

Chinese Calendar

Group Members:

| | |
|----------------------|----------|
| Henky Jamiko Gunawan | U016090A |
| Hng Wee Kwang | U011543B |
| Lim Chee Kian | U017393B |
| Seah Nam Shien | U015618W |
| Wong Chee Yeh | U011537B |

Contents

| | Page |
|--|-------|
| 1. History of Chinese Calendar | 02~06 |
| 2. Twenty-four Solar “Nodes” | 07~09 |
| 3. Heavenly Stems And Earthly Branches | 10~15 |
| 4. Chinese Calendar Leap Years | 16~22 |
| 5. The Twelve Animals As Year Designations | 23~26 |
| 6. Festivals In Chinese Calendar | 27~32 |
| 7. References | 33~34 |

HISTORY OF CHINESE CALENDAR

The Chinese civilization is the only one which has developed and used two parallel calendar systems, and thereby, one might say, has enjoyed the best of both worlds, lunar and solar. Both solar and lunar calendars take as their basic counting unit, the year, corresponding with greater or less exactitude to the period of the earth's revolution around the sun, and the month, approximating the period of the moon's revolution around the earth. Astronomers describe the motions of these heavenly bodies with mathematical accuracy and thereby define units of time which one may call the natural year and the natural month or lunation.

The traditional Chinese calendar is basically lunar. It consists of twelve months, each beginning with a new moon and reaching its midpoint with the full moon. The twelve lunations total three hundred fifty-four days, which means that individual lunations have a length of either twenty-nine or thirty days.

The farmers needed a calendar that would tell them the best times for planting and harvests, activities that followed the seasons of the natural year. In short, they needed a solar calendar. The ancient Chinese astronomers provided a luni-solar calendar for their needs that was both simple and accurate.

However, the development of the calendar and the establishing of the seasons, holidays and the New Year was too scientific and complicated for most of the people to understand. Thus a number of stories and folk tales developed which simplified its explanation.

The 'perpetual calendar' or the '*Wan-nien-li*' is said to be created by a man named Wan-nien during the Shang dynasty (1766-1123 B.C.). He resorted to methods of measuring time by noting the length of the shadows throughout the year with a gnomon and gnomon template and the length of each day with a clepsydra (water-clock). By empirical observation and with these measurements of the longest and shortest days in the year, he was able to establish the two solstices and in turn the two equinoxes. Moreover, he concluded that there were three hundred sixty-five and a fraction of days within a year's time.

Traditionally, Chinese astronomy is traced back to the time of the legendary emperor, Fu-hsi (2852 B.C.). The measurements and reverent

calculations of the royal astronomers provided the basis for the imperial calendar and almanac. The almanac fixed the lengths of the months, determined the dates of the spring and autumn equinoxes – the times a year that night and day are of equal length – and of the summer and winter solstices – when night and day differ most in length.

Calendars are all based on the cyclical movements of one or more celestial bodies. In our international calendar, it is the sun, in the Muslim calendar it is the moon, and in the Chinese calendar it was the sun, the moon and during a certain period, the planet Jupiter.

The most difficult problem for the astronomers plotting the almanac was the determination of the length of the solar year – that is, the exact length of time required to complete the cycle of seasons. The ancient estimation had been that it was three hundred sixty-six days; this figure was revised to three hundred sixty-five and a quarter days by the fourth century B.C., and this calculation was constantly refined thereafter. The Chinese based many of their computations not on the sun but on the position of the pole star and the wheeling around it of circumpolar constellations like the Ursa Major (Big Dipper); its handle pointing north in winter, south in summer, marked the twelve months of the Chinese year. The movement of the planet Jupiter, which was called *T'ai-sui* (year star) and whose orbit takes twelve years to complete, was also taken into account in the Chinese division of periodic time. Finally, the phases of the moon, from dark to full, which bear no fixed relationship to the solar year, had to be included in the computations so that the calendar months could be adjusted to fit the year.

The Chinese watched the waxing and waning of the moon which gave them the idea of a month, which they appropriately called *Yueh* or a complete cycle of the moon from new moon to new moon. They also observed that it took twelve months to cover the four seasons, and thus they formed the notion of a year. A year was first called *Sul* as it was one of the units of a full cycle of the Pole Star, but later the term *Nien* was used. However, these simple calculations were not, and could not be, exact. Between a new moon and the next, it is not twenty-nine or thirty days, but twenty-nine and a half days, making the cumulative total, eleven and a quarter days shorter than the three hundred sixty-five and a quarter days of a full year. So for a lunar calendar to be accurate, it is necessary to insert once in every two or three years, a leap month like the leap day of the solar calendar, to catch up with the motions of the earth. However, in order to know when to insert the leap month so that all the seasons are as properly proportioned as they should be, it is essential first to ascertain the winter

and summer solstices as well as the vernal and autumnal equinoxes. The ancients, however, did not come to such knowledge easily; it took centuries.

To determine how to position the lunar months, the Chinese used a solar sequence consisting of twenty-four nodes or *Chieh-ch'i* spaced at approximately fifteen day intervals through the year. The primary nodes were those of the two solstices (*Erh chih*), two equinoxes (*Erh-fen*), and spaced evenly between solstices and equinoxes, the Chinese four beginnings of the seasons (*Ssu-li*). These are continued on from year to year, irrespective of the lunar intersalations, and are referred to by the Chinese as the *Chung-ch'i* (mid-periods) and *Chieh-ch'i* (nodes). Because the popular *Ch'ing-ming* festival is considered one of the *Chieh-ch'i* or nodes, it always falls on April fifth on the Gregorian calendar except in leap years when it is on April fourth. There are twelve in each category. Each *Chieh* is followed by a *Chung* which is followed by a *Chieh*. These periods are determined solely by the solar cycle, each corresponding to a movement of about five degrees in longitude by the sun on the ecliptic or the days on which the sun enters the first and fifteen degrees of each Zodiac sign.

The lunar months are then superimposed on the twenty-four *Chieh-ch'i*. Since the synodic period of the moon is about 29.53 days, and for practical reasons, the Chinese worked in whole numbers, the result was a twenty-nine or thirty day lunar month. The Chinese referred to those months respectively as *Yueh-hsiao* and *Yueh-ta*.

Normally each lunar month will have one *Chieh* and one *Chung* with the *Chung* occurring near the middle of the month. Since the interval between two successive *Chieh* is approximately 30.43 days, occasionally there occur months with only a *Chung* but minus a *Chieh*. Such months are made intercalary or leap months and named after the preceding month with the prefix *Jun* (in Cantonese: *Yun*) added.

It is quite clear that the Chinese calendar-makers had firm knowledge of the Metonic Cycle. Resonance periods arise from the fact that although the motions of the sun, moon, and planets are incommensurable, they fall into approximate harmony after certain periods, the most useful of which is a cycle of nineteen years which almost exactly equals two hundred thirty-five lunations. In each nineteen years, the Chinese calendar contains seven intercalary or leap months. In China this cycle is called *Chang* or a chapter, and it is still the most convenient period for studying the relationship between the lunar and solar calendar.

The Chinese calendar is the longest unbroken sequence of time measurement in history. The traditional Chinese year is calculated according to a solar formula but fitted into a lunar calendar to make it a luni-solar calendar, the important events of the year are always fixed according to the traditional calendar; the festivals, religious and ritual days and the organization of fishing and agricultural activities.

The first calendar, according to the *Shih-chi* or Historical Records written about 90 B.C., is attributed to *Huang-ti* or the Yellow Emperor, 2697 B.C., who orders the study of the stars by the astronomers at his court. It was his minister *Ta Nao* who prepared the first calendar called *Kan-chih* or *Chia-tzu* system which Western scholars have translated as 'the system of cyclical characters'.

The *Kan-chih* system of reckoning dates is by combining each of the ten 'stems' with each of the twelve 'branches' in pairs, with the 'stem' being always on top of the 'branch'. Beginning with *Chia-tzu* (1 and 1 each series), and then *I-ch'ou* (2 and 2), thereafter continuing through *Kuei-yu* (10 and 10), to *Chia-hsu* (1 and 11), *I-hai* (2 and twelve) and then *Ping-tzu* (3 and 1) and permuting in the same manner. It will take sixty permutations to complete a cycle, ending in *Kuei-hai* (10 and 12) before *Chia-tzu* (1 and 1), the first pair reappears. The Chinese call this cycle *Liu-shih-kan-chih* or *Liu-shih-hua-chia-tzu* and oftentimes abbreviated as *Hua-chia*.

The Chinese sexagesimal cycle can be thought of in the image of two enmeshed cogwheels, one having twelve and the other ten teeth, so that not until sixty combinations have been made will the cycle reappear.

Again, as the system was intended for popular use, so that the meanings were to be familiar to the people at large; another phase was introduced. The twelve earthly branch characters each came to be associated with a particular animal sometime during the late *Chou* period. These are Rat, Ox, Tiger, Hare, Dragon, Serpent, Horse, Sheep, Monkey, Cock, Dog and Boar. These twelve animals were classified as *Shih-erh sheng-hsiao* or commonly called the twelve Zodiac Animals by Westerners. They are merely popular symbols for the illiterate and do not have any great significance or meaning.

The Chinese calendar was formalized by Emperor Yu which is known as *Hsia-cheng*. The term, *Cheng*, means 'proper', but in calendar-making, *Cheng* month means the first month of the year. Later when the Shang dynasty overthrew the Hsia, it changed the *Cheng* to the *Ch'ou* month, the

one preceding the Yin month.. After the Chou dynasty defeated the Shang, it named for its *Cheng*, the *Tzu* month.

The *Hsia-cheng* is much more convenient to an agrarian nation such as China. Counting from the *Yin* month, the first month three months, following the true course of nature, actually formed the spring season; the next three months, summer; the third three months, autumn; and the last three months, winter.

It was not until the year 104 B.C. that Wu-ti of the Han dynasty abolished the difference by restoring the *Hsia-cheng*, that is, by restoring the *Yin* month officially as the first month of the year – a system which has been followed up to the present times. Therefore, in modern times the Chinese calendar is often referred to as *Hsia-li* or the *Hsia* calendar.

TWENTY-FOUR SOLAR “NODES”

Solar sequence consisting of twenty-four “nodes” (*chieh 節*, the analogy is with the nodes of a bamboo) spaced at approximately fifteen-day intervals through the year. The primary “nodes” were those of the two solstices and equinoxes, and, spaced evenly between solstices and equinoxes, the Chinese four beginnings of the seasons. The complete sequence follows:

TWENTY-FOUR SOLAR “NODES”

| Name | Gregorian Calendar |
|---|---------------------------|
| 1. Spring’s Beginning (<i>li ch’un</i>) | About Feb. 5 |
| 2. Rain Water (<i>yu shui</i>) | Feb. 20 |
| 3. Stirring of Hibernating Insects (<i>ching che</i>) | March 7 |
| 4. Spring Equinox (<i>ch’un fen</i>) | March 22 |
| 5. Clear Brightness (<i>ch’ing ming</i>) | April 6 |
| 6. Grain Rain (<i>ku yu</i>) | April 21 |
| 7. Summer’s Beginning (<i>li hsia</i>) | May 6 |
| 8. Small Fullness of Grain (<i>hsiao man</i>) | May 22 |
| 9. Grain in Beard (<i>mang chung</i>) | June 7 |
| 10. Summer Solstice (<i>hsia chih</i>) | June 22 |
| 11. Slight Heat (<i>hsiao shu</i>) | July 8 |
| 12. Great Heat (<i>ta shu</i>) | July 24 |
| 13. Autumn’s Beginning (<i>li ch’iu</i>) | Aug. 8 |
| 14. Stopping of Heat (<i>ch’u shu</i>) | Aug. 24 |
| 15. White Dew (<i>pai lu</i>) | Sept. 8 |
| 16. Autumn Equinox (<i>ch’iu fen</i>) | Sept. 24 |
| 17. Cold Dew (<i>han lu</i>) | Oct. 9 |
| 18. Frost; Descent (<i>shuang Chiang</i>) | Oct. 24 |
| 19. Winter’s Beginning (<i>li tung</i>) | Nov. 8 |
| 20. Slight Snow (<i>hsiao hsueh</i>) | Nov. 23 |
| 21. Great Snow (<i>ta hsueh</i>) | Dec. 7 |
| 22. Winter Solstice (<i>tung chih</i>) | Dec. 22 |
| 23. Slight Cold (<i>hsiao han</i>) | Jan. 6 |
| 24. Great Cold (<i>ta han</i>) | Jan. 21 |

The use of this solar sequence goes back at least to the late *Chou* and conceivably considerably earlier. Several “nodes”, notably those of the solstices, equinoxes, and seasonal beginning, are the foci for observances described in this book. With a lunar calendar that fluctuated as much as a month from one year to another, the utility to the Chinese, especially for agriculture, of having a parallel fixed solar reckoning is obvious. The twenty-four “nodes” constituted, and have continued to constitute, a sort of agriculture calendar.

A striking feature of the calendar is its schematization. Sometimes this seems justified, as when Slight and Great Heat (nos. 11-12) are balanced against Slight and Great Cold (nos. 23-24), with each pair immediately following the respective solstice. Other correspondences, however, appear arbitrary, as in the balancing of Small Fullness of Grain and Grain in Beard (nos. 8-9) against Slight and Great Snow (nos. 20-21), each pair coming immediately before its respective solstice. The growth of grain during late May and early June is reasonable enough, but anyone familiar with the North China climate knows that even a little snow is unlikely to fall as early as November 22, and that “Great Snow”, if it falls at all (not too likely because of the dry North China winters), will probably do so considerably later than December 7. It would seem that the pair of snow terms has been inserted to achieve symmetry with the grain counterparts rather than for genuine meteorological reasons.

Still more striking is the emplacement of the seasonal beginnings exactly midway between the solstices and equinoxes instead of, as in the West, six weeks later. In the West, August 8 is still the height of summer whereas in the Chinese calendar it marks the beginning of autumn; November 8 is still autumn in the West but in China it inaugurates winter; and so on. There is no doubt that the Western seasons are better dated than their Chinese counterparts as far as climatic actually is concerned, but from the point of view of formal symmetry their arrangement violates the harmonious balance which is so prized by the Chinese mind. (Is it not “natural” that the Summer Solstice, the longest day of the year, should come at the middle, and not the beginning, of the summer season?) Not infrequently, and especially in the five elements cosmology to which we shall come in the next section, the Chinese have been ready, when necessary, to sacrifice objective reality for the sake of formal symmetry.

From another point of view, however, Chinese calendar-making has enabled the Chinese to keep closer to nature than is permitted for us by our

solar calendar. When Julius Caesar in 46 B.C. inaugurated the calendar bearing his name, with its non-lunar months consisting of thirty or thirty-one days each, he took a great step in the separation of man from nature — one perhaps symbolic of Western man. Like other traditional peoples the world over and unlike Western man, the Chinese have always enjoyed the aesthetic satisfaction and psychology security of knowing that the several phases of the moon will invariably fall on the same days of each month. On the other hand, they have avoided the opposite extreme, exemplified by the Arabs, of allowing their lunar calendar to drift freely without even periodic attempts to adjust it to the movements of the sun. The result, for the Arabs, is a calendar which makes a complete revolution through all four seasons of the year in the course of thirty-two solar years, thus effectively divorcing Islamic festivals from the climatic phenomena, which, in pre-Islamic days, had given them birth. To the Chinese, with their insistence on the interrelationship of man and nature, such a separation of festival life from the round of the seasons would be just as unthinkable as Caesar's separation of the months from the phases of the moon.

So far as we know, the Chinese are the only major people who have used two parallel calendrical systems, and thereby, one might say, have enjoyed the best of both worlds, lunar and solar. Because, however, of the basic incommensurability of movement between the two heavenly bodies, the Chinese lunar and solar calendars could never be correlated with complete satisfaction. According to the lunar calendar, for example, the beginning of the year, and with it the beginning of spring, could occur anywhere between January 21 and February 20 (Gregorian reckoning), whereas according to the system of the twenty-four solar "nodes", the day of Spring's Beginning fell always on a fixed solar date corresponding usually to February 5. This means that the Chinese solar beginning of spring sometimes fell in the twelfth lunar month and sometimes in the first. In other words, it could either precede or follow the lunar beginning of spring. Similar discrepancies, of course, marked the other seasonal beginnings.

HEAVENLY STEMS AND EARTHLY BRANCHES

The earliest Chinese dating system is the one having no direct connection with the movements of sun and moon. It is sexagenary cycle. It rests on two parallel sequences: a series of ten characters known as “stems” or “heavenly stems” and another sequence of twelve characters known as “branches” or “earthly branches”.

| Chinese Sexagenary Cycle of Days and Years | |
|---|-------------------------|
| <i>Celestial Stems</i> | <i>Earthly Branches</i> |
| 1. jia | 1. zi (rat) |
| 2. yi | 2. chou (ox) |
| 3. bing | 3. yin (tiger) |
| 4. ding | 4. mao (hare) |
| 5. wu | 5. chen (dragon) |
| 6. ji | 6. si (snake) |
| 7. geng | 7. wu (horse) |
| 8. xin | 8. wei (sheep) |
| 9. ren | 9. shen (monkey) |
| 10. gui | 10. you (fowl) |
| | 11. xu (dog) |
| | 12. hai (pig) |

It is believed that this sexagenary cycle was first used to date days but not years. Until the end of Former Han, it began to use for dating both years and days. Besides, with the development of the five elements in late Chou, the ten “stem” became correlated with the five elements. At some earlier time, the correlations between the twelve “branches” and the twelve lunar months also began, but it was with its eleventh month. It is because

that the Winter Solstice always occurs in the eleventh month. As a result, the months are often referred to by the names of the correlated ‘branches’ as well as by number. ‘Earthly branches’ are always expressed by 12 animal names, but the ten ‘heavenly stems’ that always be expressed by 10 Chinese numbers (1-10) can also be expressed by the ‘five elements’, like:

| | | | | | | | | | |
|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Jia | Yi | Bing | Ding | Wu | Ji | Geng | Xin | Ren | Gui |
| <i>Wood</i> | <i>Wood</i> | <i>Fire</i> | <i>Fire</i> | <i>Earth</i> | <i>Earth</i> | <i>Metal</i> | <i>Metal</i> | <i>Water</i> | <i>Water</i> |

 As Yang element

 As Ying element

Since there are only five components in the ‘five element’, the Chinese add Ying Yang into it. So, we can also use the ‘Yang wood ‘ to express ‘Jia’; ‘Ying Wood’ to express ‘Yi’..... although their title is different, it is both under the same meaning. Usually Yin-Yang means:

Yin-Yang

Ying = 2,4,6,8,.....even numbers/female

Yang = 1,3,5,7,.....odd numbers/male

It is a symbol of Chinese habit to think events from positive and negative

The Sexagenary Cycle

By combining each of the ten “stems” with each of the twelve “branches” in pairs, beginning with jia-zi(1 and 1 of each series) and yi-chou(2 and 2); thereafter continuing through gui-you(10 and 10), jia-xu(1 and 11), yi-hai(2 and 12), bing-zi(3 and 1 again); and thus continuing in the same manner, sixty nameable combinations are achieved before jia-zi, the first pair, reappear. “The Chinese sexagesimal cycle can be thought of in the image of two enmeshed cogwheels, one having twelve and the other have ten teeth, so that not until sixty combinations have been made will the cycle reappear.”

| <i>Year Names</i> | | | |
|-------------------|---------------|---------------|---------------|
| 1. jia-zi | 16. ji-mao | 31. jia-wu | 46. ji-you |
| 2. yi-chou | 17. geng-chen | 32. yi-wei | 47. geng-xu |
| 3. bing-yin | 18. xin-si | 33. bing-shen | 48. xin-hai |
| 4. ding-mao | 19. ren-wu | 34. ding-you | 49. ren-zi |
| 5. wu-chen | 20. gui-wei | 35. wu-xu | 50. gui-chou |
| 6. ji-si | 21. jia-shen | 36. ji-hai | 51. jia-yin |
| 7. geng-wu | 22. yi-you | 37. geng-zi | 52. yi-mao |
| 8. xin-wei | 23. bing-xu | 38. xin-chou | 53. bing-chen |
| 9. ren-shen | 24. ding-hai | 39. ren-yin | 54. ding-si |
| 10. gui-you | 25. wu-zi | 40. gui-mao | 55. wu-wu |
| 11. jia-xu | 26. ji-chou | 41. jia-chen | 56. ji-wei |
| 12. yi-hai | 27. geng-yin | 42. yi-si | 57. geng-shen |
| 13. bing-zi | 28. xin-mao | 43. bing-wu | 58. xin-you |
| 14. ding-chou | 29. ren-chen | 44. ding-wei | 59. ren-xu |
| 15. wu-yin | 30. gui-si | 45. wu-shen | 60. gui-hai |

Each successive time period will have a new stem and branch, until going through the stems 6 times and the branches 5 times, to give 60 unique combinations. In the case of years and dates, this gives a continuous cycle for thousands of years. This is similar for months, but in the case of a leap month, it is assigned its previous month's branch/stem combination with the leap designation added. This is why the combination is so easily calculated for years and days, but requires tables or complicated astronomical calculations to find months.

4698th or 4699th?

The beginning of the sexagenary circle is 2687B.C. which is the beginning by the Yellow King (Huang-di). 2001 is the 4698th or 4699th year of using this Stem-Branch system. I said that because the calendar of Yellow King used the winter solstice day as the first day of the year. So the first winter solstice was on around December 23rd. 2698 B.C. Today's January 1st means nothing to Yellow King. If we count that extra eight days in 2698 B.C. for a year, then year 2001 is the 4698th Chinese year. As a

result, before the winter solstice, it is the 4698th year, and after the winter solstice it should be the 4699th year.

Calculation:

Unlike a leap year, where you simple divide the year with 4, 100, or 400 to test whether or not a year is a leap year, to calculate the Chinese branch, you must first subtract 3 from the year before dividing by 12 to find out which animal is associated with the year:

$$\mathbf{Number = (year - 3)\%12;}$$

So for example, for 1997:

$$1997 - 3 = 1994$$
$$\frac{1994}{12} = 166 \frac{2}{12}$$

We only consider the numerator. That is 2

Chinese [2] = Ox, branches [2] = Chou

To retrieve the Chinese stem, it is necessary to subtract 3 from the year and then divide by 10:

$$\mathbf{Number = (year - 3)\%10;}$$

So for 1997:

$$1997 - 3 = 1994$$
$$\frac{1994}{10} = 199 \frac{4}{10}$$

We only consider the numerator. That is 4

Stems [4] = Ding

Therefore 1997 was the Chinese year Chou-Ding, or the year of the Ox.

Then all we need to do is compare the date entered with the start of the Chinese New Year, if its the same or greater then it is a simple matter of retrieving the chinese branch for the year, and if its less than then it requires retrieving the chinese branch for the previous year:

The Golden Dragon Year

Many people thing that the golden dragon year is an auspicious year and it is a year that will be concerned with peace and striving for peace as golden dragon is an auspicious symbol in Chinese. Actually, golden dragon year is the 17th year of the sexagenery year. By the matching of the celestial stem and earthly branch, this year metal match with the dragon. So, it should be the Metal Dragon Year. The Chinese use the same chinese charecter for Gold and Metal, and as Gold sounds more valuable, the Chinese like to call year 2000 the Golden Dragon rather than the Metal Dragon.

On the other hand, Golden Dragon Year is also called as White Dragon Year. As the color of the Five Elements are:

***Metal* = White & Golden**

***Water* = Black**

***Wood* = Green**

***Fire* = Red**

***Earth* = Brown**

So, Golden Dragon Year = Metal Dragon Year =White Dragon Year

Year 2000 is the 79th Golden Dragon Year

Since we know that year 2000 is the 4697th year of the sexagenery cycle (we ignore the 4698th year, because we don't count the extra eight days in 2698 B.C. for a year), and then we used 4697 to be dividing by 60.

$$4697\%60=78.2833$$

After that, then we can say that year there are 78 sexagenery cycle in 4697 years. We use the amount after the decimal point 0.2833 to time 60. In

order to know that which year does the year 2000 should be in the sexagenary cycle.

$$0.2833 * 60 = 16.998$$

As a result, we get the approximate value 17. Then we know that year 2000 is the 17th year of the sexagenary cycle, and it also means that year 2000 is the Golden Dragon Year. On the whole, year 2000 is the Golden Dragon Year, which had pass 78 sexagenary cycles. So, it is the 79th Golden Dragon Year.

CHINESE CALENDAR LEAP YEARS

Determining leap years

Chinese Calendar has 12 “principal terms”- zhongqi- in a year. Each month starts on the day of the new moon (as seen from the meridian 120° East) and the numbering of the months depend on which “principal term” it coincides with. In any case, the winter solstice must fall on the 11th month.

Since there could be 13 lunations in a solar year, there are some years that have 12 lunations, thus 12 months from one winter solstice to the next. When such a phenomenon happens, the Chinese calendar inserts an intercalary month to make sure that the winter solstice still falls on the month coinciding with the 11th “principal term”.

This month is inserted on the lunation that does not coincide with any “principal term”. It would take the number of the preceding month with an added designation to show that it is an intercalary month. If there are two months that do not coincide with any “principal term”, only the first month is considered the intercalary month. Intercalary months will be encountered roughly 7 out 19 years.

Determining Blue Moon

In a year with 13 lunations, one of the 13 full moons is called Blue Moon. This full moon looks exactly like any other full moons, just that it is given the name: Blue Moon. The other 12 full moons have their own special names, but they all appear yearly, according to the season. Only Blue Moon is rather erratic, not only because of when they appear, but also because of the rules in determining which one of the 13 full moons should be called the Blue Moon.

The purpose of adding a Blue Moon is to ensure that other moons fall correctly with respect to the equinoxes and solstices; the marker of seasons.

The original rule in determining Blue Moon, according to the Maine Farmer’s Almanac, Blue Moon is the third full moon in a season of four full moons. The newer way to determine a blue moon, apparently caused by an error in an article published by Sky & Telescope, Blue Moon is the second full moon in a month.

Comparing the occurrence of the Chinese calendar intercalary months and Blue Moon

According to an article in “The Moon Book” by Kim Long, the author stated, “The traditional Chinese and Hindu calendars are based on a lunisolar system, balancing the cycles of both the Moon and the Sun. In order not to get out of step, these calendars must periodically adjust dates and the adjustment periods are the same months in which there are blue moons.” Is the above quotation accurate? That is what we shall investigate.

Looking at the similar ways of how Blue Moons and intercalary months in Chinese calendar are defined, we can expect them to be one and the same thing. They both depend on the appearance of the 13th moon in the year, even though there are some differences in determining when which of them occur. Let’s take a look at the following table:

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1999 | b | | b | | | | | | | | | |
| 2000 | | B | | | | | | | | | | |
| 2001 | | | | | C | | | | | | b | |
| 2002 | | | | | | | | | | | B | |
| 2003 | | | | | | | | | | | | |
| 2004 | | | C | | | | b | | | | | |
| 2005 | | | | | | | | B | | | | |
| 2006 | | | | | | | | C | | | | |
| 2007 | | | | | | b | | | | | | |
| 2008 | | | | | B | | | | | | | |
| 2009 | | | | | | C | | | | | | b |
| 2010 | | | | | | | | | | | B | |
| 2011 | | | | | | | | | | | | |
| 2012 | | | | | C | | | b | | | | |
| 2013 | | | | | | | | B | | | | |
| 2014 | | | | | | | | | | C | | |
| 2015 | | | | | | | b | | | | | |
| 2016 | | | | | B | | | | | | | |
| 2017 | | | | | | | C | | | | | |
| 2018 | b | | b | | | | | | | | | |
| 2019 | | B | | | | | | | | | | |
| 2020 | | | | | C | | | | | | b | |

C = Intercalary months of Chinese calendar

B = Blue Moon appearance according to the third moon in a season rule

b = Blue Moon appearance according to the second in a month rule

However, looking at the table above, we can conclude that the intercalary months of the Chinese calendar does not coincide with the appearances of any of the Blue Moons. In order to find the possible explanation to this unexpected result, we need to take a look at the differences in determining intercalary months and the Blue Moons.

The differences in the rules of determining Blue Moons.

First of all, we need to compare the different rules of determining Blue Moons. The original rule of the third full moon out in a season of four is based on the actual lunation of the moon. The newer rule of the second full moon in a month is based on the months of Gregorian calendar, instead of the actual lunation.

The original rule pays no regard to the months of the Gregorian calendar. It does not matter which month of the year the full moon appears on. As long it is the third in a season, it is the blue moon. On the other hand, the newer rule pays close attention to the months of the Gregorian calendar. True enough, in a year of 13 lunations, there has to be at least one month with two full moons, but it does not imply that the second full moon in that month will be the Blue Moon under the original rule. This is especially true since it is possible for a month to stretch across two seasons, like March 1999 that stretches from winter to spring.

The second rule also has its inherent problems. Since the average time for a lunation is 29.5 days, it is possible for the month of February not to have any full moon at all. The full moon then will have to occur on any of the adjacent month. This loophole causes the possibility of having a Blue moon in a year of 12 lunations and the possibility of having two Blue Moons in a year of 13 lunations. An example is the year 1999, when we can observe two Blue Moons, on January and March. This second ruling also implies that there could be no Blue Moon in February because it is shorter than a period of lunation.

By looking at the explanation above, we can understand why the different definitions of a Blue Moon cause the Blue Moons identified by the different rules to be different full moons.

The differences between intercalary month and Blue Moon.

Let us now consider the intercalary months and Blue Moons. We can understand that intercalary months are determined by the actual lunations of the moon thus, we only need to compare it with the occurrences of the Blue Moon identified by third full moon in a season of four rule. Strangely, they do not occur at the same time, and worse, they could be months apart.

One possibility is that, in determining an intercalary month, we look at each individual lunation, essentially dividing the full year into 12 parts, in the case of 12 lunations a year, or 13 parts, in a year with 13 lunations. On the other hand, in determining Blue Moon, we always consider the seasons, essentially dividing the year into four parts; be it a year with 12 or 13 lunations.

Next we need to consider that a Chinese month begin with a new moon (lunar based) while the seasons begin either with an equinox or a solstice (solar based). Thus, even in a 12-lunation year, a season would not start and end exactly at the same time with a period of three Chinese months.

Considering the above, we can see that the year is divided into dissimilar portions and that each portion begins at different time. Accordingly, what is determined as a consequence of these portions would be different too. In this case, it would be the occurrence of the intercalary months and the Blue Moons.

In conclusion, from the discussions above, we can say that Chinese intercalary months and Blue Moons do not occur at the same time, even though they are similarly defined.

Appendix

Seasons and the traditional English names of its full moons

| Seasons | Name of full moon |
|--|-------------------------|
| Yule, Winter Solstice | Moon after Yule |
| | Wolf Moon |
| | Lenten Moon |
| First Day of Spring, Vernal Equinox | Egg Moon (Paschal Moon) |
| | Milk Moon |
| | Flower Moon |
| The Long Day, Summer Solstice | Hay Moon |
| | Grain Moon |
| | Fruit Moon |
| Summer's End, Autumnal Equinox | Harvest Moon |
| | Hunter's Moon |
| | Moon before Yule |
| The third full moon in any season | Blue Moon |

The occurrence of full moons

| 1999 | | |
|-----------|---------------------------------------|--------------------------------------|
| Full Moon | 3 rd full moon in a season | 2 nd full moon in a month |
| January | Moon after Yule | Moon after Yule |
| January | Wolf Moon | Blue Moon |
| March | Lenten Moon | Lenten Moon |
| March | Egg Moon | Blue Moon |
| April | Milk Moon | Egg Moon |
| May | Flower Moon | Milk Moon |
| June | Hay Moon | Flower Moon |
| July | Grain Moon | Hay Moon |
| August | Fruit Moon | Grain Moon |
| September | Harvest Moon | Fruit Moon |
| October | Hunter's Moon | Harvest Moon |
| November | Moon before Yule | Hunter's Moon |
| December | Moon after Yule | Moon before Yule |

| 2000 | | |
|-----------|---------------------------------------|--------------------------------------|
| Full Moon | 3 rd full moon in a season | 2 nd full moon in a month |
| January | Wolf Moon | Moon after Yule |
| February | Blue Moon | Wolf Moon |
| March | Lenten Moon | Lenten Moon |
| April | Egg Moon | Egg Moon |
| May | Milk Moon | Milk Moon |
| June | Flower Moon | Flower Moon |
| July | Hay Moon | Hay Moon |
| August | Grain Moon | Grain Moon |
| September | Fruit Moon | Fruit Moon |
| October | Harvest Moon | Harvest Moon |
| November | Hunter's Moon | Hunter's Moon |
| December | Moon before Yule | Moon before Yule |

| 2001 | | |
|-----------|---------------------------------------|--------------------------------------|
| Full Moon | 3 rd full moon in a season | 2 nd full moon in a month |
| January | Moon after Yule | Moon after Yule |
| February | Wolf Moon | Wolf Moon |
| March | Lenten Moon | Lenten Moon |
| April | Egg Moon | Egg Moon |
| May | Milk Moon | Milk Moon |
| June | Flower Moon | Flower Moon |
| July | Hay Moon | Hay Moon |
| August | Grain Moon | Grain Moon |
| September | Fruit Moon | Fruit Moon |
| October | Harvest Moon | Harvest Moon |
| November | Hunter's Moon | Hunter's Moon |
| November | Moon before Yule | Blue Moon |
| December | Moon after Yule | Moon before Yule |

A picture of Maine Farmer's Almanac

AUGUST, 8th month.—Begins on Sunday 1937



| D M | D W | Aspects, Holydays, Weather, Etc. | Farmers' Calendar |
|--------|--------|-------------------------------------|--|
| 1 | C | 1st Sabbath. Lammas. | <p>THE MOON usually comes full twelve times in a year, three times in each season. These moons were named by our early English ancestors as follows:</p> <p style="margin-left: 20px;">Winter Moons { 0 Moon after Yule 1 Wolf Moon 2 Lenten Moon</p> <p style="margin-left: 20px;">Spring Moons { 3 Egg Moon 4 Milk Moon 5 Flower Moon</p> <p style="margin-left: 20px;">Summer Moons { 6 Hay Moon 7 Grain Moon 8 Fruit Moon</p> <p style="margin-left: 20px;">Fall Moons { 9 Harvest Moon 10 Hunter's Moon 11 Moon before Yule</p> <p>However, occasionally the moon comes full thirteen times in a year. This was considered a very unfortunate circumstance, especially by the monks who had charge of the calendar. It became necessary for them to make a calendar of thirteen months for that year, and it upset the regular arrangement of church festivals. For this reason thirteen came to be considered an unlucky number. Also, this extra moon had a way of coming in each of the seasons so that it could not be given a name appropriate to the time of year like the other moons. It was usually called the Blue Moon. There are seven Blue Moons in a Lunar Cycle of nineteen years. This year (1937) has a Blue Moon in August the same as 1918. In 1934 and 1915 Blue Moons came in November. The next Blue Moon will occur in May 1940 as it did in 1921. There was a Blue Moon in February 1924. In olden times the almanac makers had much difficulty calculating the occurrence of the Blue Moon and this uncertainty gave rise to the expression "Once in a Blue Moon."</p> |
| 2 | 1 | ☉ runs high. ☽ in perigee. | |
| 3 | 2 | ♂ ♀ ☽. 3h. 51m. morn. | |
| 4 | 3 | ♀ rises 1h. 10m. morn. | |
| 5 | 4 | High tides 10.6 ft. | |
| 6 | 5 | ♄ in ☽. ☽ & ☉. Clear. | |
| 7 | 6 | ♄ Shaula S. 8h. 8m. eve. | |
| 8 | C | 2d Sab. ♂ ♄ ☽. ☽ on eq. | |
| 9 | 1 | ♄ Salag S. 8h. 4m. eve. | |
| 10 | 2 | ♄ sets 11h. 42m. eve. | |
| 11 | 3 | ♄ Altair S. 10h. 7m. eve. | |
| 12 | 4 | ♄ Polaris el. E. 10h. 2m. eve. | |
| 13 | 5 | ♄ Vega cul. 8h. 50m. eve. | |
| 14 | 6 | ♄ ♄ ♄. ♂ ♄ ☽. ☽ in apo. | |
| 15 | C | 3d Sab. Low tides 7.1 ft. | |
| 16 | 1 | ♄ in aphelion. ☉ runs low. | |
| 17 | 2 | ♄ rises 9h. 56m. eve. | |
| 18 | 3 | ♄ elong. E. 27.4°. ♂ ♄ ☽. | |
| 19 | 4 | ♄ stationary. Dry. | |
| 20 | 5 | ♄ rises 8h. 0m. eve. | |
| 21 | 6 | Blue Moon. | |
| 22 | C | 4th Sabbath. | |
| 23 | 1 | ☽ on equator. | |
| 24 | 2 | ♄ ♄ ☽. ♀ near Pollux. | |
| 25 | 3 | ♄ sets 1h. 10m. morn. | |
| 26 | 4 | High tide 9.9 ft. at Port. | |
| 27 | 5 | ♄ ♄ ☽. ♂ near Antares. | |
| 28 | 6 | ☽ in perigee. Sultry. | |
| 29 | C | 5th Sabbath. ☉ runs high. | |
| 30 | 1 | Low tides 8.1 ft. | |
| 31 | 2 | ♄ stationary. | |

THE TWELVE ANIMALS AS YEAR DESIGNATIONS

Whenever Chinese New Year is mentioned, the first thing that comes to the minds of most people is, "What year is this?" This is in reference to the animal representation for that year. There are twelve animals altogether to represent a cycle of twelve years and they are ranked accordingly: Rat, Ox, Tiger, Hare, Dragon, Snake, Horse, Sheep, Monkey, Cock, Dog and lastly, the Boar.

The twelve animals actually represent earthly branches, namely: *Tzu*, *Ch'ou*, *Yin*, *Mao*, *Ch'en*, *Ssu*, *Wu*, *Wei*, *Shen*, *Yu*, *Hsu*, and *Hai*. The sign *Yin* corresponds to wood, its proper animal is the tiger. *Hsu* corresponds to earth, its animal is dog. *Ch'ou* and *Wei* correspond to earth likewise, *Ch'ou* having as animal the ox, and *Wei* having the sheep. Wood overcomes earth, therefore the dog, the ox and the sheep are overpowered by the tiger. *Hai* goes with water, its animal being the boar. *Ssu* goes with fire, and has the snake as animal. *Tzu* means, also water, its animal being the rat. *Wu* also corresponds to fire, the animal is the horse. Water overcomes fire, therefore the boar devours the snake. Fire is quenched by water, therefore, when the horse eats the excrements of rats, its belly swells up.

Further in the text, it notes the relationship of the animals to the hours and why the animals were thus selected:

During the *Tzu* hour (11 p.m. – 1 a.m.), the power of the element of *Yin* reaches its paramount point, there is stillness, deceit and darkness. For this reason, the Rat is associated with this *Yin* element as the Rat usually conceals itself in darkness, hidden from everyone. This is the opposite with the *Wu* hour (11 a.m. – 1 p.m.) when the *Yang* element reaches its greatest height. There is bright lights, ease of movements, firmness and robust action. For this reason, the Horse is associated as he is swift and fast.

The *Ch'ou* hour (1 a.m. – 3 a.m.) is the period ruled by the *Yin*. Parents show kindness and love to their young offspring, caring for their every need. The association is that of the Ox for always licking their calves with parental tenderness. Again this is contracted with the *Wei* hour (1 p.m. – 3 p.m.) for the *Yang* element rises and there is the observance of propriety. The Sheep is so associated for the lamb always is in a kneeling position when taking milk from its mother which is a sign of decorum and filial piety.

In the *Yin* hour (3 a.m. – 5 a.m.) it is beginning of dawn and the break of day and the *Yang* element gains supremacy and becomes intense. This

hour is associated with the Tiger for its ferocious nature. In contrast, the *Shen* hour (3 p.m. – 5 p.m.) is the time when *Yin* begins to gain the upper hand, implying artifice. The Monkey is so associated because it is by nature clever, crafty and cunning.

Both the *Mao* hour (5 a.m. – 7 a.m.) and the *Yu* hour (7 p.m. – 9 p.m.) are the commencing hours for both the sun and the moon and the two animals become one. The Hare is associated with *Mao* and the Cock with *Yu*. With the Hare, the doe licks the buck's hair, and through this sensitive touch conceives without intercourse, while the Cock rides on the back of the hen and contact is established without feeling.

With the *Ch'en* hour (7 a.m. – 9 a.m.) and the *Ssu* hour (9 a.m. – 11 a.m.), the *Yang* element rises up and makes transformations. The Dragon is at its best in transformation, with the snake taking the second place. The Dragon and the Snake are associated with *Ch'en* and *Ssu* respectively as both are capable of transformation.

During both the *Hsu* hour (7 p.m. – 9 p.m.) and the *Hai* hour (9 p.m. – 11 p.m.), the *Yin* element declines and it is time to be safeguarded. For this nature of watchfulness, the Dog is pre-eminent, with the boar taking second place. Both of these animals are calm creatures and are associated with *Hsu* and *Hai* respectively.

The selection of the twelve animals could have been based on the *Yin* and *Yang* contrasting principles as six of the animals are domestically and the other six are wild. To the Chinese this principle of the *Yin* and *Yang* duality holds that all things in the universe are produced by the harmonious interaction of these two opposite forces. The Chinese believe that it is on the blending of the forces of this dualistic principle that their harmony depends. In addition, the Chinese also assigned each of the twelve animals to correspond with the Five Elements. This cycle of the twelve animals is common also to many peoples of Eastern Asia and used by them for the numeration and designation of years.

In China, this cycle is a correlate of the duodenary cycle of the twelve earthly branches arranged as follows:

| <i>Branch</i> | <i>Animal</i> | <i>Yin/Yang</i> | <i>Hour</i> | <i>Element</i> |
|----------------------|----------------------|------------------------|-------------------------|-----------------------|
| Tzu | Rat | Yin | 11 p.m. – 1 a.m. | Water |
| Ch'ou | Ox | Yin | 1 a.m. – 3 a.m. | Earth |
| Yin | Tiger | Yang | 3 a.m. – 5 a.m. | Wood |
| Mao | Hare | Yin | 5 a.m. – 7 a.m. | Wood |
| Ch'en | Dragon | Yang | 7 a.m. – 9 a.m. | Metal |
| Ssu | Snake | Yang | 9 a.m. – 11 a.m. | Fire |
| Wu | Horse | Yang | 11 a.m. – 1 p.m. | Fire |
| Wei | Sheep | Yang | 1 p.m. – 3 p.m. | Earth |
| Shen | Monkey | Yin | 3 p.m. – 5 p.m. | Metal |
| Yu | Cock | Yang | 5 p.m. – 7 p.m. | Metal |
| Hsu | Dog | Yin | 7 p.m. – 9 p.m. | Earth |
| Hai | Boar | Yin | 9 p.m. – 11 p.m. | Water |

Although *Wang Ch'ung* in his *Lun-heng* is perhaps the oldest noting the use of this cycle among the Chinese in the first century A.D., nevertheless, it must be assumed that since it was already common practice at that time, it must have existed earlier. According to another contemporary work, *Wu-Yueh ch'un-ch'iu*, this cycle denotation was already in use in the beginning of the sixth century B.C., so that it predates the birth of Buddha which would invalidate the first popular story of the twelve animals.

In excavated discoveries in China, the duodenary cycle of the twelve earthly branches were inscribed on the oracle bones used for divination during the Shang dynasty (1766-1123 B.C.). Moreover, on the oracle bones, evidence showed that the Chinese had marked their years according to the position of the planet Jupiter passing through twelve constellations of years, the period in which Jupiter completes one revolution around the sun. Each

year was designated by the duodenary characters denoting that part of the horizon in which Jupiter's position was at during the year.

In conclusion, the selection of the twelve animals, as examined earlier in the *Li-hai-chi* and the *Lun-heng*, is based on the Yin/Yang and Five Elements principles along with other symbolical and allegorical meanings. The cycle of twelve animals was primarily used as a popular measure for the illiterate, peasants and those unable to comprehend the more technical duodenary cycle to chronicle the years.

FESTIVALS IN CHINESE CALENDAR

The main Chinese Festivals in Singapore are:

- *Chinese New Year*
- *Qing Ming Festival*
- *Mid-Autumn Festival*
- *Dong Zhi*

However, as Qing Ming Festival and Dong Zhi are mainly astronomical in their origin, we will be only discussing the origins of Chinese Lunar New Year and the Mid-Autumn Festival, followed by a short description of each of their astronomical aspects.

LEGEND OF CHINESE LUNAR NEW YEAR

According to a legend popular among farmers, the Chinese word for “year”, *Nian*, was once the name of a monster in ancient China. The monster slept the whole year round except for the thirtieth day of the twelfth or the final month in the traditional Chinese calendar. On that day, it roamed from place to place, injuring or killing people and livestock. On one New Year’s Eve, *Nian* came to the village where several buffalo boys were cracking their herding whips in a competition. The monster was so frightened by the loud and explosive sound that it fled to another village. On arrival, it spotted some bright red clothes hanging on the line to dry. *Nian* was terrified and ran away. When it reached the third village, it stopped in front of a house and peeked through a crack on the door. The bright illumination inside made it feel dizzy. Once again, *Nian* fled in panic.

People thus came to realize that *Nian*’s fatal weakness was its fear of light, red colour and explosive sound. So to scare away *Nian*, they started setting off fireworks and firecrackers and putting on red clothes as a way to celebrate the New Year.

When all is said and done, legends are just legends. They cannot change the fact that Spring Festival marks the beginning of a year, according to the lunar calendar.

ORIGINS OF SPRING FESTIVAL

As to the origin of the Spring Festival, one legend has it that during the Shang Dynasty (c. 16th-11th centuries B.C.), a young man named Wan Nian (meaning ten thousand years) was worried about the confusion in the solar terms of the calendar indicating the relative position of the earth's orbit around the sun. The confusion had unfavourably affected farming activities. To remedy the difficult situation, Wan Nian carefully recorded the time with a sundial and a clepsydra. Finally, he succeeded in determining four of the twenty-four solar terms, the Spring Equinox, the Autumn Equinox, the Summer Solstice and the Winter Solstice.

The official responsible for the observation of climatic variations then was a man called A Heng. Being ignorant and incompetent, he was negligent in executing his duty. He tried to put the blame for his dereliction on the common folks whom, he said, had offended the gods. He suggested to King Zuyi to make sacrificial offerings to the gods in order to determine the solar terms. His suggestion was accepted and the king attended the rites at the head of his ministers and other officials. At the same time, a royal edict on offering sacrifices to Heaven was sent across the nation. Amidst all the commotion, Wan Nian requested an audience with the king, taking along his sundial and clepsydra. The king was convinced by his explanation and ordered the construction of a sundial and clepsydra in front of the altar. To ensure that Wan Nian could devote all his time and energy to more accurately measure the solar terms, the king assigned twelve boys to be his attendants.

A Heng, sensing a threat to his position, decided to get rid of Wan Nian. The incompetent official paid an assassin an enormous sum of money to take the life of Wan Nian. Unable to get close to the young man, the assassin tried to shoot him to death at a distance with an arrow. He failed in his treacherous mission, as the arrow succeeded in hitting only Wan Nian's arm. The assassin was later caught and beheaded.

When the king came to the Sun and Moon Pavilion at the altar, the site of the sundial and clepsydra, Wan Nian said to him, "Your Majesty, it's

midnight now. The old year has been completed and the new year has begun. Please define the beginning period of year.

The king said, "Let's call it the Spring Festival since spring is the first season of the year."

Wan Nian stayed on at the pavilion in pursuit of refining time measurement. After long years of observation and through meticulous calculation, he finally worked out a solar calendar. When he presented it to the king, Wan Nian was already an old man with silvery hair. Deeply touched, the king named the calendar the "Wan Nian Calendar" and granted him the title, "The Sun and Moon God of Longevity".

People today refer to the traditional Chinese New Year celebration as the Spring Festival and put up pictures of the god of longevity as part of their preparations for the occasion. It is said their purpose in doing so is to commemorate the venerable Wan Nian.

LEGEND OF THE MID-AUTUMN FESTIVAL

Around 2000 B.C., there ruled in Imperial China, an emperor, Son of Heaven and Lord of Ten Thousand Years, who had a peculiar talent for sensing by sight alone the phenomena we now called "earth-warming." One fine summer afternoon, while listening to one of his imperial concubines playing the PiPa (a pear shaped mandolin), and gazing toward his Summer Palace Gazebo, he saw ten suns overlapping each other, beating sharp rays never seen before. Ever conscious of his role as protector of the community, he feared the overpowering suns would scorch the people, dry up wells, rice paddies, lakes and seas. The earth, he dreaded, would overheat and burn to its horrific conclusion.

What was to be done? Quickly he summoned his imperial presence, General *Hou Yih*, an officer guardsman of the imperial household guards, who distinguished himself as his Lord Protector by having been a very skilled archer of tremendous strength. When he was told of the ten overlapping suns burning brightly at noon and threatening to scorch all on earth, he immediately shot nine arrows aimed at nine suns across the sky. They were reported to be on target, and by the evening, only one sun was going down over the meadows. Earth-warming was no longer a threat to life, limb, and agriculture.

His Imperial Majesty and his consort, the Empress, were impressed. Soon, the Goddess of the Western Heavenly Realm beard of General *Hou's*

giant Leap for mankind. She commissioned him to be architect and imperial builder of a multi-colored rainbow palace from her imperial collection of jade, a gem stone valued highly by the Chinese Imperial Dynasties and henceforth by Chinese people everywhere.

Naturally, as a General, he was able to marshal the sinew of armed men for the building project. The Palace was so well built and so appropriate as a fortress that Her Imperial Majesty felt that it would be a tragedy that a man so gifted should die a premature death, either in a battle or by accident. Therefore, she decided to confer eternal life on him by offering as a reward the "Elixir of Immortality-Life Eternal" in the form of the "Pill of Life Eternally" on the singular condition that he was not to swallow it until a full year of prayerful contemplation and fasting at a local monastery. He took it home, but busy with imperial duties, he had it hidden in a secret place without telling his Wife Lady O-Chang about the potent power of the Pill.

While away on one of his imperial missions, Lady O-Chang accidentally found the pill in its secret hiding place and swallowed it. Lo and Behold! She was airborne within seconds and bound for eternal banishment to the full brilliant moon above to complement the divine natural beauty of the moon with her own beautiful attributes of form and substance. As she was soaring like an eagle at full flight, contrary to the earthly laws of gravity. General Hou saw this totally unexpected turn of events and took arms in hot pursuit.

However, as if by divine intervention, typhoon winds swept and turned him back to earth. His was the earth and all therein to cherish and love till the end of his days Lady O-Chang, on the other hand, became the divinely beautiful Moon Goddess whose celestial realm was the Moon and stars that twinkle like a thousand points of light in a heavenly dance, fluttering, flickering, to and for across the skies at night, delighting one and all, especially during this season of the mid-Autumn Moon, when the celestial Goddess of the moon makes her appearance at the offerings put forward by earth people!

Children are asked to concentrate quietly at these prayerful offerings, for deep thoughts and clear minds do sometimes render the unexpected sighting of this phantom goddess of the night. For some five thousand years now, during the August Moon Festival, Chinese elders repeat this epic legend of magic for children and to all who would listen of how, why, and when this Festive Day and Night is celebrated. Lady O-Chang has reached

the status of immortality in the form and substance of the Goddess, as lovely as she ever was while here on earth.

THE SIGNIFICANCE OF EATING MOON CAKES DURING MID-AUTUMN FESTIVAL

In the 14th century, the eating of moon cakes during the Mid-Autumn Festival was given a new significance. The story goes that when the patriot *Zhu Yuan Zhang* was plotting to overthrow the Yuan Dynasty, he passed his plans hidden inside the moon cakes to his fellow rebels. Hence, the eating of moon cakes during Mid-Autumn Festival was said to commemorate the patriot *Zhu Yuan Zhang* and a commemoration of the overthrow of the Mongolians by the *Han* people.

ASTRONOMICAL ASPECTS OF THE FESTIVALS

The Chinese calendar is a luni-solar calendar, therefore meaning that it is based on the observations of the Sun and the Moon. In the solar calendar, among the 24 solar terms, there are 8 principal seasons, which indicate the beginning and the end of the *yin* and *yang* elements in the four seasons. They are the Beginning of Spring, the Beginning of Summer, the Beginning of Autumn, the Beginning of Winter, the Spring Equinox, the Autumn Equinox, the Summer Solstice and the Winter Solstice.

The first day of the first lunar month in the lunar calendar is New Year's Day, marking the beginning of the year. Since the Beginning of Spring (*li chun*) begins around this day (approximately February 4), the **LUNAR NEW YEAR** is also known as the Spring Festival, heralding the arrival or approach of the spring.

The **QING MING FESTIVAL** is based on the solar term of the solar calendar, which is in this case, the 5th solar term known as *qing ming*. It more or less coincides with April 5 in the Gregorian calendar. By this time, all the trees have sprouted leaves and flowers bloom in the springtime splendour. The people have clear and bright feelings about the occasion. One noteworthy event is that ever since the Tang Dynasty, every Chinese family visits the graves of their ancestors to sweep the graves.

The **MID-AUTUMN FESTIVAL** is based on the lunar calendar. The fifteenth day of the eighth lunar month is the middle of the autumn according to the Chinese reckoning. During this festival, there should be family reunion with the eating of moon cakes. This mid-autumn festival occurs at a time when the grain is normally stored in the granary and the people celebrate their harvest with a festival. This is also why sometimes the Mid-Autumn Festival is also known as the **HARVEST MOON FESTIVAL**.

The **DONG ZHI** is also based on the solar term of the solar calendar, which is in this case, the 22nd solar term known also as *dong zhi*. It coincides with December 22 of the Gregorian calendar. Dong Zhi is the thanksgiving of the Chinese calendar. "Dong Zhi" literally means "arrival of winter". Coinciding with the winter solstice, it is an occasion for the family to get together to celebrate the good year they have had. Tang Yuan is cooked and eaten to symbolise unity and harmony within the family. Dong Zhi occurs 6 weeks before Chinese New Year and would normally fall between 21st Dec and 23rd Dec. Notice that among all the Chinese Festivals, only the Qing Ming Festival and Dong Zhi are based on the solar calendar, while the rest are based on the lunar calendar.

References:

Books:

- The Grand Spectacle of Chinese New Year, Compiled and published by Editorial Dept. of Hong Kong China Tourism Press
- Early Astronomy by Hugh Thurston
- Ancient Astronomers by Anthony F. Aveni
- Cycle of Chinese Festivals by C.S. Wong
- Chinese New Year: Fact and Folklore by William C. Hu
- T'ung Shu The Ancient Chinese Almanac by Martin Palmer
- Festivals in Classical China by Derk Bodde
- Chinese Almanacs by Richard J. Smith
- Changing Views of The Universe by Colin A. Ronan
- The Ordering of Time by Arno Borst
- Kim Long, *The Moon Book*, Johnson Printing, 1998

URLs:

- <http://charon.nmsu.edu/~lhuber/leaphist.html>
- <http://webexhibits.org/calendars/calendar-chinese.html>
- <http://www.geocities.com/lunarcald/>
- <http://www.spellworks-inc.com/MoonNames.htm>
- <http://www.infoplease.com/spot/bluemoon1.html>
- <http://www.earthsky.com/Features/News/blue-moons.html>
- <http://www.farmersalmanac.com/astronomy/astronomy.html>
- <http://www.griffithobs.org/IPSBlueMoon.html>
- http://www.inconstantmoon.com/cyc_blue.htm
- <http://www.obliquity.com/astro/bluemoon.html>
- <http://www.projectpluto.com/bluemoon.htm>
- <http://www.friesian.com/century.htm>
- <http://www.solarviews.com/eng/moon.htm>
- <http://www.quinion.com/words/topicalwords/tw-blu2.htm>
- <http://lunarcald.tripod.com/General.html>
- <http://www.chinesefortunecalendar.com/>
- <http://www.chinesefortunecalendar.com/Y2K.htm>
- Lyle Huber, *Calendars and their History*, <http://astro.nmsu.edu/~lhuber/leaphist.html>
- Philip Hiscock, *Folklore of the "Blue Moon"*, <http://www.griffithobs.org/IPSBlueMoon.html>
- *The Maine Farmer's Almanac*, http://www.inconstantmoon.com/not_mfal.htm
- Kevin Clarke, *On Blue Moons*, http://www.inconstantmoon.com/cyc_blue.htm

- David Harper and Lynne Marie Stockman, *Blue Moon*, <http://www.obliquity.com/astro/bluemoon.html>
- Donald W. Olson, Richard Tresch Fienberg, and Roger W. Sinnott, *What's a blue Moon?*, <http://www.skypub.com/sights/moonplanets/9905bluemoon.html>
- Kelley L. Ross, Ph.D., *Traditional English Names of Full Moons, and the "Blue Moon"*, <http://www.friesian.com/century.htm>
- Kelley L. Ross, Ph.D., *The Solar Terms and the Chinese Calendar*, <http://www.friesian.com/chinacal.htm>

