REFLECTIONS OF THE LUNAR ASPECT ON WESTERN CHOU CHRONOLOGY

BY

DAVID W. PANKENIER*
Lehigh University

Study of ancient Chinese thinking about the moon’s changing aspect inevitably leads to consideration of a curious development in the history of ideas in China: the process whereby the meaning of the word ¹⁸ºœ, which originally referred to the moon’s illuminated aspect, became transformed into its exact opposite—the face of the moon in obscurity. In “The Metempsychosis in the Moon,”¹ I attempted to show that this transformation was a direct consequence of the progress during the Warring States and Han periods in understanding the mechanism of solar eclipses and, inevitably, the recognition that the moon was in fact illuminated by the sun.

The realization that the moon shone not by its own intrinsic yin or “cool” light but by reflected yang light of the sun brought about a rethinking of the older organic notion:

“Where once po had been a straightforward term referring to the lighted part of the moon, on the authority of Zhang Heng [張衡 A.D. 78–139] and others it gradually began also to denote a rather mysterious and ethereal luminescence associated with the dark portion of the moon’s disk. This transference may have been made easier by the existence of the phenomenon we know as ‘earthshine’ whereby the

* After the present article had gone to press I was presented with a copy of a 1986 article by Huang Sheng-chang which was previously unknown to me due to its limited circulation in China. In this article, Huang undertakes a thorough investigation of all the influential views, methods, and conclusions of scholars who have studied the Western Chou calendar. On the basis of his comprehensive research, which includes an even more painstaking specialized study of bronze vessel groups than that adduced here, Huang specifically refutes the four-phase interpretation of the lunar terms and reaches conclusions about their interpretation identical to those presented here. See “On Certain Problems Concerning the Western Zhou Calendar on the Basis of Bronze Inscriptions” 從銅器銘刻 試論西周曆法若干問題, in Ya-chou wen-ming lun-t’ung 亞洲文明論叢, ed. Huang Sheng-chang (Ch’eng-tu: Ssu-ch’uan jen-min ch’u-pan-she, 1986), 11–32.

moon’s darkened surface is sometimes dimly lit soon after the new moon by sunlight reflected from the earth. In this way the association of po with the recessive principle yin and with light, albeit of a somewhat whimsical variety, could be maintained even in the new mechanistic theory. Of course, this made it necessary to coin a new term for the reflected yang sunlight—guang [光]—and to develop a four-phase model to describe the process of the moon’s waxing and waning for which a simple binary one had served since the Neolithic. In place of the ancient focus of ritual, the full moon . . . new terms and distinctions appeared with which all the changes in the moon’s aspect could be denoted. But the process of assimilation of the old conceptions was not rapid, and the transition to the new theory was neither smooth nor complete. Just as might be expected, hybrid theories explaining the moon’s changing appearance were at first advanced in an attempt to account for the new knowledge in a manner congenial to the orthodox view. These typically strove to preserve the increasingly obsolete notion that ‘bright’ po denoted the intrinsic light emanating from the moon itself.\footnote{Ibid. 152.}

A good example of such a hybrid theory is found in a passage from the apocryphal commentary to the Classic of Filial Piety, Hsiao-ching wei-yüan shen-ch’i (c. A.D. 25) which is glossed in Po lu t’ung 白虎通: ‘Yüeh ‘moon’ means ch’üeh ‘defective’; [the moon is] now full now defective. Why is it sometimes defective? It is [then] turning its task over to the sun. After three days [the moon] develops into a ‘digit’ p’u; after eight days it develops into ‘brightness’ [kuang]. After two × eight = sixteen days it turns its task over [to the sun]. Between the end of its ‘last phase’ hui and the beginning of its ‘new phase’ shuo it receives again its task and resumes its course.”\footnote{Ibid. 153.} It is not difficult to discern in this formulation the influence of the popular, though relatively late, analogy with the growth of the double-soul in humans, recorded in the Tso-chuan 左傳 (Duke Chao, 7th year): “At birth a man begins to form a p’o, and after birth of the p’o his yang is called hun魂.” This implicit analogy with the lunar cycle made its first appearance in the literature at about the same time as the earliest correct statement of the moon’s illumination by the sun.\footnote{Joseph Needham, Science and Civilisation in China, Volume 3, Mathematics and the Sciences of the Heavens and the Earth (Cambridge: Cambridge University Press, 1959), 227. In spite of the growing awareness by the second century B.C. in some circles of the source of the moon’s illumination, in Huai-nan-tzu (chapter 3) the association of the moon with yin is still firmly entrenched: “The moon is forebear of the Yin, which is why when the moon wanes the brains of fishes diminish, and when the moon dies the swollen oyster shrinks”; tr. A.C. Graham, Disputers of the Tao (La Salle: Open Court, 1989), 332.} Thus it seems likely that the literary use of the term p’o to denote the “corporeal” or yin component of the human double-soul is a product of this correspondence.
LUNAR ASPECT ON WESTERN CHOU CHRONOLOGY

This does not necessarily mean that the identification between \( p'0 \) 魄 and the less volatile constituent of the human anima, although unattested in the earliest literature, could not have been made before late Chou. It is a curious fact, however, that the variant \( p0 \) 魄 never occurs in Western Chou bronze inscriptions. Instead \( p'0 \) 霞 is used there to refer to the moon’s bright aspect, even though \( p'0 \) 霞 appears in the Chou-yüan 周原 oracle bone inscriptions, apparently with that meaning. But the language and conception of the Tso-chuan text, especially the use of the term hun 魄, the yin-yang correlative thinking underlying the passage, and the burgeoning awareness of the sun’s role in illuminating the moon, all are developments dating from about the fourth century B.C. or later. In any case, the motive for weaving into this analogy in Tso-chuan an archaic expression for the moon’s waxing phase—chi sheng p'0 既生霞 (see below)—was no doubt to lend the authority of tradition to the conception. The etymology of pa 霞 “Paramount Prince,” as the same character is read in other contexts, is no less obscure—the Shuo-wen gloss “hide exposed to rain,” for which there is no text parallel, is probably an artifact of Hsü Shen’s 許慎 imagination.

As I pointed out in “Metempsychosis,” one can discern in the apocryphal passage from Po hu t’ung the contradiction that initially resulted when the attempt was made to merge the traditional definition of \( p'0 \), that is, as the ordinarily lighted portion of the moon, into the emerging theory with its newly coined kuang, a word which was used consistently thereafter to denote the portion of the moon illuminated by the sun. The result of the terminological confusion is the improbable inference that the early medieval Chinese astronomers actually perceived an intrinsic difference between the light of the first and second quarter moon, when in fact, “the real implication of the apocryphal Hsiao-ching passage above is that all the moon’s shining—its ‘task’—is attributable to the sun, and that there is no longer any room for the idea that \( p'0 \) refers to

5 On the history of the yin-yang dualism, see A.C. Graham, Disputers of the Tao, 325 ff.
6 As W.A.C.H. Dobson has observed, however, “during the age of the Paramoutcy (eighth to sixth centuries B.C.), real authority as opposed to legitimate political power lay not with the Son of Heaven but with the Paramount Princes. This was the ‘borrowed’ sovereignty of which Mencius spoke.” I am tempted to discern in this use of pa a metaphor for the nominally subordinate status of the Paramount Prince in relation to the Chou king—that is, the former is to the latter as the moon’s yin is to the sun’s yang—and perhaps the intimation that the “borrowed” sovereignty of the former is essentially a reflection of the latter’s radiance.
light emanating from the moon itself. But in spite of the obvious contradiction this was a conclusion most medieval Chinese were reluctant to draw. 7

*Wang Kuo-wei’s Theory of the Western Chou Lunar Phases*

With this review of the vicissitudes of the word *p’o* in mind, let us now consider what steps Wang Kuo-wei 王國維, whose analysis of the problem of the lunar phases in Western Chou 鉤文 phases has gained the widest following, took to arrive at the conclusion that the four terms *ch’u chi* 初吉, *chi sheng p’o* 既生霸, *chi wang* 既望, and *chi ssu p’o* 既死霸 are the names of four lunar quarters. 8 First, ignoring the difference in usage between the received texts and the bronze inscriptions, Wang assumed that since a four-phase conception is described in some early sources, and since four terms appear in the inscriptions, the latter must therefore represent the names of the phases in the earliest system. 9 Having already

9 With the sole exception of the expression *yüeh i jik (kan-chik)* 禹翌日 (千支) “the next day (cyclical sign),” date formulas in the bronze inscriptions which incorporate lunar phase terms are never followed by *yüeh* + numeral + *jik kan-chik* “passing on so-and-so many days to cyclical sign” as in the later literary texts. This exclusively literary usage may in fact reflect a late misinterpretation of *yüeh* 禹 as a particle *yü* 于 used in time phrases “to such-and-such a time,” since *yüeh* is glossed in Erh-ya and by early commentators as equivalent to *yü* 于; see Bernhard Karlgren, *Glosses on the Book of Documents* (Stockholm, 1970), no. 1479. Nor does inscriptive *yüeh* 禹, which signals a shift in the time of narration, and hence most probably ellipsis, ordinarily occur, as here, immediately after a lunar phase term without an intervening cyclical date and/or narrative. Simply stated, the enumerative formulation creates the impression that the lunar phase term denotes a fixed day or days from which a count could be initiated, whereas the impression created by the bronze inscriptions is of a period of several days during which the indicated cyclical day fell.
10 Cf. David S. Nivison, “The Dates of Western Chou,” 489, who on the whole accepts Wang’s analysis: “I will refer to the terms when appearing in inscriptions as names of quarters. What else, after all, could they be doing? There are four
LUNAR ASPECT ON WESTERN CHOU CHRONOLOGY

convinced himself on etymological grounds that the term p’o did in fact refer to the lighted portion of the moon's surface, Wang dismissed testimony to the contrary and plugged the ancient definition of the “lighted” p’o into the mature four-phase theory whose early evolution we examined above. This is perhaps an understandable error, but it is also completely contrary to the conception of that theory. There the term kuang was coined to supersede this very meaning of p’o in an effort to rescue the notion that p’o refers to the moon-soul and to its intrinsic, yin luminescence. Without the concession to yin-yang correlative thinking that made this shift in meaning necessary, it is questionable whether a four-phase model would have arisen at all.

Wang Kuo-wei’s solution, therefore, is actually based on a spurious distinction between two kinds of “light”, p’o and kuang, which arises when the later, correct theory of lunar illumination is interpreted using the inappropriate definition of p’o (i.e., p’o as the ordinarily lighted portion of the moon). The resulting misconception, that Western Chou, or even later Chinese observers actually distinguished two kinds of illumination, that present from the third to the eighth day and that present from then until the full moon, betrays a failure to investigate the source of the muddled transitional theory (illustrated by the apocryphal Hsiao-ching text quoted above) which made its earliest appearance in mid-Han.

Wang’s own explanation of his identification of chi sheng p’o “after the birth of p’o” with the eighth day (and/or the whole second quarter) and chi ssu p’o “after the death of p’o” with the twenty-third day (and/or the whole last quarter) reads as follows:

“My examination of the inscriptions on ancient vessels has yielded four terms that were anciently used to name the days: ch’u chi, chi sheng p’o, chi wang, and chi ssu p’o. Consequently, I realized that the month in ancient times was evidently divided into four parts. The first was ch’u chi, meaning the period from the first to the seventh or eighth day; the second was chi sheng p’o, meaning from the eighth or ninth day on down to the fourteenth or fifteenth day; the third was chi wang, meaning after the fifteenth or sixteenth day to the twenty-second or twenty-third; the fourth was chi ssu p’o, meaning from the twenty-third to the dark of the moon. From the eighth or ninth day on, even though the moon is not yet full, the as yet incomplete brightness has already been born for some time. From the twenty-third day on, although the moon is not yet dark, the first-born brightness [i.e., that portion illuminated by first quarter] has definitely already died. The region of the

terms, and there are four noticeable phases of the moon. A people using a system of dating referring to lunar phenomena would have needed terms serving as names for the phases.” However, study of the ethnographic material reveals that the matter is less straightforward than has been supposed; see Continuous and Quasi Week Cycles below.
moon that receives the light of the sun is one and the same side from the viewpoint of the earth; the unlighted part of the moon after the twenty-third day is that very region which is illuminated before the eighth day of the month. This is precisely the reason for the later distinguishing of a first quarter and a last quarter; because the first-born brightness has already died [after the twenty-third day] this period is called 'after the death of p'ō.' This is the correct explanation of the terms 'birth of p'ō' and 'death of p'ō' and constitutes the ancient four-quarter system of dividing the month."

It is perfectly clear that what Wang is claiming is that the p’ō or lighted portion of the moon of particular interest in Western Chou was specifically that portion which is illuminated during the five days or so between the first apparition of the luminous western limb and the half-moon on the eighth day. Therefore he identifies the period following the eighth day as chi sheng p’ō “after the birth of p’ō.” Similarly, by the twenty-third day this very portion of the lighted face—the western hemisphere—has again become dark, hence Wang identifies the phase following as chi ssu p’ō “after the death of p’ō.” In the interest of symmetry and under the influence of the hun-p’ō analogy from Tso-chuan cited above, Wang has chosen to identify the halfway point of the processes of waxing and waning as chi sheng p’ō and chi ssu p’ō respectively, an interpretation as forced as it is arbitrary. Wang’s artificial singling out of the western hemisphere of the moon as p’ō when alight is the result of a misunderstanding of the Han four-phase theory, which also introduced the concepts shang hsiun 上弦 “first quarter” and hia hsiun 下弦 “last quarter” to which he refers. Wang’s mistaken notion is explicitly contradicted by exponents of that new model, from Chang Heng through the makers of the Su-chou planisphere in the twelfth century. Moreover, whatever their other differences, the Yin-li 殷禮 chronologists (4th century B.C.), Liu Hsin 劉歆 (d. A.D. 23), Yang Hsiung 揚雄 (53 B.C.–A.D. 18), and other “pre-four-quarter theory” commentators all agree in taking processes affecting p’ō to refer to the growth and diminution of the entire illuminated region, not merely one hemisphere.

Wang Kuo-wei’s analysis of the meaning of p’ō in Western Chou is compromised by his failure to trace the post-Han four-phase theory to its true source. Aside from the simple fact that the relevant Western Chou terms are four in number (actually three if ch’u chi is excluded as unrelated to lunar phases), and only if the

---

12 See Huang Sheng-chang 黃盛璋, "Shih ch’u chi" 諸初吉, Li-shih yen-chiu 歷史研究 4 (1958): 71–86. Huang’s richly documented article argues convincingly that ch’u chi had nothing to do with phases of the moon, but rather with the
LUNAR ASPECT ON WESTERN CHOU CHRONOLOGY

undeciphered chi chi 未吉 found in the Chou-yuan oracle bones is disregarded, there is no compelling evidence to suggest that Wang's or any other four-phase system was applied in early Chou. On the contrary, there is strong evidence that this was not the case. In view of Huang Sheng-chang's research on ch'u chi alone, it is apparent that a four-phase system, even if it had existed, could not have apportioned the days among the phases as Wang Kuo-wei and others have supposed.

Practical Considerations of a Four-phase Theory

A more serious deficiency of the four-phase scheme would have quickly become apparent to early observers of the moon's phases:

"Unlike the two other basic time units, the solar day and the solar year, the synodic month is not constant but extremely variable. In the course of successive months the variability is such that time of recurrence of the lunar phases can shift by as much as two and a half days. . . . If both the sun and moon move with constant velocities around the earth in two circular orbits on the same plane, their relative velocities will be able to reproduce all phenomena that occur between the two bodies with respect to the earth. The time intervals, in which the moon repeats any phase, are equal, and the synodic month will then at once be the basic time unit; prediction of all lunar phenomena may be simply performed. In reality,

auspicious first appearance of each of the ten "heavenly stems" at the beginning of the month. Since, however, not all ten stems were equally auspicious, it may be that the term ch'u chi originally referred more precisely to the first appearance of one of a set of auspicious stems. In any case, Huang's discovery, originally inspired by a comment along similar lines by Wang Yin-chih 王引之 (1766-1834), is confirmed by extensive evidence adduced from bronze inscriptions and literary texts representing the full range of China's written legacy from Western Chou through the Ch'ing Dynasty. In particular, the occurrence of the expressions "the first keng in ch'u chi in the 5th month" wu yüeh ch'u chi meng-keng 五月吉孟庚 and "the initial keng during the auspicious days in the 5th month" wu yüeh chi jih ch'u keng 五月吉初庚 in different inscriptions which refer to the same month in the same year prove the fundamental accuracy of Huang's interpretation.

13 Three of the oracle bone inscriptions recently discovered in the floor of the early Chou palatial ruin on the southern slopes of Ch'i-shan contain the term chi chi. How this may relate to yüeh chi 月吉 and ch'u chi 初吉 is a matter for speculation. Since chi chi appears to refer to the day or days "after the auspicious" day or days, it is unlikely that the three are synonymous. The Chou-yuan inscriptions from this site have also yielded the variant chi ssu 既死 and the ambiguous chi p'o 既魄; see, e.g., "Shensi Ch'i-shan Feng-ch'u ts'un fa-hsien Chou ch'u chia-ku wen" 陝西岐山風雛村發現周初甲骨文, Wen-wu 文物 10 (1979), 41, no. H11:55; Hsü Hsi-t'ai 徐錫台, "Chou-yuan ch'u-t'u pu-tz'u hsüan shih" 周原出土卜辭選釋 Kuo-ku yü wen-wu 考古與文物 3 (1982), 61, no. H11:26,48,54; Hsü, "T'ian-t'ao Chou-yuan chia-ku wen chung yu kuan Chou ch'u t'i li-fa wen-t'i" 探討周原甲骨文有關周初的曆法問題, Ku wen-tzu yen-chiu 西文字研究 1 (1979), 203-207.
due to the gravitational forces between the celestial bodies, the motion of the moon has been one of the most fascinating problems ever imaginable to mankind. The lunar perigee, for instance, which determines the lunar velocity and therefore affects the lengths of all lunar periods such as the sidereal and synodic months etc., moves forwards and backwards. Thus the length of the anomalistic months [i.e., from perigee to perigee], which alone would be constant if treated as a 2-body problem, oscillates between limits of 25 and 29 days.\footnote{Y. Maeyama, “The Length of the Synodic Months: the Main Historical

The consequences of this variability for the length of the lunar phases can easily be confirmed by consulting the Astronomical Almanac for any year. The table below, derived from the “1982 Ephemeris for physical observations of the Moon,” displays the variation of two-and-a-half days in the duration, for example, of first and third quarters between January and December 1982; the age of the moon to fullness (100% illumination) likewise varies from 13.6 to 16.0 days:

<table>
<thead>
<tr>
<th>Month</th>
<th>Length of quarter in days</th>
<th>Age at full</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First</td>
<td>Third</td>
</tr>
<tr>
<td>January</td>
<td>7.8</td>
<td>7.0</td>
</tr>
<tr>
<td>February</td>
<td>7.4</td>
<td>7.9</td>
</tr>
<tr>
<td>March</td>
<td>7.0</td>
<td>7.7</td>
</tr>
<tr>
<td>April</td>
<td>6.8</td>
<td>8.4</td>
</tr>
<tr>
<td>May</td>
<td>6.6</td>
<td>8.2</td>
</tr>
<tr>
<td>June</td>
<td>6.8</td>
<td>8.7</td>
</tr>
<tr>
<td>July</td>
<td>7.0</td>
<td>8.2</td>
</tr>
<tr>
<td>August</td>
<td>7.3</td>
<td>7.6</td>
</tr>
<tr>
<td>September</td>
<td>7.7</td>
<td>7.7</td>
</tr>
<tr>
<td>October</td>
<td>8.0</td>
<td>7.0</td>
</tr>
<tr>
<td>November</td>
<td>8.2</td>
<td>6.3</td>
</tr>
<tr>
<td>December</td>
<td>8.2</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Under the circumstances, even if ancient Chinese observers had decided to apportion the lunar cycle into four necessarily unequal phases, rather than simply into two fortnights, it is difficult to imagine that counting off the days between recurring lunar quarters and taking note of their respective durations would have led to the conclusion that they could be assigned mean lengths and then as units of time serve a practical purpose in dating events, especially given the parallel and uninterrupted use of the ten-day hsün. It is conceivable that the change in the lunar aspect from darkness to full illumination and back to darkness was taken note of in some way, but that is another proposition entirely.
LUNAR ASPECT ON WESTERN CHOU CHRONOLOGY

If, in other words, one assumes that inscriptions containing lunar phase terms represent the surviving traces of the use of lunar phases in dating events, one must also assume that the timing of the phenomena would necessarily have fluctuated in just the manner tabulated above. In fact, the lunar aspect is omitted entirely more often than it is recorded, and given naked-eye observation and rudimentary time-keeping, the variability observed may well have exceeded the two-and-a-half day range given above. It would seem reasonable to conclude, therefore, that such indications of the lunar aspect are too imprecise to serve as a primary basis for absolute dating claiming accuracy to the day. Furthermore, given the uneven performance of the later historiographers in the Spring and Autumn Annals when it came to calibrating the calendar through direct observation, there is no reason to assume that their Western Chou counterparts did a better job several centuries earlier.

In view of the foregoing, the attempt to demonstrate the validity of Wang Kuo-wei’s or any other four-phase system by first assuming hypothetical definitions for the crucial terms and then using these definitions to assign absolute dates to the corpus of inscriptions, particularly in the absence of secure dates of reigns, identifications of the vessels’ makers, precise knowledge of the calendrical conventions then in use, and whether in fact a single royal calendar actually prevailed throughout North China, resembles nothing so much as an autonomous feedback loop. Comprehensive solutions to the chronology of Western Chou can no doubt be generated, but given the assumptions involved and the circularity of the argument

Problem of the Lunar Motion," Archives internationales d’histoire des sciences 29 (1979), 69, 84.

15 In late Shang, as in contemporary Mesopotamia, the beginning of the month, the year, and the placement of intercalary months at year-end were all established on the basis of physical observation rather than by calculation. The consequent possibility of individual months containing thirty-one or even thirty-two days in the late Shang period is addressed in connection with a discussion of the dated records from the last Shang king Ti Hsin’s campaign against the jen-fang 人方 in 1077 B.C.: see Li Ch’ang-hao 黎昌騫, ed. Chung-kuo t’ien-wen-hsüeh shih 中國天文學史 (Peking: K’o-hsüeh ch’u-pan-she, 1981), 15. In the early Babylonian calendar two or three short months of twenty-nine days in succession are common, as are series of two, three, four, five, and even six long months of thirty days; for a description of Babylonian calendrical practice in the early second millennium, see John D. Weir, The Venus Tablets of Ammizaduga (Istanbul: Nederlands Historisch-Archeologisch Instituut, 1972), 21.

16 For a succinct discussion of the problem of irregular intercalation in the Spring and Autumn period as evidence for gradual improvement in mastery of the calendar, see Chung-kuo t’ien-wen-hsüeh shih, 71–72.
there is no guarantee, in spite of various supposed constraints, that the result bears more than a passing resemblance to reality.

Throughout analyses of this kind various assumptions about calendrical conventions come into play, frequently in concert, which permit the month in question to vary by plus or minus one, and/or the precise location within the lunar phase to vary by up to seven or eight days, making for considerable latitude when it comes to placing specific inscriptions in the reconstructed calendar of months and cyclical kan-chih. If, in addition, one allows the dating of an otherwise unassignable inscription by placing it two years later than would be expected on the assumption that each king had separate royal calendars commencing two years apart, the cyclical dates defining a given month can conveniently be increased by 18 days. For example, if the first day of the first month of 922 B.C. was day kuei-yu (10), the first day of the first month of 920 B.C. will be day hsin-mao (28). Thus, if one is hard pressed to fit an inscription in a particular lunar quarter of a given month, the chances of success improve significantly if a second alternative is assumed to exist two years later. In this way a total of 48 out of 60 (i.e., days 10 through 58), or 80% of all possible sexagenary designations, now become available as targets. If, in addition, one now allows the expedient of choosing a month 29 or 30 days earlier or later, depending on which definition of "first month" is adopted for that particular year (yielding in the example above months beginning on days 57 or 58), then well over 100% of all possible sexagenary designations (i.e., days 10–58 plus days 58–28 in the example from 920 above) become potentially available, while at the same time the lunar phase can in certain cases be varied by up to a fortnight. That being the case, it is difficult to see how the numerical imperatives implicit in the procedure tell us more about Western Chou calendrical conventions than about the degree of permissiveness necessary for the dating method to succeed. Small wonder then that this method now proves to have allowed the misdating (or misidentification) of at least a dozen inscriptions attributed to the reign of I Wang 瑀王. ①7

An Alternative Interpretation

From the initial discussion above it seems clear that p'o originally did refer to the lighted portion of the moon before the advance in

①7 See David W. Pankenier, "The Bamboo Annals. Problems of Method in using the Chronicle as a source for the Chronology of Early Zhou," Bull. of the SOAS,
scientific understanding imposed a change. Presumably, early Chou practice would have been principally concerned with observing the illuminated portion of the moon as it waxed and waned in order to facilitate a reckoning of the days between successive new or full moons. Systematic observation of the “lunar mansion” occupied by the full moon each month was a good indicator of the sun’s location directly opposite, which in turn identified the solar month.\(^{18}\) We know, for instance, from the lunar eclipse record of March 12–13, 1065 B.C. in *I Chou shu* that significant ceremonies were associated with this monthly rite in the eleventh century B.C.\(^{19}\) “Birth” or “growth” and “death” or “decline” of the lunar *p'o* ought therefore to have referred in early Chou to observable changes in the entire lighted face of the moon.

Traces of what such conceptions would have been like have survived in the traditions recorded in late Chou and Han. For example, in a passage from *Li chi* 禮記, “Li-yün” 禮運 chapter (second century B.C.), we read: “The five elemental influences are distributed among the four seasons; when they are in harmony the moon is born, and for this reason it takes three fives to become replete and three fives to disappear.”\(^{20}\) Clearly, the argument can be made, with Huang Sheng-chang, that the author of this passage had every expectation that his “three fives equals half a month” analogy would be successful. This is to be expected given what we already know about the decimal system of reckoning the days continuously in use since the Shang Dynasty.

In A.D. 56, Kuang-wu ti 光武帝, the first emperor of the Later

---

\(^{18}\) Joseph Needham, *Science and Civilisation in China*, vol. 3, 232. Mid-month was of course also the focal point identified by the twelve “ch’i-centers” (i.e., fortnights) *chung-ch’i* 中氣, which constitute the only other demonstrably early subdivision of the month for which there is evidence in Chou texts; *ibid.*, 404.


Han, had a Ming T'ang 明堂 constructed, with a Ling T'ai 靈臺 observatory, and a Pi Yung 坡雍 moat. By mid-Han times precise knowledge of the architectural details of this ancient ceremonial complex were hard to come by and thorough research was commissioned which culminated in the publication of the “Illustrated Ceremonials of the Chien-wu period [A.D. 25–55]” Chien-wu li-t'u 建武禮圖. According to this work, the design of the Ming T'ang built in A.D. 56 incorporated highly symbolic numerological features, including rooms whose windows typified each of the six five-day periods into which the month was ideally divisible. 21 Here again, it is likely that such a conception would have resonated meaningfully only in the minds of listeners conditioned to thinking of the month in decimal terms.

Then there is the famous tradition concerning the miraculous ming-chieh 明筴 or calendar plant, a conspicuous figure in early medieval poetry. Chang Hsieh 張協, for example, writing in the late third century, says in his “Seven Commands”: “I lament the fall of the ming-chieh [pod] at dawn, and grieve that Wang Shu by evening will diminish.” 22 The legend has it that the auspicious ming-chieh appears in harmonious times presided over by a sage ruler, and that it once sprouted on the terrace of the legendary Yao’s 堯 palace. In an earlier discussion of such auspicious omens, the Po hu t'ang says: “When the calendar obtains its [correct] divisions, then the ming-chieh grows in the interstices of the staircase. Ming-chieh is the name of a tree. Each day of the month there grows one pod, terminating with the fifteenth day. Starting with the sixteenth day one pod falls off [daily]. Therefore it grows in the interstices of the steps to mark the days and the month.” 23 According to the Liang 梁 Dynasty (502–556) treatise “Illustrations of Propitious Portents,” Jui-yíng t’u 瑞應圖, “the ming-chieh has round leaves and is five-colored. Another name is li-chieh 疊筴 [“calendar pod”]. Its fifteen leaves grow at the rate of one a day, from the first

---


22 Chang Hsieh’s “Ch’i ming” 七命 is quoted in full in Chin shu 晉書 55.1518–1524. Wang Shu 善舒 as the moon personified appears already in the Ch’u tz’u 楚辭; see Li Shan’s 李善 commentary in Wen-hsüan 文圃 (Taipei: Yi-wen yin-shu-kuan, 1974), 35:5a, where he also quotes the second half of the following line from one of the “Nineteen Old Poems” of the Han dynasty: “At three fives the bright moon is full, at four fives the toad and hare are deficient” (Wen-hsüan, 29:7b). Notice here the implicit division of the month into the six five-day periods mentioned in connection with the Ming T’ang.

day of the moon until the full moon; on the sixteenth day the leaves begin to fall off at the rate of one a day until the last day of the moon. If the [lunar-]moon is short, then one leaf shrinks up but does not fall off.”24

Although this legendary plant makes its first appearance in Han literature, the conception of a “calendar plant” whose cycle of growth and decay parallels that of the moon is in complete harmony with the conceptions adduced above and probably derives from an archaic tradition. The model of the moon’s transformations which the ming-chieh symbolizes is strictly binary and takes no account whatever of finer distinctions such as those that began to appear by mid-Han, which process culminated in the quadripartite scheme that appears in the later astronomical literature. The symbol of the calendar plant, like that of the “cool white moon-soul” (yin p’o), remained a popular image in medieval poetry since it successfully tapped deeper resonances of the organic cycle of growth and decline and of the theme of celestial and terrestrial correspondence. The point, however, is that it is difficult to imagine how a precisely defined four-quarter model of the moon’s waxing and waning, more complex than the archaic notion underlying the metaphorical ming-chieh, could have suddenly intervened between the eleventh and eighth centuries B.C., only to vanish without a trace, leaving in its place a predilection for decimal reckoning and popular images like the “calendar plant.”

Lunar Terminology

How then are we to understand the terms chi sheng p’o and chi ssu p’o? In both cases chi must either imply “completion of” or “after having begun” the process indicated. Both interpretations of chi are conceivable, but there is a significant difference between them. Chi in the sense of “completed” is used verbally, as for example in the expression wei chi 未既, while chi in the sense of “after” or “already” is used adverbially to denote perfective aspect. However, since both chi sheng p’o and chi ssu p’o contain fully expressed verbs, it would be incongruous to interpret chi here as a verb. The second function of chi, that of a marker of perfective aspect, appears to be the proper sense of the graph in the two terms.25 Not surprisingly,

25 Chi also acquired a specialized use related to that at hand since it occurs in the Spring and Autumn Annals as a technical term for “total” (i.e., “complete”) in reference to solar eclipses; see Joseph Needham, Science and Civilisation in China, vol. 3, 420.
this seems also to be its function in *chi wang*, which can nevertheless be construed to mean anything from the day after the full moon to the entire last half of the month.

This leaves us with *sheng* and *ssu*, “birth” and “death,” or “growth” and “decline,” and with the question whether we should understand the pair to have a punctual or durative sense. In other words, are they used to describe a process having considerable duration, or do they refer to a more or less instantaneous transition from one state to another? The *Shuo-wen* defines *p’o* as the second day of the month following a long month and the third day of the month following a short month. But this punctual interpretation of *p’o* by itself leaves unresolved the issue of duration which is implicit in the combination with *chi* “after” and *sheng* “birth/growth.” Then too, the fact that the moon requires a fortnight to wane rather than simply winking out also suggests a lingering *ssu* “death.” And the image of the *ming-chieh* which gradually withers implies that the “death” of the lighted disk was conceived of as a process of decline having duration but with a clearly delimited beginning and end. But what does all this tell us about technical Western Chou usage a millennium earlier?

Such evidence suggests that only four interpretations are reasonable: that *chi sheng p’o* refers either (1) to the day or days after the first appearance of the new moon crescent, and perhaps extending to the day of the full moon (“after” punctual “birth”) or, (2) to the period following the waxing phase that culminates with the full moon (“completion” of durative “growth” and therefore overlapping *wang*). *Chi ssu p’o* then, by analogy, would refer either (3) to the day or days following the first detectable diminution of the full moon, and perhaps extending to its total disappearance (“after” punctual “death”) or, (4) to the day or days after the last appearance of the waning or “dying” crescent (“completion” of durative “decline” and therefore overlapping *shuo*). As we saw above the likelihood is greater that *chi* should be interpreted here as aspatial “after,” and so the “punctual” alternatives (1) and (3) would seem to be preferable; but given the term *chi wang*, “after the fullness,” which ought reasonably to refer to the day or days after the full moon, common sense (or a bias in favor of tidiness) would seem to require us to select alternatives (1) “punctual birth” and (4) “durative decline” in the interest of avoiding redundacy. But twentieth-century common sense is hardly an infallible guide and in this case we are left in the unenviable position of having to choose between apparently redundant definitions or inconsistency in interpreting the processes *sheng* and *ssu* as punctual or durative. If we are
to approach the problem with due caution, then, we must be open to both possibilities—inconsistency and redundancy—since we have no real grounds for dismissing either. It is quite possible to conceive of a tripartite scheme in which chi sheng p’o refers to the period before the full moon, chi wang to the day or days of the full moon, and chi ssu p’o to the remainder of the month.

Continuous and Quasi Week Cycles

This is not the place to review in detail the history of conventional units of time such as our seven-day week or the ancient Chinese hsün of ten days, except to emphasize that such continuous cycles based on precise multiples of the day are actually functionally independent of the lunar cycle. Quasi weeks, on the other hand, which are generally defined as rough approximations of fractions of the lunar month, are necessarily irregular in length and discontinuous in that the series is typically restarted each month. These different methods of timing human activity have entirely different motivations: “Quasi weeks and weeks actually represent two fundamentally distinct modes of temporal organization of human life, the former involving partial adaptation to nature, and the latter stressing total emancipation from it. The invention of the continuous week was therefore one of the most significant breakthroughs in human beings’ attempts to break away from being prisoners of nature and create a social world of their own.” The employment of cycles of time based on multiples of the day in regulating the recurrence of periodic activities has historically come about as strict dependence on natural cycles such as the lunar month decreased and other more abstract principles were substituted in its place. This is especially evident in the case of quasi or lunar weeks:

28 Zerubavel, The Week, 11. Zerubavel attributes the invention of the continuous seven-day cycle “that runs through history paying no attention whatsoever to the moon and its phases” to the ancient Jews. While, strictly speaking, this is true of the seven-day cycle, Zerubavel is mistaken in considering the continuous ten-day hsün (p. 10) already in use in Shang China in the late second millennium B.C. to be a quasi week. Both Egypt and China were using continuous weeks of ten days many centuries before the seven-day week made its appearance. The earliest use of a non-astrological, continuous, non-lunar week “used for establishing and regulating actual rhythms of human activity” (p. 11) must therefore be attributed to China.
"The starting-points in the counting of the days of the month also afford evidence for the question as to which phases of the moon are the oldest, and were already utilised for this purpose. Both the methods of counting and the phases themselves are based upon a bisection or trisection of the month; to this were then added other phases, originally quite unsystematically. Among us the quarters of the moon are common; but of their use among primitive peoples I have found only a single instance. . . . That the quadripartite division of the month should be practically non-existent among primitive peoples is easily to be understood in view of the considerations already mentioned. Unlike the halving it is not based upon any very clearly distinguishable phases, nor is there in the phases any such suggestion of a quadripartite division as is offered for a tripartite. The shape of the moon on the 8th or the 22nd day differs very little from that of the previous and the following days, and does not constitute a turning-point like the full moon. From the phases of the moon no quadripartite division can arise: the brightest phase of all, the full moon, has an unnatural position in such a division. It [i.e., quadripartite division] can only be understood as a halving of the halves of the month, and this presupposes that the moon's variation in light is regarded as a unity and divided into parts. The primitive peoples however start not with the abstract unity but with the concrete phases, proceeding at first quite unsystematically, and only subsequently combining them into a system. The quadripartite division therefore is in its very nature a numerical system. That it has penetrated so profoundly into our natures that even ethnological scholars and travellers are not always able to get away from it, is due to the connexion with the seven-day week, which is [erroneously] regarded as a division of the month, and also to the fact that we so seldom take any notice of the concrete phenomena of the heavens. . . . In reality the tripartite division is also the natural one, since it arises from the concrete phenomena of the moon, and not from any division of the month into parts consisting of a certain number of days. Here the full moon takes its proper place, which it misses in the quadripartite division."\textsuperscript{29}

In his article on "Hebdomad,"\textsuperscript{30} in contrast, F. Boll adduces late passages from Varro, Philo, Clement and others where it is assumed that the moon completes its cycle in four periods of seven days each. By this date, however, the number seven had already acquired numerological and religious associations quite unrelated to the moon. Boll's earliest and most important passage is quoted from the Babylonian "Creation Epic" in which the creator god, Marduk, commands the moon: "At the beginning of the month shine in the land. Beam with thy horns, to make known six days. On the seventh day halve thy disc. On the fourteenth thou shalt reach the half of the monthly growth . . . [remainder lost]."\textsuperscript{31} The question under debate, as pointed out by Francis H. Colson,\textsuperscript{31} is


\textsuperscript{31} \textit{The Week: An Essay on the Origin and Development of the Seven-Day Cycle} (Cambridge:
“whether this loose idea of the moon’s movements has produced the septenary arrangement, or (as Nilsson argues) been produced by it. In Babylonia . . . the seventh, fourteenth, twenty-first and twenty-eighth were marked days, that is to say the months had been subdivided into periods in which seven predominated, or in other words they had what I have called lunar weeks, though not that very different thing, the continuous week. When this has once been done, the septenary periods are for practical purposes so near to the lunar phases, that the latter are in popular language expressed in terms of the former."

It is known that in the Assyrian religious calendar the observance of every seventh day as an “evil day” had a numerological and religious, rather than a lunar, origin. This is shown most clearly by the fact that the nineteenth day of a month following a long month was also a marked day, since $30 + 19 = 7 \times 7 = 49$. Comparable evidence for the central religious or numerological importance of the number seven or a period of seven days in Chou China is lacking. Instead, we find the established Shang practice of using a ten-day $hsün$ whose continuous, hemerological character is actually given precedence early on over both the lunar month and over a less rigorous tripartite division of the month into ten-day quasi weeks which saw widespread use from Chou times on. Therefore, it is wholly unjustified to presume, as many have done, that Western Chou inscriptive terminology, by virtue of its being based on the lunar calendar, must of necessity reflect a quadripartite conception of the lunar cycle or require names for four lunar “quarters.”

**Inscriptional Evidence**

The internal evidence deriving from the inscriptions themselves has long been considered frustratingly inconclusive. One pair of vessels, the Sung ting and the Shih Sung kuei, is generally agreed to date from the same month of the same year:

“It was the third year, fifth month, day ting-ssu (54) . . .”

(史頌簋)

“It was the third year, fifth month, chi ssu p’o, day chia-hsü (11) . . .”

(頌鼎)

Since the two dates are seventeen days apart it is apparent that

---

chi ssu p'o must fall in the latter half of the fifth month, but that is all we can conclude from these inscriptions, aside from the obvious fact that nothing prevented the lunar phase being omitted entirely. Unfortunately, this is no more than we were able to infer from the terminology itself, so that neither alternative (3) "after punctual death" or (4) "after durative decline" above can be eliminated.

A slightly less ambiguous case is that of the Tso ts'e Hu yu 作册羨卣, one of the extremely rare inscriptions that contain two successive dates, one in the second month and one in the fourth month:

"It was in the second month, chi wang, day i-hai (12) . . . coming to the fourth month, chi sheng p'o, keng-wu (7) . . . "

Here a common sense interpretation of chi wang limits the range of meanings available for chi sheng p'o. If we assume that the former refers to a day no earlier than, say, the fifteenth day of the second month, then chi sheng p'o must fall between the twelfth and the twenty-fifth day of the fourth month. Here again we are only able to specify a range which is potentially applicable. Even in combination with the Sung inscriptions above the result does not really permit the elimination of either alternative (1) "after punctual birth" or (2) "after durative growth" for chi sheng p'o.

More problematical is the following pair of vessels, Ling kuei and Chao tsun, thought by some to contain separate records of the same events:

"The King being at Yen on his way to attack the Earl of Ch'u; it was the ninth month, chi ssu p'o, day ting-ch'ou (14)."

"It was the ninth month, at the Yen encampment, on day chia-wu (31) Po Mao Fu was presented a white horse."

Given the two dates seventeen days apart, unless pairing the two is a mistake, chi ssu p'o would have to fall in the first half of the month, an anomalous possibility apparently in contradiction with the pair of Sung vessels above, and a situation which cannot be accounted for by any interpretation of the lunar phases advanced so far. This difficulty naturally raises another issue, which is whether in fact a sexagenary date separated from the lunar phase by a statement identifying a geographical location should even be considered to fall within the specified phase. Consider the following example from the Ching kuei 靭倉:

34 Shirakawa, Kimbun tsūshaku, 10:589.

35 For a recent discussion of the issue see Chou Fa-kao, "Hsi Chou nien-tai hsin k'ao," 8. Chou concludes that there is indeed a possibility that cyclical dates which do not follow immediately after the lunar phase may not relate to that phase at all.
“In the sixth month, ch’u chi, the King was at P’ang ching, on day ting-mao (4) the King ordered Ching . . . coming to the eighth month, ch’u chi, on day keng-yin (27) . . .”

On its face the inscription appears to identify two dates only two months apart yet separated by eighty-three days, the second date keng-yin necessarily falling on the first day of the eighth month and the first date ting-mao falling on the eighth day of the sixth month. This would seem to indicate that one month had to have been intercalated between the two named, thus suggesting the unprecedented occurrence of interyear intercalation during the Western Chou period. Given the improbability of mid-year intercalation, however, Kuo Mo-jo 郭沫若 preferred to take the first date ting-mao to refer to an unnamed seventh month, which means that he too subscribed to the view that a cyclical date following a geographical location did not necessarily refer back to the preceding month or lunar phase.36 A second associated vessel, the Ching yu 静卣, is dated “fourth month, ch’u chi, on day ping-yin (3),” and records the king’s gift of a bow to this same Ching. If the Ching kuei date ting-mao (4) is taken to refer to the sixth month, then the two events could date from the same year. What makes the problem particularly intractable is the existence of a third vessel naming the same Ching, the Hsiao ch’ en Ching yi 小臣靜彝, which has a “thirteenth month” date—conclusive evidence of interyear intercalation that confirms what most scholars believe to have been the practice, but which vitiated the tenuous hypothesis that an intercalary month could have intervened between the two dates in the first inscription.37 Thus in this case as well we are unable to draw any definite conclusions about the interpretation of the lunar terms.

Not long ago, however, a more comprehensive study of the dated inscriptions and of the extensive Chinese scholarship on their contents was undertaken for a recent history of Chinese astronomy. The results of that effort are worth quoting in their entirety:

“Among the literary texts and bronze inscriptions from Western Chou there are many dated passages giving the year, month, day, and lunar phase. Thus far, however, the important calendrical terms hui 咸 ‘dark of the moon’ and shuo 風 ‘new moon’ have not been found. There are records of ‘thirteenth months’, but no jun or jun yueh 閏月 ‘intercalary month,’ which shows that during the Western Chou the method of year-end intercalation was still being used. In the bronze inscriptions the four terms ch’u chi, chi sheng p’o, chi wang, and chi ssu p’o regularly appear. All sorts of different explanations of their meaning have been put

36 Kuo Mo-jo, Liang Chou chin-wen tz’u ta-hsi t’u-lu k’ao-shih 兩周金文辞大系圖錄考釋 (Peking: 1937), III, 55b-56a.
37 Shirakawa, Kimbun tsūshaku, 16:123–38.
forward both in the past and in our own day. These can be divided roughly into two types. One is the so-called *ting-tien yüeh-hsiang* 定點月相 or ‘fixed-day lunar phase’ theory, which has prevailed for more than 2000 years. According to this view the four terms *ch’u chi*, *ssu p’o*, *sheng p’o*, *chi wang* denote fixed periods of one, two, or perhaps three days each month. More recently, many scholars have propounded the second type or *ssu-fen yüeh-hsiang* 四分月相 ‘four-quarter lunar phase’ theory, according to which the Chou divided the month into four parts, each approximating a week of about seven days. Whether a week of seven days really was used in ancient China, and why the Chou would have changed from the tripartite division of the month by *hsin* of ten days used by the Shang to a division of the month into four weeks, is worth investigating. Some have argued that the idea came from the West, but the evidence shows that the Babylonian use of the week began in about the seventh or eighth century B.C. Both of the above explanations consider *ch’u chi* and related terms to refer to lunar phases. But there is a strong possibility that both theories are imperfect.

Twenty years ago it was pointed out (by Huang Sheng-chang) that *ch’u chi* does not represent a lunar phase, but rather denotes the first ‘stem’ day [first appearance of each of the ten heavenly stems]. For the ancients, who considered first things especially propitious, *ch’u chi* would then have meant the day of the first auspicious appearance of a stem in each month, and not the day of new moon *shuo*, or the first appearance of the lunar crescent *fei* 龜. But there seems to be no room for doubt that *chi sheng p’o*, *chi ssu p’o*, and *chi wang* ought to relate to lunar phases. In what follows we discuss this question on the basis of recently excavated bronze inscriptions which are dated, relatively reliably, to the reigns of Kings Gong 共 and I 鼎.

In the analysis the terms which serve as boundary parameters delimiting the lunar phases are limited to: *shuo* ‘new moon’, *fei* ‘first crescent’, *wang* ‘full moon’, and *hui* ‘dark of the moon’. At the same time, *chi sheng p’o* and *chi ssu p’o* are taken to be complementary (both are either fixed days or both not).

**TABLE A** tabulates the data relating to lunar phases from the three Wei group vessels from the reign of King Kung, the *Ch’üeh T’s’ai ting* 趙曹鼎 (a representative ‘type’ vessel from the King Kung period), and the three Ssu-ma

---

58 See T’ang Lan 唐蘭, “Shensi sheng Ch’i-shan hsien Tung-chia ts’un hsí ch’u’t’u Hsi Chou chung-yao t’ung-ch’i ming-t’zu ti shih-wen ho chu-shih” 陝西省岐山縣董家村出土西周重要銅器鉅縣的釋文和定譜, *Wen-wu* 5 (1976); P’ang Huai-ching 廣懷靖, “Shensi sheng Ch’i-shan hsien Tung-chia ts’un Hsi Chou t’ung-ch’i chiao-hsüeh fa-chüeh chien-pao” 陝西省岐山縣董家村西周銅器窖穴發掘簡報, *Wen-wu* 5 (1976). The consensus among scholars that these vessels form a group is particularly noteworthy. David Nivison concurs in assigning the three Wei group vessels and the *Ch’üeh T’s’ai ting* to the reign of King Kung. When confronted with inscriptions which philological analysis identifies as belonging to a single reign, but which the four-phase interpretation of the lunar terms would not allow to be placed in the same calendar, rather than questioning the assumption that the lunar terms refer to four phases Nivison advanced yet another hypothesis to explain the anomaly. The result is his conjecture that the *Ch’üeh T’s’ai ting* refers to a second “royal calendar” that began two years after the origin year implied by the three Wei group vessels; see “The Dates of Western Chou,” 526, 553, 576. An alternative interpretation of the data suggests that this “dual royal calendar” hypothesis is an artifact of Nivison’s dating method and assumptions. In contrast, Chou Fa-kao assigns all three Wei group vessels to the reign of King Kung’s successor, King I, but identifies the *Ch’üeh T’s’ai ting* with
Kung Group vessels from the reign of King I

(1) On the basis of the three Wei Group vessels alone it is apparent that the terms do not refer to fixed days.

(2) From the three Su-ma Kung vessels it is clear that the meaning of ch’u chi and chi sheng p’o cannot be explained using the four-phase theory.

(3) When the three Wei Group vessels and the King Kung representative “type” vessel, Ch’ueh Ts’ao ting, are brought into relationship one to the other, the differential of ten days between the two chi sheng p’o dates makes it self-evident that chi sheng p’o cannot refer to a four-phase division of the month.

But what if the third year Wei ho is not a King Kung period vessel but a King I 赫 vessel? Since the Su-ma-Kung Group can be identified as King I 赫 period vessels, the Wei ho cannot be moved to King I’s reign. That’s because given the Wei ho 3rd year, 3rd month, chi sheng p’o, day jen-yin (39), such a month could not possibly have a ch’u chi, day chia-hsü (11) [given on the Shih ch’en ting]. Of course one could propose an intercalary third month in this year to explain the contradiction (and one would have to make the Shih ch’en ting’s 3rd month the intercalary month). But to date there is no basis for arguing that the Chou were using mid-year intercalation. And even if the possibility were to be admitted it would have no effect whatever on the above conclusions. Taking the Wei ho together with the three Su-ma Kung vessels and the Wei ting A & B together with the Ch’ueh Ts’ao ting, it is still apparent that the lunar phase terms do not refer either to fixed days or to four lunar phases.

If we treat the three Wei Group vessels as King I 赫 vessels (in this case taking the 27th year Wei kuei 前景 as a King Kung vessel), 40 and the three in the Su-ma Kung Group as King Hsiao 肖 period bronzes, besides the definite difficulties inherent in such a procedure (King Kung’s dates and the dates of Western Chou, the match between the Su-ma Kung Group and the Ch’ueh Ts’ao ting, the period of Hsing’s 玉 activity, etc.), there is still no effect on the above argument.

Consequently, the only possible explanation is that during the Western Chou period (at least the mid-Western Chou) the month was divided into two halves, the first half being called chi sheng p’o and the second half chi ssu p’o. Twenty years ago, on the basis of linguistic study and an analysis of the Sung ting and the Shih Sung kuei, Yabuuchi Kiyoshi arrived at the same conclusion. 41 He also argued that ch’u chi and chi wuang represented the first crescent and the full moon respectively. We have not considered examples of chi wuang here. But among the most probable choices in TABLE A (marked with asterisks), one can see that it is possible that

King Kung’s reign; see “Hsi Chou nien-tai hsìn k’ao,” 27 and Appendix B.

39 Liu Ch’i-yi 劉季益, “Cheng shih chia-tsu t’ung-ch’ i yü Hsi Chou t’ung-ch’ i t’ uan-tai” 此氏家族銅器與西周銅器斷代, K’ao-ku 5 (1978). David Nivison groups all three Su-ma Kung vessels in the same reign but as King I 赫 rather than King I 赫 period pieces. Here again he can only accomplish this and still preserve the four-phase definition of the lunar terms by assuming that one of the inscriptions, Hsing hsü, refers to a different royal calendar begun two years later than the first; see “The Dates of Western Chou,” 526, 550, 577–78. Chou Fa-kao assigns the Shih ch’en ting and Chien kuei to King Hsiao 肖 but concurs in assigning the Hsing hsü to King I 赫; “Hsi Chou nien-tai hsin k’ao,” 27.

40 This is also Chou Fa-kao’s view; ibid. 27. David Nivison is virtually alone in assigning the Wei kuei to King Mu 楚; ibid. 576.

41 Yabuuchi Kiyoshi 葉村浩, “Inreki ni kan suru ni, san no mondai” 殿際に関する三、三の問, Tōyō shi kenkyū 東洋史研究 15.2 (1956).
Table A. Calendrical relationships among Wei Group (above) and Ssu-ma Group (below) inscriptions; the most probable relationships are marked with (*); after Chung-kuo t'ien-wen-hsüeh shih (Peking, 1981), 21

| King Kung Period | Year, month, day | lunar phase |  |  |  |  |
|------------------|------------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  |                  |             | 12th | 14th | 17th, 18th, 19th | 18th, 19th | 20th, 21st | 20th, 21st | 20th, 21st | 20th, 21st |
| Wei ho           | 3rd yr, 3rd mo, jen-yin 39, chi sheng p'o | * | * | wang (15th) | shuo (1st) | fei (3rd) | fei (3rd) | fei (3rd) | fei (3rd) | fei (3rd) |
| Wei ting A       | 5th yr, 1st mo, keng-hsü 47, ch'u chi | shuo (1st) | fei (3rd) | 6th | 7th | 4th | 19th, 20th | 9th | 21st | 9th | 21st |
| Wei ting B       | 9th year, 1st mo, keng-ch'en 17, chi ssu p'o | 24th | 26th | hui shuo (1st) | 27th | 12th | fei (3rd) | 16th | fei (3rd) | fei (3rd) | fei (3rd) |
| Ch'iüeh Ts'ao ting | 15th yr, 5th mo, jen-wu 19, chi sheng p'o | 2nd | 4th | 8th | 9th, 10th | 6th | 21st, 22nd | 11th, 12th | 23rd | 23rd | 23rd |

| King I Period | Year, month, day | lunar phase |  |  |  |  |
|---------------|------------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Shih ch'en ting | 3rd yr, 3rd mo, chia-hsü 11, ch'u chi | fei (3rd) | 16th | 5th | fei (3rd) | fei (3rd) | fei (3rd) | fei (3rd) | fei (3rd) | fei (3rd) |
| Hsing hsü     | 4th yr, 2nd mo, wu-hsü 35, chi sheng p'o | 2nd | wang (15th) | 4th | 2nd | 2nd | 2nd | 2nd | 2nd |
| Chien kuei    | 5th yr, 3rd mo, keng-yin 27, ch'u chi | shuo (1st) | 13th, 14th | 3rd, 2nd (fei) | 3rd, 2nd (fei) | 3rd, 2nd (fei) | 3rd, 2nd (fei) | 3rd, 2nd (fei) | 3rd, 2nd (fei) | 3rd, 2nd (fei) |
ch'u chi could represent the first crescent (if a little forced). However, on the basis of even more Western Chou inscriptive lunar phase material we have collected, it also appears possible that ch'u chi and chi wang do not merely denote the first crescent and the full moon as fixed-day phases. It is very likely that ch'u chi does indeed refer to the first auspicious stem day, and that the meaning of chi wang is somewhat broader than just the day of the full moon."

Here, then, we have a controlled experiment which, while it does not establish conclusively the precise meaning of the terms ch'u chi and chi wang, chi sheng p'o and chi ssu p'o, is entirely adequate to demonstrate convincingly what they are not. Since this analysis is not predicated on a reconstruction of the absolute chronology but on the grouping of representative vessels regarding which there is a consensus, it also inspires more confidence than circular arguments contingent on absolute dating whose accuracy is said to establish the very definitions for the lunar terms which were instrumental in deriving the dates.

Evidently, the two terms chi sheng p'o and chi ssu p'o as lunar phases correspond best to our definitions (1) and (3) above, referring to completion of a period begun by a conceptually "punctual" event or turning point, a result that is consistent with the deeply rooted binary conception implied by the metaphorical growth cycle of the "calendar pod," and with the Chou calendrical system of twelve fortnightly ch'i-centers which focuses on mid-month. Since, however, there does appear to be some overlap among the terms, and since the only expression to survive until the early Warring States period inscriptions is the first—ch'u chi— the question suggests itself whether the redundancy might not in fact reflect a different origin or purpose for the more ephemeral chi sheng p'o and chi ssu p'o.

Given the early appearance of lunar terms in the bone and bronze inscriptions of Western Chou and their total absence in Shang inscriptions, it is possible that the Chou recorders, who were also in charge of calendrical astronomy, may have been somewhat

---

42 Chang-kuo t'i'en-wen-hsüeh shih, 20–21.
43 Based on a comprehensive study of the frequency of appearance of the four "lunar" terms in the inscriptions, Liu Yü-chin 劉雨金 reached the conclusion that ch'u chi does not belong to the same category of terminology as the other three; see his "Ch'u chi pien-hsi 初吉 洞析," Wen-wu 11 (1982), 76–84; for a critical discussion see Chou Fa-kao, "Hsi Chou nien-tai hsin k'ao," 8. The overwhelming preference in the later inscriptions for certain cyclical dates, especially the super-abundance of the combination ch'u chi, t'ing-hui (24), has often been remarked upon. This also strongly suggests that the controlling factor in the case of ch'u chi had more to do with the auspicious hemerological resonances of certain cyclical signs rather than with the age of the moon per se.
more preoccupied with observing the lunar aspect than their Shang counterparts. It has long been debated whether the system of twenty-eight lunar mansions which first became established during the Chou dynasty was influenced by the conceptually similar Indian system of naksatras which performed the analogous calendrical function in that country.\textsuperscript{44} It has been argued, with somewhat more justification, that the Chinese were already exposed to Babylonian planetary astrology sometime during the late Chou period.\textsuperscript{45} It has also been suggested, although not established, that knowledge of the 76-year (27,759 day) cycle of Calippus (370–330 B.C.), an exact concordance of phase between lunar cycles and tropical years which Han mathematical astronomers found extremely useful, was transmitted to China as a result of Alexander’s conquests in Asia in the fourth century B.C.\textsuperscript{46} The contacts which such “technology transfer” implies would presumably have been mediated, beginning in late Shang times, by nomadic or semi-nomadic peoples to the south, west, and north of the Wei Valley, some of whom no doubt belonged to the same ethnic stock as the Chou. The Chou were in constant contact with such groups and, in the case of the Ch’iang 犬, allied with them through marriage.\textsuperscript{47} Conclusive proof of such a diffusion of ideas is lacking, though we do know, of course, of the early Chinese fascination with Central Asian nephrite and horses, and the two-wheeled chariot is generally held to be an importation from Western Asia, probably during the mid-second millennium.\textsuperscript{48} In terms of astronomical terminology in particular, the curious names of the months and of the stages of the duodecimal Jupiter cycle which are glossed in Erh-ya 耒雅, “Shih t’ien” 播天, and employed freely in Ssu-ma Ch’ien’s 司馬遷 (c. 100 B.C.) “Monograph on the Heavenly Offices” 天官書 are generally thought to be of non-Chinese origin. When we turn to India we find that it was indeed the practice there to divide the month into fortnights at about the same time as the terminology involving p’o was in vogue in Chou China. The Indian scheme, as recorded in the Taittirīya-brāhmaṇa, denoted the

\textsuperscript{44} Joseph Needham, *Science and Civilisation in China*, vol. 3, 252 ff.


half of the month from new moon to full moon by pūrva-pākṣa and the second half by apara-pākṣa. Sanskrit pākṣa by itself means “a wing, a flank, one side of anything, the half of anything”; pūrva means “fore” and apara “after”. In terms of the month, then, the ancient Indian conceptions was analogous to our “forenoon” and “afternoon,” or modern Chinese shang-wu 上午 and hsia-wu 下午.

As we saw above, the etymology of Western Chou p'o 霸 is obscure, the variant p'o 需, whose earliest occurrence is on the Chou-yüan oracle bones, only seems less so because it was also used in literary texts to denote the yin or “corporeal” soul, but the reconstructed pronunciation *p'āk for both is well-established. In the case of the easternmost branch of the Indo-European family in Sinkiang and Kansu already mentioned—the Tocharian dialects—the word corresponding to Sanskrit pākṣa is pak “part” in the eastern A dialect and pake in the western B dialect. There were also verbs pāk- “to ripen, cook” (trans.) and pālk- “to see,” “to light,” “to burn” (intrans.) common to both dialects, and there was a noun pālk “a look.” One or more of these may be cognate with pālent “full moon day” [dialect B]. Without more information on terminology pertinent to Tocharian calendrics, however, the actual...

of the Royal Asiatic Society (1966), 18, 22, 27, 30; Pulleyblank, “The Chinese and their Neighbors,” 459; cf. also M. von Dewall, Pferd und Wagen im frühen China (Bonn, 1964); Edward L. Shaughnessy, “Historical Perspectives on the Introduction of the Chariot into China,” Harvard Journal of Asiatic Studies 48.1 (1988), 189–237. According to the Warring States narrative Mu t'en-tzu chuan 穆天子傳, several days’ march to the west of the Chou homeland there lived a people called ch'ik-wu 赤烏 “Red Crow” who descended from the royal lineage of Chou and who presented large numbers of horses, cattle and sheep in tribute to King Mu. See Rémi Mathieu, Le Mu tianzi chuan: Traduction annotée, étude critique (Paris: Institut des Hautes Études Chinoises, 1978), 33. The astrological association between the Chou homeland and the Vermilion Bird asterism together with the momentous significance of the Red Crow augury in connection with the bestowal of Heaven’s Mandate on Chou in 1059 B.C. are discussed in Pankenier, “Astronomical Dates,” 4 ff. Whether there is a connection between the nomadic or semi-nomadic ch'ik-wu and Tocharian groups in the region such as the *Taxwar (= Ta-yüan 大宛) or *Ywati (= Yueh-chih 越質), is unknown, but it is particularly interesting to note the association of the ch'ik-wu both with horses and with the same potent astrological (totemic?) motif as the Chou.


50 Bernhard Karlgren, Grammata Serica Recensa (Stockholm, 1964), #772 & #782.
connection between pak/päk/päk and Archaic Chinese päk is difficult to establish conclusively. Nevertheless, it is significant that E.G. Pulleyblank has pointed to a Tocharian origin for such Chinese words as ch'i-lin 麒麟 “unicorn” (as “heavenly horse”) and ch'ien 乾 “heaven” and has intimated that these Tocharian-Chinese contacts may indicate a special connection with Chou rather than Shang.51

Although the connection is conjectural, the close resemblance between archaic Chinese and Indo-European parallels is suggestive. If p'o/*päk were a transplanted loan word for the illuminated “flank” of the moon it would presumably have come into service along with the practice of loosely dividing the month into fortnights. Since, however, the hsin system was already so firmly entrenched and in continuous use since Shang times, a calendrical innovation associated with the terminology chi sheng p'o and chi ssu p'o, like the later series of foreign terms for the months and duodecimal Jupiter stations, may never have achieved much currency apart from the highly specialized use to which it was put by the court historiographers. Such terminology may simply have fallen into disuse as a consequence, while the more popular ch'u chi, with its intrinsic link to hemerology and the hsin decade system, continued to be employed as long as bronze inscriptions carried internal dates. Because of the suggestive analogy between the lunar cycle and the birth of the anima in the later Chou conception, the variant p'o 跤 perhaps found new vitality in a different guise thanks to its attachment to the yin half of the hun-p'o double-soul.

**Implications: The “Wu ch'eng” Dates and the Yin-li**

Liu Hsin, in reconstructing the calendar for the year of the Chou conquest (1122 B.C. in his scheme), based himself on the month, lunar phase, and sexagenary day-dates which he attributed to the “Wu ch'eng” chapter of Shang-shu.52 In his reconstruction Liu took ssu p'o to refer to shuo or new moon, and sheng p'o to refer to wang or full moon. This, of course, is directly contradicted by Wang Kuo-wei’s four-quarter interpretation, and most adherents of the latter have dismissed Liu Hsin’s definitions out of hand. As Tung Tso-

---


52 Han shu 漢書, 21B.1015. The dated passages quoted from “Wu ch'eng” differ only in minor detail from the version of the same events recorded in the “Shih fu” chapter of Yi Chou shu.
pin has pointed out, however, his extensive research on early chronology revealed that at least as early as the fourth century B.C. the "Yin Calendar School" (Yin-li chia 殷曆家) had already calculated 1070 B.C. to have been the date of the Chou conquest "on the basis" of the same sexagenary day-dates and lunar phase definitions as Liu Hsin.\textsuperscript{53}

But the Yin-li solution does more than merely antedate Liu Xin's analysis of the lunar phases. Because Tung Tso-pin accepted Liu Hsin's lunar phase definitions, he himself failed to realize that the identification of the year 1070 B.C. as the date of the Conquest could have been determined indirectly through extrapolation using planetary conjunction periods, and that, therefore, the possibility exists that the "Wu ch'eng" day-dates and/or the lunar phase data could to some extent be Yin-li constructions. The Wu hsing ch'an 五星占 "Prognostications of the Five Planets," record of planetary ephemerides recovered from a second century B.C. tomb at Ma-wang-tui, recognizes approximate Jupiter-Venus conjunction periods of twenty-four years and Jupiter-Saturn conjunction periods of twenty years. The least common multiple of these two periods would be 120 years. Given the actual conjunction of Venus, Jupiter, and Saturn in February of 364 B.C. a retrospective extrapolation from that date would have yielded 1084 (i.e., 6 times 120, or 30 times 24, or 36 times 20) as the probable mid-eleventh century date of a conjunction potentially involving the planets. In fact, 1084 is the precise date of the transfer of the Mandate to Chou, according to the Yin-li. The closest actual conjunction to that date, one between Jupiter and Saturn, occurred in 1079 B.C. The five-year error in the Yin-li extrapolation (1084–1079) thus corresponds to what would be expected at a remove of eight centuries given the inaccuracy of the round figure of twenty years for the Jupiter-Saturn conjunction period (as against the true 19.859 years). This suggests that the 20-year conjunction period did indeed play a role in the extrapolation.\textsuperscript{54}

When the "Wu ch'eng" dates are tested on the calendar for 1070

\textsuperscript{53} Tung Tso-pin 董作賓, Yin-li p'u 殷曆譜, vol. 1 (Nan-ch'i, 1945), 4:2a–4b.

\textsuperscript{54} See David W. Pankenier, "Early Chinese Astronomy and Cosmology," 237 ff. Significantly, William Hung also concluded from evidence in Tso-chuan that retrospective extrapolations based on the twelve-year Jupiter cycle were begun about 364 B.C.; see his preface to Harvard-Yenching Institute Sinological Index Series, Supplement No. 11, Combined Concordances to Ch'un-ch'iu, Kung-yang, Ku-liang and Tso-chuan, Vol. 1 (1937), lxxxiv. On the fourth century B.C. date of both the Yin calendar and Chuan-hsü 頓頊 calendar, see also Chung-kuo t'ien-wen hsüeh shih, 74.
B.C. as reconstructed by Tung Tso-pin\textsuperscript{55} they fit exactly, if one interposes (as did Liu Hsin) an intercalary month between the second and fourth months, and if one applies the same lunar phase definitions as Liu Hsin.

As expected, the \textit{Yin-li} reconstruction illustrated in Figure 1 exhibits a two-day error in computing the new and full moons, since the \textit{Yin-li} formulas are known to have generated an error of +0.25 days per extrapolated \textit{pu} (the Chinese term for the Calippic cycle) of seventy-six years. This simply means that those responsible for the computation thought that the new moons occurred two days earlier than they actually did. Similarly, Liu Hsin’s own calculations some three hundred years later are an additional day early, which fact prompted him to fault the \textit{Yin-li} for being one day late! When the full dates quoted by Liu Hsin from the “Wu ch’eng” are inserted in the calendar for 1070 (Figure 1) the \textit{Yin-li} assumptions about the meaning of the lunar phase terms become apparent. Like Liu, the \textit{Yin-li} chronologists thought that \textit{ssu p’o} identified the new moon and \textit{sheng p’o} the moon at its fullest. Unlike Liu (compare Figure 2), however, the \textit{Yin-li} scheme makes the day \textit{p’ang ssu p’o} in the first month the \textit{second} day after the new moon rather than the \textit{first}. Thus it appears that Liu was forced to equivocate in deriving his own solution: his calculations of the cyclical designations yielded new moon dates one sexagenary number higher than the \textit{Yin-li}, and so Liu cannot make a distinction between \textit{ssu p’o} (“new moon” in his scheme) and \textit{chi ssu p’o} (the day following, according to \textit{Yin-li}) in the second month, or between \textit{sheng p’o} (“full moon” in Liu’s view) and \textit{chi sheng p’o} (the day following, according to \textit{Yin-li}) in the fourth month. Likewise, whereas in the first month Liu’s \textit{jen-ch’en} (29) as \textit{p’ang ssu p’o} identifies the day following the new moon, in the \textit{Yin-li}, \textit{jen-ch’en} (29) as \textit{p’ang ssu p’o} necessarily identifies the \textit{second} day after the new moon. This explains why Liu, who was aware of the problem, accepts the \textit{Yin-li} definitions of \textit{ssu p’o} and \textit{sheng p’o} and explicitly states that “\textit{p’ang + lunar phase}” means “next day following,” but scrupulously avoids stipulating what he thought \textit{chi “after”} signified. In the \textit{Yin-li} solution both \textit{chi sheng p’o} and \textit{chi ssu p’o} clearly identify a specific day rather than a period of several days as implied by Liu Hsin’s treatment (see Figure 2).

One implication of all this is that the “Wu ch’eng” dates quoted by Liu Hsin probably do not derive from an extant old version of \textit{Shang-shu} at all but rather from the same \textit{Yin-li} from which Liu

\textsuperscript{55} See Tung, Chung-kuo nien-li tsung-p’u 中國年曆綜譜 (Hong Kong, 1960).
Figure 1. The Yin-li reconstruction of the calendar for 1070 B.C. based on "Wu ch'eng"

<table>
<thead>
<tr>
<th></th>
<th>XII</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>59</td>
<td>p'ang ssu 29</td>
<td>58</td>
<td>28</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td></td>
<td>chia-tzu 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>43</td>
<td>ping-wu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>ssu p'o</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[chi ssu p'o]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"Wu ch'eng" 一月壬辰崤次死霸
二月既死霸越五日甲子(1)
四月既生霸越六日庚戌(8)

The 30th day is shaded out in each short month of 29 days.
The cyclical designations of first days of each month are those assigned by Tung Tso-pin. The Yin-li calculations uniformly produced new moons two days early so that their results for the new and full moons in months I, II & IV are placed in brackets. The Yin-li identification of [ssu p'o] as new moon and [sheng pe] as full moon is apparent from the reconstruction, as are the anomalous definitions of chi sheng p'o and chi ssu p'o as specific days rather than periods of several days.
quotes so liberally elsewhere in his treatise "Canon of the Ages." Liu did not fabricate the "Wu ch'eng" passages from whole cloth, since he evidently found it necessary to force his interpretation in order to make the data conform to his calendar for 1122 B.C., but just as Ho Ping-ti has remarked, these records have clearly passed through the hands of numerous Warring States and Han period specialists interested in establishing the early chronology and so must be treated with due caution.

What is especially noteworthy about the Yin-li reconstruction in this regard is the regular sequence of consecutive designations—sheng p'o, chi sheng p'o, p'ang sheng p'o, and chi p'ang sheng p'o—for the days following the full moon in the fourth month, as well as the corresponding sequence following the new moon in the first month. This regularity, it must be admitted, together with the observation that such enumerative formulas, the term p'ang, and the seemingly anachronistic use of yüeh 營, are not attested in the bronze inscriptions, lends a particularly worrisome retrospective flavor to this literary evidence. The strong impression created by these two series of terms is that chi sheng p'o and chi ssu p'o were thought at the time to refer to specific days only, rather than to a period of several days. The Yin-li reconstruction in itself does not prove the "Wu ch'eng" month, lunar phase, and day dates to be unreliable, but there is a possibility, at the very least, that some manipulation of one or the other element in the dates has taken place, even if this only amounted to the interpolation of superfluous terms like p'ang ssu p'o and enumerative data such as "on the fifth day" and "on the sixth day." It is the likelihood of this sort of "harmless" emendation (from the point of view of the Yin-li chronologists) that renders the "Wu ch'eng" dates of questionable value as primary evidence for the calendar of the Conquest year.

In my view, the possibility must be considered that the dates attributed to "Wu ch'eng" to some extent reflect Yin-li calculations of the conditions that were thought to obtain in the year 1070 B.C. In other words, the effort must be made to establish whether the

---

56 Ho Ping-ti 郭炳棣, "Chou ch'u nien-tai p'ing-yi" 周初年代評議, Hsiang-kang Chung-chen ta-hsieh hsieh-pao 香港中文大學學報 1 (1973), 26. Ho concluded after studying the various chronological arguments and the "Wu ch'eng": "Even if these three records of events from this chapter ["Wu ch'eng"] are based on historical material from early Chou, it is questionable whether the sexagenary day-dates and lunar phases are entirely genuine, having been spared even the slightest interpolation during the Warring States period when vigorous progress was being made in the knowledge of astronomical calculation, or whether late Chou dating phraseology has not been substituted for that of early Chou."
Figure 2: Liu Hsin’s reconstruction of the calendar for 1122 B.C. based on “Wu ch’eng” and the Yin-li

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31</td>
<td>60</td>
<td>30</td>
<td>59</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>[sheng p’o] 41</td>
<td></td>
<td>[p’ang sheng]</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Wu ch’eng”  一月壬辰朔旁死霸
二月既死霸越五日甲子(1)
四月既旁生霸越六日庚戌

The “Wu ch’eng” passages are quoted from Han shu, “Lù-li chih,” ch. 21B. The second date, which actually reads “3rd month” in Han shu, has been emended to agree with Guo-yü, Yin-li, Shih-chi, and “Shih fù” chapter of Ti Chou shu. The 30th day is shaded out in each short month of 29 days.

The cyclical designations of first days of each month are those for 1122 B.C. assigned by Tung Tso-pin. Liu Hsin’s reconstruction uniformly produced new moons three days early by comparison with modern calculation, so that his results for new moon [ssu p’o] and full moon [sheng p’o] in months I, II, & IV are placed in brackets.
dates as we now have them were the starting point of the Yin-li
reconstruction of the chronology or whether they were to some
extent the result. The question must be asked why, for example, the
Yin-li reconstruction of the calendar for 1070 B.C. required the
insertion of an intercalary month between the second and fourth
months in that year. Liu Hsin, for his part, is explicit about his
calculations requiring such an intercalary month in the year 1122.

Studies which proceed from the unexamined assumption that the
"Wu ch‘eng” dates are genuine and which argue that the duplicate
series of military and ritual events in the present “Shih fu” 世俘
chapter of I Chou shu constitute an authentic record of the actual
sequence of events in the Conquest year, all necessarily involve
speculative scenarios which assume either (i) an intercalary month
between the Conquest and the subsequent celebration in Chou or,
(ii) that at least two different calendars were used to record the
dates, or (iii) that an expedient “calendar reform” intervened
between the first and fourth months in that year which in effect
redefined the months. This is the analysis of “Shih fu” offered by
Edward Shaughnessy, and followed by David Nivison.57 Both schol-
ars’ reconstructions also rely on Wang Guo-wei’s four-phase inter-
pretation of the lunar phases which has been shown to be open to
question. In addition to these reservations, I do not subscribe to the
view that the parallel sequences of military and ceremonial activi-
ties recorded in the “Shih fu” chapter of I Chou shu represent two
distinguishable series of events on identical days two months apart,
the first series taking place near the Shang capital and the second in
the Chou homeland.

Since the “Shih fu” is supposed to be based on the original “Wu
ch‘eng,” if Shaughnessy’s assumptions in this regard were correct
the Yin-li chronologists in the fourth century B.C., who are more
likely to have had access to the original “Wu ch‘eng” than either
Ssu-ma Ch’ien or Liu Hsin, would surely have remarked upon this
feature of the Conquest chronology, or else they would have taken
some account of it in their reconstruction. They did neither, and
their silence in this regard, not to mention that of Liu Hsin, is
compelling.

Also implicit in Edward Shaughnessy’s and David Nivison’s
interpretation is the improbable premise that the present sequence
of dated passages in the transmitted text of “Shih fu,” with one
minor exception, exactly reproduces the true sequence of events in

57 Shaughnessy, “‘New’ Evidence on the Zhou Conquest,” Early China
the year of the Conquest. Rather than second guessing, at a remove of three millennia, about poorly understood logistical obstacles and ceremonial behavior in connection with the Conquest campaign, I share the view of K'ung Kuang-sen 孔廣森 and other commentators that two accounts of the same events differing only in minor detail have been transmitted and that the two should be conflated. Indeed, no less a critic than Ku Chieh-kang 鍾鎮剛 concluded on the basis of his critical study of the “Shih fu” chapter, “it is a pity that this text is in disarray; one cannot tell how many transposed passages, omissions, and textual errors there are.”

A preponderance of the evidence now indicates not only that King Wu did not reform the calendar in the year of the Conquest but that, just as the historical accounts suggest, in a demonstration of filial respect for the dynastic founder, King Wu continued to use the “Mandate calendar” promulgated by his father, King Wen, in the year Wen claimed the dynastic mandate—1058 B.C. This reckoning certainly continued through the year of the Conquest, 1046 B.C., the thirteenth year of that count, and probably until King Wu’s death in the fourteenth year, as I have argued elsewhere.

A crucial question therefore is, did the Yin-li chronologists alter the dates given in “Wu ch’eng” because their computations demanded it, or was it the original “Wu ch’eng” dates that dictated, for example, the insertion of an intercalary month when applied to the reconstructed calendar of 1070 as well as 1122? What other details of the “Wu ch’eng” dates as transmitted may be a conse-


59 David W. Pankenier, “Astronomical Dates,” 33–35; “Early Chinese Astronomy and Cosmology,” “Appendix A: Chronology of Kings Wen and Wu,” passim. Edward Shaughnessy, basing himself on information from the “Tso lo” 作洛, “Ta k’uang” 太匡, and “Wen cheng” 文政 chapters of I Chou shu, concurs in dating King Wu’s death to the fourteenth year in the Mandate calendar, but then fails to recognize the inconsistency in his argument when these same pre-Ch’in passages from I Chou shu date the ceremonial events following the battle of Mu-yeh to the thirteenth year of the Mandate calendar, directly contradicting his premise that the Conquest occurred in the twelfth year of the Mandate; see “On the Authenticity of the Bamboo Annals,” Harvard Journal of Asiatic Studies 46.1 (1986), 159, 167. The latter, twelfth-year theory proves to be a Ch’in and Han period misconception for which there is no support either in I Chou shu or in the reconstructed Bamboo Annals chronology; for a full discussion see my “The Bamboo Annals Revisited.”
quence of the Yin-li solution to the problem of the Conquest date? A glance at Figure 1 suggests the answer to the first question: the insertion of an intercalary month would have been required of the Yin-li reconstruction for 1070 because the regular fourth month in that year would not have contained a day keng-hsü (47) at all. If, in addition, we assume that the Yin-li date of 1070 was initially identified as that of the Conquest on other than calendrical grounds, such as, for example, on the basis of extrapolated planetary cycles, it would follow that at least the “Wu ch’eng” month and cyclical dates can have been accurately transmitted, since even the Yin-li chronologists, like their more modern counterparts, appear to have been obliged to posit a mid-year adjustment of the calendar by intercalation simply to accommodate the data. If, on the other hand, the Yin-li chronologists settled on the year 1070 on purely calendrical grounds we cannot even be sure that the “Wu ch’eng” day dates as we have them now are authentic. The evidence is not conclusive either way. We can see that Liu Hsin confronted a similar dilemma and responded by adjusting his calendar to accommodate the data, but in his case we do know precisely what data he obtained from the Yin-li.

The situation is somewhat different, however, in regard to the regular sequence in “Wu ch’eng” of lunar phase terms in combination with the enumerative formulas, for here even more stringent requirements are imposed by the Yin-li reconstruction. The Yin-li scheme is so precise in its punctual definition of the lunar terms and their locations in relation to the key cyclical dates that the 1070 solution to the chronology of the Conquest year is virtually unique! For this very reason, Liu Hsin’s recalculation of the Conquest year as 1122 obliged him to force his interpretation of the lunar terminology and gloss over the Yin-li distinction between “chi + lunar phase” and “p’ang + lunar phase” since Liu could not duplicate in 1122 the eight-day span between sheng p’o and day keng-hsü (47) in the fourth month or the five-day span between chi ssu p’o and day chia-tzu (1) in the second month (compare Figures 1 and 2). Similar definitional problems can be detected in all reconstructions thus far, most notably those for 1045 B.C., regardless of which interpretation of the lunar phases is adopted.60 What this means is that the “Wu ch’eng” dates as transmitted by Liu Hsin probably do contain interpolated data, specifically the term p’ang and enumer-

— 60 See David Nivison, “The Dates of Western Chou,” 566, and Chou Fa-kao, “Hsi Chou nien-tai hsin k’ao,” 9, whose reconstructions of 1045 B.C. both require chi sheng p’o and p’ang sheng p’o as well as chi ssu p’o and p’ang ssu p’o to be separated by one day, in contrast to the Yin-li where no such separation is possible.
tive formulas incorporating yüeh, which are contingent on the 1070 solution and are therefore probably not genuine.

The Calendar for 1046 B.C. as Conquest Year

In "Astronomical Dates in Shang and Western Zhou" I first proposed that the year 1046 be considered the likeliest candidate as the date of the Chou Conquest of Shang. Nothing has occurred in the interim to prompt me to revise that view; on the contrary, close analysis of the Bamboo Annals chronology and comparison with the coherent account provided by various chronologically significant passages in I Chou shu and Kuo-yü has strongly reinforced that conclusion. Still, some of the information on hand concerning the calendar of the Conquest year has taken on a new significance. Unlike "Wu ch'eng," such data did not play a role in Warring States or Han dynasty efforts to establish the chronology. First, there is the record in I Chou shu of the lunar eclipse of March 12–13, 1065 which was cited earlier. This record explicitly identifies the date of the eclipse as cheng yüeh 正月 or "first month" and thus provides solid evidence for when the year was held to begin in early Chou. This verifiable date, whose calendrical significance is often overlooked, can only mean that the first month was not the solstitial month but was the second lunation after the solstice as in the traditional Hsia calendar. There is strong positive evidence, accordingly, that the cheng yüeh or first month of the Conquest year in the Chou calendar ought also to have been the second after the solstice. Second, another dated passage has survived in I Chou shu which, though it does not give the month, does give the cyclical designation for the new moon day of the month in which the King Wu’s allies were confirmed in their status as vassals during the celebrations in the Chou capital of Feng 鄴. The passage from the “Feng pao” 鄴保 chapter begins: “It was in the 23rd year, day keng-tzu (37), new moon; the Lords of the Nine Regions all came to Chou. The King was at Feng. In the morning twilight, the King stood in the Lesser Hall. The King announced to Tan, Duke of Chou, ‘Wuhu! The various Lords have all come to felicitate us. [They have] suffered bitterly in service to Shang. How shall I preserve and keep [their loyalty]? How shall I employ them and send them off?’”

As I have pointed out elsewhere,⁶¹ although the text presently

reads "23rd ritual cycle" this is certainly a copyist's error. Feng did not become the Chou capital until after the defeat of Ch'ung in the sixth year of the Mandate (i.e., 1052) near the end of King Wen's reign. The Duke of Chou goes on in the passage to deliver a homily on diplomacy, and it is impossible that he could have been advising King Wen in the twenty-third year of Wen's reign. Hence the speaker could be none other than King Wu. There was no twenty-third year in the Mandate calendar, but there is a single keng-tzu (37) new moon in the decade following 1050, the date of King Wen's death. If, therefore, the text originally read "thirteenth year" instead of "twenty-third year," a common enough transcription error, day keng-tzu (37) can immediately be confirmed as the new moon day of the fourth month in the year of the Conquest (26 April 1046 B.C.; JDN 133 9847), the very same fourth month when "Shih fu" and "Wu ch'eng" agree that the various lords gathered in Chou to be reinvested by the new King.

Given this remarkably precise independent confirmation of the date 1046 for the Conquest, if we now provisionally accept the "Wu ch'eng" months, attested lunar terms chi sheng p'o and chi ssu p'o, and cyclical dates, and combine them with the definitions of chi sheng p'o and chi ssu p'o as the fortnight preceding the full moon and that following the full moon, respectively, how do they fit the calendar for 1046 B.C.?

As it happens, the winter solstice that year (30 December 1047) actually occurred on only the second day, kuei-mao (40), of the "first" month (December 29–January 27 by Tung Tso-pin's tables), so it is easy to imagine that there could be a discrepancy  

---

62 Edward Shaughnessy protests at length that the passage from "Feng pao" is unreliable; see 'The 'Current' Bamboo Annals and the Date of the Zhou Conquest of Shang,' Early China 11–12 (1985–87): 53, n. 7. He does not mention its significance if genuine: as a benchmark astronomical date in the year 1046 it decisively refutes the 1045 Conquest hypothesis. The "Feng pao" passage belongs with the litany of events dated to the fourth month of the Conquest year which is currently collected in the "Shih fu" chapter; it was misplaced early on only because the erroneous "twenty-third year" heading made it appear to belong to King Wen's reign. This new moon date, in what was in fact the thirteenth year of the Mandate, together with the lunar eclipse record of 1065 B.C. from the "Hsiao K'ai" chapter of I Chou shu, which correctly identifies the year in King Wen's reign, the month, and the exact day, could not possibly have been retrospectively calculated since these data only became meaningful in absolute terms once King Wen's reign and the Mandate calendar were astronomically dated in 1983. This suggests that Shaughnessy's general conclusions ("On the Authenticity of the Bamboo Annals," 159–63) about the unreliability of passages from I Chou shu which do not contain commentary by K'un Chao孔兆 are in need of revision.
between Tung’s reconstruction and what was actually identified as the solstitial month in Chou that year. In the eleventh century B.C. it is safe to assume that there was a margin of error of at least a week if not more in the physical observation of the winter solstice. If, therefore, the solstice had actually been thought to occur in what Tung reconstructs as the last month of the previous year (which ended on 28 December), there is no difficulty in placing the month and sexagenary day dates attributed to “Wu ch’eng” in the calendar for 1046 (Figure 3). The departure from Chou can have occurred on the day following jen-ch’en (29) in the first month; the battle at Mu-yeh can have occurred on 21 March, day chia-tzu (1), in the second month; and the ceremonies in Chou, at which trophies and prisoners were displayed and the authority of the various local lords was reconfirmed by King Wu, can have begun on day keng-hsü (47) in the fourth month.

From Figure 3 it is apparent that when the “Wu ch’eng” dates are placed in the calendar for 1046 B.C. the resulting identification of chi sheng p’o and chi ssu p’o as the waxing and waning fortnights of the moon now agrees with what was concluded above on the basis of the Western Chou inscriptions. The identification of the first month as the second lunation after the winter solstice agrees with what we know to have been true in 1065. And, significantly, there is no need to impose either an expedient intercalary month, or to introduce a speculative revision of the calendar between the events of the second and fourth months. Moreover, certain of the dates which have survived in “Shih fu” and “Wu ch’eng,” notably jen-ch’en (29) in the first month and keng-hsü (47) in the fourth month, which mark military and ceremonial events whose timing was under the control of the Chou king, now fall on the first day of a ten-day period, based on a count beginning on the first of each month (in contrast to the Shang hsün which began on chia 甲 stem days). This may be an indication that the popular quasi week so familiar from later times (as in such expressions as wu yueh shang hsün 五月上旬 ) may already have come into use in Chou as a result of the alternation of twenty-nine and thirty day months. Such careless usage would have been incompatible with the Shang conception with its rigid identification of the days of the hsün with the ten stems chia through kuei. It is also worth noting that the day hsin-wei (8), identified in the famous Li kuei 利簋 inscription as the

---

64 See Appendix A for discussion of the different versions of the calendrical dates for the Conquest year given in “Wu ch’eng,” “Shih fu,” and Shih-chi.
Figure 3. The Calendar for Conquest year 1046 B.C.

<table>
<thead>
<tr>
<th>XII</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>Jan 28</td>
<td>9</td>
<td>38</td>
<td>hsin-wei 8</td>
</tr>
<tr>
<td>Dec 30</td>
<td></td>
<td></td>
<td></td>
<td>keng-tzu 37</td>
</tr>
<tr>
<td></td>
<td>ping-wu 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>keng-hsu 47</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>jen-ch'ên 29</td>
<td></td>
<td>Mar 21(♀)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"Wu ch'eng" dates: 一月壬辰(9)奴死霸
二月既死霸越五日甲子(1)
四月既卒死霸越六日庚戌

"Feng pao" date:  進十有三祀庚子(9)緋九州之侯威格於周...

"Li kuei" date:  武王征商滅甲子(1)…辛未(8)王在閔...

date of an award ceremony immediately following the battle of Mu-yeh, now turns out to be the first day of the third month, and that the concluding ceremony on day i-mao (52) when King Wu was settled on his throne now coincides with the full moon in the fourth month.
Conclusions

We have seen that, although p’o originally did refer to the lighted portion of the moon, the four terms ch’u chi, chi sheng p’o, chi wang, and chi ssu p’o appearing in the Western Chou bronze inscriptions do not refer to four lunar quarters. Instead, ch’u chi probably refers to the first appearance of each auspicious “heavenly stem” during the first ten-day week of the month, chi sheng p’o denotes the waxing phase of the moon, chi wang the day or days of the full moon, and chi ssu p’o the moon’s waning phase. This basic conception yields a division of the month into lunar fortnights with the full moon period and “ch’i center” as the central focus at mid-month, a pattern that is consistent both with the inscriptive and literary evidence and with later tradition, but which may also exhibit some affinity with the practices of Indo-European groups with whom the Chou were most likely in contact.

Examination of the earliest reconstructions of the calendar for the year of the Chou Conquest, based on dates preserved in the “Wu ch’eng” chapter of Shang-shu, those of Liu Hsin in mid-Han dynasty and of the Yin-li chronologists in mid-fourth century B.C., suggests that those dates may be genuine in certain respects. In view of the clear evidence of manipulation of those records, however, only once the year of the Conquest is reliably established by other means can it be determined to what extent the “Wu ch’eng” dates have been faithfully transmitted. Evidence adduced both here and elsewhere identifies 1046 B.C. as the thirteenth year of the Mandate calendar—the year of the Chou Conquest. Strongly reinforcing that conclusion is a new moon date from the Conquest year itself found in I Chou shu. This precisely dated record identifies the first day of the fourth lunar month—26 April 1046 B.C.—and describes the ceremonial activities appropriate to that month during which the Chou allies who had convened in Feng were confirmed in their status as vassals by King Wu. When the dated events of the Conquest year attributed to “Wu ch’eng” by Liu Hsin and quoted by him from the Yin-li are tested on the calendar for the year 1046 B.C. the resulting fit agrees with the definitions of chi sheng p’o and chi ssu p’o as lunar fortnights. Furthermore, the resulting calendar confirms the identification of the first month of the year as the second after the solstitial month and it demonstrates also that, in contrast to other reconstructions, there is no need to assume an improbable mid-year intercalation or hypothetical “calendar reform” in order to accommodate the “Wu ch’eng” and “Shih fu” data.
APPENDIX A

Variant versions of the "Wu ch'eng" dates

The "Wu ch'eng" as quoted by Liu Hsin and the "Shih fu" chapter of I Chou shu disagree as to the lunar phase and cyclical day in the first month date. Different versions of "Shih fu" give p'ang sheng p'o and cyclical dates ping-ch'en (53) and ting-ssu (54) or, alternatively, ping-ssu (43) . . . ting-wei (44), rather than p'ang ssu p'o, jen-ch'en (29), and kuei-ssu (30) as in "Wu ch'eng." The "Shih fu" ping-ch'en (53) version is incompatible with the other dates found in that text. As for the "Shih fu" ping-ssu (43) version, although surprisingly late as the date of King Wu's departure from Chou, day ping-ssu (43) as p'ang sheng p'o does fit the Yin-li reconstruction of the first month of 1070 exactly, though not Liu's 1122 (see Figure 1), so that there is a possibility that "Shih fu" ping-ssu (43), p'ang sheng p'o may represent either an alternative Yin-li reconstruction or a confusion with another date. In fact, ping-ssu (43) is identified by Liu Hsin (though without lunar phase) as the day King Wu caught up with his advancing army before it reached the Yellow River at Meng-chin 禰津. Yin-li could conceivably have had "ping-ssu (43), p'ang sheng p'o" as the date of King Wu's rendezvous with the army, not as the date of his demarche from Chou. This Liu Hsin could not follow because the new moon day of his first month fell exactly one cyclical day later than the Yin-li, which made day ping-ssu (43) in the first month of 1122 fall on sheng p'o rather than p'ang sheng p'o (see Figure 2). On the other hand, Liu's jen-ch'en (29) could only become "p'ang ssu p'o" (i.e., the day after new moon in Liu's view) by disregarding the Yin-li definition of chi ssu p'o as the day after the new moon (as in the second month date, see Figure 1). Since both "jen-ch'en (29), p'ang ssu p'o" and "ping-ssu (43), p'ang sheng p'o" fit the Yin-li reconstruction for 1070 so precisely, despite the misidentification of the year of the Conquest and the complete misinterpretation of the lunar phase terms, there is a possibility that both versions of the first month record dependent on the dubious "p'ang + lunar phase" may actually be Warring States period reconstructions. There is no independent confirmation for either date. On the contrary, Ssu-ma Ch'ien's utter silence when it comes to these dates suggests that they were unknown to him, or at least that he considered them unreliable. On the rare occasions when Ssu-ma Ch'ien does supply cyclical dates he never mentions lunar phases, which fact is surely not without significance.65

---

65 As Wm. Theodore de Bary has noted, "On the whole Ssu-ma Ch'ien in his handling of sources displays careful judgment and a laudable skepticism not always equalled by his successors"; see de Bary, Sources of Chinese Tradition (New York: Columbia University Press, 1960), Volume 1, 235. The rationale for Ssu-ma Ch'ien's cautious approach is made plain from the outset in his comprehensive tabulation of the chronology (Shih-chi 13.487): "When Confucius arranged the Spring and Autumn Annals from the old historical texts, he noted the first year of a reign, the time when the year began, and the day and month for each entry; such was his exactitude. However, when he wrote his prefaces to the Book of History, he made only general references and did not mention year and month. Perhaps he had some material, but in many cases there were gaps and it was impossible to
LUNAR ASPECT ON WESTERN CHOU CHRONOLOGY

Liu Hsin\(^{66}\) quotes the "Preface" to Chou shu as saying that the advancing Chou army forded the Yellow River at Meng-chin in the first month on day \(wu-wu\) (55). Ssu-ma Ch'ien quotes the same passage,\(^{67}\) which he identifies with the "T'ai shih" 維誓 chapter of Chou shu. He makes the date "twelfth month, day \(wu-wu\) (55)."

Both month indications are obvious reconstructions. The quote is actually from the preface to the "T'ai shih" which correctly dates King Wu's pre-engagement harangue to the assembled troops to day \(wu-wu\) in the thirteenth year, with no month indicated. If the fording at Meng-chin occurred only a few days before the battle on day chia-tzu (1), which was in chi ssu p'u, the second half of the month, this crossing of the Yellow River would necessarily have taken place in the second month, not the first. Although both "Shih fu" and "Wu ch'eng" as well as other sources all agree that the battle of Mu-yeh occurred in the second month, Ssu-ma Ch'ien in his monograph on the "Hereditary House of Ch'i"\(^{68}\) reconstructs the date of the battle "eleventh year, first month, day chia-tzu," which is, of course, inconsistent with his account in the "Basic Annals" cited above.

In any event, day chia-tzu as the date of the Battle of Mu-yeh in the second month of the Chou calendar corresponds in my reconstruction to March 21, 1046 B.C. This date is two months later than I proposed in 1983 in "Astronomical Dates in Shang and Western Zhou." I am now persuaded on the basis of the lunar eclipse record in I Chou shu from just twenty years before the Conquest that the Chou first month in 1046 was also the second lunaation after the solstice just as in 1065. It is most significant in this connection that during the entire eastward march of the Chou army from 17 February (first month, day jen-ch'en) through 21 March (second month, battle of Mu-yeh on day chia-tzu) the planet Jupiter was stationary at 100° longitude, nearly dead center in Jupiter station Quail Fire right next to the auspicious "Bird" star α Hydric. This behavior of the planet, which may even be alluded to in the famous Li kuei inscription, could only have been interpreted as highly favorable to the Chou cause.\(^{69}\)

One event in the "Shih fu" sequence that must have occurred in Chou in the fourth month is dated only "day chia-yin (51)." Edward Shaughnessy\(^{70}\) translates (incorrectly) "On jia-yin (51), inspection of the military Yin at Muve. . . ." 甲寅鴆戌役於牧野 and argues on this basis that the passage demonstrates unequivocally that this first series of ceremonial events must have taken place near the Shang capital.\(^{71}\) I submit that it does just the opposite. The verb yeh 謙 here does not mean "inspect" but, as in Tso-chuan and elsewhere, "to announce, to make known (to a superior)"; by extension "to call on (a superior) to convey a message";

\(^{66}\) Han shu 21B.1515.
\(^{67}\) Shih-chi, "Basic Annals of Chou" 4.121.
\(^{68}\) Shih-chi 32.1480.
\(^{69}\) On the role of planetary astrology in Chou military strategy during the conquest campaigns and the importance of the behavior of Jupiter in particular, see my "Astronomical Dates," 7–15, and especially "The Bamboo Annals Revisited."
\(^{70}\) Shaughnessy, "'New' Evidence on the Zhou Conquest," 58.  
\(^{71}\) Ibid. p. 65 and n. 74.
consequently, in Han times yeḥ becomes the official title of such an “Internuncio.” In this case the object of the verb yeḥ is “the use of arms on Yin at Mu-yeḥ.” “Mu-yeḥ” is not the location of the speaker but rather the location where recourse to weapons took place. King Wu is not in the Shang territory but is reporting on the conduct of the actual battle to his august predecessors in the ancestral temple in Feng, not in some hypothetical provisional facility near the battlefield. Records in this first sequence of ceremonial events, including the offering of captives, booty, announcement to Heaven etc., which are duplicated in the second sequence that describes the offering of captives, booty, announcement to Heaven etc., undoubtedly also took place back in Chou and not in the Shang territory. The Bamboo Annals still correctly dates these events to the “thirteenth year” and explicitly identifies the location as the ancestral temple in Chou.

Still another fragmentary entry in “Shih fu” which is obviously out of place in its present location at the very beginning of the chapter is the record of a ceremonial event dated to the “4th month, day i-uei (32).” At this time King Wu is said to have “consummated his sovereign rule over the Four Regions, succeeded to the Mandate of Yin, and possessed the Kingdom.” This sounds like the conclusion of the account of the celebrations and logically it ought to follow rather than precede the series of events beginning on day keng-hsi (47) in the fourth month when King Wu reinvests the lords of the various states, announces the victory to Heaven and presents captives and trophies. As it is, the fourth month of 1046 contained no day i-uei (32). However, the final dated fragment contained in the parallel version of events in “Shih fu” merely records a musical performance on day i-mao (52) and ends with “the King was settled [on his throne].” The pattern throughout the sequence of ceremonial events in the fourth month is that in each instance the king first performs some ceremonial activity or makes a declaration, and then the musicians perform. I suspect that the fragment dated i-uei (32), which is obviously out of place, is in fact a mistake for i-mao. It actually records the ceremonial climax associated with the musical performance dated i-mao (52) which concludes the events of the fourth month. Putting the two together yields: “In the fourth month, day i-mao (52), King Wu consummated his sovereign rule over the Four Regions, succeeded to the Mandate of Yin, and took possession of the Kingdom. The musicians played “Yū the Exalted Fathered K’ai (celebrating both Yū the Great and his son Ch’i 賢 who succeeded Yū in Hsia just as Wu is here succeeding his father King Wen) in three reprises. The king was settled [on his throne]”—both a more plausible and a more satisfying conclusion to the account.

---

72 For jüng “weapons” as a verb, cf. e.g., Kuo-yü (Ssu-pu pei-yao ed., 3:4b) where the authentic “T’ai shih” chapter of Chou shu is quoted: “if attacked with force of arms, Shang will be overcome” jüng Shang pi k’o 戎商必克.