

# The Chinese calendar and its operational rules

Autor(en): **Liu, Baolin / Stephenson, F. Richard**

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# The Chinese Calendar and its operational rules

BAOLIN LIU and F. RICHARD STEPHENSON

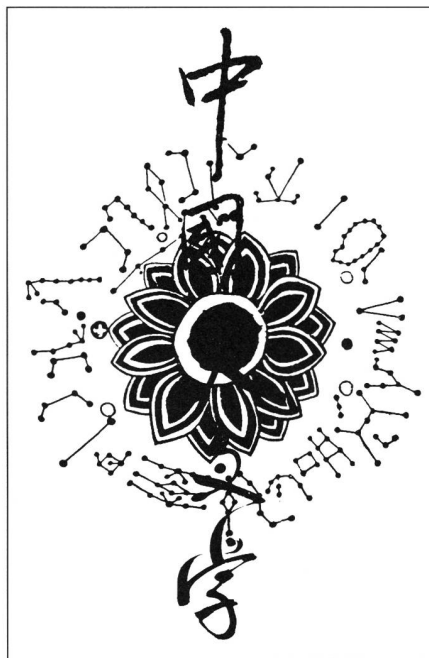
The Chinese calendar is a form of luni-solar calendar. The rules in operation today have remained unchanged since almost the very beginning of the last (Qing) dynasty – i.e. as far back as A.D. 1645. Since 1914, Western astronomical theory has been used in calculating the positions of the Sun and Moon (and other relevant details) but the basic rules have been unaffected. It is the purpose of this article to explain these rules, particularly with regard to the determination of month numbers and intercalation. One of the present authors (Liu) has specialised in the study of the Chinese calendar for many years.

## The Lunar Month

The first day of each month of the Chinese calendar is determined from the new Moon. By definition, the new Moon does not mean a thin crescent which is only just visible, but the actual conjunction of the Moon and Sun; except on those occasions when a solar eclipse is visible, this can only be fixed by computation. Throughout the Qing Dynasty (A.D. 1644-1911), and also during the period 1912-1913, Beijing local apparent time was used for computation. This was replaced by Beijing mean time between 1914 and 1928. However, since 1929, a standard time of 8 hours ahead of Universal Time (UT) has been adopted. For calculating the calendar, the longitude of 120 degrees east is taken as the fundamental meridian. In particular, the new day is regarded as commencing at midnight on this longitude.

To determine the moment of new Moon it is necessary to calculate precisely when the longitudes of the Moon and Sun are equal. The times of new Moon may be obtained by inverse interpolation. For instance, in the *Chinese Astronomical Almanac*, a table of phases of the Moon is given in terms of the date and mean time at the standard longitude of 120 deg east. Table 1 lists the dates and mean times (at this reference longitude) of the new Moons throughout 1998. Each of these dates is the first day of a lunar month.

The mean length of a synodic month is a little greater than 29.5 days (more precisely: 29.530589 days). On the Chinese calendar, the length of a month is



always 30 or 29 days. Months containing 30 days are known as long months; those with only 29 days are short months. As might be expected from the length of the mean synodic period, the frequency of long months is slightly greater than that of short ones. In any period of 235 months (the Metonic cycle), which is closely equal to 19 tropical years, the ratio of the number of long months to short months may be either 124 to 111 or 125 to 110. Due to perturbations of the lunar orbit by the Sun, the actual length of a synodic month varies cyclically during the course of about a year from approximately 29.3 to 29.8 days (the extreme range is from 29.27 to 29.84 days). Because of this variation, in any one year there can sometimes be two successive short calendar months, but occasionally – as last happened in 1990 – as many as four consecutive long months.

Twelve lunar months comprise 354 or 355 days. If a calendar year were always to consist of 12 lunar months, it

would be less than a tropical year (365.2422 days) by about 11 days. Hence the seasons would gradually shift throughout the year – as happens in the Islamic calendar. In order to avoid this drift, an intercalary month must be added from time to time. In the Chinese calendar, the intercalary years containing this additional month occur at intervals of either two or three years. Over any 19-year period, there are 12 years containing 12 months and seven years with 13 months. In particular, 1998 is an intercalary year (see below), as will be 2001.

Numerical cycles are not used to fix intercalation in the Chinese calendar. Both the start of each year and the selection of intercalary months are controlled according to 24 dates in the year known as the solar terms.

## The 24 Solar Terms

In Western countries there are four standard seasonal markers: the vernal equinox (solar longitude = 0 deg), summer solstice (90 deg), autumnal equinox (180 deg) and winter solstice (270 deg). However, in China there are as many as 24 solar terms, each approximately 15 days apart. Four of these terms are the equinoxes and solstices. Many of the remaining 20 terms have descriptive names, indicative of annual climatic variations in the central part of China. The first solar term in any year is defined as the date and time (at longitude 120 deg east) when the solar longitude is 315.0 deg. This is midway between the winter solstice and the vernal equinox; it thus now occurs around Feb 4 (on the Gregorian calendar). The second term is the date and mean time when the solar longitude is 330.0 deg (approximately Feb 19), and so on at 15-deg intervals. The last term (longitude 300 deg) occurs around Jan 20 (in the following year). Odd numbered solar terms are known as *Jieqi* (sectional terms), even numbered ones as *Zhongqi* (principal terms). There are twelve of each in a year. Only *Zhongqi* are used in fixing the lunar months. The 24 solar terms, including whether they are classified as *Jieqi* or *Zhongqi*, and their approximate dates on the Gregorian calendar, are listed in Table 2. In this table, the «1st Jie» is an abbreviation for the first *Jieqi* (the first solar term: *Lichun*). Similarly, the «1st Zhong» is an abbreviation for the first *Zhongqi* (the term *Yushui*), etc. It will be noted that in the case of the *Zhongqi* or principal terms, the solar longitude is an integral multiple of 30 deg; thus, the equinoxes and solstices are among the principal terms.

Table 1. Dates and mean times (at 120 deg. E) of new moons in 1998

Date/Time (h)	Date/Time (h)	Date/Time (h)
Jan 28 / 14.02	Feb 27 / 1.43	Mar 28 / 11.23
Apr 26 / 19.68	May 26 / 3.53	Jun 24 / 11.83
Jul 23 / 21.73	Aug 22 / 10.05	Sep 21 / 1.02
Oct 20 / 18.15	Nov 19 / 12.45	Dec 19 / 6.70

Throughout the year, *Jieqi* and *Zhongqi* alternate, as is evident from Table 2. Before the Qing Dynasty, mean longitudes of the Sun were used for calculating the dates and times of the solar terms. The length of a tropical year was then divided into 24 equal parts, each containing approximately 15.22 days. On this scheme, a solar term occurred every 15.22 days; such terms are known as mean solar terms.

From A.D. 1645, the second year of the Qing Dynasty, mean longitudes of the Sun were no longer used for calculating the solar terms; they were replaced by true longitudes – as is the case today. Terms calculated by this revised method are called true solar terms. Since the orbital motion of the Earth is uneven, after adopting true longitudes the intervals between any two adjacent solar terms are unequal. When the Earth is near perihelion (in the Northern winter: actual date around Jan 2), the Sun apparently moves faster than average. The time required for the Sun to travel 15 deg along the ecliptic is thus shorter than average. Under these circumstances, the minimum interval between two adjacent solar terms is only 14.72 days. Alternatively, when the Earth is near aphelion (Northern summer: around Jul 5), the Sun moves relatively slowly. The time required for the Sun to travel through 15 degrees is longer and the interval between two adjacent solar terms is consequently greater: maximum 15.74 days. This significant variation about the mean of 15.22 days can affect both the start of the year and the choice of intercalary month.



Solar Terms	Meaning	Solar Long	Jieqi/Zhongqi	Approx date
Lichun	Beginning of Spring	315	1st Jie	Feb 4
Yushui	Rain Water	330	1st Zhong	Feb 19
Jingzhe	Wakening of Insects	345	2nd Jie	Mar 6
Chunfen	Spring Equinox	0	2nd Zhong	Mar 21
Qingming	Pure Brightness	15	3rd Jie	Apr 5
Guyu	Grain Rain	30	3rd Zhong	Apr 20
Lixia	Beginning of Summer	45	4th Jie	May 6
Xiaoman	Grain Full	60	4th Zhong	May 21
Mangzhong	Grain in Ear	75	5th Jie	Jun 6
Xiazhi	Summer Solstice	90	5th Zhong	Jun 21
Xiaoshu	Slight Heat	105	6th Jie	Jul 7
Dashu	Great Heat	120	6th Zhong	Jul 23
Liqiu	Beginning of Autumn	135	7th Jie	Aug 8
Chushu	End of Heat	150	7th Zhong	Aug 23
Bailu	White Dew	165	8th Jie	Sep 8
Qiufen	Autumnal Equinox	180	8th Zhong	Sep 23
Hanlu	Cold Dew	195	9th Jie	Oct 8
Shuangjiang	Descent of Frost	210	9th Zhong	Oct 23
Lidong	Beginning of Winter	225	10th Jie	Nov 7
Xiaoxue	Slight Snow	240	10th Zhong	Nov 22
Daxue	Great Snow	255	11th Jie	Dec 7
Dongzhi	Winter Solstice	270	11th Zhong	Dec 22
Xiaohan	Slight Cold	285	12th Jie	Jan 6
Dahan	Great Cold	300	12th Zhong	Jan 20

Table 2. The 24 solar terms

### Determination of the Month Number and the Intercalary Month

New Year on the lunar calendar can occur at any time between Jan 21 and Feb 20. As mentioned above, the first day of each lunar month is determined from the new Moon (i.e. conjunction of the Moon and Sun in longitude). The month number in any year is derived from the *Zhongqi*, not the *Jieqi*. Thus the lunar month containing the term *Yushui* («rain water»: solar longitude = 330 deg) is normally the first month in the year. Similarly, the lunar month containing the term *Chunfen* (Spring Equinox: solar longitude = 0 deg) is the second month, etc. Therefore, apart from in very rare instances, the term *Yushui* always occurs between the first and 29th

(or 30th) days of the first lunar month. Similarly, *Chunfen* normally occurs between the first and 29th (or 30th) days of the second month, etc. The precise position of these terms in the appropriate months is unimportant.

Most lunar months contain two solar terms: one *Jieqi* and one *Zhongqi*. However, in winter, because of the relatively rapid solar motion, on infrequent occasions there may be as many as three terms (two of one kind and one of the other) in a lunar month. Such an instance always occurs in either the tenth, eleventh, twelfth, or first lunar months. On very rare occasions, the last term of the twelfth month may in fact be the first principal term *Yushui*. Under these circumstances, the start of the new year is delayed, and the first lunar month contains only the second sectional term *Jingzhe*. This unusual situation last took place in 1984/5 and will not recur until 2033/34. It should be stressed that the month containing the winter solstice (*Dongzhi*) must be the eleventh month; this is an invariable rule.

Normally, any month without a *Zhongqi* (or principal term) is an intercalary month. Since the Revolution in A.D. 1911, this rule has remained the same as in the Qing Dynasty. Because of the uneven solar motion, the interval between two successive *Zhongqi* varies considerably – from about 29.4 days in winter to approximately 31.4 days in summer. Hence if a certain *Zhongqi* falls

Fig. 1. Huge gnomon at Gaocheng, Henan province, built in A.D. 1276 by Guo Shoujing. The shadow of the vertical gnomon, 9.8 m in height, was projected on a horizontal scale, 31.5 m in length; this scale was placed due north of the tower. Pinhole imaging was used to accurately define the shadow edge. This allowed accurate calendar determination, particularly of the solstices and equinoxes, and also the days on which festivals or ceremonies, as decreed by the emperor, should be held. Photograph courtesy of ARNOLD VON ROTZ.

at the end of a lunar month, the next *Zhongqi* might not fall in the following month, but at the beginning of the next again month. Thus there will be no *Zhongqi* in the second of these three lunar months, but only a *Jieqi*. According to rule, since this month has no *Zhongqi*, it will normally be the intercalary month of that particular year. (If a month contains no *Jieqi*, this is of no consequence as far as intercalation is concerned).

As an example, we shall explain how the month numbers in 1998 and the intercalary month in the same year are determined – see Table 3.

From Table 3, it can be seen that in 1998, the dates Jan 28, Feb 27, Mar 28, Apr 26, etc are all new Moons. Each of those dates is the first day of a lunar month. The lunar month from Jan 28 to Feb 26 contains the term *Yushui* (actual date Feb 19), which is the *Zhongqi* of the first month; hence that lunar month is called the first month. As there are 30 days from Jan 28 to Feb 26 inclusive, that lunar month is a long one. Similarly, as the lunar month from Feb 27 to Mar 27 inclusive contains the term *Chunfen* – the *Zhongqi* for the second month – and contains 29 days – that lunar month is called the second month and is a short one. Most of the remaining lunar months can be obtained by analogy.

However, the lunar month from Jun 24 to Jul 22 inclusive in 1998 contains no *Zhongqi*; as a result, that lunar month is an intercalary month. Since the preceding month is the fifth month, the additional month is called the intercalary fifth month; the intercalary always takes the number of the preceding normal month. Note the (temporary) reversal of the sequence of *Jieqi* and *Zhongqi* after this intercalary. The original sequence will not be restored until the ninth month of 1999; this will happen because the eighth month of 1999 has no *Jieqi*. Over the years, the order of *Jieqi* and *Zhongqi* frequently interchanges owing to the average length of a lunar month (29.53 days) being less than the mean interval between two adjacent principal or sectional terms (30.44 days).

The above account explains the rules for intercalary months in ordinary cases. However, the rule mentioned above is inapplicable to rare exceptional cases. An exceptional case occurs when there happen to be two *Zhongqi* in a lunar month. This will only occur in the winter when the Sun moves through 30 deg in less than a calendar month. As a result, nearby months before and afterwards will contain no *Zhongqi*. The last such exception occurred in 1984/85 and the next will take place in 2033/34. The eleventh lunar month in 1984 had two *Zhongqi*, while what became the in-

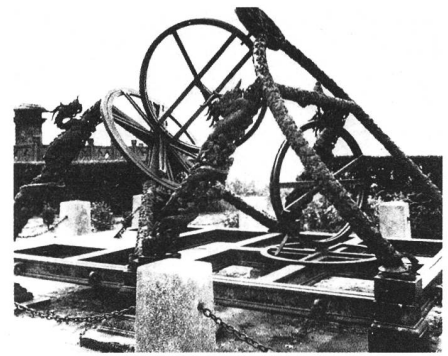


Fig. 2. Equatorial torquetum at Purple Mountain observatory. Probably cast around A.D. 1437, this instrument is a copy of the no longer extant torquetum built at Beijing by the great extant astronomer Guo Shoujing in about 1270. (Reproduction from «Wissenschaft und Technik im alten China» hrsg. vom Inst. für Geschichte d. Naturwiss. d. Chines. Akad. d. Wiss. Aus d. Chines. von Käthe Zhao in Zusammenarbeit mit Hsi-lin Zhao, Basel; Birkhäuser Verlag, 1989. Courtesy of Birkhäuser Verlag, Basel)

tercalary tenth month of that year and the first month of 1985 each contained no *Zhongqi*. Even more unusual, the eleventh and twelfth lunar months of A.D. 2033 will both have two *Zhongqi*, while the eighth and what will become the eleventh month of that year and the first month of 2034 will each contain no *Zhongqi*.

In these rare instances, the rule for determining the intercalary month is as follows. As noted previously, the month containing the winter solstice must be the eleventh month. If there are 13 months from one eleventh month to the next eleventh month (in exclusive counting), that year is an intercalary year. Then, in that intercalary year, the first month after the winter solstice which contains no *Zhongqi* is an intercalary month. In fact, the rule for fixing the intercalary month in ordinary cases can be included in this same rule. Based on this rule, in 1984 the tenth lunar month was the intercalary (rather than the first month of 1985), while in 2033 the intercalary will be the eleventh month.

### The Ganzhi System

In the Chinese calendar the year, month, day and time may also be counted according to the *Ganzhi* system or sexagenary cycle. *Gan* means celestial stems, while *Zhi* means terrestrial branches. The ten celestial stems are as follows: *Jia, Yi, Bing, Ding, Wu, Ji, Geng, Xin, Ren, Gui*. The twelve terrestrial branches are: *Zi, Chou, Yin, Mao, Chen, Si, Wu, Wei, Shen, You, Xu, Hai*. In the *Ganzhi* cycle, the ten stems are combined with the twelve branches in

Table 3. Determination of month numbers and intercalary for 1998

New Moon	Jieqi or Zhongqi in Lunar Month	Month Number as Determined	Long or Short
28 Jan 1998	4 Feb: 1st Jie 19 Feb: 1st Zhong	First	long
27 Feb	6 Mar: 2nd Jie 21 Mar: 2nd Zhong	Second	short
28 Mar	5 Apr: 3rd Jie 20 Apr: 3rd Zhong	Third	short
26 Apr	6 May: 4th Jie 21 May: 4th Zhong	Fourth	long
26 May	6 Jun: 5th Jie 21 Jun: 5th Zhong	Fifth	short
24 Jun	7 Jul: 6th Jie (no Zhongqi)	Int. Fifth	short
23 Jul	23 Jul: 6th Zhong 8 Aug: 7th Jie	Sixth	long
22 Aug	23 Aug: 7th Zhong 8 Sep: 8th Jie	Seventh	long
21 Sep	23 Sep: 8th Zhong 8 Oct: 9th Jie	Eighth	short
20 Oct	23 Oct: 9th Zhong 7 Nov: 10th Jie	Ninth	long
19 Nov	22 Nov: 10th Zhong 7 Dec: 11th Jie	Tenth	long
19 Dec	22 Dec: 11th Zhong 6 Jan: 12th Jie	Eleventh	short
17 Jan 1999	20 Jan: 12th Zhong 4 Feb: 1st Jie	Twelfth	long



		Gan (Celestial Stems)										
		甲 jia	乙 yi	丙 bing	丁 ding	戊 wu	己 ji	庚 geng	辛 xin	壬 ren	癸 gui	
Zhi (Terrestrial Branches)	子 zi	1		13		25		37		49		rat 鼠
	丑 chou		2		14		26		38		50	ox 牛
	寅 yin	51		3		15		27		39		tiger 虎
	卯 mao		52		4		16		28		40	hare 兔
	辰 chen	41		53		5		17		29		dragon 龙
	巳 si		42		54		6		18		30	snake 蛇
	午 wu	31		43		55		7		19		horse 马
	未 wei		32		44		56		8		20	sheep 羊
	申 shen	21		33		45		57		9		monkey 猴
	酉 you		22		34		46		58		10	fowl 鸡
	戌 xu	11		23		35		47		59		dog 狗
	亥 hai		12		24		36		48		60	pig 猪
		mu (wood) 木		huo (fire) 火		tu (earth) 土		jin (metal) 金		shui (water) 水		
		Elements										

Table 4

the following way. The stems are taken in order six times with the branches repeated five times, forming sixty combinations. This system has been compared with the motion of two interlocking gear wheels, one with ten teeth, the other with twelve. The full *Ganzhi* cycle is shown in Table 4.

At present, the *Ganzhi* system is no longer used in China for reckoning the month, day, or time – although it was for many centuries in the past. However, the system is still used for naming the *year* of the Chinese calendar. As shown in Table 5, the twelve branches are also linked with twelve animals for astrological purposes. In particular, these animals serve as reminders of the year of a person's birth.

No.	Branch	Animal	No.	Branch	Animal
1	Zi	Rat	2	Chou	Ox
3	Yin	Tiger	4	Mao	Hare
5	Chen	Dragon	6	Si	Snake
7	Wu	Horse	8	Wei	Sheep
9	Shen	Monkey	10	You	Fowl
11	Xu	Dog	12	Hai	Pig

Table 5. Links between twelve branches and twelve animals

The cyclical year for any A.D. date can be found by adding 57 to the A.D. year, dividing by 60 and multiplying the remainder by 60. Thus 1911, the year of the Revolution, was the 48th year of the cycle; it was therefore known as the *Xinhai* Year. Similarly 1998, is the 15th year of the present cycle, i.e. the year *Wuyin*. Since *yin* (the appropriate Branch) corresponds to tiger, 1998 is therefore the Year of the Tiger.

**Compact Calendar Table**

Table 6 is a compact concordance of the Chinese calendar with the Western calendar for the years 1998 to 2009.

The New Year of the Gregorian calendar almost always falls in either the eleventh or twelfth month (in exceptional rare cases – for example in 2033 – in the intercalary eleventh month) of the Chinese calendar. In the above table, the first day of the twelfth month of the year

Table 6. Twelve-year Chinese-Western calendar: AD 1998 - 2009

Wuyin: 1998	Jimao: 1999	Gengchen: 2000	Jiashen: 2004	Yiyou: 2005	Bingxu: 2006
No.	Type	1st day	No.	Type	1st day
1	long	Jan 28	1	short	Jan 22
2	short	Feb 27	2	long	Feb 20
3	short	Mar 28	3	short	Mar 21
4	long	Apr 26	4	long	Apr 19
5	short	May 26	5	short	May 19
6	long	Jun 24	6	long	Jun 18
7	long	Jul 23	7	short	Jul 17
8	short	Aug 22	8	short	Aug 16
9	short	Sep 21	9	long	Sep 14
10	long	Oct 20	10	short	Oct 14
11	short	Nov 19	11	long	Nov 12
12	long	Jan 17	12	short	Jan 10

Xinsi: 2001	Renwu: 2002	Guiwei: 2003	Dinghai: 2007	Wuzi: 2008	Jichou: 2009
No.	Type	1st day	No.	Type	1st day
1	long	Jan 24	1	short	Feb 18
2	long	Feb 23	2	long	Feb 7
3	short	Mar 25	3	short	Mar 19
4	long	Apr 23	4	short	Apr 17
5	short	May 23	5	long	May 17
6	long	Jun 21	6	short	Jun 15
7	short	Jul 19	7	long	Jun 14
8	short	Sep 17	8	short	Jul 13
9	short	Oct 17	9	long	Aug 13
10	long	Nov 15	10	short	Aug 11
11	short	Dec 15	11	long	Aug 31
12	long	Jan 13	12	short	Sep 29

*Wuyin* corresponds to Jan 17 in 1999, the year 1999 being understood. Similar remarks apply in later years.

The above 12-year Chinese-Western calendar was taken from *The Newly Compiled Perpetual Chinese Calendar*, which was produced by one of us (LIU) and published under the auspices of Purple Mountain Observatory, Nanjing (1984). Although modern calendar tables based on this work are now readily available, certain calendar compilers continue to use the outmoded *Wannian Shu* (Perpetual Chinese Calendar: literally «Ten-thousand Year Calendar») issued during the Qing Dynasty. The *Wannian Shu* contains several mistakes. In our opinion these archaic tables should no longer be utilised.

PROF. BAOLIN LIU  
14-106 Second Lane  
Nanjing, 210008 China

PROF. F. RICHARD STEPHENSON  
University of Durham, Department of Physics  
Durham DH1 3LE, UK

## Zusammenfassung

### Die Rechenregeln des chinesischen Kalenders

Der chinesische Kalender stellt eine Form eines Lunisolarkalenders, auch gebundener Mondkalender genannt, dar. Lunisolarkalender sind im Allgemeinen um einiges komplexer im Aufbau als Mond- oder Sonnenkalender. Folgende Bedingungen müssen erfüllt werden:

- Die Mondmonate haben 29 Tage – Hohle Monate – oder 30 Tage – Volle Monate, und der Monat fängt bei Neumond an.
- Die Jahreslänge soll an den Sonnenlauf, d.h. an das tropische Jahr angepasst werden, und das chinesische Jahr beginnt ungefähr beim Frühlingsanfang – *Li tsch'ün* –, wenn der ekliptale Längengrad der Sonne 315 Grad beträgt. Daher fängt das neue Jahr irgendwann zwischen dem 21. Januar und dem 20. Februar an.
- Sowohl das Jahr als auch der Monat sollen eine ganze Anzahl Tage aufweisen.
- Die als Basis dienenden astronomischen Perioden, der mittlere Sonnentag, der mittlere synodische Monat mit 29,530589

Tagen und das tropische Jahr mit 365,2422 Tagen, bilden Grössen, die inkommensurabel sind. Um die geforderte Abstimmung zu erreichen, muss man von Zeit zu Zeit, nach gewissen Regeln, Schaltmonate einfügen.

Soweit den Verfassern bekannt, sind diese Regeln in einer vollständigen oder dem heutigen Stand entsprechenden Form in keiner europäischen Sprache in der Literatur vorhanden. Es ist der Zweck dieses Artikels, diese Regeln im Detail zu erläutern. Die heutigen Rechenregeln sind in ihrer Basis seit Anfang der *Qing Dynastie*, 1645 n.Chr., unverändert geblieben. Als Grundlage gilt, dass eine Periode von 253 mittleren synodischen Monaten ziemlich genau die gleiche Anzahl Tage wie 19 tropische Jahre beinhaltet. Dies führt zu einer Verteilung von 124 oder 125 vollen und 110 oder 111 hohlen Monaten innerhalb einer Periode. Ferner wird die Ekliptik (*hoang – tao* = gelbe Bahn) in 24 Jahreszeiten – 12 *Jiegi* und 12 *Zhonggi* – geteilt. Die Anordnung der Schaltmonate erfolgt im Zusammenhang mit den 24

Jahreszeiten, und jeder Monat ohne einen *Zhonggi* ist ein Schaltmonat. Seit 1929 wird als Referenzmeridian der Meridian 120 Grad östlich von Greenwich für die Bestimmung des ekliptalen Mond- und Sonnen-Längengrades angenommen.

In diesem Artikel wird ausserdem der Sexagesimalzyklus kurz erläutert. Hier erfolgt die Zählung der Tage und Jahre nach einem Zyklus von 60 Einheiten. Es gibt zehn himmlische Stämme – *Gan* – und zwölf irdische Zweige – *Zhi*. Daher die Bezeichnung Ganzhi. Der Leser wird auf die Tabelle verwiesen, welche die bekannten chinesischen «Tierkreiszeichen» enthält; diese werden zur Namegebung der Jahre verwendet. Zum Beispiel: 1998 war das Jahr *Wu-yin*, das Jahr der Erde und des Tigers; das ist das 15. Jahr innerhalb des gegenwärtigen Zyklus.

Zusammenfassung:  
RENY O. MONTANDON  
Brummelstrasse 4  
CH-5033 Buchs

## Résumé

### Les règles pour l'établissement du calendrier chinois

Le calendrier chinois constitue une forme de calendrier luni-solaire.

Les calendriers luni-solaires sont en général beaucoup plus complexes que les calendriers lunaires ou solaires.

Les conditions suivantes doivent être satisfaites:

- Les mois lunaires ont 29 jours – mois caves – ou 30 jours – mois pleins. En plus le début du mois est fixé d'après la nouvelle lune.
- La longueur de l'année doit correspondre à la course du soleil, c'est-à-dire à l'année tropique et que l'année commence aux environs de *litchoen* – début du printemps –, quand la longitude céleste de soleil est de 315°, c'est-à-dire la nouvelle année peut commencer entre le 21 Janvier et le 20 février.
- En plus le début du mois est fixé d'après la nouvelle lune.
- En plus, autant l'année comme le mois doivent avoir un nombre entier de jours.

d) Les périodes astronomiques qui servent de base, à savoir, le jour solaire moyen, le mois synodique moyen avec 29,530 589 jours et l'année tropique avec 365,24 22 jours sont des grandeurs incommensurables.

Afin de répondre à ces exigences il faut de temps en temps introduire des mois intercalaires.

Le but de cet article est d'expliquer les règles qui doivent être suivies et leur application, qui, à la connaissance des auteurs, n'existent pas dans la littérature, en ce qui concerne les langues européennes, ceci en tant que d'un point de vue d'un traitement détaillé et actualisé.

Les principes des règles d'établissement du calendrier sont restés inchangés depuis le début de la dynastie Qing, A.D.1645

On part du fait que 235 mois synodiques moyens correspondent approximativement au même nombre de jours que dans 19 années tropiques. On répartit la période en 125 (ou 124) mois pleins et 110 (ou 111) mois caves.

En plus, l'écliptique (*hoang - Lao* = orbite jaune) est répartie en 24 sections de saison – 12 *tchié* et 12 *tchi* –. L'arrangement des mois intercalaires est fait en fonction des 24 sections de saison, c'est-à-dire chaque mois sans tchi est un mois intercalaire.

Depuis 1929 le méridien de longitude 120° Est de Greenwich, est pris comme méridien de référence pour la détermination de la longitude céleste de la lune et du soleil.

Finalement on traite encore de façon résumée le cycle de soixante.

Ici on compte autant les années comme les jours selon un cycle de soixante.

Il y a dix troncs célestes – *Gan* – et douze branches terrestres – *Zhi* –, d'où la désignation *Ganzhi*. Voir la table qui contient en plus les signes zodiacaux chinois, qui désigne les années.

Par exemple, en 1998 a commencé l'année *Wu-yin* (la 15<sup>e</sup> année du présent cycle), l'année de la terre et du tigre.

Résumé:  
RENY O. MONTANDON  
Brummelstrasse 4, CH-5033 Buchs