

Tambora's Rumblings in *The Annals of Lan Xang*

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Abstract

The Annals of Lan Xang suggest that sound generated in the eruption of Mount Tambora in 1815 was heard at a distance of about 3,350 km in the middle Mekong basin. This article describes three versions of the *Annals of Lan Xang* and the chronology found therein and discusses the two relevant annals.

1. The Annals of Lan Xang

Two versions of The Annals of Lan Xang are published as the *Phongsawadan Yaw Mu'ang Wiang Jan* (*The Annals of Vientiane*) in Part 70 of *The Collected Chronicles* (Vol. 44:1969:131-152). According to their introduction (*Collected Chronicles*, Vol. 44:1969:131), the two works were prepared by one Ong-pen-jao Kattiya on a date corresponding to Saturday, October 28, 1893. However, while the published versions reached their present form on this date, they seem to have descended from two distinct lines of earlier annals which had been kept at different points in the middle Mekong basin since sometime in the 18th century of the Christian Era.

The first version (*Collected Chronicles*, Vol. 44:1969:131-137) consists of about 51 annals, covering a period of about 139 years, from A.D. 1695-96 to A.D. 1834. Since it contains more reports of events in the vicinity of Nakhon Phanom than do the other versions of *The Annals of Lan Xang*, I believe it to have been kept in that area and call it *The Nakhon Phanom Version of the Annals of Lan Xang*, or *Nakhon Phanom*.

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Arisen from the same stock as *Nakhon Phanom* is a third version of *The Annals of Lan Xang*. Khun Surajit Jantharasakha found a palm-leaf manuscript of this version written in *tham* orthography in a monastery in Mukdahan, had it transcribed into Standard Thai orthography, and kindly presented a copy of the transcription to me. This version bears the title *bawk sakkarat khwam klu'an wai khawng lan chang*, or *The Dates of Events in Lan Xang*; I call it *The Mukdahan Version of the Annals of Lan Xang*, or *Mukdahan*. It covers a period of about 173 years, from A.D. 1695-96 to A.D. 1868, and consists of 64 annals. Of the first 32 annals in *Mukdahan* and in *Nakhon Phanom*, 29 are identical or nearly so, indicating that they came from a common source.

The second published version (*Collected Chronicles*, Vol. 44:1969:138-152) is of separate stock. It consists of about 100 annals and covers a period of about 158 years, extending from A.D. 1698-1699 to A.D. 1857. Because in comparison with the other versions, it contains more reports on events which occurred in the vicinity of Vientiane and Nong Khai, I believe the annals to have been kept somewhere in that area and call it *The Vientiane Version of the Annals of Lan Xang*, or *Vientiane*.

The three versions represent one genre of Tai historiography, that which the introduction to Part 70 (*Collected Chronicles*, Vol. 43:1969:151) terms ປຸມໂຮນ *pum hon*, and which David Wyatt (1976:118-119) has called "astrologers' notebooks of extraordinary events." The annals report prodigies of nature, such as droughts, earthquakes, eclipses, floods--and of course, strange sounds in the night--as well as wars, political changes, celebrations, and other happenings within the human community. The annals are of particular interest because they are among the very few surviving sources of information on the history of the middle Mekong basin during the 18th and first quarter of the 19th centuries of the Christian Era.

The annalists who wrote these works seem to have supposed that their readers were already familiar with the events recorded. The individual annals making up these sets of annals are terse in the extreme, stating in a

bare minimum of words and without any explanation or amplification that such and such an event occurred in a certain year. What I take to have been a major intent of those who wrote these works was expressed well by Plummer (1892:xix-xxi, quoted by Garmonsway, 1972:xviii), writing on the English chronicles:

A chronicle was not a device for arranging a store of events, and for reducing the accumulations of history to literary order. It was not (what it at length became) a method, a system of registration, whereby each event was put into its chronological place. The chronicle form had a more primitive use. This was to *characterize* the receeding series of years, each by a mark and a sign of its own, so that the years might not be confused in the retrospect of those who had lived an acted in them. ...To posterity they present merely a name or two, as of a battlefield and a victor, but to the men of the day they suggested a thousand particulars, which they in their comrade-life were in the habit of recollecting and putting together. That which to us seems a lean and barren sentence, was to them the text for a winter evening's entertainment.

In the culture of their time, then, the annals were complemented by oral tradition. This served to amplify their laconic reports while for their part, the annals gave to tradition a temporal framework. Apart from tradition, the annals yield scant information; apart from the annals, oral tradition loses its temporal dimension, and events that were separated in time tend to collapse, like a telescope, one into another. An example of this tendency is found in *Aen Lung Buaphet [A Talk with Lung Buaphet]* (Thawin Thawngsawangrat, 1979), in which an elderly resident of Renu Nakhon recounts the founding of that settlement; in this account, events of the Siamese-Vietnamese war of the A.D. 1830s and 1840s and those of the Chinese bandit, or Haw, incursions of the 1870s and 1880s have fallen together into one mega-event.

2. Chronology

The annals ordinarily maintained the temporal dimension of community history by simply giving the year in which an event occurred. The format of the typical annal--a little over half of those in *Vientiane* and roughly three-quarters of those in *Nakhon Phanom* and in *Mukdahan*--is:

the serial number of the year of the *Julasakkarat* Era, the name of the year according to the cycle of twelve or the cycle of sixty, and the report of the event.

The precision of dating, however, may be greater, the greatest being that in six annals of *Vientiane*, in which the format is:

the serial number of the *Julasakkarat* year,
the name of the year according to the cycle of sixty,
the lunar month,
the day of the month,
the day of the week,
the name of day according to the cycle of sixty,
the watch of the day, and
the report of the event.

Less frequently in *Vientiane*, the report of the event follows the serial number and name of the year and is followed by the month and day; this, however, is the usual format of annals in *Nakhon Phanom* and *Mukdahan* in which the month and day are given.

Years

The *Julasakkarat* Era

All the annals in the three versions begin with the serial number of the year of the *Julasakkarat* Era. In all versions, the serial number is nearly always truncated by the subtraction of 1,000, so that the year *Julasakkarat* 1060, for example, is written (*Jula*)sakkarat 60, and *Julasakkarat* 1212 is written (*Jula*)sakkarat 212. Abbreviation of the serial number of the year by elimination of

the thousands, hundreds, and even tens place seems to have been a common practice in what is now Laos and the Northeastern and Northern Regions of Thailand (Vickery 1974:279); some examples from the 17th century of the Christian Era may be found in Griswold (1957:92, 95, 96).

The *Julasakkarat* Era was the most commonly used era among the Tai of the middle Mekong and Chao Phraya basins from the end of the 14th to the end of the 19th centuries of the Christian Era. Billard (1971:74) believes the *Julasakkarat* calendrical system to have been formulated in India in about A.D. 638, to have been adopted and adjusted for use in lower Burma, and from thence at a later time to have spread with Sinhalese Buddhism to what is now Thailand, Laos, and Cambodia. Inscriptions indicate that the system had come into use among the Tai in the upper Chao Phraya basin by about A.D. 1370 (Griswold and Prasert na Nagara 1974), in Luang Pra Bang by about A.D. 1490 (Griswold 1957:82), in the vicinity of Vientiane by about A. D. 1535 (*Collected Inscriptions*, Part 4, 1970:22-25), and at That Phanom by A.D. 1615 (Pruess, 1976:64).

The *Julasakkarat* calendar is a luni-solar calendar: the year is regulated by the sun and the months are regulated by the moon. The era begins from Sunday, March 22, A.D. 638 (Julian) (Billard, 1971:74). On the day before, there occurred both the spring equinox and a solar eclipse (Cassini, 1969:188) and it is at the spring equinox that the new solar year commences. This event is called *songkran*, meaning the "entry" of the sun into the zodiac sign of *mesa*, a passage analogous to the sun's reaching the First Point of Aries, or the spring equinox, in Western astronomy.

This passage takes place over a period of three or four days. The sun is seen to circle the heavens once in the course of a year, and an average speed can be assigned to its motion. In fact, however, the sun is seen to move at varying speed, being sometimes ahead and sometimes behind the position predicted on

the basis of its average speed, so a correction is provided to give the actual location of the sun. This correction, called the equation of the sun, is the difference between the motions of the real sun and the average sun.

At *songkran*, the real sun is moving faster than the average sun, and it "enters *mesa*" 52 hours and 24 minutes before the average sun. The day on which the real sun enters *mesa*, called *songkran pai*, is taken as the beginning of the astronomical year; the day on which the average sun enters *mesa*, called *songkran khu'n*, is taken as the beginning of the civil year. These two days are separated by one or two days, which are called *mu' nao*. The *songkran* festival thus comprises three or four days: *songkran pai*, *songkran khu'n*, and one or two intervening *mu' nao*. It is on the final day of the festival, *songkran khu'n*, that the civil year begins and that one is added to the serial number of the old year to give the serial number of the new.

The length of the year of the *Julasakkarat* calendar is 23 minutes 24 seconds longer than that of the Gregorian, a difference which causes *songkran* to occur about one day later every 61 Gregorian years (Prince Phetsarath 1956:794). During the 19th century of the Christian Era, the 12th and 13th centuries of the *Julasakkarat* Era, the difference had increased such that the entry of the real sun into *mesa* by *Julasakkarat* reckoning occurred roughly 19 to 21 days after the spring equinox by Gregorian reckoning, and as a result, the civil year began at a Gregorian date between April 12 and 14, most frequently on April 13, and it was to this date that *songkran* was fixed in Siam when the Gregorian calendar came into use there late in the nineteenth century. Today, *songkran* is still celebrated in Thailand on April 12, 13 and 14, but now the observance marks the entry of the real sun into *mesa*; the entry of the average sun into *mesa*, the beginning of the civil year according to traditional reckoning, now falls on April 15 or 16.

The Cycles of 12 and of 60 Years

In all versions of the *Annals of Lan Xang*, years are identified by a name drawn from the cycle of 12 or the cycle of 60. The cycle of 12 appears in two forms, one of which is called "Tai" and the other, "Khawm" [Siamese-Khmer] (Griswold and Prasert na Nagara, 1969:76, 84, Phra Theprattanamoli, 1985: 155) Each name is identified with an animal. The two sets of names and corresponding animals are as follows :

Tai	Khawm	animal
<i>jai</i>	<i>chuat</i>	rat
<i>pao</i>	<i>chalu</i>	ox
<i>yi</i>	<i>khan</i>	tiger
<i>mao</i>	<i>thaw</i>	rabbit
<i>si</i>	<i>marong</i>	dragon
<i>sai</i>	<i>maseng</i>	snake
<i>sa-nga</i>	<i>mamia</i>	horse
<i>mot</i>	<i>mamae</i>	goat
<i>san</i>	<i>wawk</i>	monkey
<i>hao</i>	<i>raka</i>	cock
<i>set</i>	<i>jaw</i>	dog
<i>khai</i>	<i>kun</i>	pig

The Tai cycle of 12 is combined with a cycle of 10 names to form the cycle of 60, in which case the 12 are termed *luk pi* "Children of the Years" and the 10 *mae pi* "Mothers of the Years". The Mothers are:

1. Kap
2. Hap
3. Huai
4. Moeng
5. Poek
6. Kat
7. Kot
8. Huang
9. Tao
10. Ka

A complete cycle of 60, set out after Prince Phetsarath (1956 : 790), is shown below:

Kap	Hap	Huai	Moeng	Poek	Kat	Kot	Huang	Tao	Ka
-jai	-pao	-yi	-mao	-si	-sai	-sa-nga	-mot	-san	-hao
-set	-khai	-jai	-pao	-yi	-mao	-si	-sai	-sa-nga	-mot
-san	-hao	-set	-khai	-jai	-pao	-yi	-mao	-si	-sai
-sa-nga	-mot	-san	-hao	-set	-khai	-jai	-pao	-yi	-mao
-si	-sai	-sa-nga	-mot	-san	-hao	-set	-khai	-jai	-pao
-yi	-mao	-si	-sai	-sa-nga	-mot	-san	-hao	-set	-khai

In the first line are the ten Mothers, and under each one are the Children permitted. Odd Mothers, i.e., the first, third, fifth, seventh, and ninth terms of the cycle of ten, may have only odd Children, i.e., the first, third, fifth, seventh, ninth, and eleventh terms of the cycle of twelve; likewise, even Mothers may have only even Children (Sao Saimong, 1981:9).

This same cycle of 60 is also used by the Chinese and the Vietnamese (Vickery, 1976:342). In China, the Mothers are the 10 celestial stems and the Children, the 12 terrestrial branches, and there, this cycle came to be used in reckoning years in the first century of the Christian Era (Needham, 1954-71, Vol. III:396). The cycle was never used in Siam (Vickery, 1974:342), but there is something roughly similar: the Siamese combined the Khawm form of the cycle of 12 with ten terms derived from Indic numbers one to nine and the word "complete". The numbers are equivalent to the right-most digit in the *Julasakkarat* year serial number, and the word *samru't*, "complete", is used when that digit is zero; thus:

xxx1 <i>ekkasok</i>	xxx4 <i>jattawasok</i>	xxx8 <i>attasok</i>
xxx2 <i>thosok</i>	xxx5 <i>benjasok</i>	xxx9 <i>nopphasok</i>
xxx3 <i>trisok</i>	xxx6 <i>chawsok</i>	xxx0 <i>samru'tthisok</i>
	xxx7 <i>saptasok</i>	

Among the three versions, *Vientiane* is distinct because the cycle of sixty is consistently used in naming years; the Tai form is used in all annals except

the last two (*Julasakkarat* 1281 and 1219 [1856 and 1857], in which the Siamese cycle of 60 is used. In *Nakhon Phanom*, the cycle of 60 is used to designate years in only seven annals; in all others, the cycle of 12 alone is used. Likewise in *Mukdahan*, as would be expected given the fact that it and *Nakhon Phanom* share a common origin, the cycle-of-60 year names appear in only three of first 31 annals, the cycle of 12 being used in all the others. In the next 16 annals of *Mukdahan*, however, the Tai cycle of 60 is used exclusively, but then, in all the remaining annals save one, the cycle of 12 reappears, but now in its *Khawm* form.

Months

The *Julasakkarat* calendar provides 12 months, which are identified by the numerals one through 12. Each month corresponds to an observed lunation. The month is divided into two *khang*, or "fortnights" : a *khang khu'n*, or "waxing fortnight," comprising 15 days, which extends from a new moon to the full moon, and a *khang raem*, or "waning fortnight," comprising 15 days in even-numbered months and 14 days in odd-numbered months, which extends from the full moon to the following new moon. Thus, even-numbered months always have 30 days, and odd-numbered ones usually have 29 days.

Accord between the months, which are governed by the lunar period of 29.53 days, and the seasons, which are governed by the solar period of 365.25875 days (Prince Phetsarath, 1956:793), is maintained by intercalating days and months. The accumulation of the fractions of a day over the years is managed by intercalating a "leap-year day" every four to seven years as the fifteenth day in the waning fortnight of the seventh month.

In a similar manner, the difference of about 11 days between the 365+-day solar year and the 354 days of the twelve lunar months is managed by intercalating a "leap month" of 30 days at two-to-three-year intervals after the eighth month; this intercalary month is called "the double eight month."

There are thus three calendar years: an ordinary calendar year of 12 months comprising 354 days; a leap-day calendar year of 12 months with 355 days, a fifteenth day being added to the waning fortnight of the seventh month; and a leap-month calendar year of 13 months with 388 days, the double eighth month of 30 days being inserted after the eighth month.

The traditional calendar presents very strikingly a lunar face, and it is easy to see why it has often been described, erroneously, as a lunar calendar. One can gauge the date simply by looking at the moon, and with the moon the community celebrates, for with one exception, all of the traditional feast days are fixed in the calendar and to the phase of moon. Buddhist sabbaths, *wan sin*, fall at the new moon (the 14th or 15th day in the waning fortnight), the first quarter (the eighth day in the waxing fortnight), the full moon (the 15th day in the waxing fortnight), and the last quarter (the eighth day in the waning fortnight). The principal sabbath of the month is the full moon, and as the months succeed each other around the calendar year, it is on this day, the 15th day in the waxing fortnight, that the great feasts of the Buddhist Church are celebrated: *Makhabucha* in the third month, *Wisakhabucha* in the sixth, and *Asalahabucha* in the eighth; this day is also the culmination of the great shrine feasts, for example, at That In Hang in Sawannakhet Province in the first month, at That Sikhottabun near Tha Khaek and at That Choengchum in Sakon Nakhon in the second month, at Wat Phu in Jampasak (Thao Boun-souk, 1971:146) and at That Phanom in Nakhon Phanom Province in the third month, and at That Luang in Vientiane in the 12th month (Thao Boun-souk, 1971:147-148). The following day, the first day in the waning fortnight, marks the beginning of the *phansa* rainy season retreat in the eighth month and its end in the eleventh. Furthermore, in addition to the solar new year, *songkran*, there is also a lunar new year. This falls not at the beginning of the first lunar month (which comes in November or early December), but at the beginning of the fifth (in March or early April). It may well be that, at one time, the lunar new year was celebrated at the beginning of the first month, which is

the new moon before the winter solstice (Phrabat Somdet Phra Chulachomkla Chaoyuhua, 1971: 287), and which was the time of the new year in China under the Chou dynasty (Wu, 1964:721), and perhaps this has something to do with why the lunar months are numbered the way they are. In any case, the lunar new year, *Trut*, is celebrated at the new moon of the fifth month. The observance lasts three days: the fourteenth and fifteenth days in the waning fortnight of the fourth month and the first day in the waxing of the fifth. This celebration did indeed inaugurate a new year, for, in Siam at least, on the final day of *Trut*, the name of the year according to the cycle of 12, i.e., the animal name of the year, was changed (Phrabat Somdet Phra Chulachomkla Chaoyuhua, 1971:284; Wales, 1931:299)

The odd man out in all of this is *songkran*. In the *Julasakkarat* calendar, *songkran* is a moveable feast, like Easter is in the Gregorian calendar. Just as Easter cannot be fixed in the solar Gregorian calendar because a lunar factor (*the Sunday after the first new moon after the spring equinox*) enters into its determination, so *songkran*, which is regulated by the sun, cannot be fixed among the lunar months of the *Julasakkarat* calendar. However, intercalation keeps *songkran* within a certain period of the year, comparable to the 35-day period between March 22 and April 25 during which Easter occurs. Thus, *songkran* ordinarily falls within a 29-day period extending from the sixth day in the waxing fortnight of the fifth month to the fifth day in the waxing fortnight of the sixth month.

Cycles of Days

The Seven Days of the Week

In all three versions, days are designated according to the seven days of the week. Originating in ancient Mesopotamia, this system reached the Tai via India and the Mon and Khmer civilizations of mainland Southeast Asia; in early Tai inscriptions, the seven days of the week are called *wan meng*, "the day according to the Mon reckoning" (Griswold and Prasert na Nagara, 1974:129,137-138;

Phra Theprattanamoli, 1985:150) or *wan khawm*, "the day according to the Khmer reckoning" (Griswold and Prasert na Nagara, 1969:76,84). The days of the week are named after the same heavenly bodies as they are in the Gregorian calendar, and their order is the same. The days of the week may also be designated by a number, such that Sunday is 1 and Saturday is 7 or 0.

1	wan athit	"Day of the Sun"	Sunday
2	wan jan	"Day of the Moon"	Monday
3	wan angkhan	"Day of the Mars"	Tuesday
4	wan phut	"Day of the Mercury"	Wednesday
5	wan pharu'hat	"Day of the Jupiter"	Thursday
6	wan suk	"Day of the Venus"	Friday
7 or 0	wan sao	"Day of the Saturn"	Saturday

The Cycle of Sixty Days

Vientiane is distinct in that, in addition to the week, days are sometimes designated according to the cycle of 60; this is found nowhere in either *Mukdahan* or *Nakhon Phanom*. The cycle of 60 day names is formed in the same way as the Tai cycle of 60 year names; in this case, the terms of the cycle of 10 are called *mae mu'*, i.e., "Mothers of the Days," and those of the cycle of 12, *luk mu'*, or "the Children of the Days."

In Tai inscriptions, day names according to this cycle of 60 are called *wan thai*, or "the day according to the Tai reckoning" (Griswold and Prasert na Nagara, 1974:129,137-138; Phra Theprattanamoli, 1985:150-152). In China, these have been used in reckoning days since the second millennium before Christ (Wu, 1964a:619-620; Wu, 1964b:720-721). It may be that this system was taken up by the Tai from the Chinese at an early date (Vickery, 1974:344).

The Day

The civil day (*mu'* or *wan*) lasts from sunrise to sunrise, beginning at 6 a.m. (Prince Phetsarath, 1956:788).

Watches

The day is divided into "watches" (*yam*), each with a name. The system found in *The Annals of Lan Xang* appears to be that described in Prince Phetsarath (1956:789), in which there are 16 watches, eight for the day and eight for the night, and each 1.5 hours long, because four of the five watches found in *Vientiane* and the one watch found in *Mukdahan* (*yam kawng ngai* in Annal 207) appear among those listed in Prince Phetsarath (no watches are found in *Nakhon Phanom*). The watches of *Vientiane* and the names and their clock times from Prince Phetsarath are:

Annal	Name in <i>Vientiane</i>	Name and clock time in	
		Prince Phetsarath (1956:789)	
175	<i>yam klai rung</i>	(not listed)	
188, 1214	<i>yam kawng ngai</i>	<i>ngai</i>	0730-0900 h
200	<i>yam thiang wan</i>	<i>thiang</i>	1030-1200 h
176, 187, 198	<i>yam kawng laeng</i>	<i>laeng</i>	1330-1500 h
209	<i>yam lae klai kham</i>	<i>thae klai kham</i>	1500-1630 h

3. The Rumblings of Tambora in the Annals of Lan Xang

The first annal of interest is from *Vientiane* (p. 145):

ศักราชได้ 176 ปีกากาเส็ด (จก) เดือน 6 ขึ้น 2 ค่ำ วันจันทร์ เมื่อ (sic) (วัน) มีชี (sic) ได้ () (sic) เทวดาลั่นกลอง (ตีกลอง) เท่ายอด (จนดึง) 3 ค่ำวันอั้นการจีง อย่า (หยุด) แลเดือน 6 ขึ้น 8 ค่ำวันอาทิตย์ยามกลองแลง (บ่ายโมงเศษ) ลมหลวง

The parentheses enclose Siamese glosses of Lao words; ignoring these and correcting the typographical error, the annal may be translated:

When the Era had reached 176, a *kap-set* year, on the second day in the waxing fortnight of the sixth month, a Monday and a *Moeng-khai* day, the gods rolled their drums and did not stop until the third day of the

waxing, a Tuesday, and on the eighth day in the waxing fortnight of the sixth month, a Sunday, during the early afternoon watch, there was a great wind storm.

The era is the *Julasakkarat* Era, and as usual in the *Annals*, the serial number of the *Julasakkarat* year is truncated. The tables in Damrongrachanuphap (1973:35) and the chart in Sao Saimong (1981) show *Julasakkarat* 1176 to have been a kap-set year.

Calendrists differ in the way in they intercalate days and months. Phrabat Somdet Phra Chulachomklao Chaoyuhua (1973:292) observed that not only did this cause divergences among the calendars of the Burmese, the Siamese, the Lao, and the Khmer but even among those dressed in Bangkok itself. As an example, consider the patterns of intercalation of Eade (1989:156), Thawngkham Yimkamphu (1989:64-67) and Phra Thewalok (Somdet Phra Chao Boromwongthoe Kromphraya Damrongrachanuphap, 1973:21) for the decade *Julasakkarat* 1170 to 1179:

	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179
Eade	D	M	O	O	M	D	O	M	O	M
Thawngkham	O	M	D	O	M	O	D	M	O	M
Thewalok	O	M	D	O	O	M	D	M	O	M
O = ordinary year					D = leap-day year			M = leap-month year		

Eade's intercalation of leap days is distinct from the pattern shared by Thawngkham Yimkamphu and Phra Thewalok and Phra Thewalok's intercalation of leap months differs from that of Eade and Thawngkham Yimkamphu in that *Julasakkarat* 1175 rather than 1174 is a leap-month year.

The difference that arises when a leap day is inserted in one calendar but not another is that the first will be one day of the week ahead of the other for any given day of the lunar month. This difference disappears when a leap day is inserted in the second calendar.

The year *Julasakkarat* 1176 began on a Wednesday, and this fell on the eighth day in the waning fortnight of the fifth month if 1175 had been treated as a leap-day year or on the ninth day in the waning fortnight of the fifth month if it had not. In the latter case, the difference would have been compensated for by insertion of a day at the end of the seventh month of *Julasakkarat* 1176.

The following year, *Julasakkarat* 1177, began on a Friday, and this fell on the sixth day in waxing fortnight of the sixth month. This is unusual, for normally *songkran* falls no later than the fifth day in the waxing fortnight of the sixth month.

The first date according to the lunar month in the annal, the second day in the waxing fortnight of the six month, thus occurred twice in *Julasakkarat* 1176. The first occurrence, near the beginning of the year, was a Thursday (if 1175 had been a leap-day year) or a Wednesday (if 1175 had been an ordinary year) and so it is not the day indicated. The second day in the waxing fortnight of the sixth month occurred again at the end of the year, four days before *songkan khu'n* of *Julasakkarat* 1177, and this was a Monday (Thawngkham Yimkamphu, 1980:66, 68). The coincidence of a Monday and a *Moeng-kai* day in *Julasakkarat* 1176 satisfies the condition of Billard (1963:412) and so the date seems correct. Therefore, the following day was a Tuesday and the third day in the waxing fortnight, and the following Sunday was the eighth day in the waxing fortnight of the sixth month. This Sunday fell after *songkran khu'n* and was thus in *Julasakkarat* 1177, for the eighth day in the waxing fortnight of the sixth month in *Julasakkarat* 1176 was a Monday (if 1175 had been a leap-day year) or a Tuesday (if 1175 had been an ordinary year).

Two observations may be made. Tuesday, the third day in the waxing fortnight of the sixth month was *songkran pai*, the beginning of the astronomical year, Wednesday and Thursday were *mu' nao*, and Friday was *songkran khu'n*, the beginning of the civil year *Julasakkarat* 1177. The gods rolling their drums on Monday and Tuesday occurred before the civil new year and so is properly reported in the annal for *Julasakkarat* 1176. However, this annal also reports the wind storm

on Sunday afternoon, which, occurring as it did after the civil new year, one would think should have been recorded in an annual *Julasakkarat* 1177.

In fact, however, there is no annual 1177 in *Vientiane*, and occasionally events of two years are reported in a single annual: there are four such annals in *Vientiane*, four in *Nakhon Phanom*, and two in *Mukdahan*. In most of these, there is some reference to the passage from one year to the next, sometimes by citing the name of the new year according to the cycle of sixty, but usually by the phrase ແຕ່ປີເກົ່າເກົ່າຂອດປີໃໝ່ *tae pi kao thao hawt pi mai* "from the old year into the new"; however, in this annual and one other in *Vientiane* and in one annual in *Mukdahan*, no indication is given of the change of the year.

A second observation is that, although these dates are after *Trut* at the beginning of the fifth month, the name of the year remains *Kap-set*; evidently, the practice of changing the cycle-of-twelve designation of the year at *Trut* was not followed.

Following the method of Billard (1963), Monday and *Moeng-khai* day coincided in *Julasakkarat* 1176 on the Gregorian date April 10, 1815, the day on which began the most violent phase of one of the greatest volcanic eruptions in history.

Mount Tambora is on the peninsula extending northward from the island of Sumbawa, which lies to the east of Lombok, Bali, and Java. Following Stothers (1984), the mountain began to rumble and a dark cloud appeared at its summit as early as 1812. A minor eruption began on April 5, 1815, with explosions so loud that, when heard in Jakarta, 1200 km away, they were mistaken for artillery fire. The noise then gradually diminished until, on the evening of April 10, the major eruption began.

According to an eyewitness report (Wurtzburg, 1984:366), at about 7 p.m., three great columns of flame shot high into the air from the crater of the volcano, and soon firey flows engulfed its slopes. By about 8 p.m., the mountain was no longer visible because of falling pumice, and later, ash. At about 10 p.m., violent winds sweeping down the slopes and a tsunami rising up from the sea uprooted trees and carried them off along with houses, animals, and people.

When the winds died down at about 11 p.m., explosions began, and from midnight, they went on continuously until the evening of April 11. The explosions were very powerful: "in many places the sound waves produced concussions that resembled mild earthquakes" (Stothers, 1984:1192) and were audible at great distances: "The sound was picked up [on April 11] as far west as Fort Marlborough at Benkulen (1800 km [from Tambora]), Mukomuko (2000 km), and probably Trumon (2600 km) [all of which are] on the island of Sumatra" (Stothers, 1984:1193)

If the sound reported in *Vientiane* originated in the eruption of Tambora, it would increase the range of audibility by about 750 kilometers. Nong Khai ($17^{\circ} 52'N$ $102^{\circ} 43'E$) is about 3,352 kilometers from Tambora ($8^{\circ} 16'S$ $117^{\circ} 59'E$), and Vientiane ($17^{\circ} 59'$ $102^{\circ} 38'E$) is about 16 kilometers farther away. Sounds produced in volcanic eruptions have been heard at much greater distances; those caused by explosions of Krakatoa, west of Java, on August 27, 1883, were heard as rock blasting at Elsey Creek in South Australia (2,224 km from Krakatoa), as ship's guns at Diego Garcia Island (3,674 km away), and as gunfire at Rodriguez Island (4,811 km distant), near Mauritius in the Indian Ocean (Francis, 1976:77-78), and the 1815 Tambora eruption may well have been bigger than Krakatoa (Francis, 1976:264).

It thus seems likely that Tambora was the cause of the "drumming" reported in *Vientiane*. The dates given agree with the report that the explosions continued from midnight to the evening of April 11. Because the civil day began at 6 a.m., the "drumming" before dawn was attributed to Monday, and its continuation after dawn to Tuesday.

I believe that the sound of the eruption was also heard at Mukdahan ($16^{\circ} 31'N$ $104^{\circ} 43'E$), about 3,117 kilometers from Tambora, for Mukdahan reports:

คักราชได้ 177 ปีอับได (พ.ศ. 2358) อุบัติเหตุเสียงดัง
กำໄได คนทั้งPLAN [sic] ສ້າງກີແມ່ນປິນ້ນແລ

The parentheses enclose a Buddhist Era equivalent of the *Julasakkarat* year. The word ໜາມ is probably a typing error; the word should be ໜາມ. The annal may be translated:

When the Era had reached 177, a *Hap-khai* year, that year there was an unaccountable loud noise in the south, and everyone trembled with fear.

Again, the serial number of the year is truncated. *Julasakkarat* 1177 was a *Hap-khai* year (Somdet Phra Chao Boromwongthoe Kromphraya Damrongrachanuphap, 1973:35; Sao Saimong, 1981). It began on a Friday, the sixth day in the waxing fortnight of the sixth month (April 14, 1815) and ended on a Tuesday, the 15th day in the waxing fortnight of the fifth month (April 12, 1816).

The description of the noise and the direction from which it came fit with the eruption of Tambora; the date does not. It may be that the noise was registered in an annal for *Julasakkarat* 1177 because it occurred so close to *songkran* of that year. Again, it may be that because of the way intercalation was handled in Mukdahan, *songkran khu'n* had already passed. A third possibility is that in the mind of the annalist, *songkran* was less the passage of the sun according to the formulas and more the celebration of this feast by the community during the waxing fortnight of the fifth month. Because in some years *songkran* fell very close to *trut*, the two merged into one continuous period of feasting (Phraya Anuman Rajadhon, 1957:115). There is some evidence that that the lunar new year may have become predominant in some places. Raquez (1902:128) states that the serial number of the year was changed on the first day of the fifth month. Wimonphan Pitathawatchai (1973:62) places *songkran* of the fifteenth day of the waxing fortnight in the fifth month; likewise, Keyes (1974:499 Note 4) states that traditionally in Tambon Khwao in the Mu'ang district of Mahasarakham Province of northeastern Thailand (about 150 km west-southwest of Mukdahan), the main day of the New Year's celebration was the day of the full moon of the fifth lunar month. Because the noise was heard well after this time, it may have been recorded as an event of the new year.

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