THE MANGRAI BUDDHA IMAGE OF CHIANG MAI: A COMPUTER–ASSISTED REREADING

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The Buddha images of Northern Thailand have received close attention, notably in English from A. B. Griswold (*Dated Buddha Images of Northern Siam*, Ascona, 1957) and in Thai from Hans Penth ("Inscriptions on the Base of Buddha Images in Chiang Mai", Bangkok, 1976).

Dr. Penth informs me that some 25% of the images he studied are accompanied by inscriptions, most of them of some substance, in which calendrical data play a part. In some instances, however, one of which is the subject of the following analysis, the inscription could contain a wealth of detail. Its format was a carry–over from the style used on many of the Northern stone inscriptions.

In distinction from their Southern counterparts, the Northern stone inscriptions often contain an abundance of calendrical and planetary detail. The apex of the stone often exhibited a circle, usually of some 8–12 cm in diameter, that was divided into twelve segments, into which the numbers from 1 to 7 were inserted according to where the planets from the sun (1) to Saturn (7) were located at the auspicious moment commemorated.[1]

These "duang chata" have a similar function to a horoscope diagram in the West and they exhibit a high degree of accuracy. Consequently, when once the computational system underlying the diagrams is understood to the extent that it can be replicated, the date represented by a given duang can be verified to within a maximum of two and a half days.

The dating to within two and a half days is possible because each of the twelve segments in the diagram represents one sign of the zodiac ("rasi"). The positions allocated in the diagram to the outer planets (Saturn, Jupiter, and Mars) therefore uniquely define the year; the position of the sun uniquely defines the month in that year; and the position allocated to the moon points to a time in that month. Since the moon must traverse the whole circle of the twelve rasi in thirty days or so, it is obvious that it can occupy a given rasi for only two and a half days.

A legible duang therefore offers to a historian competent to decode it, powerful assistance in reading the date on an inscription, which can otherwise be uncertain or illegible. Or contrariwise, the ability to determine where the planets were at any given time means that a legible date on a stone can be used to replicate a given duang, thereby greatly assisting in reading it.

If all the stone inscriptions and all the Buddha pedestals were now as clear to read as the Nan inscription, then the function of computer analysis (valuable even then) would be merely to verify the accuracy of the original data. But the Nan inscription is in an unusually good state of preservation: almost all of the historical evidence on stone inscriptions or Buddha images is contentious at some point. Consequently the computer's role becomes more important, in that it may be used to determine doubtful readings and to fill lacunae, a function that can be used to advantage with well over 80% of the record.

A good example of this function is supplied by a Buddha image at Wat Chai Phra Kiat, Chiang Mai (Griswold, no. 82; Penth, no. 22); and although the image has already been published twice, there are still some useful observations to be made about it. In the first place, the two dates on its pedestal can now be established with greater confidence than before; in the second, the unusually copious data can be read with greater comprehension than before; in the third, several lacunae in the reading of it can be filled out.

Admittedly no substantial redating of the image results in this instance; but a complete and secure interpretation of a historical record must always be inherently preferable to an incomplete and tentative one.

The inscription records that the making of the image was a pious enterprise: a number of images in the city were in a damaged state,[2] and it was decided to collect up these fragments and to use their metal to cast a new image in celebration of Chiang Mai's famous founder king, Mangrai. Who, though,

Fig. 2. The duang (planetary diagram) of Wat Chang Kham, showing the positions of the planets on the day recorded in the text.

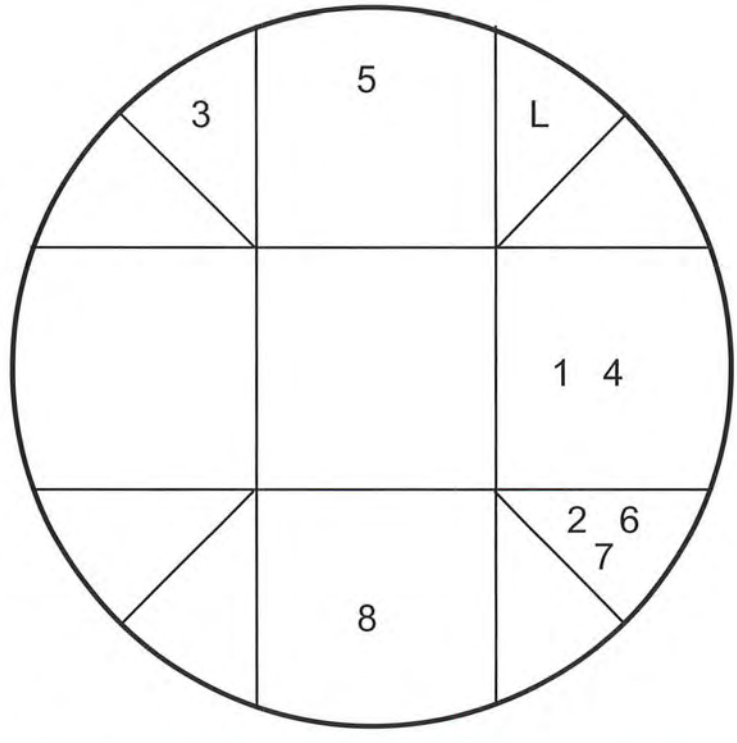

Fig. 3. The computer's version, confirming all the positions assigned to the planets in the duang.

Fig. 4. The Mangrai Buddha Image. Photograph by H. Penth, 1970.

were the prime movers in this enterprise? One is said to be the nominal ruler of Chiang Mai at the time, "the Princess Regent [Wisutthithewi] ... ancestress of the city;" but the other was "the Commanding General of the Victorious Army, the Protector of the City," acting on behalf of "the pious King of Kings who is Lord of the White Elephant and the Golden Palace, Sovereign over all princes"—the Burmese overlord. There is clearly either a political or a diplomatic dimension to the occasion, besides a religious one.

The text contains two dates: the first records that the decision was made to collect up the broken images on the 3rd (*pace* Griswold, not the 8th) day of the waxing moon of the second lunar month in C.S. 927. The second records that the casting of the new image was begun on the 13th day of the waxing moon in the fourth month of that same year. These details, if no others were present, would indicate that the enterprise was begun on 26 October 1565 and that the image was ready to be cast on 3 January 1566.

It is characteristic of this style of inscription, however, to present more than a bare minimum of information. We are also told that the first date fell on a Friday, a *rawai yi* day, in the month of Karttika, and that the second date fell on a Wednesday, a *kap set* day, in the month of Pusya.

Some explanations are required here. In the more familiar mode of reckoning used in central Thailand, Karttika is the 12th lunar month and Pusya is the 2nd lunar month; but in parts of the North the month numbers were two higher: in Chiang Mai "2" represents Karttika and "4" represents Pusya.[3]

And what of "rawai yi" and "kap set" ? Just as each year was designated in the North by the Chinese system of combining words belonging to a cycle of ten terms and words belonging to a cycle of twelve terms, so were the days. *Prima facie* the combinations would admit of 120 possibilities, but terms that were members of the odd component of either sequence were not allowed to be matched with terms in the even part, thereby reducing the possibilities to 60.

In the resulting series, "rawai yi" (attached to the first date in the inscription) lies 3rd in sequence and "kap set" (attached to the second date) lies 11th in sequence. By *inclusive* counting these two combinations are consequently 9, **69**, 129 ... places apart, as one cycle follows after another. What, then, of the weekdays? If Friday is day 1 in a given sequence, by inclusive counting Wednesday will be 6, 13 ... **69,** 76 ... days distant from Friday as the weekdays successively rotate. The inscription's data are therefore consistent in this matter.

The consistent weekday count can now be used to test the accuracy of the astrologer's reckoning by lunar phase. On both the Central and the Northern systems, Karttika has 30 days, Margasirsha has 29 days, and Pusya has 30 days. The question to be answered is therefore: if 3 waxing of Karttika is a Friday, on what lunar day will the corresponding Wednesday in Pausha occur?

Karttika 3 = Friday
Karttika 10, 17, 24 = Friday, so
Karttika 30 = Thursday, and
Margasirsha 1 = Friday
Margasirsha 8, 15, 22, 29 = Friday, so
Pausha 1 = Saturday
Pausha 8 = Saturday, so
Pausha **12** = Wednesday.

Since Griswold and Penth both read the lunar phase of the second date as the 13th, this discrepancy must be regarded as an error at source. This conclusion is reinforced by the fact that the Burmese part of the text also defines the second date as "the 13th day of the waxing moon ... the 11th lunar day."

To a novice the seeming ambivalence in the Burmese reckoning, as between the 13th and the 11th days, will seem confusing; but with due correction to one of its elements, the reckoning can be seen to be coherent. The time of the lunar month is in fact presented in two ways: firstly by "waxing moon" where the reckoning is according to the civil calendar (read "12th" for 13th); and the second is according to the astronomical calendar ("11th" is correct for the "tithi"). The difference between the two modes of presentation may be explained as follows: the civil calendar is necessarily predicated on the notion that the moon always travels at an *average* speed, such that allocating twelve or sometimes thirteen lunar months to a year will match its course over the long term. In the short term, however, the moon's actual course will sometimes be ahead of, sometimes behind, the position determined for it by

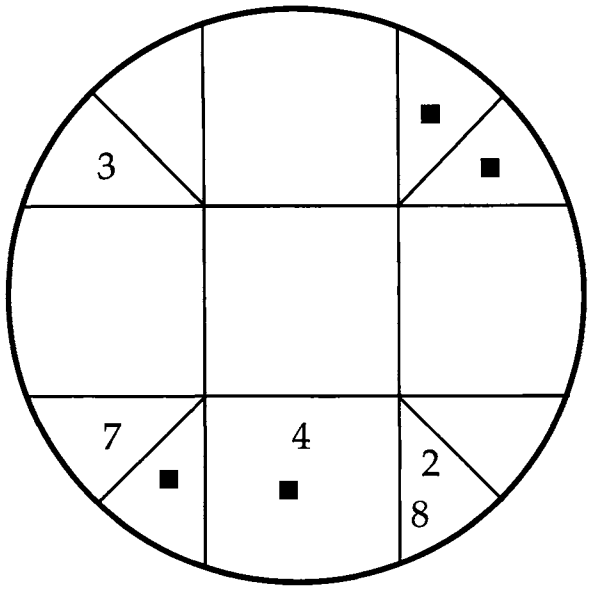

Fig. 5. Duang chata for 3 Karttika C.S. 927 (■ represents an undecipherable mark that may or may not be a digit).[4]

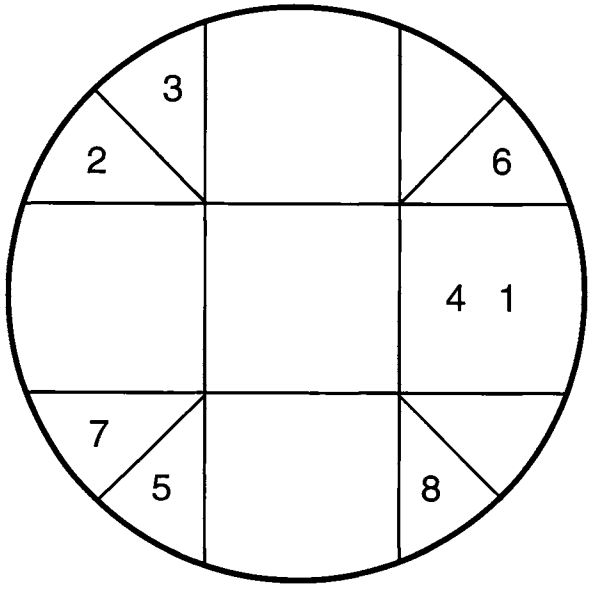

Fig. 6. Computer version for 3 Karttika C.S. 927 (= 26 October 1565 A.D.)

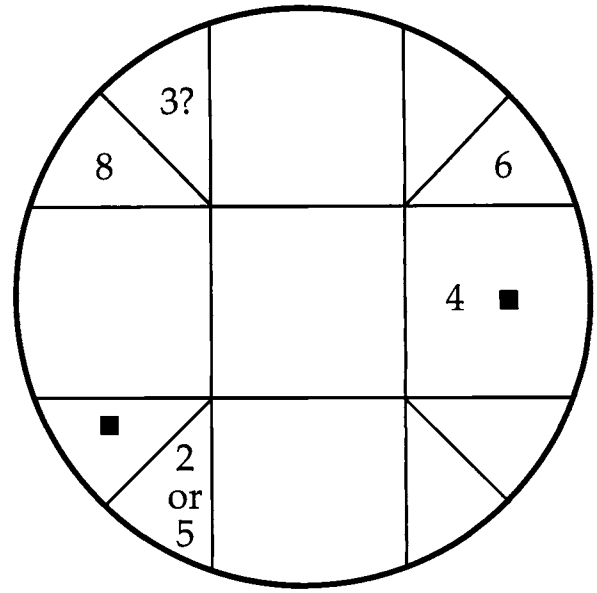

Fig. 7. Duang chata for 13 Pausha C.S. 927.

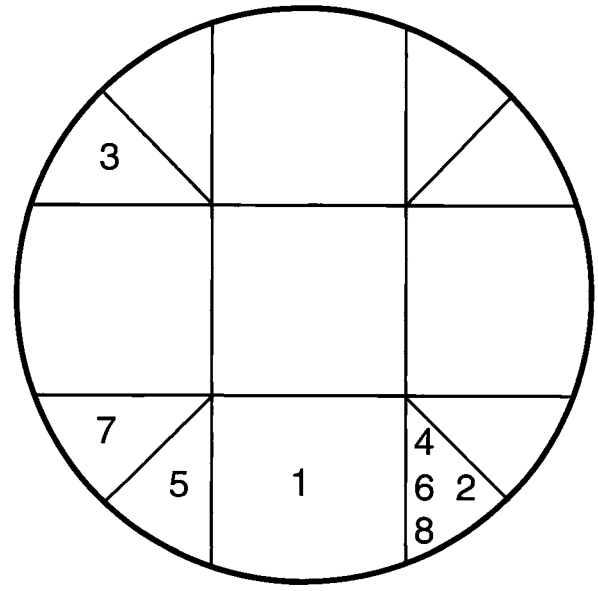

Fig. 8. Computer version for 13 Pausha C.S. 927 (= 2 January 1566 A.D.)

the civil reckoning. However, the civil calendar was adjusted to reality with sufficient precision for it to be inherently unlikely that the gap would amount to as much as two days. In fact at the early afternoon time given by the inscription for its second date, the moon's actual position expressed in "lunar days" (tithi) was 11:07 on the 12th of the civil calendar: on the 13th of the civil calendar, the tithi was 12:13.

From this error at source, however, it does not follow that we are here in the hands of amateurs. So far only details in the body of the text have been examined; but both dates are accompanied by duangs and by some of the numbers that derive from the elaborate computation required to generate them. Among these the pride of place is taken by the "horakhun" (Skt: "ahargana"). It represents the elapsed days since the start of the era, the Chulasakarat or Little Era, commonly in use in Burma and Thailand. This has its origin in March A.D. 638.

A horakhun therefore provides a unique identifier for a date, if its value is legible and correct. In the case of the duang for the first date, the horakhun's value is read by Penth as 338806, and this is indeed consistent with 3 Karttika in C.S. 927.

The next point to be considered is rather minute, but my present purpose is to indicate just how strictly the inscriptional data can be tested—in a context where *any* assistance in fixing a date will be of great benefit to the historian. Be it said, then, that a horakhun and a cyclic day combination must have a direct relation with each other. The simple formula for relating the two to each other is as follows: find the remainder of (horakhun+17) / 60. In the present instance this value is 338823 / 60 = 5647: remainder 3, where it has already been indicated that "rawai yi" indeed comes 3rd in the sequence.

With this degree of consistency in the evidence, it would come as no surprise that the duangs accompanying the dates held true, if they could be read with any confidence. They are so difficult of access and so degraded, however, that it is necessary to reverse the procedure at this juncture. The computer findings may now be used as substitutes for largely illegible data, as opposed to those less vexatious occasions where the computer's findings may be adopted to confirm clear data.

Comparison of the originals with the computer versions is more easily made in tabular form (fig. 9, where "[d]" represents the position of an unreadable digit).

The showing for the second date almost certainly indicates the extreme difficulty of reading the duang, not poor calculation at source. The evidence of the Thai historical record at large indicates one can reasonably expect that better than 80% of data of this type will prove to be correct.

The circumstances that led to the creation of this culturally and politically important image were such as to demand particular effort. Certainly the attendant inscriptional documentation was carried substantially beyond the norm. The pedestal of the image exhibits far more detailed information than was customary, and the computer allows us to recover those parts of the information that are no longer readily decipherable.

Fig. 9. Tabular Comparison

Karttika 3	Duang	Computer
sun (1)	—	9
moon (2)	7	2
Mars (3)	2	1
Mercury (4)	6	9
Jupiter (5)	[d]	5
Venus (6)	[d]	10
Saturn (7)	4	4
Rahu (8)	7	7

Pausha 12	Duang	Computer
sun (1)	—	6
moon (2)	5?	7
Mars (3)	1?	2
Mercury (4)	9	7
Jupiter (5)	5?	5
Venus (6)	10	7
Saturn (7)	[d]	4
Rahu (8)	2	7

With many objects (the Turin Shroud comes to mind) advanced scientific techniques are nowadays called upon to determine their authenticity. The technique of computer analysis, when brought to bear upon the Mangrai Buddha, provides us not only with a confirmation of its inscriptional data, but also with a sure guide to reading its degraded or obliterated elements.

NOTES

1. When an "8" is also present, it indicates the position of "Rahu," the supposed monster that tries to devour the sun or the moon at eclipse time. More mundanely, it is the point on the ecliptic (the sun's path) that marks where the moon will cross it going from north to south. The sun, the moon, and Rahu have to be in line, if an eclipse is to take place.

   When a supposed "9" is also present on a duang chata, it is more likely in fact to be an "L", for "lagna," a point on the ecliptic that lies on the eastern horizon at a particular time; it is the equivalent of the "ascendant" in Western terms, and is used to record the time of day. The historical records assume in many cases that the lagna, the rœk, and the tithi are auspicious. The rules for determining auspiciousness, however, are on the whole much too complex and various for us to be able to recover them with any certainty in most circumstances. It may be noted in passing, however, that there is one form of reckoning with clear and set rules that define what is known as a "tithi mahasunya", a day when nothing whatever should be attempted. It is alarming, therefore, to find that the *Chotmaihet Hon* of Chameun Kongsin (*Prachum Pongsawadan*, Vol. 8, pp. 159–60) records that C. S. 1230, 12 waning of the 12th month, a Wednesday (= 11 November 1868) was a "tithi mahasun"—but it was also the day of King Chulalongkorn's Coronation. Upon investigation, however, one finds that this bad tithi did not come into operation until 8:10 p.m., whereas the Coronation is recorded as taking place (? beginning) at 6:54 a.m.

2. The text is not without problems, but Dr. A. V. Diller and Professor D. K. Wyatt (personal communication) both read it as implying that the images were not merely in disrepair but had been damaged in "disturbances."

3. There is a third mode of reckoning clearly attested in parts of the North where the month numeral is one higher than Central reckoning and one lower than Chiang Mai reckoning. See my article, "The Designation of Lunar Months in the Thai Historical Record" in a forthcoming volume of the series *Phasa–Charuk* published by Silpakorn University.

4. The diagram includes some further thoughts kindly provided to me by Dr. Penth who was skilful, in the circumstances, to be able to read anything.