PBUH), the second caliph, dates from 16 July 622 AD, when the Holy Prophet (PBUH) emigrated from Makkah to Madinah. Since lunar calendar falls short of the solar calendar by about 11 days, the current Muslim Era is 1420 AH, not 1377 AH (1999-2000), the Muslim Era advancing one year almost every 32 solar years.

Although the Julian calendar, as a means of grouping days into months and year, was codified by Julius Caesar, the system of actually numbering the consecutive years with reference to some important event was started much later. The Christian Era, now in vogue throughout the world, was devised by D Eixgius, an Italian monk, in 525 AD. Christ's birth was taken as the point of reference, and years were reckoned as either AD (Anno Domini, "in the year of the Lord") or BC (Before Christ). There was no AD 0; the year before AD 1 was BC 1. This omission, or aberration as the mathematician would call it, is attributable to the fact that the digit, 0, was not known to the West until the 13th century. Zero (0) was invented in the Indian subcontinent and the West came to know about it through the Arabs much later. It is interesting to note that the Roman numerals (I, V, X, L, C, D, M), which the venerable monk presumably used, do not contain any symbol for 0. Equally interesting is the fact that the digits — 0, 1, 2, ..., 9 — that we use everyday are known as Arabic numerals. This omission led to a "conflict" between history and science, or more precisely, between history and mathematics.

In mathematics, the point of reference, or the origin as it is normally called, is always assigned the value 0. Other quantities, counted in relation to this origin, either increase or decrease depending on which side of the origin the quantity lies. There cannot be any break in time as it flows continuously. One cannot jump from -1 to +1 without passing through 0. To put it another way, there must be 0 on the time axis between -1 and +1. That is, in the present context, there must be

AD 0 between BC 1 and AD 1. For a scientist, this is an immutable principle; it cannot be trifled with. Any departure from this will result in inconsistencies and contradictions. Since it is not possible, at this stage, to have AD 0, the mathematician would treat AD 1 as the origin, at least notionally, and then terminate the first millennium on 31 December 999 in order not to duplicate the same error over and over again. The first millennium will then span a period of 999 years only, but the second and the succeeding millennia will remain immune from the "virus" of misplaced origin. That is, each of them will cover a period of 1000 years, as it should.

What is more important, this convention will obviate many complications that would ensue from the omission of AD 0. It is, as if, the mathematician has preempted the occurrence of a serious problem similar to Y2K bug that we were about to face. The convention might appear rather esoteric, and cause a little unease. But the fact remains that we are not free to use numbers in a way that contravenes the very principles on which they are based. The number system is, after all, a theoretical framework with its rigid laws and by-laws. Hence the second millennium which commenced on 1st January 1000 AD expires on 31 December 1999. However, from the standpoint of a historian, the second millennium begins in 1001 AD, and the third in 2001. In this tug of war between history and science, science and mathematics have prevailed. The requirement of the number system itself has predated this.

Understandably, the approach of the Third Millennium generated a great deal of excitement and expectations all around the globe. Apart from the fact that a millennium, like a century, is a convenient unit of time, it has no special significance — physical, religious, or otherwise. It has no magical attribute, either for good or for evil. A day and a year have physical significance in that they are both caused by the movement of the earth. A millennium, on the other hand, is just a creation of the human mind. Let us treat it as such, and disabuse ourselves of fancy myths concerning the millennium.

The author is a former Professor of Statistics at Dhaka University.

The Night of Honour

by Kazi Aulad Hosain

Muslims all over the world supplicate Allah Gafur-ar-Rahim for salvation of their sins during this holy month of Ramadan and we are fortunate that we have got the best and the greatest of all the nights, the Laila-tul-Qadr, or the Night of Honour, in this holy month of Ramadan.

LAILA-TUL-QADR or the Night of Honour referred to in the Holy Qur-an (Sura Qadr) is the best of all nights. This Sura Al-Qadr of the Holy Qur'an has a back-ground, which I may mention here for the kind information of readers. One day our holy Prophet (peace be on him) was in the midst of his companions (sahaba) and while discussing with them matters of religion he said, "A saint from among the Children of Israel (Bani Israel) achieved spiritual and physical power as a result of his continuous prayers to Almighty Allah for a long period of one thousand years. On hearing this, the companions became sad since they would be unable to offer prayers to Allah for a thousand years as they would not live that long. Benign Allah heard the discussion and appreciating the despair of the holy Prophet's companions, revealed Sura Qadr to the holy Prophet (PBOH).

Now let us see for a moment what Almighty Allah says in Sura Qadr of the Holy Qur'an. He declares, "(1) We have indeed revealed this (Message) in the Night of Honour. (2) And what will explain to thee what the

Night of Honour is? (3) The Night of Honour is better than a thousand months. (4) Therein come down the angels and the Spirit by Allah's permission on every errand. (5) Peace! This until the rise of Morn."

It may be further pointed out that the entire Qur-an was written and memorized by the "Huffaz" during the lifetime of our holy Prophet (peace be on him). Such a unique and wonderful Holy Book, dear readers, was revealed to our holy Prophet (peace be on him) in the Laila-tul-Qadr, that is, in the glorious Night of Honour or Power as clearly indicated in the aforesaid Sura of Al-Qur-an.

Again, in revealing verses 2 and 3 of Sura Qadr to the holy Prophet (peace be on him), when the All-knowing Benign Allah says that this glorious Night is better than a thousand months, it should not, however, be interpreted literally but should rather be taken as a figure of speech. According to Al-lama Abdullah Yusuf Ali, a great translator of the Holy Qur-an and a commentator of international repute, "One moment of enlightenment under God's Light is better than a

thousand months or years of animal life and such a moment converts the night of darkness into a period of spiritual glory."

The holy month of Ramadan, we are all aware, is the best of all the twelve months of the Islamic calendar and at the same time it is also the glorious month for self-purification and seeking salvation of one's sins. Muslims all over the world supplicate Allah Gafur-ar-Rahim for salvation of their sins during this holy month of Ramadan and we are fortunate

that we have got the best and the greatest of all the nights, the Laila-tul-Qadr, or the Night of Honour, in this holy month of Ramadan.

In view of the facts stated above the religious Muslims pass this unique night, (27 Ramadan) offering special prayers, reciting the Holy Qur-an and supplicating Benign Allah for salvation and fulfillment of their just and genuine desire. They must not let this rare opportunity slip and beseech His Benediction.

Ministry of Health and Family Welfare Policy Research Unit Appointment Notice for International Consultant

Policy Research Unit (PRU) of the Ministry of Health and Family Welfare, Bangladesh invites applications to appoint an International Consultant on full time basis primarily for a period of 12 months. PRU seeks a qualified person with high/senior-level experience in health economics and health policy development with proven ability to work in health policy analysis and policy development at the national level. The successful applicant will work under the direction of the Joint Chief, PRU to assist him in the policy research and coordination of research work for PRU and its sub-units (Health Economics, Human Resource Development, and Gender, NGO, Stakeholder Participation Unit). Responsibilities will also include assist in development of Operation Plans, its implementation and monitoring and reviewing work plans for PRU sub-units as well as drafting policy guidance and reports at the request of the government will also be required of the successful applicant. Along with a Ph.D degree in economics or related discipline, the successful applicant will have at least 5 years experience in health policy research or health economics research and at least 3-5 years field experience in Bangladesh or South Asia providing design and direction of national-level health policy development programs. A working knowledge of sector-wide health projects is highly desired.

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The Month of Ramadan and the Night of Power

by Abu Imran

No one knows which night of the month is the night of Qadr. There is an indication that it is after the 20th of Ramadan and falls on an uneven night i.e. 21st, 23rd, 25th, 27th or 29th. But some hold the opinion that the 27th night is the night of Qadr and hence by and large people try to pass this night in "Ebadat".

THE holy month of Ramadan bears special significance due to the fact that the holy Qur'an was first revealed on the holy prophet (PBUH) in this month. In the words of Allah — "The month of Ramadan in which was revealed the Qur'an, a guidance for mankind, and clear proofs of the guidance, and the criterion (of right and wrong). And whosoever of you is present, let him fast the same number of days; Allah desireth for your ease. He desireth not hardship for you, and (He desireth) that you should complete the period, and that you should magnify Allah for having guided you, and that peradventure ye may be thankful. (2:185).

Islam is the complete code of life and the month of Ramadan demands that it should be propagated and practiced widely so that people could know what Allah's commandments are. In this blessed month the believers offer extended prayers like the non-obligatory ones called Nawafil in general and the Taravi (extra prayers following the Esha prayer) (wherein the entire quran is recited by the Huffaz those who have memorized the entire quran by heart) over this one month. This helps the believers to be reminded of their duty and responsibility vis-a-vis the dos and the don'ts in Islam.

Ramadan gives a unique opportunity for being reminded constantly of Allah's commandments contained in the holy Qur'an. And if all the commandments are followed rigidly the problems confronted in everyday life by man will be eliminated and peace will reign supreme since rights of all will be secured and obligations discharged.

The holy month of Ramadan is important because in this month the month-long fasting — abstaining from food, drink, sex, any evil such as backbiting, slandering, etc — from pre-dawn to dusk was made obligatory on the believers to attain piety. In this regard the holy Qur'an says — "O ye who believe! Fasting is prescribed for you, even as it was prescribed for those before you, that ye may ward off (evil)." (2/183). Fasting helps one to physically experience the pains of hunger and thirst suffered by the destitute and thereby makes one to be compassionate to the less fortunate ones in the society. It invokes their sympathy and induces them to help others. The month-long exercise of patience and forbearance helps a man/woman grow spiritually, too for he/she refrains from the forbidden things only for Allah and his pleasure. So Allah, too gives rewards for such acts profusely beyond one's imagination.

And the other thing which makes the holy month of Ramadan extremely important is that during this month Allah (SWT) has kindly ordained the night of power — "Lailatul Qadr" — which is better than a thousand months. The holy Qur'an says: — "In the name of Allah, the beneficent the Merciful. 1. Lo! We revealed it in the night of power. 2. Ah, what will convey unto thee what the night of power is? 3. The night of power is better than a thousand months. 4. The angels and the spirit descend therein, by the permission of their Lord, with all decrees. 5. (That night is) peace until the rising of the dawn (AL-QADR)".

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The "Ebadat" (worship) done in this night brings immense reward. People are seen engaged in prayers and supplication in anticipation of such night so that they are purified and attain piety. No one knows which night of the month is the night of Qadr. There is an indication that it is after the 20th of Ramadan and falls on an uneven night i.e. 21st, 23rd, 25th, 27th or 29th. But some hold the opinion that the 27th night is the night of Qadr and hence by and large people try to pass this night in "Ebadat". And Ebadat is expected to be accepted by Allah (SWT) if dos and don'ts as dictated by the holy Qur'an and the Sunnah are strictly followed and Ramadan is observed in its spirit and essence. Then the believer will have peace here and salvation in the hereafter.

A Millennial Reverie

by Manzoor Ahmed

And there has been a near-universal demand that there must be a moratorium on hartal and other forms of protests that seriously disrupt economic production and life of citizens.

HOLLIS, New Hampshire, U.S.A. In this northeastern nook of the United States, the winter haze has settled over the rolling hills. The year-end holiday (stretched in to the new year/season assumed a special character as the business outlets and the media continued their relentless promotion of the new millennium, even though it does not begin until 1 January, 2001.

People's minds for now are away from the political ritual every four years of the presidential primary election season that begins in the state of New Hampshire. Soon the candidates of the two major parties for the Presidential contest in November, 2000 will stomp the towns and villages of the state. Al Gore and Bill Bradley of the Democratic Party and George Bush, Jr. and John McCain of the Republican side, the front-runners in the opinion polls in the two parties, will each make the case to the ordinary party members why he rather than someone else should be the nominee of the party.

No one now knows who ultimately will be the Presidential nominees of the two parties. The primary elections, in which the registered members of each party indicate their preference, will decide who the Democratic and Republican nominees will be.

The holiday quiescence and the winter scene are reminders of the contrast with Bangladesh including the diametric difference in the political culture. They prompt one to give in to a millennial reverie.

The niceties of a democratic process in the selection of the party nominee for the head of the government do not apply in Bangladesh, at least not in the ordinary sense of a democratic process. A dynastic approach and the unquestioned authority of the dynastic heir to the mantle of leadership prevail in our political culture. Be that as it may.

Could it be that a millennial spirit has taken over and the dynastic leaders have decided to give priority to welfare of the people and national interest over their total preoccupation with holding on to or grasping government power, promoting parochial advantages, and glorifying the personal ego?

One dreams... The Prime Minister has declared that the next general election will be held before the end of 2000. She has also called for year 2000 to be the year of turning a new leaf in national politics — the year of building and practicing the culture of democracy. She has pledged her government's and her party's total cooperation for a non-partisan national campaign to establish civility and a code of

honourable conduct in national politics. She has invited the leaders of the opposition alliance to join in a roundtable to discuss a smooth and peaceful run-up to the general election.

The leader of the opposition has welcomed the Prime Minister's announcement. The opposition chief has persuaded the opposition alliance to join the roundtable. The alliance has proposed that the roundtable agenda focus on creation of the conditions for presenting and debating major national issues before the electorate, for carrying out a peaceful and orderly election campaign, and holding the polls fairly and transparently. The opposition alliance also has proposed that President Justice Shahabuddin Ahmed, as a neutral and respected personality, be invited to chair the roundtable.

The media, intellectuals, non-governmental organizations, and the smaller political parties have responded with jubilation to what has been dubbed as a millennial breakthrough in the political impasse. A plethora of ideas have been put forward to make a genuine new beginning for the nation.

Ground-rules for the use of the electronic media for presenting and debating the party platforms and sharing time

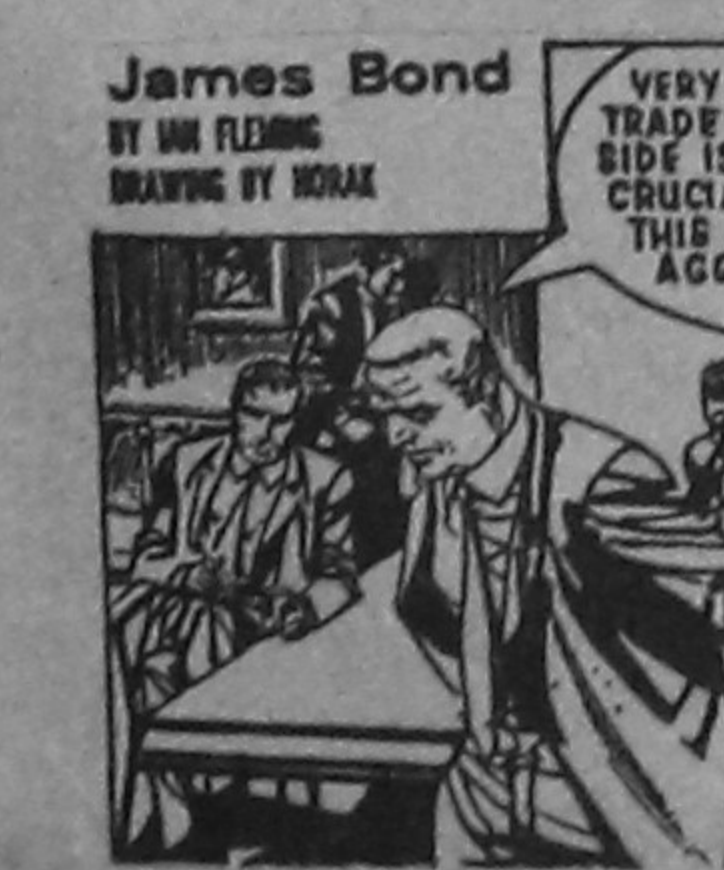
equitably should be established. Suggestions have been made for enhancing authority, independence and capacity of the election commission. It has been stressed by many that the criteria of eligibility of candidates and regulations regarding campaign financing and expenditure must be enforced. Guidelines for the conduct of the police force and law-enforcement authorities in relation to political activities should be developed collectively and applied in good faith.

The Parliament should become the principal forum for debating major national agenda. The opposition's grievances about parliamentary procedures should be addressed jointly, from both sides of the aisle, suggested several prominent personalities. And there has been a near-universal demand that there must be a moratorium on hartal and other forms of protests that seriously disrupt economic production and life of citizens.

The internet edition of the Daily Star brings the news that another hartal is being threatened by the Opposition alliance in disregard of the sanctity of the holy month of Ramadan. The snow falls softly over the rolling hills of New Hampshire. The reverie breaks.

The author is director of Unicef Office in Japan.

TOM & JERRY:



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