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The Key to the Chronology of the Three Dynasties:

The “Modern Text” *Bamboo Annals*

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THE KEY TO THE CHRONOLOGY OF THE THREE DYNASTIES:

THE "MODERN TEXT" *BAMBOO ANNALS*

David Shepherd Nivison

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## Summary of the Argument

1. Shaughnessy's discovery that a slip in the *Annals* chronicle for Cheng Wang of Zhou has been moved to the end of the chronicle for Wu Wang shows that the *Bamboo Annals* chronology is at least as early as the fourth century BCE, and is earlier than any other known. So in trying to reconstruct exact dates one must begin with this.
2. The *Annals* date for the conjunction of 1059 BCE is 1071, back 12; its dates for the reign of Wen Wang are 1113-1062; thus the correct dates should be 1101-1050. Other chronologies give Wen 50 years only. Inscriptions show that a Zhou king normally had a post-mourning "accession" in his third year; so Wen's dates must be 1101/1099-1050. This is confirmed by the lunar eclipse on day bingzi (13) in the first month of Wen's 35<sup>th</sup> year, = 1065, as mentioned in *Yi Zhou shu* 23 "Xiao Kai."
3. Mourning-completion indirectly indicates a royal calendar with first year 1056 (1058 being "mandate year" after the conjunction). If Mu Wang's first year was 100 years after the beginning of Zhou, it could be 956. This is confirmed by bronze inscription dates (taking lunar phase terms to mark approximate lunar quarters).
4. The dates for kings two through four, assuming *Annals* reign lengths, therefore should be these: Cheng Wang, 1037/35-1006 (2 + 30); Kang Wang, 1005/03-978 (2 + 26); Zhao Wang, 977/75-957 (2 + 19), confirmed by the Xiao Yu *ding* inscription (979). Wu Wang died three years after the conquest, which must be 1040, on Qing Ming Day, confirmed (e.g.) by the final line of the "Da Ming" ode in the *Shi jing*.
5. The Zhou Gong Regency was then misdated as the seven years before Cheng's 30 years, making the conquest 1045 (still reflected in other dates in the present *Annals*). The Yin Li conquest date is 1070, back 25 from 1045; if the Yin Li date for the first year of Shang, 1579, is also back 25, then the correct date is Pankenier's date 1554.
6. Pankenier's conjunction date 1953 for Shun 14, and Pang's solar eclipse date 1876 for Zhong Kang 5, plus two-year intervals between reigns, yield complete Xia Dynasty dates to 1561-1555 for next-to-last king Fa; so the last king Jie is an invention. This chronology seems verified by the first day of Kong Jia, 17 Feb 1577, = jiazi (01). Thus *gan* names of kings were apparently determined by first days of their reigns.
7. This *gan* hypothesis is confirmed by its successful application to all the Shang kings, who all have *gan* names. Confirmations of resulting exact dates for all of Shang include these: (1) Two traditional errors are explained, (a) the impossibly long 75 years for Tai Wu; and (b) the misdating of Yong Ji before Tai Wu rather than after him. Also (2) Shang bone inscriptions show that Wu Yi did die (as in the *Annals*) during a hunt "in the He-Wei area" in his 35<sup>th</sup> year, the correct date being 1109 BCE.
8. Analysis of middle and late Western Zhou bronze inscriptions together with *Annals* reign lengths yields exact dates for Zhou kings from Mu Wang through You Wang.

## Summary, Appendices

1. Dukes of Lu: Xian Gong's reign should be 23 years rather than the 32 years in the *Shiji*; and Li Gong's succession date was the "first year" of Gong Wang, but was Gong Wang's accession date (915) rather than his succession date (917); also, the reign of the first duke Bo Qin was incorrectly lengthened 3 years in the *Annals* as an indirect consequence of the moving of "Shaughnessy's slip."
2. The Late Shang ritual cycle: 70 or more inscriptions for the eastern campaign of Di Xin must be dated to 1077-1076, the campaign beginning on 29 September 1077, with the annual *zai* sacrifice to Shang Jia. From this starting point for analysis, the first days of sacrifice years from 1120 through 1041 are calculated, confirming dates for the Wu Yi, Wenwu Ding and Di Yi reigns.
3. Pre-Zhou chronicle: Successive revisions from ca. 427 to 300 are explained, showing that dates in the *Annals* back to Huang Di are systematically related to Xia and post-Xia dates. (Therefore the original text must have begun with Huang Di.)
4. Conquest dates other than the correct date 1040 explained and refuted: notably, the "13<sup>th</sup> year" theory of Liu Xin and many later scholars; and the incorrect but widely accepted date 1027, thought to be required by a quotation from the *Annals* by Pei Yin.
5. Chronology, Huang Di through Western Zhou: tabular summaries.
6. Dated Western Zhou bronze inscriptions and lunar quarters theory: Absolute dates are computed for 56 bronzes that have full internal dates, using the four quarters (*yue xiang*) theory. The system is demonstrated by a tabular presentation of a day-by-day analysis of the Zhou conquest campaign in the first half of 1040 BCE.
7. The slip text of the *Bamboo Annals*: Legge and other later scholars have argued that the *Annals* text and dates were reworked after the discovery of the book ca. 280 CE, so that the *Annals* dates are worthless for recovering ancient chronology. These objections are analyzed and refuted.
8. The Wei revision and the "modern text": Errors and lacunae in the Wei (4<sup>th</sup> century) part of the chronicle are here examined, showing that the "modern text" probably derives from a copy of the work that was being done by the Jin court scholars before it was finished; and that the creators of the original text ca. 318-299 altered the dating of the reign of Huicheng Wang (as king) for political reasons, making it 335-319 rather than 334-319 BCE.

It is now reasonably well established (if not agreed) that the "Modern Text" *Bamboo Annals* (*Jinben Zhushu jinian*), with mostly non-essential modifications, is for the most part the text buried ca. 299 BCE and exhumed ca. 280 CE. Accordingly, this monograph experimentally accepts it as an authentic text of the fourth century BCE, and analyzes its dating system, seeking to reconstruct thereby an exact chronology of early China, not for the entire two millennia covered by the *Bamboo Annals* chronicle, but for all of the controversial part of it, from before the beginning of the so-called "Three Dynasties," through Xia, Shang and Western Zhou. The procedure is to use references to conjunctions, eclipses, etc., to pin down key absolute dates. Almost always the *Annals'* dates do not agree. Explanations must then be found for the *Annals'* errors, and these explanations show the *Annals'* dates to be the results of successive systematic revisions of an original chronology. This chronology can thus be recovered and demonstrated to be correct.

(The foregoing summarizes what this monograph is. Unnecessary misunderstanding will be avoided if I say what it is not. If my conclusions survive criticism, they do not constitute a history of the Three Dynasties, even though they imply much that will concern any historian. Nor is this work a substitute for archaeological investigations, which ought to continue independently and with energy. Further, I do not think that I have anything to say about the early history of writing, or of political entities. Reconstructing an exact chronology of "reigns" as far back as ca. 2000 BCE, and tying it to precisely datable astronomical events, from eclipses to first days of lunations (this much I do claim), requires only that dates were remembered in some way, by some kinds of social entities. The way could be merely memory, prompted by non-written aids; and the entities could be merely prominent lineages (of no more than heads of mud villages) whose accumulated memories happened to survive. Almost certainly we would need to assume much more than that; but it is the task of others to show how much more.)

This monograph has been constructed out of the achievements of others, notably D. N. Keightley, E. L. Shaughnessy, D. W. Pankenier and K. Pang. (And I owe much, also, to Shima Kunio and to Chang Yuzhi.) My contribution has been to put them together and to take the implications of their work seriously, adding one discovery of my own: calendar breaks of two or three years at the beginnings of reigns, and their effect on dating, in Xia and Shang, as well as in Western Zhou. I believe the best explanation for these breaks is that a successor-king had to observe some kind of ritual mourning before assuming full royal functions. In the Xia, the break was apparently a formal interregnum. By late Western Zhou, it was perhaps little more than a convention determining what would count as "year one" in computing a date, though mourning must still be assumed.

(This monograph is being translated into Chinese by Shao Dongfang, in the National University of Singapore. A Chinese publication is planned.)

David Shepherd Nivison  
Los Altos, California, January 1999

## The Key to the Chronology of the "Three Dynasties":

### The "Modern Text" *Bamboo Annals*

This monograph (and my unpublished book that lies behind it, *The Riddle of the Bamboo Annals*)

I dedicate to the memory of my friend and colleague Wilbur Knorr (1945-1997), late Professor of Classics and of Philosophy, and in the Program in the History of Science, at Stanford University.

### Basic Assumptions: Keightley's Axiom; Shaughnessy's Discovery

1. "A basic principle of historiography is that, given conflicting accounts, one should rely on the earlier version unless there are reasons to the contrary." I quote from D. N. Keightley, "The Date of the Shang Historical Period," a lecture given in 1974. Anyone must agree with Keightley about this. But what does one do if there are reasons to the contrary? In deciding not to follow one's earliest source, one is judging it to be in error. To be confident of this judgment, one should be able to explain how and why this error arose, given what one has decided is the truth.

1.1 Early sources for exact dates in the Three Dynasties, prior to 841 BCE, all disagree. The earliest source is the *Jinben Zhushu jinian*, the "modern text *Bamboo Annals*."<sup>1</sup> This text has usually been judged to be a late (Song or Ming) fake. But the work of E. L. Shaughnessy (*HJAS* 1986) has shown that the chronicles for Wu Wang and Cheng Wang are the authentic text as buried in the Wei state royal tomb or cache ca. 299 BCE. At least one correction is needed: the removal of one slip's worth of text (40 spaces) from near the end of the Wu Wang chronicle, and its insertion in a gap, for years 15, 16, and 17, in the Cheng Wang chronicle.<sup>2</sup> Shaughnessy's discovery that this slip had been moved out of place is what shows that this part of the *Annals* is authentic; and this demonstration then creates a presumption that the whole book is authentic, unless reasons can be found for rejecting this or that part of the text. (Also, the present text has *ganzhi* for years, that were added in the Jin Dynasty (see Appendix 8), by editors who changed Jin-Wei dating to royal Zhou dating as well. These are merely changes in notation.)

1.2 Shaughnessy, however, thinks that the *Annals'* internal chronology was altered by the scholars who worked on it after its discovery ca. 280 CE. This would have made it unusable for deducing exact dates, even of Western Zhou reigns (most of his Zhou dates are right), let alone dates of pre-Zhou rulers. E.g., he thinks giving Mu Wang a 55-year

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<sup>1</sup> For an easily accessible text and translation, see Legge (1865), "The Annals of the Bamboo Books."

<sup>2</sup> Bamboo slips in old texts varied in standard length. Shaughnessy relies on a statement by Xun Xu, Jin court editor of another text in the cache (*Mu Tianzi zhuan*) that this text -- or the texts -- was/were "all in slips of 40 *zi*." He then guesses that this applies also to the *Annals*, and also that there were blank spaces between year entries; and he finds that these guesses explain everything he looks at. I will be using this "guess + verification" method repeatedly.

reign may have been an alteration of an unknown original feature (*Sources*, p. 254). And he believes that the misplacing of the slip that he discovered was an intentional "correction" made by the scholars working on the recovered slips (Shaughnessy, 1986; and *Sources* p. 241). But the *Annals'* account in year 14 records Wu Wang's illness that was in fact fatal, as Shaughnessy grants, and it then refers to the "Jin Teng" chapter of the *Shang shu*. In the "Jin Teng," however, Wu Wang survives this illness, as the text of the transposed slip makes him do in the *Annals*. Therefore, unless the scholars working on the book in the Jin Dynasty rewrote it so as to make it refer to the "Jin Teng," one must conclude that the slip was moved before the text was buried. And there are other reasons for this conclusion: details in the *Zuo zhuan* (provided by Wang Guowei, *Jinben*, under Wu Wang 15 and 16) imply that events in those three slip-added years occurred in Wu Wang's reign; so the slip had already been moved, and the altered chronology generally accepted, before the *Zuo zhuan* was written. Further, when the Wu Wang chronicle is copied out in slip-form and made to begin where the Jin scholars found it to begin, Shaughnessy's slip text is no longer a slip; so apparently the text was recopied before it was buried and after the slip was moved.

1.3 Therefore it seems to me that the *Annals'* chronology, as affected by the moving of the slip before 299 BC, is almost certainly the oldest chronology available. Shaughnessy's discovery, moreover, is so impressive as to require an experiment: In what follows, I will treat the "modern text" *Bamboo Annals*, all of it (except for non-essential changes in chronological notation), as a Warring States text, its reign lengths and implied dates just as they were when the text was buried. I will experimentally analyze it as such, making inferences from it to rebuild a hypothetical true chronology back as far as I can reach.

1.3.1 As "Shaughnessy's slip" itself shows, the *Annals'* chronology is at least partly incorrect. So in using it one must question it at every step (for "authentic" does not mean "true"); and if reason is found to reject a date or a reign length, one must find a probable explanation for the error. Usually that explanation will require that one have deduced what the correct account must be. The implications that I develop in this way usually seem obvious to me. But nothing can be more obvious than that obviousness is not an objective property of implications. I offer what follows, therefore (no matter how sure I allow myself to sound), as a series of suggestions, that I hope others will find useful.

1.4 A preliminary point must be made: It is sometimes supposed that the only way chroniclers of the Warring States era had for calculating dates in the past was to add successive reign lengths. This is not true. From at latest the middle of the 5<sup>th</sup> century BCE the system of counting by 19-year *zhang* and 76-year *bu* was in use (Nivison 1992), and it was being used (as will be demonstrated below) by experts who from time to time worked on the texts that became the *Bamboo Annals*. This *zhang-bu* system may have been used only for dates in the remote past. The *Annals* also has end-of-dynasty summaries giving the number of years in the dynasty; and for the Western Zhou era at least, chroniclers had at hand the succession of reign lengths of ducal houses that could be correlated with the reigns of kings. Notably, the *Annals* provides or implies a complete chronology of the dukes of Lu, containing errors, but these can be eliminated by



careful analysis, to yield a chronology of Lu that is more accurate than the one in the *Shiji* (see Appendix 1). In working out the exact dates of reigns of Western Zhou kings, they had in hand not only the exact date of its end (the equivalent of 771 BCE) but also what they believed to be the exact date of its beginning. They thus faced the problem of reconciling the sum of what they believed to be the lengths of reigns with what they believed to be the length of the entire period.

## Pre-Conquest Zhou Dates; Mourning Intervals

2. I begin with the record, under year 32 of Di Xin of Shang, of a conjunction of the five planets in lunar lodge Fang. For the *Annals* system, the equivalent date is 1071 BCE. A conjunction of all five visible planets is rare, occurring at most once in about 500 years. Such events were regarded as extremely important; therefore it is reasonable to see this as a record of an actual conjunction. Further, there was a dramatic conjunction near this time; but it occurred in May, 1059 BCE, twelve years later, and was not in Fang (in Jupiter station 10, Da Huo, near Antares) but in eastern Jing (in station 6, Chun Shou, in Cancer). (That this is the conjunction to which the *Annals* refers was suggested by Needham (1959, p. 408 note c), and affirmed by Pankenier (*Early China* 7 p. 4).)

2.1 Why the error? Perhaps partly because the *Annals* chronicle (for reasons to be explained: 4.1) took 1050 as the date of the conquest, and accepted the belief (see Appendix 4) that Jupiter was in Chun Huo (Quail Fire, station 7) at the time of the conquest. But probably also because astrologers in Wei used old records which must have represented the conjunction as heralding the rise of the ancestor state of Jin. Jupiter was part of the conjunction, necessarily. Jupiter was in Fang, in the middle of station Da Huo in 771 BCE, when Jin saved the Zhou Dynasty from extinction. This was 300 years (25 x 12 years) after 1071 BCE, and at that time it was believed (incorrectly) that Jupiter moved around the zodiac in just 12 years; so the conjunction, to have the double significance of heralding the rise of Zhou and also foretelling the later dominance of Jin, must have been in Fang, and in 1071. In addition, there was the tradition, probably true, that when the first lord of Jin was given his fief Jupiter was in Da Huo. The *Annals* makes that true too, by dating the appointment (incorrectly) to 1035 BCE (3 x 12 years after 1071; and I think not accidentally, just 700 years before the ruler of Wei declared himself king in 335 BCE; see Appendix 8).

2.2 But we can use these errors: The conjunction is backdated in the *Annals* by 12 years. If it was taken as a sign that Heaven's Mandate was shifting from Shang to Zhou, perhaps, then, other dates in the *Annals* for events important for Zhou in late Shang were also shifted back 12 years. The *Annals'* dates for the reign of Wen Wang in the Zhou state before the conquest of Shang are 1113-1062. Let us, therefore, try 1101-1050, a reign of 52 years.

2.3 A reign of 52 years is supported indirectly by *Lü shi chunqiu* 6 "Ji Xia" 4 "Zhi Yue.": There, it is said that Wen had a reign of 51 years rather than 52; but this is an error caused by the author misunderstanding the phrase "*sui liu yue*" as meaning "in the

6th month of the year," rather than (correctly) as "a year later, in the 6th month."<sup>3</sup> But 52 years for Wen Wang conflicts with the *Shiji* (4.6b), "Zhou Benji," and the *Shang shu*, "Wu Yi," which give him a reign of 50 years. Both figures are correct: In the Zhou Dynasty (at least) it was the custom for a king's official year-count usually to be reckoned not from his succession but from the year after he had completed mourning for his father. This fact was noticed at least 15 years ago (see Nivison 1983 pp. 524-35), and more evidence for it was found a few years later (see Shaughnessy, *Sources*, pp. 148-55). Counting from the exact date of a king's death, 25 (or 27) months were required for mourning, which therefore would not be complete until sometime in the year after the succession year. The year following that was the first year of what Shaughnessy calls the accession calendar. He has also noticed that in inscriptions this accession calendar was not used until rather late in a reign. In the reign of Xuan Wang, beginning in 827/25, the accession calendar began to be used in 809, the year after completion of mourning for Gong He, who had been regent during the exile of Xuan Wang's father.

2.3.1 Further, sometimes an apparent accession calendar can be required when no royal mourning is going on (see Nivison 1983, pp. 530-31): If a ruler has occasion to promulgate a new calendar in a new jurisdiction, perhaps long after his father's death, he may postpone requiring general use of the new calendar for two years, to allow his new subjects to finish any mourning obligations they may have before formally recognizing their new ruler.

2.3.2 Both of these principles are illustrated in the tenure of Wen Wang of Zhou. If he had a reign of 2 + 50 years ending in 1050 BC, then his succession and accession years were 1101 and 1099. If the conjunction of 1059 was the mark of the change of Heaven's Mandate, then the celestially mandated first year was 1058, and Wen Wang lived until the 9th year of "the Mandate." The 9th year is implied in the *Annals*, and is suggested in the "Wen Zhuan" chapter (#25) of the *Yi Zhou shu*. But both the *Shiji* and the *Shang shu da zhuan* say that Wen Wang died in the 7th year of his *de jure* reign as universal king, and this implies that the first year was 1056 (Nivison 1983 pp. 523-24). We can accept both first years, and suppose that it was only in 1056 that Wen Wang formally promulgated a "royal" calendar. He may also in this year 1056 have formally conferred expectant royal status on his son and heir Wu Wang, for this (as will be shown, 7.5.1) was a common late Shang practice. The year that can be identified as 1056 is sometimes referred to as the first year of Zhou, and sometimes as the first year of Wu Wang.<sup>4</sup>

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<sup>3</sup> The event is the king's illness (and an earthquake) in Wen Wang's 9th year; in the *Annals* this earthquake is in Di Yi 3 (6th month), therefore 1093 (see 7.6.2, 7.7, and Appendix 2). The *Lü shi chunqiu* says, "Zhou Wen Wang li guo ba nian sui liu yue Wen Wang qin ji...." The writer must be copying out of some source that read "Wen Wang had reigned 8 years" (with some event narrated here; then) "sui 6th month, Wen Wang went to bed sick," etc. (The repetition of "Wen Wang" is not otherwise explainable.) The account adds that Wen Wang reigned another 43 years, for a total of 51 years. But the word "sui" actually specifies year 9, and  $9 + 43 = 52$ .

<sup>4</sup> There is another possible reason why this year was identified as the first year of Wu Wang: Some investigator in the early fifth century BCE, who knew that the conquest year was 1040, and believed Jupiter's period to be exactly twelve years, probably deduced that Jupiter was in Chun Huo in 1041 (the probable basis of the astrological details in *Guo yu*, "Zhou yu" 3.7 at the beginning of Wu Wang's conquest campaign), and so that 1065 was the "Mandate" year, and that therefore Wen Wang must have died in 1057 (argued in Nivison 1992).

2.4 So far, these dates are guesses. But in the *Yi Zhou shu*, "Xiao Kai" (#23), there is mention of an eclipse of the moon on day bingzi (13) of the first month of year 35, in a reign that must be Wen Wang's. I assume that the "Xia" calendar is being used, beginning the year with the pre-spring-equinox month, and beginning the day at dawn. A lunar eclipse so described occurred a few hours after midnight, on 13 March 1065 BCE (a leap year), which would be year 35 in a calendar starting in 1099 BC; and after midnight but before dawn was still Xia-style 12 March, which was a bingzi day, and the (Xia style) 15th of the lunar month (the month began with 27 Feb, renxu (59)). Another confirmation of my "guesses" can be found in a fragment of Huangfu Mi's *Di wang shi ji* (chronology of generations of rulers), middle 3rd century CE: "In Wen Wang's 42nd year, Jupiter was in Chun Huo (Quail Fire). Wen Wang thereupon renamed this year the first year of his receiving the Mandate; he then for the first time called himself king."<sup>5</sup> If 1065 was the 35th year, the 42nd year must be 1058, the year following the conjunction. This is especially impressive, because Huangfu Mi did not know that the conjunction was in the preceding year; another fragment (quoted in a note in *Kaiyuan zhan jing* 19) puts it in Fang, as in the *Annals*. But Chun Huo for year 42 is right, because if Jupiter (in the conjunction) was not in Fang (in Da Huo) but in Jing (in Chun Shou) in 1059, it had to be seen as being in the next station Chun Huo in 1058.

### Lunar Phase Data and Dates of Mu Wang

3. More confirmations, and an extension of confirmed exact chronology, require first settling the disputed question of the meaning of so-called "lunar phase (*yue xiang*) terms" in old texts and in Zhou bronze inscriptions. The many arguments offered by Shaughnessy (*Sources* pp. 136-47) seem to me to be decisive, in showing that the four terms *chuji*, *jishengpo*, *jiwang*, and *jisipo*, found in inscriptions, name approximately the four lunar quarters (or first days thereof, in old texts). To this I can add my own argument (*EC* 20, pp 179,184-188) that the introductory sentences in two *Shang shu* chapters, the "Shao Gao" and the "Kang Gao," are accounts of the same event, and together show that the term *zaishengpo* must include the 6th, in a short month, and the 7th, in a long month; and that therefore *jishengpo* must be the 7th or the 8th, or the quarter beginning on that day.<sup>6</sup> The bronze inscriptions that must be assigned to the reign of Xuan Wang are especially persuasive proof of the "four quarters" interpretation.

3.1 One can now confirm the date 1056. The *Bamboo Annals*, among other texts, says that the first year of Mu Wang, which it sets at 962, was just 100 years after the beginning of Wu Wang's reign, which in the *Annals* chronicle text is 1061, and in the end-of-Zhou summary is 1062. These errors will be explained in due course (7.8.2). The fact behind the *Annals'* date 962 could be that Mu Wang's first year was 958, or 956, or 949, 100 years respectively after 1058, 1056, and 1049 (the year after Wen Wang's death). I will test these three dates by using two bronze inscriptions that must be assigned to Mu Wang's reign.

<sup>5</sup> Huangfu Mi, *Di wang shi ji*, as quoted in *Shiji* 4 "Zhou Benji" 6b, *Zheng-yi* commentary.

<sup>6</sup> Shaughnessy himself thinks that the second quarter began a day or more later (see *Sources* pp. 284-5).

3.1.1 The Qiu Wei *gui* is one of a set of "Qiu Wei" vessels, the others dated to "year 5" or "year 9", with décor putting them probably in Gong Wang's reign, and with dating details incompatible with the Qiu Wei *gui*. The Qiu Wei *gui* has the date 27<sup>th</sup> year, 3<sup>rd</sup> month, 2<sup>nd</sup> quarter, day wuxu (35). If Mu 1 = 958, the year is 932. In that year the 3<sup>rd</sup> month counting from the solstice month begins with day gengzi (37), and the month does not contain wuxu. But the calendar might begin with the post-solstice month, and in that case the 3<sup>rd</sup> month begins with jisi (06), making wuxu the 30<sup>th</sup>, impossible as 2<sup>nd</sup> quarter. If Mu 1 = 956, the year is 930. In that year the 3<sup>rd</sup> month counting from the solstice month begins with jichou (26), making wuxu the 10<sup>th</sup>, in the 2<sup>nd</sup> quarter. If Mu 1 = 949, the year is 923. In that year the 3<sup>rd</sup> month counting from the solstice month begins with wuyin (15), making wuxu the 21<sup>st</sup>, in the 3<sup>rd</sup> quarter, not the 2<sup>nd</sup>; and the next month does not contain wuxu. Therefore Mu 1 must be 956.

3.1.2 The Shi Ju *gui* and a related vessel have styles that put them in Zhao Wang or early Mu Wang, and it is a 3<sup>rd</sup> year vessel, so Mu Wang is most likely. It is dated 3<sup>rd</sup> year, 4<sup>th</sup> month, 2<sup>nd</sup> quarter, day xinyou (58). If Mu 1 = 958, the year is 956, and the 4<sup>th</sup> month counting from the solstice month begins with jiwei (56), making xinyou the 3<sup>rd</sup>, in the 1<sup>st</sup> quarter, not the 2<sup>nd</sup>; and the next month does not contain xinyou. If Mu 1 = 956, the year is 954. In that year the 4<sup>th</sup> month counting from the solstice month begins with dingwei (44), making xinyou the 15<sup>th</sup>, the last day of the 2<sup>nd</sup> quarter in a long month, which this is. If Mu 1 = 949, then the year is 947, and the 4<sup>th</sup> month counting from the solstice month begins with dingyou (34), making xinyou the 25<sup>th</sup>, in the 4<sup>th</sup> quarter, not the 2<sup>nd</sup>; and the next month does not contain xinyou. Therefore, again, Mu 1 must be 956.

3.2 The Shi Ju *gui* has an added interest: it speaks of the king as visiting the "new palace"; and in the year 954 in the *Annals*, we read that "the Spring Palace was built." The exact date of the Shi Ju *gui* converts to 15 March, which happens also to be the 15<sup>th</sup> of the Chinese 4<sup>th</sup> month; i.e., the date is the middle of the middle month of spring, in the Chinese calendar. But the *Annals* date is "9<sup>th</sup> year," just as if 962 were correct as Mu 1. This shows that when the *Annals* chronology was altered to make Mu 1 be 962 rather than 956, just enough years were inserted at the beginning to make the absolute dates of the recorded events in the reign the same as before; and in fact most of the first years in the *Annals* chronicle for Mu Wang are blank, namely years 2, 3, 4, 5, and 7. Year 7, back six, must be year 1; year 8 must be understood as year 2, year 9 as year 3, and so on. Year 6, therefore, must be understood as year 0, i.e., the year of Zhao Wang's death and the destruction of the Zhou home army by Chu. The lone entry in this year says that Yan, ruler of Xu, came to the Zhou court and was given an appointment as *bo*. Yan was the most powerful non-Chinese lord in the east, in the Huai valley, potentially very dangerous; and the action of the Chinese court in effect sealed an alliance with him, thus buying time. This is exactly what one would expect in the desperate circumstances. (For more on dating of Western Zhou inscriptions see Appendix 6.)

## From Mu Wang back to the Zhou Conquest of Shang

4. But why was Mu 1 changed from 956 to 962? The initial two-year mourning periods for Cheng Wang, Kang Wang, and Zhao Wang, were dropped, while the reign lengths were otherwise kept the same, and the beginning date of Cheng Wang's reign (in the *Annals*, after the Regency) was kept fixed at 1037. The dates, then: Zhao Wang, 977/75-957, 2 + 19 years; Kang Wang, 1005/03-978, 2 + 26 years; and Cheng Wang, 1037/35-1006, 2 + 30 years.

4.1 But Cheng Wang's reign is given in the *Annals* as 37 years, and is made to start with the 7-year regency of Zhou Gong, placed before Cheng's 30 years beginning 1037. Do I assign the two of them 2 + 37 years, putting Wu Wang's death in 1045, only five years after his father? This seems impossible: one would have to date the conquest to 1047, and lunar phase dates in the genuine "Wu Cheng" chapter of the *Shang shu* as quoted in the *Han shu* (21B60a-b) will not allow this. It seems, then, that "37 years" is wrong: Cheng Wang's reign is 1037/35-1006, 2 + 30 years; and the Regency must have been 1037-1031. If Wu Wang died two years after his conquest of Shang (as, e.g., the *Shiji*, "Feng Shan Shu" says; and as the *Annals* too said before the moving of Shaughnessy's slip), then he must have died in 1038, and the conquest must have been in 1040. A simple explanation of the *Annals'* error might be this: the true succession date of Cheng Wang, 1037, was accepted, but was wrongly thought to be his coming-of-age year, first of 30; thus the regency was incorrectly made to precede this 30 years; and the 3-year extension of Wu Wang's life due to Shaughnessy's slip was accepted, making the conquest 1050. (But see Appendix 4, note 15.)

4.2 A partial confirmation of these hypothetical dates is provided by two items in Kang Wang's reign. The Xiao Yu *ding* inscription refers to Cheng Wang as the preceding king; and it has the date 25th year, 8<sup>th</sup> month, 3<sup>rd</sup> quarter, day jiashen (21). The 25<sup>th</sup> year was late in the reign, so one supposes the accession calendar counting from 1003, making the year 979 BCE. In this year an earlier intercalary month was due; if one assumes a calendar beginning with the solstice month, the 8<sup>th</sup> month (9<sup>th</sup> in strict count) began with day gengwu (07); this makes jiashen (21) the 15<sup>th</sup>, the first day of the 3<sup>rd</sup> quarter in a month after a long month, which this was. Another confirmation is provided by mention in the *Han shu* (21B63a) of the date given in the (genuine) "Bi Ming" chapter of the *Shang shu*: "In the 6<sup>th</sup> month of the 12<sup>th</sup> year, *fei* (new moon day) was gengwu (07)." The 12<sup>th</sup> year counting from the succession year 1005 must be 994. The preceding year called for an intercalation; if one assumes that it was not made, then the 6<sup>th</sup> month (5<sup>th</sup> counting from the solstice month) began with wuchen (05), so that *fei* (the 3<sup>rd</sup> day, in a long month, which this was) was gengwu.

4.3 Many proofs are possible that the Regency was the first seven years of Cheng Wang's 2 + 30 years, and that the conquest therefore was in 1040. For example, in Appendix 2, I use oracle inscriptions to show that the first year of Di Xin of Shang was 1086 BCE. But the *Annals* makes this first year sixteen years earlier, 1102. The best explanation of this 16-year shift is that at some time in the evolution of the *Annals* chronology Di Xin's last year *de facto* was reinterpreted as his last year *de jure*, which

would be 1057, the year before the inauguration of the Zhou royal calendar; and if this was a 16-year shift, the *de facto* last year, i.e., the year before the conquest, must be 1041.

4.3.1 Another proof: The *Guo yu*, "Jin Yu" 4, says that when Tang-shu Yu, first lord of Jin, was given his fief, Jupiter was in station Da Huo (Great Fire). The *Annals* implies this too, for it dates this event to 1035, three Jupiter periods after 1071, its (false) date for the Zhou-heralding conjunction, said (incorrectly) to have been in "Fang," middle lunar lodge in Da Huo. The correct Da Huo year nearest 1035 was 1031; so this was probably the year the fief was granted; and if the Regency was actually 1037-1031, the occasion was probably the great assembly of lords that the *Annals* says occurred in the last Regency year. Further, this act by Cheng Wang (so says the "Jin Shijia" in the *Shiji*, 39.1b) followed a boyish game with his younger brother Tang-shu, in which the young king (obviously still in tutelage) playfully said "I grant you a fief." Supervising officials then insisted the words be made good. (It may be that the date 1035 -- see Appendix 8 -- was picked, to validate the Wei ruler's assumption of kingship in 335 BCE.)

4.3.2 And another proof (among yet others): In late Shang and early Zhou, the annual calendar of 24 solar seasons, of 15 or 16 days each, seems to have been counted from the autumn equinox, determined by observation (this determination being much easier than determining the solstice by observation). The four seasons were assumed to be approximately equal, making the interval from autumn equinox to winter solstice exactly 91 days, by convention; and this actually made the "solstice" two days late. The first days of solar periods apparently were favored as lucky days, and preferred for important events, if the date of the event could be picked. When these days are determined by counting from the autumn equinox, the day of the victory at Muye in 1040, on day jiazi near the end of the (Xia calendar) 2<sup>nd</sup> month, turns out to be the first day of Qing Ming (in this year, 18 April), the major annual festival in ancestor-worship. This is confirmed by the "Da Ming" ode, #236 in the *Shi Jing*, celebrating Zhou royal ancestors down to Wu Wang's victory. It concludes, "*si fa Da Shang; hui chao, Qing Ming*": "Then he attacked Great Shang; this happened in the morning, on Qing Ming [day]." (For other proofs see Nivison 1997; for dates in the conquest campaign see Appendix 6.)

### The False Conquest Date 1045, and the Yin Li Date for the Beginning of Shang

5. Nonetheless, chroniclers in the Zhou capital in the 5<sup>th</sup> - 4<sup>th</sup> centuries BCE apparently still assumed initial mourning periods, thus taking 1056 as year one for Zhou, and also believed that the Regency of seven years preceded Cheng Wang's reign of 30 years (taken as his years of maturity, mourning for Wu Wang being done in the first years of the Regency). This gave much more prominence to Zhou Gong, whose importance was being magnified in the middle and late 5<sup>th</sup> century. This would make the conquest fall in 1045; and there are several vestiges of this belief in the *Bamboo Annals*, although the present *Annals* dates the conquest five years earlier (showing the work of Wei chroniclers). E.g., at Mu 18, i.e., 945, there is the record that "the lords came to court" (*zhu hou lai chao*); probably this entry was so dated because it was thought to mark the 100<sup>th</sup> anniversary of the conquest. (One must remember that dates of events within Mu

Wang's chronicle are not distorted by the incorrect dating of Mu Wang's first year.) And in the chronicle for Wu Yi of Shang, dated there (incorrectly, as will be seen) 1159-1125 BCE, the entry for year 3, 1157, says that Dan Fu, Wen Wang's grandfather, was confirmed as Duke of Zhou and assigned the city of Qi (i.e., Qi-shan, which Dan Fu had already occupied). Pre-conquest Zhou dates in the *Annals* are set back 12 years; so originally in an earlier version of the *Annals* this date must have been 1145, just 100 years before the conquest if in that version the conquest were dated 1045. More evidence survives undisguised, in the date given in the *Annals* for the first year of Yao, 2145, 1000 years earlier: this was important to Zhou because the Zhou founding ancestor Hou Ji was believed to have been Yao's minister of agriculture. One can assume that these dates 1145 and 2145 were invented.

5.1 Putting the conquest at 1045, while keeping 1056 the formal first year of Zhou, thought to be the first year of Wu Wang, meant that the conquest was in Wu's year 12, and his death therefore in Wu 14. This version of the *Annals* could now be used by others who must have been puzzled by what they thought tradition told them: Wu Wang actually died in 1038, his 12<sup>th</sup> year counting from 1049. And he actually conquered in 1040, his 17<sup>th</sup> year counting from 1056. Not knowing that two different first years were involved, people would suppose that "12" and "17" had gotten switched, and would search for a way to unswitch them. The Zhou version dating the conquest to 1045 and Wu's death to 1043 provided the solution: there must be a missing slip, that would make Wu die in year 17! The slip was obtained from years 15-16-17 in the Cheng chronicle, as Shaughnessy noticed. Thus the transposition was not a post-Han mistake; it must have been done in Warring States, when the later forgotten conquest date 1045 was still accepted. That it was deliberate and calculated is shown not only by the fact that the Wu chronicle had to be touched up (by referring to the "Jin Teng"), but also by a rewriting of the Cheng chronicle that had to be done before the desired text formed a slip: the Cheng chronicle now has a *di* sacrifice to Zhou Gong in year 13, which should have been in year 23, after his death in year 21. If this deformity is corrected and the original correct date restored, the 15-16-17-year gap ceases to be in slip position.

5.1.1 This alteration set the sequence of conquest era events in the *Annals*, though not yet the dates. The sequence after the slip move goes thus: conquest, year  $x$ ; conquest year  $x + 2 + 3$ , Wu dies; years  $x + 6$  through  $x + 12$ , Zhou Gong's regency; year  $x + 13$ , first year of Cheng's 30-year reign. Specialists accepting this, but also knowing and respecting 1037 as Cheng Wang's "first year," interpreted as his first year *after* the Regency; and not accepting the concept of mourning intervals at all, would believe that the absolute dates were just those we find in the *Annals*, putting the conquest at 1050.

5.2 Determining that the false date 1045 was firmly believed by many also makes possible an inference that leads to much more chronology. The present *Annals* has Li Wang of Zhou dated 853-828 (including Gong He's regency), Why 853? Probably because in an earlier version only the accession reign lengths for Li Wang, Xuan Wang and You Wang were recognized. This would have made Xuan 1 be 823. Li Wang's accession reign was actually 30 years, as revealed in the *Shiji*'s mistake: "*Li Wang ji wei san shi nian...*," misinterpreted as meaning "After Li Wang had been on the throne for 30

years..." rather than "Li Wang's reign was 30 years." Pursuing this idea the *Shiji* author(s) go on to suppose that Li Wang reigned 37 years before he was driven into exile (*Shiji* 4.21a-22b). That error must be an old one: the present *Annals* dates Li Wang's birth to 864, making his life span just 37 years -- surely the source of the error followed in the *Shiji* (as Lei Xueqi noticed two centuries ago). The error implies 878 rather than 853 as first year for Li Wang, a difference of 25 years. Apparently this 25-year set-back was adopted by the authors of the so-called Yin Li chronology, probably in the 4<sup>th</sup> century BC; for this chronology dates the conquest to 1070, just 25 years before 1045.<sup>7</sup>

5.2.1 This error too is instructive. The Yin Li has its dates for the beginning of Shang: 1580, for Tang's defeat of Xia; and 1579, for the first year of Shang. (See Chen Mengjia 1956, p. 212.) Could the true dates be 25 years later? First year of Shang, then, 1554? This is the date that D. W. Pankenier picked, for other reasons (*EC* 7, p. 17 ff.). One of his reasons (a valid one) was that in the *Annals'* end-of-Shang summary, and in other Han era texts, it is said that from the beginning of Shang to the year recognized as the beginning of Zhou was 496 years. For the *Annals* the dates are 1558 and 1062, respectively: it must take 1062 as the *de facto* first year of Wu Wang (not as the Mandate year, please note), even though also taking it as the year of Wen Wang's death, because Zhou king dates sans mourning periods had Mu 1 as 962. For Pankenier, who does not accept the mourning period hypothesis, the true dates are 1554 and 1058. He is right, but is not entitled to be sure, if 1056 also counts as a first year for Zhou. We need more evidence.

#### Dates for Xia: Pankenier's Conjunction; Pang's Eclipse

6. More evidence is provided, indirectly, by an astonishing discovery made by Pankenier himself (though he has not seen his way to accept its implications). Pankenier noticed (*EC* 9-10) that in *Mozi* 19 "Against Aggressive Warfare" there are three accounts of Heaven's mandates to the founders of the Xia, the Shang and the Zhou Dynasties, in disguised mythic language that actually refers to celestial phenomena: the conjunction of 1059, for Zhou; the successive heliacal risings of the planets (*cuo xing*) in late 1576, for Shang; and the bestowal to Yu of Xia in the "Dark Palace," which Pankenier is able to identify as lunar lodge Ying Shi. He then identifies another conjunction that occurred there, in February, 1953 BCE; and by close analysis of the language of the *Annals* for Yao and Shun (see Appendix 7) he associates this event with the transfer of power from Shun to Yu, dated in the *Annals* at 2029 BCE, the 14<sup>th</sup> year of Shun. This was probably too speculative for some historians reading Pankenier's work.

6.1 But he is certainly right. The Xia chronicle differs from the chronicles of Shang (Yin) and Zhou. It, unlike the others, has interregnums between reigns, of varying

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<sup>7</sup> For Lei's views, see *Zhushu jinian yizheng*, at Xiao Wang 7. For Yin Li dates, here and below, see also Zheng Xuan's chronology, *Congshu jicheng* 3572, *Shang shu Zheng zhu*, pp. 60-61. Zheng was misled by Liu Xin's "13<sup>th</sup> year" error (see Appendix 4): he should have counted 14 years from *wuwu bu* 29 (1083) to the conquest year (inclusive) rather than 13 years from 1082; but either way, Zheng implies that the Yin Li conquest date was 1070. See also Mao Shi, Kong Yingda's commentary to the introductory section of the Odes of Bin, quoting Zheng's commentary to the "Jin Teng."



length, but about a third are just two years each. And the interregnums preceding the first two reigns are explicitly said to be for completion of mourning for the predeceasing ruler. An obvious experiment is to suppose that here we find an earlier institution anticipating the mourning completion two-year periods at the beginnings of Western Zhou reigns, except that in some cases the lengths of these interregnums have gotten distorted. I.e., they all ought to be two years. If we accordingly rewrite the Xia chronicle making Shun 14 be 1953, with two year gaps between reigns, but with reign lengths otherwise as given in the *Annals*, we get to 16 October 1876 BCE as the 1<sup>st</sup> of the (Xia) 9<sup>th</sup> month of the 5<sup>th</sup> year of the 4<sup>th</sup> king Zhong Kang; and the *Annals* says that on that day there was an eclipse of the sun. Other old texts, the *Zuo zhuan* and a reconstituted chapter of the *Shang shu*, also mention this eclipse, and they say that at the time the sun was in lunar lodge Fang. The accounts are correct: the eclipse was discovered by Kevin Pang (see Nivison and Pang, *EC* 15). This eclipse, which was ring-form, occurred in the morning in the longitude of the Xia domain (and it was indeed in Fang). Its path of totality was some distance north, but near enough to have been reported.

6.2 The chronicle says that the day was gengxu (47), and this is not correct, for the day was bingchen (53). But here again an error, once explained, is instructive. The *Annals* date for the eclipse is 1948 BCE, 72 years earlier than 1876. This back-dating is part of a backward extension of the *Annals* chronology designed to make the first year of Yao be the numerologically pregnant date 2145. Similarly 1953, the year of the conjunction, is represented by Shun 14, 76 years back at 2029 in the *Annals*. 76 years suggests what is going on, for it is the length of a *bu* (of four 19-year *zhang*); so the chronicle betrays the loving attention of experts who were using the *zhang-bu* system. But why, then, did they not redate the eclipse back 76 years, to 1952? They didn't, because it had to be in Fang. In the *zhang-bu* system, a *ji* of 20 *bu*, 1520 years, is a complete cycle, when the sequence of first days, *ganzhi*, of *bu* begins over again (or so it was thought; actually calculating back a *ji* would produce a day date five *ganzhi* early). To get the right *ganzhi* for the day, therefore, the experts would want to pick a date one *ji* before a date near their own time, whose *ganzhi* they knew. But one *ji* after 1952 is 432 BCE; and in that year, the sun was not in Fang on the first of the Xia 9<sup>th</sup> month. Nor did 431, 430, or 429 meet this criterion; but 428 did; hence the date 1948 BCE. It is 428 that dictated the day gengxu, because it happens that 427 BC, in the Yin Li chronological *zhang-bu* system, is the first year of a "jiyou *bu*," i.e., a *bu* whose first day (of the solstice month of that year, the Xia 11<sup>th</sup> month) is jiyou (46). (See Zhang Peiyu (1987), pp. 91, 252.) The first day of the 9<sup>th</sup> month of 428 must therefore be 29 + 30 days earlier than jiyou (46), which is gengxu (47). The Jin court scholars of 280 CE cannot have done this figuring, because by their time the cumulative *ganzhi* error in the *zhang-bu* system was obvious. They did know that 427 BCE was the first year of a jiyou *bu*; but to have used this information they would have had to understand the precession of the equinoxes (to ascertain that the sun was in Fang on the first of the 9<sup>th</sup> month of 428); and they would have had to be trying to invent an erroneous calculation that calendar astronomers of the late fifth century BCE might have made; and it is not reasonable to impute such a motive to them.

6.3 This experiment, so far, has been successful. I now continue it, through to the end of Xia, always positing just a two-year break after every death of a reigning ruler. (Thus

I allow no break after Bu Jiang, the 11<sup>th</sup> king, who retired after 59 years.) Here I assume 50 years for Shun, plus two years of mourning for him (but see p. 41). The result, for the whole of Xia:

King #	<i>Bamboo Annals</i> Dates		Corrected Dates	
1. Yu	1989-1982	(8 years)	1914-1907	(8)
	Interregnum 1981-1979	(3)	1906-1905	(2)
2. Qi	1978-1963	(16)	1904-1889	(16)
	Interregnum 1962-1959	(4)	1888-1887	(2)
3. Tai Kang	1958-1955	(4)	1886-1883	(4)
	Interregnum 1954-1953	(2)	1882-1881	(2)
4. Zhong Kang	1952-1946	(7)	1880-1874	(7)
	Interregnum 1945-1944	(2)	1873-1872	(2)
5. Xiang	1943-1916	(28)	1871-1844	(28)
	Interregnum 1915-1876	(40)	1843-1842	(2)
6. Shao Kang	1875-1855	(21)	1841-1821	(21)
	Interregnum 1854-1853	(2)	1820-1819	(2)
7. Zhu	1852-1836	(17)	1818-1802	(17)
	Interregnum 1835-1834	(2)	1801-1800	(2)
8. Fen	1833-1790	(44)	1799-1756	(44)
	Interregnum (none)		1755-1754	(2)
9. Mang	1789-1732	(58)	1753-1696	(58)
	Interregnum 1731	(1)	1695-1694	(2)
10. Xie	1730-1706	(25)	1693-1669	(25)
	Interregnum 1705-1703	(3)	1668-1667	(2)
11. Bu Jiang	1702-1644	(59)	1666-1608	(59)
	Interregnum (none: retires)		(none: retires)	
12. Qiong	1643-1626	(18)	1607-1590	(18)
	Interregnum 1625-1623	(3)	1589-1588	(2)
13. Jin	1622-1615	(8)	1587-1580	(8)
	Interregnum 1614-1613	(2)	1579-1578	(2)
14. Kong Jia	1612-1604	(9)	1577-1569	(9)
	Interregnum 1603-1602	(2)	1568-1567	(2)
15. Hao	1601-1599	(3)	1566-1564	(3)
	Interregnum 1598-1597	(2)	1563-1562	(2)
16. Fa	1596-1590	(7)	1561-1555	(7)
	Interregnum (none)			
17. Di Gui	1589-1559	(31)		

6.3.1 The target date 1555 is reached, exactly, at the end of the reign of Fa, supposedly the next-to-last king. It seems that for Pankenier to be right about the first year of Shang, we must conclude that Di Gui, alias Jie, owes his existence to the Warring States historical imagination.

6.3.1.1 But Pankenier is right, and Di Gui is a fiction. Among the indications of this I select three: (1) As has long been noticed, the accounts of Jie, here Di Gui, are suspiciously like the accounts of the last Shang king Di Xin (in the *Annals*, he is the only Xia king called "Di + gan"). (2) In the *Annals*, the chronicles for the other Xia kings, usually very short, are of irregular length. But the chronicle for Di Gui, besides being substantial, can be counted out into exactly eight 40-space slips' worth of text. A reasonable explanation is that it was written and added later. And (3): In the *Annals* there are 17 kings for Xia, and the dates reflect numerology. The first year of Yu (*de jure*, after the death of Shun), who was the first king, is 1989; the first year of Mang, the ninth king, is 1789; and the first year of Di Gui, the last king, is 1589. If Di Gui weren't there, numerological history would have offered us a dynasty of just 400 years, 16 reigns, the first half being just 200 years, and the second half being just 200 years. This, I think, is the way the text once read. (I demonstrate this in Appendix 3.)

6.4 This reconstruction of Xia dates can be confirmed, in a way that leads on. Many scholars have puzzled about the names of Shang kings, usually two syllables, the last always one of the ten *gan* (stems). Why? This is also true of two Xia kings in the list, Kong Jia and Di Gui. With exact dates, it becomes possible to try out what ought to have been anyone's first hypothesis, namely that the *gan* in a king's name is the *gan* of the first day of that king's reign. For Kong Jia, the first year of his reign is 1577, though 1579 perhaps could be regarded as his succession year. If one assumes the "Xia" calendar, the first day of 1577 must be the first day of the pre-equinox month, which was 17 February, Julian Day 114 5471, a *jiazi* day, first day of the 60-day cycle. So we can take the king's name, Kong Jia, as meaning "Great Jia."

6.4.1 Di Gui lacks a date, lacking existence. But there was a last king of Xia, namely Fa; so perhaps he was the real "Di Gui." If one takes the first year, 1563, of the two-year interregnum preceding Fa's seven years as his succession year, one finds that the (Xia calendar) first day of this year was 12 February, Julian Day 115 0580, a *guiyou* (10) day. There is one more king to check, because another name for the 13<sup>th</sup> king Jin, Kong Jia's predecessor, was "Yin Jia," perhaps meaning "Succession Jia" or "Next Jia" (after *jiazi*) His succession year was 1589, and the pre-spring-equinox month in this year probably began on 1 March, Julian Day 114 1101, *jiaxu* (11). (Probably, because the syzygy was after midnight but before dawn, the theoretical beginning of the Xia day.)<sup>8</sup>

6.4.2 More tests are possible: Occasionally pre-dynastic Shang royal ancestors are mentioned in the Xia chronicle, notably the one treated in sacrifices as the founding ancestor, Shang Jia (Shang Jia Wei). His father Wang Hai (Zi Hai) was killed in 1719, according to the *Annals*. (I think we can assume that Shang chronology during this period was controlled, independently of alterations in Xia dating, by records kept by the Shang descendant state Song.) The first day of 1718 in the Shang calendar (first day of

<sup>8</sup> Before the *Annals'* record of Jin's death in the 8<sup>th</sup> year, the text reads, "There was an inauspicious portent in the sky;— ten suns appeared together." The source of this impossibility may be that Kong Jia perhaps retroactively decreed that as of that year the 60-day cycle would be set forward ten days (= "suns"). I.e., the original date of Kong Jia's accession would then have been *jiayin* (51), reset as *jiazi* (01). If so, the original day of Shang Jia's succession (below, 6.4.2) would have been *jiazi* (01), not *jiaxu* (11). Did the system of *gan* names begin with Shang Jia? Did the system of *gan* day-dates itself begin with him?

the post-solstice month) was 18 January, Julian Day 109 3941, *jiayu* (11). And there is Tang, the conquering founder of Shang, whose *gan* name was Tai Yi. The *Annals* gives his year 1, before the conquest, as 1575, surely right, because it is the year after the planetary configurations described as in 1580, but (as Pankenier has shown) actually in 1576; and the fact that they enter the record presumably indicates that they were regarded as a heavenly sign of dynastic change. Tai Yi (Tang) did not use 1575 for his *gan*, because it began with a *gui*-day, and *gui* was the *gan* of his father and predecessor Shi Gui (and probably for that reason remained taboo for kings' names throughout the Shang). Like Wen Wang in Zhou in 1056, however, Tang would have proclaimed himself after an interval that would allow his subjects to complete any mourning obligations; and in Shang this interval normally was three years, not two. (This is suggested by the account of Shang Jia Wei: succeeding in 1718, it was not until 1715 that he took the field and killed his father's murderer.) So one must look at the year 1572: it began, for Shang, with 22 January, Julian Day 114 7272, *yichou* (02). (Later, after Tang's death, a sacrifice was offered to him on day *yichou*.)

#### Dates for Shang: the Shang System of Royal *gan* Names; Modes of succession

7. So in the Xia era, wherever a *gan* name can be tested, there appear to be no exceptions: for a ruler, a *gan* in his name is determined by a day that counts as his first day. Without this finding it would be quite impossible to do anything with Shang chronology until the very end of the Shang, when inscriptions become available.

7.1 There are difficulties enough at best. The Shang kings followed rules, which one discovers by looking and thinking. (1) A king never uses *gui*. (2) No two successive reigns have kings with the same *gan*. (But a father and son in non-successive reigns may have the same *gan*.) (3) In Shang, as in Xia and in Western Zhou, for each king there was an accession year after completion of mourning; but in Shang it was usually three years after the succession year rather than two. I suspect that this is because a king's year of death counted as his last year only if he died near the end of it; otherwise it would be his successor's first year. (4) If the succession year would dictate the *gan* of the preceding reign, the accession year is used instead. (5) Since *gui* is taboo, if it would be dictated by these rules, the next day, *jia*, is used instead.

7.2 Liu Xin as quoted in *Han shu* (21B48b-49a) says that Tang exercised power as king for 13 years; but the *Annals* says that his 12<sup>th</sup> year was his last; and Liu Xin himself implies that the 13<sup>th</sup> year was also the first year of Tang's successor, his grandson Tai Jia. I conclude that Tang died early in the year, which must be 1542. But something strange was going on, because in most Shang king lists, including that in the *Annals*, Tai Jia is preceded by two short reigns, Wai Bing, 2 years, and Zhong Ren, 4 years. The *Annals* also says that Yi Yin, who had been Tang's chief minister, exiled or confined Tai Jia and made himself king. What actually happened, I think, was this: At Tang's death, Yi Yin was in control, and was seeking to make himself king, but didn't get that far. First he used two puppets (probably Tai Jia's uncles). 1542 began with a *ren* day, indicating that Zhong Ren was named functioning king while Tai Jia did mourning. 1541 began with a

*bing* day, indicating that it was then that Tai Jia was removed from the scene, being replaced as formal mourner by Wai Bing, for the remaining two years of mourning. 1539 began with a *jia* day, indicating that retroactively Tai Jia took this year as determining his *gan*. Meanwhile he was in detention, and for four years Zhong Ren was "king" in name, 1539-1536. 1536 was Tai Jia's seventh year *de jure*; in the "7<sup>th</sup> year" of Tai Jia the *Annals* account says that Tai Jia escaped from confinement and killed Yi Yin. This is a shocking revision of pious history, as in the account given by Mencius, who says that Yi Yin removed Tai Jia temporarily to reform him, and restored him to his position when the reforming was successful. But I think the account that I have pieced together must be right, if my *gan* theory is right.

7.3 Applying this theory to the *Bamboo Annals* reign lengths of kings down to Tai Wu yields precise dates, after one correction: All received king lists for Shang, including the one in the *Annals*, have Tai Wu, in the 5<sup>th</sup> generation from Tang, preceded by 5<sup>th</sup> generation Yong Ji. As Keightley shows (*Sources* p. 186, d), evidence from the oracle inscriptions indicates that Tai Wu came first. Moreover already in the "Wu Yi" chapter of the *Shang shu*, probably contemporary with the *Annals*, Tai Wu (in the "Wu Yi" misnamed "Zhong Zong") is said to have had an impossibly long reign of 75 years, as also in the *Annals*. These two errors are probably related. Here, I think, is the correct account:

Tai Jia, 1542/1539-1528, 3 + 12 years; 1539 first day, 18 January, jiyin (51)

Wo Ding, 1527/1524-1506, 3 + 19 years; 1527 first day, 4 February, jiaxu (11), avoided; 1524 first day 1 February dinghai (24). (Brother of Tai Jia.)

Xiao Geng, 1505/1502-1498, 3 + 5 years; 1505 first day 3 January dingyou (34), avoided; 1502 first day 31 December 1503 gengxu (47). (Son of Tai Jia; "Da Geng" in oracle inscriptions.)

Xiao Jia, 1497/1494-1478, 3 + 17 years; 1497 first day 3 February gengxu (47), avoided; 1494 first day (solstice month) 1 January guisi (30), resolving to jiawu (31). (Brother of Xiao Geng.)

Tai Wu, 1477/1474-?, 3 + ? years; 1477 first day (solstice month) 24 December 1478 jiyin (51), avoided; 1474 first day (pre-solstice month) 22 November 1475 wuxu (35). (Son of Xiao Geng.)

7.3.1 Taking the year (here 1474) as beginning with the pre-solstice month (the *hai* month) was standard for many years near the end of the dynasty, as oracle inscriptions (on my analysis) show (see Appendix 2). For the early period it may be anomalous. In the *Annals* Tai Wu's first year is made 1475, I assume because it was just 100 years after the proclaimed first year 1575 of Tang, the founder. It is conceivable that the pre-solstice month was picked as first month for this reason, in order to get the reign to begin in what would normally be regarded as the earlier year. This could have been done simply by omitting an expected intercalation in 1476.

7.3.2 But in the *Annals* and other chronologies Yong Ji is given a 12-year reign preceding Tai Wu. Why? The full explanation requires explaining the whole of Shang chronology. But notice that if (1) the Wai Bing reign of two years is taken to be the

whole of the mourning for Tang; (2) the Zhong Ren reign of four years is taken to precede Tai Jia's de jure reign of twelve years; (3) Tai Wu's accession year is made to be exactly 100 years after Tang's first year 1575 (held fixed); and (4) after these things are done, mourning periods are omitted after Tai Jia -- then the result is as follows (see also Appendix 3, and 7.8-7.8.2, notably for the date 1558 in the *Annals* as the first year of Shang):

Shang year 1	1558	(back from 1554)
Tang last year	1547	(back from 1543)
Wai Bing	1546-1545	(back from 1541-1540)
Zhong Ren	1544-1541	(back from 1539-1536)
Tai Jia	1540-1529	(back from accession 1539-1528)
Wo Ding	1528-1510	(back from accession 1524-1506)
Xiao Geng	1509-1505	(back from accession 1502-1498)
Xiao Jia	1504-1488	(back from accession 1494-1478)
-----	(1487-1476,	12 years)
Tai Wu	1475-	

7.3.2.1 The 12-year gap opened up by deleting four 3-year mourning periods was filled by reversing the order of the two 5<sup>th</sup> generation kings, Tai Wu and Yong Ji. Yong Ji did have a 12-year accession calendar (as I will show), which must have made this switch seem a justifiable "correction." At the same time, this switch would allow Tai Wu's reign to extend through what had been Yong Ji's years, thus lengthening Tai Wu's reign.

7.4 From the first year of Tai Wu, the eighth king, to the first year of Wu Ding, the twenty-second king, I have almost nothing to use except *gan* in kings' names and *Annals* reign lengths, two of which (Tai Wu's and Pan Geng's) I believe are wrong. From Wu Ding, in whose reign oracle inscriptions begin, to the end of Shang, there is much more material, fixing Wu Ding's death date at 1189 BCE. The *gan* criterion and *Annals* reign lengths combined make the following the most probable assignment of dates from Tai Wu to Wu Ding:

King	<i>Annals</i> date		Nivison dates,		Generation # first days	
8. Tai Wu	1475 (75)		1477 (3+60) /1474	23 Jan jiashen 22 Nov '75 wuwu	5	
9. Yong Ji	1487 (12)		1414 (2+12) /1412	18 Dec '15 jimao	5	
10. Zhong Ding	1400 (9)		1400 (3+9) /1397	11 Jan dingsi*	6	
11. Wai Ren	1391 (10)		1388 (1+10)* /1387	28 Jan dingchou 19 Dec '88 renyin	6	
12. Hedan Jia	1381 (9)		1377 (3+9) /1374	29 Dec '78 jiachen	7	
13. Zu Yi	1372 (19)		1365 (2+19) /1363	16 Jan yichou	7	

David S. Nivison, "The Key to the Chronology of the Three Dynasties"  
*Sino-Platonic Papers*, 93 (January, 1999)

14.	Zu Xin	1353	(14)	1344	(3+14)	21	Jan*	xinyou*	8
				/1341					
15.	Kai Jia	1339	(5)	1327	(3+5)	15	Jan	jiashen	8
				/1324					
16.	Zu Ding	1334	(9)	1319	(3+9)	16	Jan	dingmao	9
				/1316					
17.	Nan Geng	1325	(6)	1307	(3+6)	3	Jan	dingsi	9
				/1304		30	Jan	gengzi	
18.	Yang Jia	1319	(4)	1298	(2+4)	23	Jan	jiazi*	10
				/1296					
19.	Pan Geng	1315	(28)	1292	(24)*	17	Jan	gengyin	10
20.	Xiao Xin	1287	(3)	1268	(2+3)	22	Jan	xinchou	10
				/1266					
21.	Xiao Yi	1284	(10)	1263	(3+10)	26	Jan	xinwei	10
				/1260		24	Jan	yiyou	
22.	Wu Ding	1274	(59)	1250	(3+59)	4	Jan	dingsi	11
				/1247					

Asterisks indicate emendation of a reign length (Pan Geng), or adjustment of a mourning interval (Wai Ren, only one year; but see p. 44), or adjustment of a first day by one (regularizing alternation of long and short months). (See 7.8.)

7.5 One problem in the final period leads me to offer another conjecture. Down to the generation before Wu Ding, normally there were two brother kings in each generation. In the generation before Wu Ding there were four brothers, and the second, Pan Geng, I believe counted the reign of his predecessor-brother as part of his own reign. Wu Ding was the son of the last and youngest, it seems contrary to rule; he was long lived, with a reign of 3 + 59 years (59 years in the *Annals*), and was the only king in his own generation. Wu Ding was succeeded by two of his sons, Zu Geng and Zu Jia, and apparently neither of them was Wu Ding's designated heir and chief mourner, who was probably Zu Ji, lost to history. Moreover Zu Jia, like Pan Geng, I believe counted his brother Zu Geng's reign years as part of his own. Further, in the next generation there were two brothers, Feng Xin and Kang Ding; but they were sons of Zu Jia, not Zu Geng or Zu Ji, and Feng Xin seems to have predeceased his father, having only nominal royal status (Keightley, *Sources*, p. 187, h). We see here a profound institutional change, from regular fraternal succession for two and a half centuries, to strict father-son succession, from Kang Ding on. This needs explaining.

7.5.1 I propose that the reason for fraternal succession was the fear of usurpation, which nearly succeeded in the regime of Yi Yin, unscrupulous minister of the deceased king who took advantage of the mourning obligations of the heir to reach for the throne himself. To guard against this danger it became the practice for a king A to designate a brother B as the king immediately succeeding, holding the kingship in the royal family while king A's son and heir did mourning. Later after king B's death A's son became king C, and so on. It worked well for a long time, effectively preventing ministerial usurpation. But eventually this threat was replaced by the threat of fraternal usurpation.

This, I think, was what was going on in the generation of four brothers before Wu Ding. And it continued after Wu Ding, who must have outlived any younger brothers anyway. He had to rely on his heir's brothers; and both of them were looking out for themselves, the last, Zu Jia, being the winner. Wu Ding's heir, Zu Ji, designated *xiao wang*, "junior king" or in effect "expectant king," does get royal recognition in the sacrifices, but no more than that (*Nan-bei*, Ming 631; Shima, *Sōrui*, 496.4). Zu Jia solved the problem simply by conferring royal status on his chosen heir at once. His first choice died early, so he then chose a second, who in time succeeded as Kang Ding, and at once did what Zu Jia had done: he picked his heir Wu Yi and gave him his royal *gan* name immediately. This was the practice from then on.

7.6 If this is what happened, once I have fixed Wu Ding's dates, I can use *Annals* reign lengths and *gan* theory to fix the rest of the dates. Keightley (*Sources* p. 174 note 19) has studied four oracle inscriptions in Wu Ding's reign that mention lunar eclipses, and that have partial dates, at least the *ganzhi* for the day. He dates these from 1199 to 1180; but I think that the one dated 1180 must actually refer to an eclipse in 1201, so that the last in the set becomes an eclipse dated 1189. Eclipses seem to have been portents of the death of a ruler (recall the solar eclipse of 1065: it occurred almost certainly while Wen Wang was a prisoner of the Shang king in Youli, and the *Yi Zhou shu* text continues with Wen Wang's advice that the Zhou court attend to the problem of the succession). And the oracles late in Wu Ding's reign indicate that he was often ailing.

7.6.1 So 1189 is a fair first guess as the date of his death, and it turns out to work. If he did have the 59 years that the *Annals* gives him, preceded by a three-year mourning, then his succession year would be 1250, which began with a *ding* day. Further, 1188 also began with a *ding* day, so that year couldn't be used by Zu Geng, who must use 1185, which (regularized to make long and short months alternate) began with a *geng* day. The *Annals* gives Zu Geng 11 years, which I will assume here include the mourning preamble, ending in 1178. 1177 began with a *gui* day, resolving to *jia*, for Zu Jia. Zu Jia thus used 1177 himself; but 1175, post-mourning, began with a *xin* day, giving appointed expectant king Feng Xin his *gan*. (While the *Annals* gives Feng Xin four years, other chronologies give him six years, which I take as 1177-1172.) Feng Xin died in 1172, I assume; 1171, regularized, began with a *ding* day, for the next appointment, who became Kang Ding. Zu Jia's supposed 33 years must be 1188-1156, including the Zu Geng years, so Kang Ding succeeded in 1155, post-solstice month beginning with an *yi* day, and I assume that he at once appointed his chosen son Wu Yi as expectant king (*xiao wang*). The Kang Ding reign in the *Annals* is 8 years, and I posit a two-year mourning interval. Thus Wu Yi succeeded in 1145, post-solstice month beginning with a *ding* day, and in that year appointed his successor Wenwu Ding. The reign for Wu Yi in the *Annals* is 35 years, which I take to be 1143-1109. Oracle inscriptions, together with the *Annals* account, confirm that Wu Yi died on a post-campaign hunt "in the He-Wei region" late in 1109. (For the argument see Appendix 2.)

7.6.2 Oracle inscriptions require a calendar beginning in 1118; so Wu Yi must have given his heir a calendar in that year. The "Wen Ding" reign in the *Annals* is 13 years, which should be 1118-1106; other chronologies give Wenwu Ding 3 years, which must



be 1108-1106. Oracle inscriptions require a calendar beginning in 1105, which began with an *yi* day, and must be the first year of the "Di Yi" reign. Since oracle inscriptions require a calendar beginning in 1086 (see Appendix 2), which must be Di Xin's, this "Di Yi" reign was 19 years, whereas in the *Annals* it is 9 years. The explanation, I believe, is that Warring States editors could not admit a 10-year overlap of the Wu Yi and Wenwu Ding reigns, and shortened the Di Yi reign by ten years: 1105-1087 to 1095-87 (backed 16 to 1111-03; see 7.7), assigning those ten years to Wenwu Ding. It is likely, moreover, that Wenwu Ding and Di Yi are the same person: i.e., appointing his heir who was to be Zhou Xin (Di Xin) in his own accession year 1106 (beginning with a *xin* day) Wenwu Ding proclaimed himself "*di*" in 1105; for Zhou homeland oracle inscriptions, and a few late Shang bronze inscriptions, refer to a "Wenwu Di Yi" as royal object of cult.

7.6.3 Finally, we find no oracle inscriptions that one would expect to be Di Xin's dated to a year higher than 20. The explanation is likely to be that there was another calendar beginning half way through the long Di Xin reign (1086-1041). The first year must be 1068, explaining the date "23<sup>rd</sup> year" in *Yi Zhou shu* 21 "Feng Bao," which is probably 1046. (The date continues with "*gengzi shuo*," true of the 5<sup>th</sup> month of 1046.) 1068 must then be the year when Zhou Xin took the title "*di*" and appointed his son Prince Lu Fu "Wu Geng"; for 1068 began with a *geng* day; and 1068 is also exactly 37 years after 1105; and other chronologies give 37 years to "Di Yi." The explanation could be that 37 years elapsed between the two "*di*" inaugurations. (Probably Di Yi created the 1086 calendar for his son, later "Di Xin," before his own death; but I doubt that Di Yi actually lived until 1069.) The *Annals'* dates of Wen Wang's detention in Youli by the Shang king are 1180-1074; reduced by 12, the true dates are revealed to be 1068-1062; so we can see what happened: the calendar first year 1068 was the occasion for a double "coronation," which would require the presence of all subject lords, including the Zhou ruler Wen Wang, who was becoming dangerous, and Di Xin used the opportunity to place him under arrest.

7.7 It is the calendar first year 1086, however, that corresponds to the first year for Di Xin as given in the *Annals*, which is 1102, a 16-year back-shift. If the Wenwu Ding calendar was actually 1118-1106, shifted down ten years to 1108-1096 to avoid overlap with Wu Yi, the same 16-year shift applies to it; in the *Annals* it is 1024-1112; and Wu Yi likewise: actually 1143-1109, in the *Annals* 1159-1125. But farther back the shift works differently: Zu Geng's 11 years were claimed by Zu Jia, and editorially this could not be countenanced; Zu Jia had to have 33 years, *preceded* by 11 years for Zu Geng. The result is that Wu Ding's dates are shifted back 16 + 11 years, 1247-1189 to 1274-1216 in the *Annals*. This confirms my dating for Wu Ding. (The Feng Xin four years could not be left inside Zu Jia's reign, of course; the four years were obtained by clipping out the two 2-year mourning periods at the beginnings of the reigns of Kang Ding and Wu Yi. So Feng Xin did not alter the 16 + 11 count.)

7.7.1 But why this 16-year shift at all? One must suppose that it was caused by the latest occurrence of it in the chronicle, and this consideration points to Di Xin. His real tenure was 1086-1041, 46 years. 46 years starting with 1102 ends with 1057, the next year 1056 being the first year of the Zhou royal calendar. So this 16-year back-shift in

late Shang dating occurred early in the history of successive revisions of chronology, before the Zhou "first year" changed to 1062, and therefore before mourning periods were deleted from the Zhou chronicle. In a sense, it was another instance of undoing overlapping: The years from 1056 on could not be both Shang's and Zhou's, both Di Xin's and Wu Wang's. But one can see also another reason: when Zhou Gong's Regency was moved back five years, making the conquest 1045 rather than 1040, Di Xin's 46<sup>th</sup> year could not be 1041; making it 1057 got it out of the way. (The elimination of overlaps is in itself part of the "1045" point of view, being required in moving Yao 1 back to 2145.) Another indication of the early date of these changes is that they involve shifting the eclipse of 1876 back to 1948. 1948 was picked because it had to be a year just one *ji* (1520 years) back from a date when the sun was observed to be in Fang on the first day of the Xia ninth month; so the revision must have been made while records of solar positions for 432-428 were still available. (See Nivison and Pang, *EC* 15.)

7.8 The principle that reign overlaps were unacceptable to "1045"-oriented Warring States editors combines with another observation, to give a complete confirmation of Shang chronology. That observation was that the Di Gui reign at the end of the Xia chronicle must be a Warring States invention; and that Di Gui 1, = 1589, must in an earlier stage of the text have been the first year of Shang. That date is inelastic, because it is tied hagiographically to Yao 1 = 2145: Yao, 100 years; mourning, 3 years; Shun, 50 years; mourning, 3 years; Xia kings one through eight, 200 years; Xia kings nine through sixteen, 200 years. 1589 is 35 years early, the correct first year of Shang being 1554. Therefore, undoing overlaps must total 35 years:

16 years, Di Xin 46 back from 1041 to 1057

11 years, Zu Geng's reign (actually 3 + 8) made to precede Zu Jia's claimed 33 years

4 years, Yang Jia's reign made to precede Pan Geng's claimed 28 years

4 years, Zhong Ren's 4 years made to precede Tai Jia's *de jure* 12 years

16 years applied to reigns back to the end of Zu Jia; 16 + 11 applied to reigns back to the end of Pan Geng; 16 + 11 + 4 applied to reigns back to the end of Zhong Ren; and 16 + 11 + 4 + 4 applied to earlier dates, with one exception: Tang 1 was moved back only 31 years, in tandem with Tai Wu 1, which had become exactly 100 years later, because Wai Bing's two (mourning) years replaced the three year mourning interval at the beginning of the (*de jure*) Tai Jia calendar, raising subsequent dates by one, to Tai Wu, so that his 60 years became 61.

7.8.1 This set the date Shang 1 at 1589, where it must have remained for a while. But eventually it must have been noticed that the 1000-year interval from Tang 1 to the first year of Duke Ping of Song, 575 BCE, had become 1031 years; so all early Shang dates were reduced 31 years, and the 31-year Di Gui reign was born. The 31-year down-shift had to be coupled with elimination of mourning intervals; indeed, that step may have prompted the down-shift as much as did the 1000-year problem. (Often editorial changes seem to have been made for more than one reason.) Mourning intervals from Zhong Ding through Wu Ding totaled 31 years. Therefore, Tai Wu's 60 years, + 1 = 61, was increased by 2 + 12 (1414-1401, which had been Yong Ji's reign) to become 75, i.e.,

1475-1401; while Yong Ji's 12 years were shifted into position before Tai Wu, to fill the 3+3+3+3 gap opened by dropping mourning periods before the accession reigns of Wo Ding, Xiao Geng, Xiao Jia, and Tai Wu. (The "Wu Yi" chapter of the *Shang shu* cannot have been composed until after this was done, since it accords Tai Wu the 75 years that results.) See Appendix 3 for all of this.

7.8.2 Finally, notice that one result has been that the first year of Shang has moved back four years, 1554 to 1558. This meant that the first year of Zhou, 496 years later, had to be 1062. The closest meaningful year was 1061, succession year of Wu Wang, once the 1059 conjunction had been moved back 12 to 1071; so 1062 became, in a sense, and in the end-of-Zhou summary, Wu's first year (his father Wen Wang had died in the third month of his death year); and accordingly the conquest, supposed to have been in Wu's 12<sup>th</sup> year, had to become 1051 in some sense. The sense was found by composing and inserting a slip (exactly 40 spaces) marking this year as when the campaign began, and when Zhou *de facto* began. This was what appeared to the Jin court editors, who thus marked the year with the *ganzhi* "gengyin," which accidentally remained in place in a later post-exhumation editing that changed the "first year" back to 1050. Meanwhile in Wei deletion of mourning intervals in the Zhou chronicle had produced 962 as Mu Wang 1, implying 1062 as Zhou 1; thus (again) two mistakes supported each other.

### Middle and Late Western Zhou Dates

8. I have fixed Western Zhou chronology down to the first year of Mu Wang, set at 956 BC, and I have shown that dates of events within his reign are for the most part true as given in the *Annals*; but two questions about Mu Wang remain: (1) Did he have an accession calendar? And (2) how long did his reign last? (1) Shaughnessy and I had both dated the Xian *gui*, a 34<sup>th</sup>-year inscription, in Xuan Wang's reign, where it does fit; but neither of us had seen a picture of the vessel or its text. Sarah Allan (review of Shaughnessy, *Sources*), who had seen both, pointed out that it must be a Mu Wang vessel, and noted that the first-year date 956 doesn't work. But 954 does work: the date of the Xian *gui* is 921 (Appendix 6, #5). Thus 954 must be Mu Wang's accession year, a year that would be marked by festivities and in other ways, such as, perhaps, the building of a new palace in springtime (see above, 3.2).

8.1 (2) How long the reign lasted is a more complex problem. The *Annals'* reign length is 55 years, like almost all other early sources; but we should expect that if Mu Wang's reign was made to begin earlier by deletion of mourning intervals, it must also have been made to last longer by deletion of mourning intervals in reigns of all five later kings whose predecessors were their own fathers (i.e., Xiao Wang and Yi Wang excepted). Therefore, tentatively, one would expect that Gong Wang's first year, given in the *Annals* as 907 BCE, ought to be 917. The *Annals'* reign for Gong Wang is 12 years, 907-896. But Gong Wang's reign was longer than that, because there is an inscription in the Jue Cao *ding* (II), which mentions Gong Wang as reigning king and has a 15<sup>th</sup> year date, which could be 901, accepting 915 as first year. Two other vessels, by Qiu Wei, will accept 917 as first year. The Mu Wang chronicle has an independently datable event

-- the death of Duke Wei of Lu -- in year 45, i.e., in 918; the date ought to be 916, as I show in Appendix 1. This error tends to confirm 917/915 as first years for Gong Wang, because it is best explained by supposing that Duke Wei's successor Duke Li was remembered as having begun his reign with the first year of Gong Wang, but the wrong first year was assumed. (There is also an event in year 51, i.e., in 912: the writing of the "Lu Xing" chapter of the *Shang shu*; but this is legendary.). Shaughnessy, moreover, has noticed that in the chronicle for Zhao Wang 6<sup>th</sup> year is the entry "Winter, 12<sup>th</sup> month: peaches and plums blossomed" (*Sources* p. 254, note 67). The date Zhao 6 is 972 (using 977 as Zhao Wang's correct first year); and Shaughnessy's suggestion is that this was an auspicious sign marking the birth of Mu Wang, who would then be 55 *sui* in 918. This is probably the origin of a belief that his reign was 55 years; and for chroniclers in the late 300's BCE this would have seemed to be confirmed in other ways. Notably, the *Annals* under Gong Wang 9, i.e., 899, says that on day dinghai (24) of the first month (meaning surely the first day thereof), an appointment was given to Mao Qian, probably as chief minister. 909 is the year that fits (confirming, for us, 917 as a first year for Gong Wang); but an expert in the late 4th century using the *zhang-bu* system and the Xia calendar (as did the *Annals*) would conclude that this year 9 must be 899 -- confirming, for him, 907 as first year for Gong Wang.

8.1.1 But I must take 917/915 as Gong's first years, and must give him some number *n* of years more than 2 + 12, *n* being equal to or greater than 3. What is the value of *n*? In 5.2 I argued that Li Wang's first year 853 in the *Annals* results from deleting mourning (in an earlier superseded chronology) for Li, Xuan and You, i.e., six years; so Li's first years should be 859/857. Applying this idea strictly gives the following:

<i>Annals</i>		Should be
6. Gong Wang	907-896: 12 years, back 2 x 5,	917/915-904, 2 + 12
7. Yih Wang	895-871: 25 years, back 2 x 4,	903/901-879, 2 + 25
8. Xiao Wang	870-862: 9 years, back 2 x 3,	876-868, 9
9. Yi Wang	861-854: 8 years, back 2 x 3,	867-860, 8
10. Li Wang	853-: back 2 x 3,	859/857-

Inscriptions seem to be satisfied by "should be" dates for 9 and 10. If I assume that *n* = 4, then I get as dates for Yih Wang 899/897-873 (2 + 25) that are well supported by inscriptions, and there is no trouble with Gong Wang, whose dates become 917/915-900. This indicates a proper reign for Xiao Wang of five years, 872-868, i.e., 9 minus *n*. Could there be a reason why Xiao Wang would claim four more years after having five?

8.2 The *Annals* has a note saying that Yih Wang was incompetent, and it says that he "moved" to Huai Village in his 15<sup>th</sup> year, which would be 881, using the *Annals'* first year 895, or 883, using the correct accession year 897. His uncle Pi-fang succeeded him irregularly as Xiao Wang; in the *Annals* he has 9 years, but all other sources give him 15. Therefore I conjecture that Pi-fang was in control by 882, *de facto* reigning 882-868, and that Yih Wang's retirement was forced. Yih Wang probably survived until 868, for inscriptions in the eight-year reign of his son and legitimate heir Yi Wang (giving

prominence to a certain "Sima Gong") indicate 867 and 865 as first years, presumably indicating mourning (though this is not reflected in the *Annals* chronology).<sup>9</sup> A note in the *Annals* says of the year 864, which records nasty weather portents, that in this year the later Li Wang (Prince Hu, son of Yi Wang) was born. The note is probably part of the original text, because it implies that Li Wang's life was 37 years (*sui*), and this if true explains why his pre-exile reign was mistakenly taken in the *Shiji* to be 37 years. My hypothesis, then, is that Xiao Wang did not retire at once after Yih Wang's death, staying on in one of the two capitals; but that he found his support, and his *raison d'être*, ended once Yi Wang had an heir; and that he then had to withdraw. This would account for the *Annals'* nine years for Xiao: what Xiao Wang really had were five, 872-868, when all accepted him, and four, 867-864, when only his own faction stayed with him.

8.3 Confirming this analysis, the chronicle for Yi Wang, in the *Annals* 861-854 but really (I hold) 867-860, has entries for every year except years 4 and 5, which would be 864-863; and the chronicle for Xiao Wang has only two entries in the last four years, which are for years 7 and 8; and these in the *Annals* system are precisely the years 864-863. What happened was another editorial undoing of overlapping: Xiao Wang was accorded his last four years free and clear, while the events in Yi 4-5 preserved their absolute dates 864-863, and so -- when mourning periods were dropped, reducing Xiao to 870-862 -- they had to be cut out of the Yi Wang chronicle and inserted into the Xiao Wang chronicle as years 7-8.

8.3.1 The operation of giving to Xiao Wang outright the four years that overlapped with Yi Wang pushed Xiao's five years back 4; and with this adjustment, earlier dates too had to move back four years. But the back-shifting had to stop short of the last year of Mu Wang, held in place by its supposed correlation with the death of Duke Wei (and, perhaps, by still available knowledge of Mu's true life span and death date). So Gong Wang's reign had to be shortened by four years, to 2 + 12; and later, with the dropping of mourning periods as assumed by Wei experts, absolute dates became what they are in the present text. I do not think that any other explanation is possible for the *Annals'* 12 years for Gong Wang; and if there is none, then my dates for Gong Wang, 917/915-900, for Yih Wang, 899/897-873, for Xiao Wang, 872-868, for Yi Wang, 867/865-860, and for Li Wang, 859/857-828 (including Gong He, 841-828), are confirmed.<sup>10</sup>

8.4 One more point needs to be made about the Li Wang reign era. If he was born in 864, he was a mere child of 6 (*sui*) when he became king, and must have had a regent until coming of age, presumably in his 20<sup>th</sup> year, 845; and he would thus have had a new calendar beginning in 844. I propose that the regent was Sima Gong, and that this person

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<sup>9</sup> There are four inscriptions, recording receptions in the "Shi Lu Palace," with "Sima Gong" as introducer. See Appendix 6, vessels 19, 20, 22, and 23, implying *yuan* dates 867, 867, 867, and 865.

<sup>10</sup> Another confirming datum is often alleged for the first year of Yih Wang being 899 BCE: The chronicle for Yih 1 says "a day dawned twice in Zheng." (Zheng was the location of the royal residence north of the Hua Shan Mountains, about 40 miles east of Zong Zhou.) This is held to be a reference to the (supposed) sunrise solar eclipse on 21 April 899. But recent work by F. R. Stephenson shows that this eclipse occurred not "in Zheng" but too far east even to have been reported to the Zhou capital (Stephenson 1986, 1992). Possibly what is meant by *dan* "dawned" is not sunrise but the very first light of dawn reflected on the mountains or high clouds above them.

was the same man later known to history as Gong He, regent after Li Wang was driven into exile in the Fen river valley at the end of 842. This hypothesis makes sense of a number of bronze inscriptions. Notably, there are two *gui* inscriptions by a Shi Dui, that have dates that cannot be in the same calendar: a "1<sup>st</sup> year" inscription that can be 857, and a "3<sup>rd</sup> year" inscription that fits in 842, if 844 is a "1<sup>st</sup> year."<sup>11</sup> The king is the same in both; in the "1<sup>st</sup> year" one he (i.e., the written order that the scribe gives to Shi Dui) bids Shi Dui to assist "Shi He Fu," obviously Gong He, by assuming duties that must belong to the Sima's office. (If Sima Gong has recently become regent, it is understandable that he would have to have some relief from former official duties.) In the "3<sup>rd</sup> year" one, the king refers to the earlier commission, again mentioning "Shi He Fu," and renews and extends it (and awards more lavish gifts)

8.5 There is one more problem, in what has been thought to be a time when dates are unquestionable. The famous Mao Gong *ding*, bearing the longest bronze inscription known, must be, to judge from the style of the tripod and the text, a very late Western Zhou piece made at the beginning of a reign; so it is probably in You Wang's first year. Another shorter inscription, strikingly similar in composition, is the Shi Hong *gui*, and it has a full "1<sup>st</sup> year" date. The date will not fit in 781, supposedly You Wang's first year, but it will fit easily in 783. I must propose, therefore, that Xuan Wang did not have a 46-year reign, dying in 782, but died in 784, and that 783 is You Wang's succession year, while 781 is his accession year. There are no events recorded in Xuan 44-45, 784-783. Further, in the original *Annals* (as reported by Du Yu, the author of the classical commentary on the *Zuo zhuan*), Zhou royal dates changed in 784 to Jin ducal dating, 784 being the first year of Shang-shu of Jin. If this year was originally "*yuan nian*" (1<sup>st</sup> year, i.e., for Shang-shu) then when in the late 4<sup>th</sup> century mourning periods were dropped from the *Annals*, You Wang's reign had to change from (2 +) 11 years to 11 years; but must still end with 771. And if Xuan Wang had died in 784, i.e., in "*yuan nian*," You Wang's "first year" 781 would have to be called "*si nian*," "4th year" of Shang-shu. But this would be incomprehensible. So (I propose) it was judged that "*yuan ㄨ nian*" for Xuan Wang's death must be a miswriting of "*san 三 nian*," "3<sup>rd</sup> year" (the two characters *yuan* and *san* being almost alike). You Wang's dates, therefore, must be 783/781-771, 2 + 11 years; and Xuan Wang's dates must really be 827/825-784, 2 + 42 years.

8.6 This close relationship between disallowing mourning intervals and the grafting of a Jin-Wei chronicle onto an original Zhou chronicle shows, again, that doing away with mourning intervals was the fundamental aspect of the Wei revisions in the late fourth century. That was the move that had shifted Mu 1 back from 956 to 962, and Wu Wang 1 back to 1062, supposedly his father's death year. This had to be reconciled with 1061, resulting from redating the conjunction of 1059 in Jing back to 1071 in Fang, and dating the appointment of Tang-shu Yu to 1035. Probably all of this was designed to support Wei king Huicheng's self-coronation in 335. In contrast the earlier Zhou-oriented revisions centered on undoing overlapping -- a legitimist bias at work: one royal authority at a time. The triggering move was making Zhou Gong's seven years precede Cheng Wang, redating the conquest from 1040 to 1045, Di Xin's last year from 1041 to 1057, and so on back, to dating Yao 1 as 2145. Appendix 3 makes more of this clearer.

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<sup>11</sup> See Appendix 6, vessels 28 and 33.

APPENDICES

Appendix 1: The Dukes of Lu

There are two sets of dates for the "dukes" (*gong*) of Lu during the Western Zhou era. One is implied in the *Shiji* (33.8a-b), "Lu Shijia," and the other is implied in the *Bamboo Annals*. To compare them, I list the stated or implied death dates, followed by stated or implied reign lengths:

	<i>Shiji</i>	<i>Bamboo Annals</i>	Correct
Bo Qin	999	989	990 (46)
Kao Gong	995 (4)	988 (1)	986 (4)
Yang Gong	989 (6)	(982) (6)	980 (6)
You Gong	975 (14)	968 (14)	966 (14)
Wei Gong	925 (50)	918 (50)	916 (50)
Li Gong	888 (37)	879 (39)	879 (37)
Xian Gong	856 (32)	(856) (23)	856 (23)
Shen Gong	826 (30)	826 (30)	826 (30)

(The death date of Kao Gong is implied by the record of the construction of the Rush Palace, which must mark the first year of Yang Gong; the death date of Yang Gong, required for consistency, has gotten overwritten in the *Annals* by the (incorrect) death entry for Kang Wang; and the death date of Xian Gong (856), again required for consistency, has gotten overwritten by the *Annals* record for Yi Wang, displaced six years into Li Wang's chronicle.)

The reign length of Bo Qin, son of Zhou Gong, is given by Liu Xin as quoted in the *Han shu* (21B63a), who says it is 46 years, beginning with the first year of Cheng Wang's 30 years. The *Shiji* data thus imply that Cheng Wang's 30-year reign began in 1044, as does his 37-year reign in the *Annals*. This is impossible: I have shown that Cheng Wang's 30 year accession calendar began in 1035. Therefore some mistake has set the *Shiji* dates back nine years. Obviously the error lies in the reign given in the *Shiji* for Xian Gong, where "23" was altered to "32." (This has been argued by Lei Xueqi; see Lei under Li Wang 12.) There remain two differences: (1) Kao Gong's reign is three years shorter in the *Annals* and Bo Qin's death is one year later; and (2) Li Gong is given 37 years in the *Shiji*, but 39 years in the *Annals*, so that the preceding death dates in the *Annals* are two years earlier.

Both of these last two differences are *Annals* errors. Correcting the first error by giving Kao Gong four years makes Bo Qin's death date in the *Annals* (992) two years earlier than in the (corrected) *Shiji* (990); thus Bo Qin's date shows the same two-year difference as the other death dates. Correcting the second error in the *Annals* by giving Li Gong only 37 years then makes the two lists alike in all details.

But why do I say that it is the *Annals* data that are wrong in these last two respects? Because if these are taken to be *Annals* errors and not *Shiji* errors, it is possible to explain them; whereas if it is supposed that it is the *Shiji* that is in error, no explanation is available.

The explanation of the first error is Shaughnessy's slip. It added three years to Wu Wang's reign. In an earlier, and later overwritten, version of the *Annals*, this had to displace subsequent dates by three years, down to but not including the first year of Mu Wang, which remained fixed by the fact that it had to be 100 years after the beginning of Zhou. This three-year displacement was undone in subsequent revisions, but two vestiges of it remain in the present text. The first vestige, giving Kao Gong only one year, had probably been incorporated into some independent chronology of Lu, which Warring States editors of the *Annals* thought they must respect.

The second vestige of the three-year displacement is in the Zhao Wang chronicle. There we find two campaigns against Chu recorded, in years 16 and 19. The last was the disaster that resulted in the death of the king and the destruction of the Zhou army at the Han River. The 16<sup>th</sup>-year entry merely says "[Zhou] attacked Chu, and in crossing the Han encountered a great *si* (water buffalo)." The word "*si*" 兕 must originally have been "*xiong*" 兕 "disaster," the two characters being almost identical in form. This sentence must originally have introduced the text now standing alone in year 19, as a capsule description of the main event for the year. (For a comparable feature, see the text in Cheng 7, which begins "The Duke of Zhou returned the government to the king"; all the rest of the text for year 7 recounts the actions step by step leading up to this act, which is consummated at the very end of the year.) I.e., when a Warring States revision restored 19 years as the length of Zhao Wang's reign, the date "16<sup>th</sup> year" was retained, and assigned the first sentence, with "disaster" altered to "water buffalo" (supposedly an omen in an imaginary first expedition, since there had been only one disaster).

The second error, moving the death dates of Wei Gong and earlier Lu rulers back two years, is easily explained by the fact that it is the *Annals* that originally assumed two-year mourning-completion periods at the beginnings of reigns. To say that Wei Gong died in 918 is to say that his successor succeeded in 917, which was the "first year," i.e., the succession year, of Gong Wang. The correct "first year" must have been the accession year 915. Similarly, it must have been remembered that Bo Qin's reign had begun in Cheng Wang's first year, actually the first year of his accession (30-year) calendar; and it was supposed that in this case too "first year" referred to the succession year. This error too probably passed into an independent Lu chronology, which the final Warring States editors of the *Annals* felt obliged to respect.



## Appendix 2: The Late Shang Ritual Cycle

The sacrificial year can be described as normally 36 *xun* (10-day periods) alternating with 37 *xun* years. A typical inscription was made on the last day (*gui* day) of a *xun*, announcing the sacrifice(s) for the next day. Therefore it is convenient to key the system to *jia* kings (the *gan* name determined the sacrifice day in the 10-day *xun*). There were five sacrifices: *ji*, *zai* and *xie*, in successive *xun* for a given king, in the first third of the year; *yong*, in the second third, and *yi*, in the last third. Usually the first third had 13 *xun*. Each of the three thirds was introduced by a common ceremonial (*gong dian*) for all recipients of sacrifice. The entire *jia* schedule can be reconstructed from charts at pp. 57, 59 and 60 of Shima, *Kenkyū*; and the entire schedule of primary sacrifice days (*ji*, *yong*, *yi*) for all kings and consorts in any third of the year is given in a diagram, p. 101 in Shima, *Kenkyū*. There is disagreement as to which series, *ji*, *yong*, or *yi*, was conceived as starting the ritual year, Shima (whom I follow, not for his reasons) taking it to be the *ji* series (see Chang, pp. 186-91). What has not been done is to map this schema out, with its variations, on correct absolute dates over so-called Period Five of the shell and bone inscriptions. One must do this if one is to obtain chronological information from this material. It is this that I attempt to do here.

One must begin with a set of related inscriptions supplying enough detail to identify the year, the reign, and for at least one inscription recording a sacrifice the year, month and day within the reign. Probably the only such set is the set of over seventy to over 100 inscriptions (depending on what one includes) that record the daily progress of the campaign against the Ren Fang (or Yi Fang), in years 10-11 of a king who must be Di Xin. (A convenient list is given in Chen Mengjia 1956 pp. 301-304.). These inscriptions require that year 10 ended with either *jiawu* (31), *yiwei* (32) or *bingshen* (33), and contained an intercalary 9<sup>th</sup> month. The only such year in late Shang is 1077 BCE, interpreted as taking the winter solstice month as last month, which ended with day *yiwei* (32). That the year must have an intercalary 9<sup>th</sup> month is seen from a few inscriptions that name the year; here, month lengths assume the year is 1077 BCE:

year 10:	month 9,	<i>jiawu</i> (31)	05-34 (30 days)	
	month 9,	<i>guihai</i> (60)	35-03 (29 days)	(intercalary)
	month 10,	<i>guiyou</i> (10)	04-33 (30 days)	
year 10:	month 10,	<i>jiawu</i> (31)		

The autumn equinox day, 2 Oct, JD 132 8324, was day *dingyou* (34), *qi*-center at the end of the first "9<sup>th</sup>" lunar month; therefore the next lunar month that I call "9<sup>th</sup>," of 29 days, contained no *qi*-center, and must be intercalary, if the rule stated in later literature applied (and in this material it gives consistent results).<sup>12</sup>

The inscription recording the launching of this campaign is *HJ* 36482, dated "day *jiawu* (31) ... 9<sup>th</sup> month, coincident with the *zai* sacrifice to Shang Jia, in the 10<sup>th</sup> *si*

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<sup>12</sup> A *qi*-center is the middle day of a *solar* month (twelfth of the solar year); the solstice and equinox days are *qi*-centers. See Nivison 1989, p. 210, and reference to Kong Yingda, for this intercalation rule.

(year)." This information determines the date of the inscription to be 29 September 1077 BCE, JD 132 8321, and implies that the ritual cycle in this year began (with the first, i.e., *gong dian*, sacrifice of the *ji* series) on 9 September, JD 132 8301, a *ji*axu (11) day. Thus year one in this royal calendar is 1086 BCE. Another inscription, *HJ* 37852, anticipates trouble with the Ren Fang, and is dated "yihai (12) ... 2<sup>nd</sup> month, coincident with the *yong* for Zu Yi, in the 9<sup>th</sup> *si*." This fixes the date as 20 March 1078 BCE, JD 132 7762, and implies that the current ritual cycle began 20 Sept 1079, JD 132 7581, again a *ji*axu (11) day, with the civil year again beginning with the post-solstice month.

Two other inscriptions, however (*Xu-bian* 1.5.1), are dated *guiyou* (10), 11<sup>th</sup> month, 3<sup>rd</sup> *si*, and *guiwei* (20), 12<sup>th</sup> month, and the first one gives *ji*axu (11) as the first day of the *ji* series, which must be 16 October 1084, JD 132 5781. If this date is in the 11<sup>th</sup> month in 1084, the civil year began with the *hai* (pre-solstice) month, which was 19 Nov - 18 Dec. It follows that from 1084 until 1079 the cycle was kept at 36 *xun*, always beginning with *ji*axu, so that the first day of the cycle precessed 21 days every four years; and that at some time between these dates the beginning of the civil year was moved forward two months, probably by running a 14-month year.

One of the longest sets of ten-day inscriptions is #2503 in Li, Qi and Allan, 1985, composing fragments in several earlier publications (note that the month dates the diviner's action on *gui*-day, not the *ji*-day sacrifices):

<i>Guiyou</i> (10) ... 2 <sup>nd</sup> month.	<i>Ji</i> axu (11), <i>ji</i> for Xiao <i>Jia</i> , etc.; the king's 8 <sup>th</sup> <i>si</i> .
<i>Guiwei</i> (20) ... 3 <sup>rd</sup> month.	<i>Ji</i> ashen (21), <i>zai</i> for Xiao <i>Jia</i> , etc.
<i>Guisi</i> (30) ... 3 <sup>rd</sup> month.	<i>Ji</i> wu (31), <i>ji</i> for Qian <i>Jia</i> , etc.
<i>Guimao</i> (40) ... 3 <sup>rd</sup> month.	<i>Ji</i> achen (41), <i>ji</i> for Qiang <i>Jia</i> , etc.
<i>Guichou</i> (50) ... 3 <sup>rd</sup> month.	<i>Ji</i> ayin (51), <i>ji</i> for Xiang <i>Jia</i> , etc.
<i>Guihai</i> (60) ... ? month.	<i>Ji</i> azi (01), <i>zai</i> for Xiang <i>Jia</i> , etc.
<i>Guiyou</i> (10) ... ? month.	<i>Ji</i> axu, <i>ji</i> for Zu <i>Jia</i> , etc.

In a hand copy in an earlier collection, the month number in the next-to-last is rendered "4"; but it is actually illegible. If one doubts, as I do, that months were ever allowed to run to 31 days, this "8<sup>th</sup> *si*" must contain an intercalary third month. I now try again, experimentally, the later rule that a month lacking a *qi*-center is intercalary, together with the hypothesis that *qi* divisions were determined by counting 15-day or 16-day periods from an observed autumn equinox, making the officially recognized winter solstice two days late. The inscription data determine that the current cycle began on *ji*wu (31), so it must be in a calendar other than the one beginning in 1086. But it is also implied that the first day of the cycle must fall in the first month of the civil year; so the date must be earlier than the date of any such inscription examined so far.

The year that fits is 1098: In that year the actual solstice was *xinwei* (08), 31 Dec (1099), so the recognized solstice (hence a *qi*-center) would be 2 Jan, *guiyou* (10), which was the last day of the lunar month. The second month after that lacked a *qi*-center and must be intercalary 3<sup>rd</sup> month. Therefore, again, the civil year is starting with the *hai*

month. And if this year is the eighth, then the calendar must begin in 1105. Further, it happens that we have a 7<sup>th</sup> *si* inscription, that is consistent with this "8<sup>th</sup> *si*" set; it is *Yi-cun* 545: "Day *guiwei* ... 5<sup>th</sup> month. *Jiashen* (21), *zai* to Zu Jia; the king's 7<sup>th</sup> *si*." This sacrifice is on the 111<sup>th</sup> day of the cycle; so the 1<sup>st</sup> day again is *jiawu* (31); in 1099 *jiashen* (21) in a "5<sup>th</sup> month" (counting from the *hai* month) must be 19 March. One can now plot the ritual calendar experimentally for two decades, 1111-1092, cycle first day, civil year first month, and *xun* in the cycle:

1111	<i>jiawu</i>	(31)	<i>hai</i>	36	<i>xun</i>
1110	<i>jiawu</i>	(31)	<i>hai</i>	37	
1109	<i>jiachen</i>	(41)	<i>hai</i>	36	
1108	<i>jiachen</i>	(41)	<i>hai</i>	37	
1107	<i>jiayin</i>	(51)	<i>hai</i>	36	

-- and so on: 1105-4 will be *jiazi* years; 1099-8 will be *jiawu* years; 1093-2 again will be *jiazi* years; and by that time it will be evident that keeping the cycle beginning in the first month of the civil year, even when that month is moved back to the first month of winter, is impossible (for when 36 *xun* and 37 *xun* cycles alternate the cycle first day precesses one day every four years). So the calendar masters gave up, and let the ritual year run at 36 *xun* through 1086, keeping the first ritual day *jiazi*. Then they ran a 37-*xun* ritual year, raising the first day to *jiayu*, where it remained through 1077. Thus the beginning of the ritual year rapidly precessed, from early winter to early autumn. Probably from 1092 on the term "*si*" was thought of as just meaning "year" in the ordinary sense.

The few extant inscriptions of the campaign against the Yu Fang in the west, toward the confluence of the Wei River and the Yellow River, fit the years 1110-1109. The opening inscription (*Jia-bian* 2416, the longest one known) is dated "Day *dingmao* (04) ... 10<sup>th</sup> month, coincident with the *yi* for Da Ding." The *yi* for Da Ding (son of Tang, father of Da Jia, i.e., Tai Jia) is on day 274, so the cycle began on day *jiawu* (31), 27 Nov 1111; day 274 was 27 Aug 1110, the 10<sup>th</sup> month in this (*hai*) year being 10 Aug - 8 Sep. Routine sacrifice inscriptions in the following spring require a ritual year beginning on a *jiachen* (41) day. The last inscription for the campaign, on an animal skull, has the king in the autumn on a hunt in Yu Fang territory, a standard way of marking a victory. If Di Xin's calendar actually began in 1086, whereas the *Bamboo Annals* dates it to 1102, late Shang dates are being back-dated 16 years. The *Annals'* date for the death of Wu Yi is 1125; so it must actually have been in 1109. The *Annals* record says that Wu Yi died in a thunderstorm during a hunt "in the He - Wei area."

*Jia-bian* 2416 has no year date. But fragment #1908 in the White collection (see Chang p. 246) is a shorter version of the same text, and it is dated "9<sup>th</sup> *si*." Therefore I conclude that late in his reign Wu Yi began a new calendar for his heir Wenwu Ding, in 1118. The *Annals'* thirteen years for "Wen Ding" ought to be, then, 1118-1106; and the three years assigned to him in other chronologies must be 1108-1106. In 1105 Wenwu Ding changed his title to "Di Yi," starting a new calendar (thus after his death he sometimes receives offerings as "Wenwu Di Yi). The *Annals* gives Di Yi only nine years, because Warring States editors could not accept a ten-year overlap of the Wu Yi

and Wenwu Ding reigns; so they cut ten years out of the 19-year "Di Yi" reign (1105-1087, making it 1095-1087, backed 16 years to 1111-1103).

Most chronologies give "Di Yi" 37 years. This figure probably has a basis: it would imply that there was another "di" inauguration in 1068. The 23<sup>rd</sup> year of a calendar beginning in 1068 would be 1046. *Yi Zhou shu* 21 "Feng Bao" has Wu Wang and Zhou Gong receiving lords from other states, in a situation that is obviously late pre-conquest, on the first of the month (not named), being day gengzi (37), in the "23<sup>rd</sup> year." There are only two late pre-conquest years containing months beginning with gengzi: 1046 and 1041. If 1068 began a new year count, moreover, this would help to explain why no inscriptions for Di Xin's era have been discovered with year dates higher than 20. (See 7.6.3.)

If 1068 was the year of a second "di" inaugural, it was picked, and perhaps groomed, for the event. 1105-4 had been jiazi years in the cycle. To make 1068-7 jiazi years, Di Xin would have to resume alternating 36-*xun* and 37-*xun* cycles by letting the cycle beginning 9 Sep 1077 run 37 *xun*. So I will assume he did this. There is a 20<sup>th</sup> year set that seems to confirm this guess; see Shima, *Kenkyū*, p. 148 (piecing together *Xu-bian* 6.5.2, 6.1.8, and 3.28.5); the year would be 1049. But other inscriptions (including late Shang bronze inscriptions) would then require year counts beginning in 1065, the expected promulgation year for the new "reign." My reconstruction of the whole ritual calendar, 1120-1041, thus includes this assumption too; I leave it for others to test.

But in the years 1120-1112, I must argue that another factor is at work. Before Wu Yi's death, only 35 *xun* were needed in a sacrificial year. If at some earlier time the civil year had been beginning with the first month of spring, then being changed to the first month of winter, the result could be, for a number of years, cycles that began in the second, third or even the fourth month. To get the cycle and the civil year realigned, it would have been necessary occasionally to run 35-*xun* cycles, making the first day of the cycle precess 15 days a year. Shima, *Kenkyū* p. 161 reproduces a dozen fragments implying cycles beginning in late winter or spring, that guide me in reconstructing the ritual calendar for 1120-1112.

My complete reconstruction follows:

Year	<i>ganzhi</i> , <i>si</i> 1st day	Reign/year	JD#, <i>si</i> 1st day	Date of <i>si</i> 1st day	<i>xun</i>
1120	01	Wu Yi 24	131 2391	17 Feb 1120	36
1119	01	25	2751	12 Feb 1119	36
1118	01	Wenwu Ding 1	3111	7 Feb 1118	36
1117	01	(Wu Yi 27) 2	3471	2 Feb 1117	35
1116	51	(28) 3	3821	17 Jan 1116	36
1115	51	(29) 4	4181	12 Jan 1115	36
1114	51	(30) 5	4541	7 Jan 1114	35
1113	41	(31) 6	4891	23 Dec 1114	36
1112	41	(32) 7	5251	17 Dec 1113	35

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1111	31		(33)	8	5601	2 Dec	1112	36
1110	31		(34)	9	5961	27 Nov	1111	37
1109	41		(Wu Yi 35)	10	6331	2 Dec	1110	36
1108	41	Wenwu Ding	1	(11)	6691	26 Nov	1109	37
1107	51		2	(12)	7061	1 Dec	1108	36
1106	51		3	(13)	7421	26 Nov	1107	37
1105	01	"Di Yi"	1		7791	1 Dec	1106	36
1104	01		2		8151	25 Nov	1105	37
1103	11		3		8521	30 Nov	1104	36
1102	11		4		8881	25 Nov	1103	37
1101	21		5		9251	30 Nov	1102	36
1100	21		6		9611	24 Nov	1101	37
1099	31		7		9981	29 Nov	1100	36
1098	31		8	132	0341	24 Nov	1099	37
1097	41		9		0711	29 Nov	1098	36
1096	41		10		1071	23 Nov	1097	37
1095	51		11		1441	28 Nov	1096	36
1094	51		12		1801	23 Nov	1095	37
1093	01		13		2171	28 Nov	1094	36
1092	01		14		2531	22 Nov	1093	36
1091	01		15		2891	17 Nov	1092	36
1090	01		16		3251	12 Nov	1091	36
1089	01		17		3611	7 Nov	1090	36
1088	01		18		3971	2 Nov	1089	36
1087	01		19		4331	27 Oct	1088	36
1086	01	Zhou Xin	1		4691	22 Oct	1087	36
1085	01		2		5051	17 Oct	1086	37
	11				5421	21 Oct	1085	36
1084	11		3		5781	16 Oct	1084	36
1083	11		4		6141	11 Oct	1083	36
1082	11		5		6501	06 Oct	1082	36
1081	11		6		6861	30 Sep	1081	36
1080	11		7		7221	25 Sep	1080	36
1079	11		8		7581	20 Sep	1079	36
1078	11		9		7941	15 Sep	1078	36
1077	11		10		8301	09 Sep	1077	37
1076	21		11		8671	14 Sep	1076	36
1075	21		12		9031	09 Sep	1075	37
1074	31		13		9401	14 Sep	1074	36
1073	31		14		9761	08 Sep	1073	37
1072	41		15	133	0131	13 Sep	1072	36
1071	41		16		0491	08 Sep	1071	37
1070	51		17		0861	13 Sep	1070	36
1069	51		18		1221	07 Sep	1069	37
1068	01	Di Xin	1	19	1591	12 Sep	1068	36
1067	01	(=Zhou Xin)	2	20	1951	07 Sep	1067	37
1066	11		3	21	2321	12 Sep	1066	36

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1065	11	4	1	2681	06 Sep	1065	37
1064	21	5	2	3051	11 Sep	1064	36
1063	21	6	3	3411	06 Sep	1063	37
1062	31	7	4	3781	11 Sep	1062	36
1061	31	8	5	4141	05 Sep	1061	37
1060	41	9	6	4511	10 Sep	1060	36
1059	41	10	7	4871	05 Sep	1059	37
1058	51	11	8	5241	10 Sep	1058	36
1057	51	12	9	5601	04 Sep	1057	37
1056	01	13	10	5971	09 Sep	1056	36
1055	01	14	11	6331	04 Sep	1055	37
1054	11	15	12	6701	09 Sep	1054	36
1053	11	16	13	7061	03 Sep	1053	37
1052	21	17	14	7431	08 Sep	1052	36
1051	21	18	15	7791	03 Sep	1051	37
1050	31	19	16	8161	08 Sep	1050	36
1049	31	20	17	8521	02 Sep	1049	37
1048	41	21	18	8891	07 Sep	1048	36
1047	41	22	19	9251	02 Sep	1047	37
1046	51	23	20	9621	07 Sep	1046	36
1045	51	24	21	9981	01 Sep	1045	37
1044	01	25	22	134 0351	06 Sep	1044	36
1043	01	26	23	0711	01 Sep	1043	37
1042	11	27	24	1081	06 Sep	1042	36
1041	11	28	25	1441	31 Aug	1041	37
1040	(end of Shang)						

Note: To find the *gan*zhi for a JD (Julian Day) number, divide by 60 and subtract 10 from the remainder. (If the remainder is less than 10, add 60 before subtracting.) For JD numbers, a convenient reference is Stahlman and Gingerich (1963).

For the sacrificial schedule for Jia kings, and the way *ji*, *zai* and *xie* sacrifices were compounded in late Shang, see Shima, *Kenkyū*, pp. 56-61 (names of kings are here the ones encountered in inscriptions; Qian Jia 𠄎甲 = Hedan Jia; Qiang Jia 羌甲 = Kai Jia; Xiang Jia 象甲 = Yang Jia):

<i>Xun</i> 1	<i>Gong dian, ji</i>		
<i>Xun</i> 2	<i>Ji Shang Jia</i>		
<i>Xun</i> 3		<i>Zai Shang Jia</i>	
<i>Xun</i> 4	<i>Ji Da Jia</i>		<i>Xie Shang Jia</i>
<i>Xun</i> 5	<i>Ji Xiao Jia</i>	<i>Zai Da Jia</i>	
<i>Xun</i> 6		<i>Zai Xiao Jia</i>	<i>Xie Da Jia</i>
<i>Xun</i> 7	<i>Ji Qian Jia</i>		<i>Xie Xiao Jia</i>
<i>Xun</i> 8	<i>Ji Qiang Jia (= Wo Jia)</i>	<i>Zai Qian Jia</i>	
<i>Xun</i> 9	<i>Ji Xiang Jia (= Yang Jia)</i>	<i>Zai Qiang Jia</i>	<i>Xie Qian Jia</i>
<i>Xun</i> 10		<i>Zai Xiang Jia</i>	<i>Xie Qiang Jia</i>
<i>Xun</i> 11	<i>Ji Zu Jia</i>		<i>Xie Xiang Jia</i>

<i>Xun</i> 12		<i>Zai Zu Jia</i>	
<i>Xun</i> 13			<i>Xie Zu Jia</i>
<i>Xun</i> 14	<i>Gong dian, yong</i>		
<i>Xun</i> 15	<i>Yong Shang Jia</i>		
<i>Xun</i> 16			
<i>Xun</i> 17	<i>Yong Da Jia</i>		
<i>Xun</i> 18	<i>Yong Xiao Jia</i>		
<i>Xun</i> 19			
<i>Xun</i> 20	<i>Yong Qian Jia</i>		
<i>Xun</i> 21	<i>Yong Qiang Jia</i>		
<i>Xun</i> 22	<i>Yong Xiang Jia</i>		
<i>Xun</i> 23			
<i>Xun</i> 24	<i>Yong Zu Jia</i>		
<i>Xun</i> 25			
<i>Xun</i> 26	<i>Gong dian, yi</i>		
<i>Xun</i> 27	<i>Yi Shang Jia</i>		
<i>Xun</i> 28			
<i>Xun</i> 29	<i>Yi Da Jia</i>		
<i>Xun</i> 30	<i>Yi Xiao Jia</i>		
<i>Xun</i> 31			
<i>Xun</i> 32	<i>Yi Qian Jia</i>		
<i>Xun</i> 33	<i>Yi Qiang Jia</i>		
<i>Xun</i> 34	<i>Yi Xiang Jia</i>		
<i>Xun</i> 35			
<i>Xun</i> 36	<i>Yi Zu Jia</i>		

I hesitate to venture descriptions of these rites (or sacrifices: probably always offerings of money (i.e., cowries), wine, food or victims were involved). Some, perhaps all, must have been public events; e.g., a date in an inscription can sometimes be given as (or include) "yong-day," "yi-day," or "xie-day," apparently without need of further identification. There is some evidence that some or all of them involved robed public processions (perhaps like the frequent *matsuri* in Kyoto). For example, there are divinations revealing anxiety about rain that might disrupt such an event and spoil the robes. Another example is part of the long inscription already mentioned (p. 29) that begins the campaign against the Yu Fang (*Jia-bian* 2416; Shima, *Sōrui*, 518.4): "Let it be on [this] day of the robed yi rite that we march forth" (*hui yi yi ri bu* 惠衣翌日步).

All I can claim to know – and all I need to know, for my purpose -- are the names, and the standard sequence.

The characters for these five rituals are as follows (I give modern conversions, as far as possible): *ji* 祭; *zai* 齎; *xie* 劓; *yong* 月; *yi* 翌.

### Appendix 3: The Development of the Pre-Zhou Parts of the Chronicle

Here I tabulate selectively:

- (a) the *Annals'* chronology from Huang Di to Shang, with the imaginary "Di Gui" reign in place (intended dates are not given in the *Annals* before Yao, but can be deduced);  
 (b) an earlier chronology for the same, without the 31-year "Di Gui" reign, and assuming two-year breaks after deaths of rulers before Yao; and  
 (c) a hypothetical earliest correct chronology supposing (i) that Shun 14 was 1953 BCE; and (ii) that Yao's reign ended with the exile of his son Dan Zhu in Yao's 58<sup>th</sup> year, Yao then being inactivated by Shun for the rest of his life, counting as the first nine years of Shun's reign, which were followed by a two-year mourning break.<sup>13</sup>

	(a)	(b)	(c)
Huang Di 100	2402	2406	<b>2287</b>
HD 50	<b>2353</b>		
Zuo Che 7	2302	2306	2187 <sup>14</sup>
Zhuan Xu 78	2295	2299	2180
ZX 13		<b>2287</b>	
Zhuan Xu, death	2218	2222	2103
Mourning		2221 (2)	2102 (2)
Di Ku 63	2217	2219	2100
Mourning		2156 (2)	2037 (2)
Zhi 9	2154	2154	2035
Yao 1	2145 (100)	<b>2145</b> (100)	2026 (58)
Yao 42	<b>2104</b>		
Yao 58			1969
Yao, death	2046	2046	
Mourning	2045 (3)	2045 (3)	
Shun 1	2042 (50)	2042 (50)	1968
Yao, death (Shun 9)			1960
Mourning (calendar break)			1959 (2)
Shun 10			1957
Shun 14 (conjunction)	2029	2029	<b>1953</b>
Shun, death	1993	1993	1917
Mourning	1992 (3)	1992 (3)	1916 (2)
Yu 1 (de jure)	<b>1989</b>	<b>1989</b>	1914
Zhong Kang 5 (eclipse)	1948	1948	1876
Mang (9th Xia king)	<b>1789</b>	<b>1789</b>	<b>1753</b>
Di Gui	<b>1589</b>		
Shang, first year	1558	<b>1589</b>	<b>1554</b>

<sup>13</sup> Such a break must be assumed after Shun's death in Yu's total *de facto* tenure (Legge, "Annals," p. 118); so I assume it also after Yao's death. Yao's last 9 years = Shun's first 9; see *Shiji* 1 "Wu Di Ji" p. 29a.

<sup>14</sup> For this seven-year mourning interval led by Huang Di's minister Zuo Che, see Legge, "Annals," p. 110; also Fang & Wang 1981 p. 170, citing *Lu shi* quotations from *guben Bamboo Annals*.



Many scholars argue that the pre-Yao part of the text cannot have been part of the *Annals*; but the pre-Yao and post-Yao connections shown here refute this claim. This material also shows how the chronology in the present *Annals* was worked out. I obtain 2287 as the first year of Huang Di in the earliest stage of the text (c). The same date turns out to be the date of the promulgation of the supposed first calendar in Zhuan Xu 13, in the still early second column (b) (still recognizing two-year mourning intervals after deaths of rulers; none after Zhi, son of Di Ku and merely displaced by Yao). This date 2287 is confirmed as the supposed starting year of the "Zhuan Xu Calendar" by a quotation from the lost *Hong Fan zhuan* of Liu Xiang, in the middle of the second chapter of the three-chapter "Monograph on the Calendar" ("Li Zhi") in the *Xin Tang shu*. (I have analyzed this text in my "Response" in *Early China* 15 (1990), pp. 169-70.) The date seems to have been invented, for calendar convenience: 2287 is 1860 years before 427 BCE, the first year of "jiyou bu" in the Yin Li scheme, used elsewhere by Warring States *Annals* editors, e.g., in deriving the day-date for the Zhong Kang eclipse.  $1860 = 31 \times 60$ ; every 31 years the *ganzhi* of first days of lunar months are repeated; and every 60 years the *ganzhi* for the first day of the year advances 12 (obviously these figures can only be approximate). So I must conjecture that this earliest chronology was formulated when 427 BCE could be conceived as a base date.

The next stage may be the work of Zhou or Lu oriented specialists a generation later: Yao 1 was made to be 1000 years before the supposed recognition of Dan Fu as Duke of Zhou by the Shang king (the date 1145 is shifted back 12 years in the present text), which in turn was supposed to be 100 years before the Zhou conquest of Shang, calculated in Lu-Zhou circles around 400 BCE to have been in 1045 BCE. This change required inserting material in the *Annals* to push the date, 2026, back 119 years to 2145 (shown in bold in column (b)). When this was done, 2287 became Zhuan Xu 13, and was saved as a calendar base by inventing the entry in that year of the promulgation of the calendar.

In column (a), mourning intervals disappear, and with them the date 2287. The death of Zhuan Xu becomes 2218; and *Zuo zhuan*, Zhao 8, says that in the year of his death Jupiter was in Chun Huo. This implies a calculation, assuming a 12-year period of Jupiter, based on observation in some year between 400 and 330; e.g., Jupiter was in Chun Huo in 370. Two dates, however, reveal the hands of Wei editors in the late fourth century BCE: 2353, the date in the present text of an elaborate sacrifice by Huang Di (set off by a long Warring States commentary) in his 50<sup>th</sup> year, is 100 *zhang* (19-year intercalation cycles in the Yin Li) before the year 453, the date of the decisive battle that established Wei as an independent state. 2104 is more complicated: The actual date of the Zhou-heralding conjunction was early summer, 1059; and the actual date of the Shang-heralding planet formation was early winter, 1576, an interval of 516 1/2 years. The interval has been obscured by the moving of both dates in the present *Annals*; but in any case these were signs of Heaven's authentication of Shang and of Zhou; what about Wei? In the hands of Wei editors, the Zhou conjunction had moved back to 1071, with Wei import (being 300 years before 771). Doubling the interval, to 1033 years before 1071, i.e., to 2104, now Yao 42, one might hope to find a sign that the future rise of Wei had been heralded in the stars. The entry at Yao 42 reads "a brilliant stellar display (*jing xing*) was seen in constellation Yi." The line is plucked from the long commentary after

the entry for Yao 70 (= 2076, 500 years before the actual date of the Shang-heralding *cuo xing* display), which goes on also to describe a supposed conjunction. (Thus, these long myth-laden commentaries seem to belong to the Warring States text of the *Annals*.)

The Xia dates show that 1589, the first year of "Di Gui," must earlier have been a (fictive) date for the beginning of Shang: column (b) makes Xia exactly 200 + 200 years, starting with the *de jure* first year; the true dates suggest this, by exhibiting Xia as 200 + 199 years, from the *de facto* first year. The 40-year interregnum after Xiang of Xia in the *Annals* is a Warring States insertion, being part of the reworking of the chronology to get Yao 1 back to 2145. Another part was to make Yao's reign 100 years rather than 58 years.

Yet another was the editing that pushed the first year of Shang back from 1554 to 1589. This was done by eliminating overlaps in Shang reigns: 16 + 11 years' worth, in the chronicle after Wu Ding; four years more, to make Pan Geng 28 years rather than 24; and four years to make Zhong Ren precede Tai Jia. The following table for Shang to Wu Ding shows details of this process. Columns numbered (1), (2), (3), show the following:

(1) Treating Wai Bing's 2 years as the whole of the mourning for Tang made Tai Wu's first year exactly 100 years after the first year of the Founder, and lengthened the Tai Wu reign to 61 years. (The *Annals'* chronicle for Tai Wu dates the last event in his reign short of his death to his 61<sup>st</sup> year: "the 9 *yi* tribes of the east came to offer service.")

(2) Elimination of overlaps raised the first year of Shang to 1589, and made the *cuo xing* planet display five years before Tang 1 rather than the preceding year, since Tang 1 had to be kept just 100 years before Tai Wu 1. But this caused Tang 1 to be 1031 years before the first year of Duke Ping of Song rather than exactly 1000 years; and it left no way to see the beginning of Zhou as being 496 years after the beginning of Shang.

(3) Eventually this led to moving Tang 1 and Tai Wu 1 down 31 years, Di Gui then being invented to fill the gap. At the same time, mourning intervals were eliminated, creating a 12-year gap before Tai Wu, filled by making Yong Ji precede him; and lengthening Tai Wu's reign by (Yong Ji's) 2 + 12 years to 75 years. Note that the total of mourning years for reigns 10 through 22 is 31, exactly matching the Di Gui reign.

The "true dates" are dictated by *Annals* reign lengths and by *gan* data (see 7.4). (In a few cases the selected first day of a month is one day earlier or later than Zhang Peiyu's date, but long-short regularization could justify this. On the one year mourning interval in the reign of Wai Ren, see p. 44.) This reconstruction requires assuming that Tai Wu, if he was the son of Xiao Geng, lived to be over eighty; it also requires questioning whether Yong Ji was Tai Wu's brother; perhaps Yong Ji was the son of Xiao Jia, and Tai Wu's cousin. In any case, he was in Tai Wu's generation but was not a "main sequence" king.

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Shang Date Shifts, from True Dates to Annals Dates

King	True Dates	Length	(1)	(2)	(3)
"Di Gui" (31)					+31 1589
cuo xing	1576		1576	+35 1611	-31 1580
1. Tang 1	1575		1575	+31 1606	-31 1575
Shang 1	1554		1554	+35 1589	-31 1558
Mourning	1542-40	(3)	---		
2. Wai Bing	1541-40	(2)	+1 1542-41	+35 1577-76	-31 1546-45
3. Zhong Ren	1539-36	(4)	+1 1540-37	+31+4 1575-72	-31 1544-41
4. Tai Jia	1539-28	(12)	+1 1540-29	+31 1571-60	-31 1540-29
5. Wo Ding	1527/24-06	(3+19)	+1 1528/25-07	+31 1559/56-38	-31+3 1528-10
6. Xiao Geng	1505/02-98	(3+5)	+1 1506/03-99	+31 1537/34-30	-28+3 1509-05
7. Xiao Jia	1497/94-78	(3+17)	+1 1498/95-79	+31 1529/26-10	-25+3 1504-88
Yong Ji				(3+3+3, +3=12, inserted)	1487-76
8. Tai Wu	1477/74-15	(3+60) *	+1 1478/75-15 +0 (=3+60+1)	+31 1509/06-46 (-3; 60+1, +2+12, =75)	-31 1475 -01
9. Yong Ji	1414/12-01	(2+12)		+31 1445/43-32	(2+12 deleted)
10. Zhong Ding	1400/97-89	(3+9)		+31 1431/28-20	-31+3 1400-92
11. Wai Ren	1388/87-78	(1+10) *		+31 1419/18-09	-28+1 1391-82
12. Hedan Jia	1377/74-66	(3+9)		+31 1408/05-97	-27+3 1381-73
13. Zu Yi	1365/63-45	(2+19)		+31 1396/94-76	-24+2 1372-54
14. Zu Xin	1344/41-28	(3+14)		+31 1375/72-59	-22+3 1353-40
15. Kai Jia	1327/24-20	(3+5)		+31 1358/55-51	-19+3 1339-35
16. Zu Ding	1319/16-08	(3+9)		+31 1350/47-39	-16+3 1334-26
17. Nan Geng	1307/04-99	(3+6)		+31 1338/35-30	-13+3 1325-20
18. Yang Jia	1298/96-93	(2+4)		+31 1329/27-24	-10+2 1319-16
19. Pan Geng	1292 -69	(24) *		+27+4 1323 +27 -96	(28) -8 1315-88
20. Xiao Xin	1268/66-64	(2+3)		+27 1295/93-91	-8+2 1287-85
21. Xiao Yi	1263/60-51	(3+10)		+27 1290/87-78	-6+3 1284-75
22. Wu Ding	1250/47-89	(3+59)		+16+11 1277/74-16	-3+3 1274-16

#### Appendix 4: Other Conquest Dates Explained

In other chronologies one must focus on dates for the Zhou conquest of Shang, the problem that has always received most attention. The true date, I have argued (4.3-4.3.2), is 1040. Very early (perhaps before 400 BCE), interest in Zhou Gong and puzzling over apparent date contradictions led to supposing that the seven-year regency preceded Cheng Wang's 30-year reign, putting the conquest date back five years to 1045. There are the *Bamboo Annals* dates, 1050 and 1051 BCE; and the Yin Li date, 1070, already partly explained (4.1, 4.3.1, 5.2, 7.8.2).<sup>15</sup>

Liu Xin's date, 1122, was based on at least three false beliefs: (1) that Jupiter's movement was 145 stations in 144 years; (2) that Jupiter was in Chun Huo at the time of the conquest; and (3) that the term *po* meant the unlit part of the moon, and therefore that the conquest day *ji*azi, four days after *jisipo*, must be soon after the beginning of the month rather than shortly before the end of it. The false 144:145 ratio would have been believed by a person accepting the *Annals* and observing the position of Jupiter in 315 BCE, for in that year the 12-year rule would have told one that Jupiter ought to be in Da Huo -- the *Annals* having implied that this was the planet's position in 1035 when the first lord of Jin was appointed; actually Jupiter was five stations further on in 315 BCE:  $(1035 - 315) + 5 = (5 \times 144) + 5 = 5 \times 145$ . It is likely that this is the origin of Liu's mistake (indirect; for he didn't have access to the *Annals*). The *Annals* too implies that Jupiter was in Chun Huo at the time of the conquest; so this belief is older than the *Annals*. Liu's source for it was the *Guo yu*: "Zhou Yu" 3.7 contains a list of celestial locations at the time Wu Wang's campaign started, beginning with the statement that Jupiter was in Chun Huo (astrologically due south). The campaign actually began in mid-winter of 1040 (late 1041 in the Xia calendar), when Jupiter was astrologically due north, in Xu (see Pankenier 1983, p. 241).<sup>16</sup> This tells us that the *Guo yu* text is the product of a computation by an observer in the late sixth or early fifth century (knowing the correct conquest date, but using the 12-year rule: argued in Nivison 1992).

Another aspect of Liu's theory was that the conquest was in the 13<sup>th</sup> year of the Mandate, since it was known that the first year was a Chun Huo year. This error was implied by his other beliefs, but he probably thought he had independent reasons for it, and I have seen no explanation for this misconception. It needs an explanation, because it has continued to be, independently, influential with other scholars, even modern ones, who have argued for other dates.

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<sup>15</sup> If (as suggested in 4.3.1 and argued in Appendix 8) 1035 -- as the date of Tang-shu's appointment in a Da Huo year -- was picked by Wei adapters of the *Annals* to validate Huicheng's claim of kingship in 335, this dictated 1050 as a Chun Huo year, hence the year of the conquest; and would also require 1071 for the conjunction, in Fang, the middle lodge of Da Huo.

<sup>16</sup> Pankenier cites Yang Liang's commentary to *Xunzi*, 8, "Ru Xiao" (p. 85 in Wang Xianqian, *Xunzi jijie* (Shijie shuju: *Zhu zi ji cheng*): "Shi Zi says, 'When Wu Wang attacked Zhou [Xin], Yu Xin remonstrated saying, 'When Jupiter is in the north, one does not attack northward.' Wu Wang did not follow [the advice].'" Pankenier himself does not accept this account, preferring to see the *Guo yu* text as valid. In an article in *Guwenzi Yanjiu* 12 (1985) I rejected the *Guo yu* data, rightly, but I was wrong at that time in analyzing the text as a late insertion in the *Guo yu*. Nivison 1992 corrects these errors of mine.

This error can be traced to an early Han calendar convention, followed uncritically in the *Shiji*, in turn used by Liu. The convention was to use the names of the months in the Xia calendar for dates in any calendar. E.g., if the civil year began with the first month of winter, it began "in the 10th month," since in the Xia calendar the winter solstice month was the "11<sup>th</sup> month." This led the *Shiji* authors to understand "11<sup>th</sup> year 12<sup>th</sup> month," given them as the date when the Zhou armies got across the Yellow River, to mean the *first* month of the 11<sup>th</sup> year, assuming that this "11<sup>th</sup> year" was a time when a calendar was in use that began the year with the post-solstice month, i.e., the "12<sup>th</sup> month." Liu accepted this usage too, but differed with the *Shiji* on another point: The *Shiji*, "Zhou Benji," seems to say (unlike the *shijia* chapters) that the date of the conquest battle was counted from the year when Wen Wang (deceased) had been first recognized as king; and it explicitly says that Wen Wang died in the seventh year counting from the recognition year. Evidence was available to Liu (e.g., *Yi Zhou shu* 25, "Wen Zhuan") that Wen Wang was still alive in the "9<sup>th</sup> year" of the "Mandate"; and Liu assumed that Wen died then. I have shown that Wen Wang had promulgated a calendar in 1056, the third Mandate year; so both dates, 7<sup>th</sup> year and 9<sup>th</sup> year, are correct. But probably no one in early Han knew of this, or its archaic institutional basis. Therefore Liu assumed that the *Shiji*'s "11<sup>th</sup> year" for the conquest was a mistake for "13<sup>th</sup> year." This compound of errors was based on yet another, that the conquest year was a "12<sup>th</sup> year" rather than a "17<sup>th</sup> year," as I argued in 5 and 5.1. (See *Han shu* 21B53b-54a, with Wang Xianqian's comment; and *Shiji* 4 "Zhou Benji," 7a-9a.)

Finally, a date widely accepted now, apparently with a secure text basis, is 1027 BCE. (I pass over others, most of them modern speculation; altogether there are over forty dates that have been proposed and defended.) The source is the Six Dynasties historian Pei Yin, who is quoted as having quoted the *Bamboo Annals* as saying that "from Wu Wang to You Wang was 257 years." Pei is obviously offering this quote as stating the length of Western Zhou; so his meaning is "from the first year of Wu Wang" (presumably the year of the conquest) to the last year of You Wang (771, inclusive) was 257 years. What is not noticed is that Pei Yin shows elsewhere that *he never had a copy of the Bamboo Annals in his own hands*; for he tells us (*Shiji jijie* after death of Wei king Xiang in "Wei Shijia," *Shiji* 44.10a) that "Xun Xu says that He Qiao said that the *Annals* begins with Huang Di and ends with 'the present king' of Wei" (Xun and He were Jin court scholars working on the *Annals* after its recovery ca. 280 CE). (see Nivison in *EC* 15 p. 171 n. 12.) One must conclude that Pei's statement about the length of Western Zhou reflects his interpretation of someone else's quotation from the *Annals*. The *Annals* text quoted has to have been the end-of-Zhou summary. This is what the summary says:

When Wu Wang destroyed Yin, *the year-star was in gengyin (27)*; in 24 years, *the year-star being in jiayin (51)*, the cauldrons (of Xia, then Shang, now Zhou) were deposited in the city of Luo. To You Wang was 257 years. The total was 281 years. From Wu Wang, *first year jimao (16)*, to You Wang, *gengwu (07)*, was 292 years.

The italicized phrases, containing *ganzhi* for years, could not have been in the original; when they are deleted, exactly 40 characters remain, i.e., one slip's worth; so this remaining text seems authentic. Apparently the quotation that Pei Yin saw contained only the first two sentences, without the totals that follow. But without these totals, the text is ambiguous: It could (and does) mean, "24 years after Wu Wang destroyed Yin, the cauldrons were deposited in Luo; from then until (the end of the reign of) You Wang was 257 years." But Pei -- fairly enough, if this is all he saw -- took it to mean, "... (from Wu Wang) to You Wang was 257 years." The right meaning is the only possible interpretation consistent with the rest of the *Annals*, as anyone who accepts the *Annals* as authentic will see at once. So the 1027 hypothesis belongs to the point of view that holds the *Annals* to be fake. That view is no longer tenable; neither is the date 1027.

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For more proposed dates of the Zhou conquest of Shang, see the systematic collection of this scholarship by Beijing Shifan Daxue, Guoxue Yanjiusuo (as in Nivison 1997). Their publication includes 57 articles, on 36 dates. The "brief" bibliography, pp. 687-690, lists studies (modern and ancient) on 44 different proposed dates. Over 100 studies are listed there, by over 75 scholars, most of them Chinese, but including also the most important American, Japanese and European scholars who have worked on this problem. My own article for 1040 in this collection is a translation, by Stanford graduate student Zhou Ping, of the chapter on the Zhou conquest of Shang in my unpublished book *The Riddle of the Bamboo Annals*.

I note with interest that the date I defend, 1040 BCE, was also proposed a few months before I had first proposed it, by Zhou Wenkang. (Zhou's argument is briefer, and somewhat different.) Further, Professor D. N. Keightley (see Keightley 1978, p. 175) had actually conjectured not just 1041, but 1041 or 1040, on the basis of average reign lengths between Wu Ding of Shang and the Gong He Regency in 841 BCE. I continue to be confident that the date 1040 BCE will gain general acceptance.

Appendix 5: Chronology, Huang Di through Western Zhou

Name of ruler	<i>Annals</i> (= implied)	(with mourning)	Correct [= legendary]
Huang Di	(2402, 100 yrs)	(2406)	[2287-2188, 100]
Zuo Che inter- regnum	(2302, 7)	(2306)	[2187-2181, 7]
Zhuan Xu	(2295, 78)	(2299)	[2180-2103, 78]
ZX 13: calendar promulgated		(2287)	

(The *Annals* chronology was expanded backward to make Yao's 1<sup>st</sup> year the numerologically significant date 2145. 2287, which had been 1<sup>st</sup> year of the entire chronology, was then retained as 1<sup>st</sup> year of the "Zhuan Xu calendar." "2287" disappears when mourning intervals are dropped)

(mourning)		(2221-20, 2)	[2102-2101, 2]
Di Ku	(2217, 63)	(2219)	[2100-2038, 63]
(mourning)		(2156-55, 2)	2037-2036, 2
Zhi	(2154, 9)		2035-2027, 9
Yao	2145-2046, 100 years		2026-1969, 58
Yao imprisoned			1968-1960, 9
(mourning)	2045-2043, 3		
(mourning; calendar suspended)			1959-1958, 2
Shun	2042-1993, 50 years		1968-60, 1957-35
(mourning)	1992-1990, 3		
(mourning, calendar suspended)			1934-1933, 2

It is possible that Shun's 50-year reign in the *Annals* is valid. This would put his death in 1917, 1916-15 being mourning, and 1914 being Yu 1 *de jure*. For the reasons for supposing 1935 as death date (if Shun is historical at all), see Nivison and Pang in *Early China* 15 (1990) p. 95: in part:

It may be that Shun actually died in 1935, his thirty-second year, when the *Annals* record reads that he "ascended the mountains on the (four) sides (of the realm)," *zhi fang yue* 陟方岳, for the word *zhi* 陟 in the *Annals* always means "died" (said of a ruler).

In the following table for Xia, I use this idea; for if Yao's supposed reign of 100 years is obviously hagiography, one must suspect the same for Shun's 50 years; so perhaps the words "*fang yue*" were added after "*zhi*" just to let Shun have a reign worthy of a sage. The problem should not be allowed to affect subsequent absolute dates for Xia kings; if one supposes that Shun died in 1935, one must simply give Yu 26 years rather than 8.

(In the following tables, *Annals* dates are at left, corrected dates at right.)

### Xia Dynasty

1.	Yu	(de facto) 2029-	(Shun, year 14)	1953, conjunction
	(mourning			
	for Shun)	1992-1990,	3 years	1934-1933, 2
	Yu			
	(de jure) 1989-1982,	8		1932-1907, 26
	(mourning) 1981-1979,	3		1906-1905, 2
2.	Qi	1978-1963,	16	1904-1889, 16
	(mourning) 1962-1959,	4		1888-1887, 2
3.	Tai Kang	1958-1855,	4	1886-1883, 4
	(mourning) 1954-1953,	2		1882-1881, 2
4.	Zhong Kang	1952-1946,	7	1880-1874, 7
	ZK 5, eclipse, 1948			1876, eclipse
	(mourning) 1945-1944,	2		1873-1872, 2
5.	Xiang	1943-1916,	28	1871-1844, 28
	(usurpation) 1915-1876,	40 (fictional)		
	(mourning)	0		1843-1842, 2
6.	Shao Kang	1875-1855,	21	1841-1821, 21
	(mourning) 1854-1853,	2		1820-1819, 2
7.	Zhu	1852-1836,	17	1818-1802, 17
	(mourning) 1835-1834,	2		1801-1800, 2
8.	Fen	1833-1790,	44	1799-1756, 44
	(mourning) (none)	0		1755-1754, 2
9.	Mang	1789-1732,	58	1753-1696, 58
	(mourning) 1731,	1		1695-1694, 2
10.	Xie	1730-1706,	25	1693-1669, 25
	(mourning) 1705-1703,	3		1668-1667, 2
11.	Bu Jiang	1702-1644,	59	1666-1608, 59
	(retires; dies Qiong 10,	no calendar break)		
12.	Qiong	1643-1626,	18	1607-1590, 18
	(mourning) 1625-1623,	3		1589-1588, 2
13.	Jin	1622-1615,	8	1587-1580, 8
	(mourning) 1614-1613,	2		1579-1578, 2
14.	Kong Jia	1612-1604,	9	1577-1569, 9
	(mourning) 1603-1602,	2		1568-1567, 2
15.	Hao	1601-1599,	3	1566-1564, 3
	(mourning) 1598-1597,	2		1563-1562, 2
16.	Fa	1596-1590,	7	1561-1555, 7
	(no interregnum)	0		
17.	Di Gui	1589-1559,	31 (imaginary)	

(See 6 through 6.4.2 for confirmations of dates at right: A conjunction in 1953 fixes Shun 14. Assuming mourning intervals of two years gives 16 Oct 1876 as eclipse date, which is correct; and gives 17 Feb 1577, jiazi, as first day of Kong Jia, explaining his name; and the actual first year of Shang was 1554, Di Gui being fictional (see 6.3.1.1).)



## Shang Dynasty

Planet display	1580	1576
Tang, year 1	1575	1575
Conquers Xia	1559	1555
1. Tang (Mourning)	1558-1547, 12 years	1554-1543, 12 1542-1540, 3
2. Wai Bing	1546-1545, 2	1541-1540, 2
3. Zhong Ren	1544-1541, 4	1542/1539-1536, 3+4
4. Tai Jia	1540-1529, 12	1542/1539-1528, 3+12
Yi Yin usurpation	1540-1534, 7	1542-1536, 7
Yi Yin killed	1534	1536

(The *Annals* says that Yi Yin actually made himself king. I think that he was trying to do this, but got no farther than setting up Wai Bing and Zhong Ren as his puppets, while he had Tai Jia in detention; that is probably why those two are omitted in some chronologies.) (Below, \* marks a major emendation.)

5. Wo Ding	1528-1510, 19 years	1527/1524-1506, 3+19
6. Xiao Geng	1509-1505, 5	1505/1502-1498, 3+5
7. Xiao Jia	1504-1488, 17	1497/1494-1478, 3+17
8. Tai Wu	1475-1401, 75	1477/1474-1415, 3+60*
9. Yong Ji	1487-1476, 12	1414/1412-1401, 2+12
10. Zhong Ding	1400-1392, 9	1400/1397-1389, 3+9
11. Wai Ren	1391-1382, 10	1388/1387-1378, 1+10
12. Hedan Jia	1381-1373, 9	1377/1374-1366, 3+9
13. Zu Yi	1372-1354, 19	1365/1363-1345, 2+19
14. Zu Xin	1353-1340, 14	1344/1341-1328, 3+14
15. Kai Jia	1339-1335, 5	1327/1324-1320, 3+5
16. Zu Ding	1334-1326, 9	1319/1316-1308, 3+9
17. Nan Geng	1325-1320, 6	1307/1304-1299, 3+6
18. Yang Jia	1319-1316, 4	1298/1296-1293, 2+4
19. Pan Geng	1315-1288, 28	1292-1269, 24*
20. Xiao Xin	1287-1285, 3	1268/1266-1264, 2+3
21. Xiao Yi	1284-1275, 10	1263/1260-1251, 3+10
22. Wu Ding	1274-1216, 59	1250/1247-1189, 3+59
23. Zu Geng	1215-1205, 11	1188/1185-1178, 3+8
24. Zu Jia	1204-1172, 33	1177/1175-1156, 2+20*
25. Feng Xin	1171-1168, 4	[1175-1172, 4]
26. Kang Ding	1167-1160, 8	[1171-1156], 1155/1153-1146, 2+8
27. Wu Yi	1159-1125, 35	1145/1143-1109, 2+35
28. Wenwu Ding	1124-1112, 13	1118-1108/1106, 10+3
29. Di Yi	1111-1103, 9	1105-1087, 19* [-1069, 37]



### Western Zhou Dynasty

Wen Wang	1113-1062, 52 years	1101/1099-1050, 2+50
Conjunction	1071	1059
Mandate	1070	1058
Royal calendar		1056
1. Wu Wang	1061-1045, 17	1049-1038, 12
Conquest	1050 (year 12)	1040 (year 17 from 1056)

(The "Royal Calendar" was re-identified as the calendar of of Wu Wang, perhaps in mid 5<sup>th</sup> century BCE; 1041 was miscalculated as a Chun Huo year, making 1065 the Mandate year and 1057 the year of Wen's death (argued in Nivison 1992). It then seemed that Wu Wang, with a 12-year reign, conquered in year 17. The anomaly was resolved by shifting Zhou Gong's Regency back five years (making it the 7 years preceding Cheng Wang's 30), and transposing a slip from Cheng Wang's chronicle to the end of Wu Wang's (as discovered by Shaughnessy) to give Wu Wang three more years of life. The effect was to switch "12" and "17.")

Wu as king	1050-1045, 6	1040-1038, 3
2. Cheng Wang	1044-1008, 7+30	1037/1035-1006, 2+30
Zhou Gong Regency	1044-1038, 7	1037-1031, 7
3. Kang Wang	1007-982, 26	1005/1003-978, 2+26
4. Zhao Wang	981-963, 19	977/75-957, 2+19
5. Mu Wang	962-908, 55	956/954-918, 2+37
6. Gong Wang	907-896, 12	917/915-900, 2+16
7. Yih Wang	895-871, 25	899/897-873, 2+25
8. Xiao Wang	870-862, 9	872-868, 5

(Li Wang was born in 864, and Yi Wang's lack of an heir before that time was probably the justification for Xiao Wang's usurpation. So Xiao Wang's claimed tenure probably continued through 864, and this gave him 9 years in effect. Yi Wang's father Yih Wang may have been in forced retirement, living to 868.)

9. Yi Wang	861-854, 8	867/865-860, 2+6
10. Li Wang	853-842, 12	859/857-828, 2+30
Gong He Regency,	841-828, 14 years	841-828, 14
11. Xuan Wang	827-782, 46	827/825-784, 2+42
12. You Wang	781-771, 11	783/781-771, 2+11

(Received dates for Xuan and You are 827-782 and 781-771. See 8.5 for the reasons for this correction.)

Appendix 6: Dated Western Zhou Bronze Inscriptions; Lunar "Quarters"

('25 8 C(21)' means '25<sup>th</sup> year, 8<sup>th</sup> month, 3<sup>rd</sup> quarter, *jiashen* (21)'; '979zr' means the year 979, assumed to begin with the *zi* month (winter solstice month), and to contain an intercalary (*run*) month. ('h' = '*hai*,' pre-solstice month; 'c' = '*chou*,' post-solstice month.) '9(07)' means '9<sup>th</sup> month (counting from the solstice month), first day *gengwu* (07).') (Shaughnessy (1991) and I agree on almost three-fourths of these datings.)

Bronze vessel	Date given	Reign	Yuan	Year	Month( <i>gan</i> )	Day
1. Xiao Yu <i>ding</i>	25 8 C(21)	Kang	1003	979zr	9(07)	15
2. Shi Ju <i>gui</i>	3 4 B(58)	Mu	956	954z	4(44)	15
3. Geng Ying <i>ding</i>	22 4 C(46)	Mu	956	935z	4(24)	23
4. Qiu Wei <i>gui</i>	27 3 B(35)	Mu	956	930z	3(26)	10
5. Xian <i>gui</i>	34 5 C(55)	Mu	954	921z	5(32)	24
6. Qiu Wei <i>he</i>	3 3 B(39)	Gong	917	915c	4(27)	13
7. Qiu Wei <i>ding</i> I	5 1 A(47)	Gong	917	913c	2(47)	1
8. Qi Sheng Lu <i>yi</i>	8 12 A(24)	Gong	917	910c	909.1(24)	1
9. Qiu Wei <i>ding</i> II	9 1 D(17)	Gong	917	909c	2(53)	25
10. Zou <i>gui</i>	12 3 C(27)	Gong	917	906c	4(05)	23
11. Jue Cao <i>ding</i> II	15 5 B(19)	Gong	915	901z	5(06)	14
12. Shi Hu <i>gui</i>	1 6 C(11)	Yih	899	899z	6(53)	19
13. Hu <i>ding</i>	1 6 C(12)	Yih	899	899z	6(53)	20
14. Wu <i>fangyi</i>	2 2 A(24)	Yih	899	898c	3(19)	6
15. Yi <i>zhi</i>	2 3 A(52)	Yih	899	898c	4(49)	4
16. Da Shi Ce <i>gui</i>	12 1 C(31)	Yih	897	886z	1(11)	21
17. Wang <i>gui</i>	13 6 A(35)	Yih	897	885h	5(33)	3
18. Mu <i>gui</i>	7 13 B(51)	Xiao	872	866h	12(39)	13
19. Shi Yu <i>gui</i>	3 3 A(11)	Yi	867	865z	3(8)	4
20. Shi Chen <i>ding</i>	3 3 A(11)	Yi	867	865z	3(8)	4
21. Shi Shi <i>gui</i> I	1 4 B(51)	Yi	865	865z	4(37)	15
22. Jian <i>gui</i>	5 3 A(27)	Yi	867	863z	3(26)	2
23. Xing <i>xu</i>	4 2 B(35)	Yi	865	862h	1(22)	14
24. San Ji <i>gui</i>	4 8 A(24)	Yi	865	862h	7(18)	7
25. Shi Shi <i>gui</i> II	5 9 B(1)	Yi	865	861h	8(11)	9
26. Bo Shi Fu <i>ding</i>	6 8 A(6)	Yi	865	860z	8(06)	1
27. Wang Chen <i>gui</i>	2 3 A(27)	Li	859	858c	4(27)	1
28. Shi Dui <i>gui</i> I	1 5 A(51)	Li	857	857cr	7(50)	2
29. Shi Fu Fu <i>xu</i>	1 6 A(24)	Li	857	857cr	8(19)	6
30. Shi Li <i>gui</i>	11 9 A(24)	Li	857	847c	10(20)	5
31. Da <i>gui</i>	12 3 B(24)	Li	857	846c	4(17)	8
32. Da <i>ding</i>	15 3 D(24)	Li	857	843z	3(60)	25
33. Shi Dui <i>gui</i> II	3 2 A(24)	Li	844	842c	3(24)	1
34. Shi Hui <i>gui</i>	1 1 A(24)	Gong He	841	841y	3(19)	6
35. Ni <i>zhong</i>	1 3 B(57)	Gong He	841	841c	4(48)	10
36. Yi <i>gui</i>	27 1 C(24)	Li	859	833z	1(03)	22

37. Wuji <i>gui</i>	13 1A(39)	Gong He	841 829z	1(39)	1
38. Ge You Cong <i>ding</i>	31 3A(29)	Li	857 827z	3(27)	3
39. Ke xu	18 12 A(27)	Li	844 827z	12(22)	6
40. Bo Ke hu	16 7B(32)	Gong He	841 826c	8(18)	15
41. Song <i>ding</i>	3 5 D(11)	Xuan	827 825z	5(44)	28
42. Xi Jia <i>pan</i>	5 3 D(27)	Xuan	827 823z	3(03)	25
43. Guoji Zibo <i>pan</i>	12 1A(24)	Xuan	827 816z	1(24)	1
44. Xing hu	13 9 A(15)	Xuan	827 815h	8(15)	1
45. Ke Zhong	16 9 A(27)	Xuan	827 812h	8(27)	1
46. Zou <i>ding</i>	19 4 C(28)	Xuan	827 809h	3(13)	16
47. Ci <i>ding</i>	17 12 B(52)	Xuan	825 809z	12(39)	14
48. Xiu <i>pan</i>	20 1 C(11)	Xuan	825 806c	2(56)	16
49. Bo Ju Sheng hu	26 10A(16)	Xuan	825 800y	12(16)	1
50. Huan <i>pan</i>	28 5 C(27)	Xuan	825 798y	7(07)	21
51. Bo Kui Fu xu	33 8 D(28)	Xuan	825 793y	10(06)	23
52. Shanfu Shan <i>ding</i>	37 1A(47)	Xuan	825 789y	3(47)	1
53. Shi Hung <i>gui</i>	1 2 C(27)	You	783 783c	3(12)	16
54. Shi Mou <i>gui</i>	1 9 C(24)	You	783 783cr	11(08)	17
55. X <i>gui</i>	2 1 A(24)	You	781 780c	2(24)	1
56. Zha zhong	3 4 A(51)	You	781 779c	5(48)	4

1. In 979 there ought to be an intercalary 6<sup>th</sup> month in the *zi* calendar.

23. The shift from a year beginning with the *zi* month to a following year beginning with the *hai* month, though 863 was not a 13-month year, is perhaps explainable by the shift from 867 as *yuan* to 865 as *yuan*. When 865 was taken as base for the calendar, the intercalation due (and actually made) in 865 was ignored.

33. The *shuo* was actually at 01:32 on the next day, *wuzi* (25).

34. At the beginning of a new order, confusion: so the popular calendar is used, although it is not official. The expected *chou*-year calendar is used later. The confusion continues, every available calendar being used in the next 15 years.

38-40. Xuan Wang's *de jure* succession was 827. But Gong He at the capital I assume did not leave his post at once, the deceased Li Wang had been far away, and the supporters of his son probably moved slowly and carefully. Therefore it is reasonable to suppose Li Wang calendars still being used in 827. The Bo Ke hu, which I date to 826, appears to be addressed to Gong He, still functioning as head of state; the maker acknowledges his gratitude to "the friendship of *tian you wang bo*," i.e., to "the lord functioning as king, assisted by Heaven."

45. 8.1 = (28) (*shuo* 06:44). Long-short regularization calls for (27).

47. Change from *hai* as first month to *zi* as first month between the Zou *ding* and the Ci *ding* is caused by the change from 827 as *yuan* to 825 as *yuan*. Assume an intercalation effecting this change, after month 3 (= "4") and before month 12.

51. In 793, 10.1 = (07), syzygy 00:21; interpret as (06) (allowed by regularization). I have assumed that the 23<sup>rd</sup> is in *jiwang*. This inscription may be carelessly irregular (*jisipo* is carelessly inscribed as simply "*jisī*").

54. Assume an intercalation between month 3 and month 11. (783z was a 13-month year. If by this time the *qi* calendar was based on an accurate determination of the solstice, the 5<sup>th</sup> month would be intercalary.)

55. 780c, 2<sup>nd</sup> month first day = (25); regularization allows (24), forced here by *chuji dinghai* being especially auspicious.

The following table gives characters for dated Western Zhou inscriptions, as numbered:

1. 小孟鼎	15 趯解	29 叔尊父鬲	43 虢季子白盤
2 師遽殷	16 大師盧殷	30 師釐殷	44 癩壺
3 庚賁鼎	17 望殷	31 大殷	45 克鐘
4 裘衛殷	18 牧殷	32 大鼎	46 趨鼎
5 鮮殷	19 師鯨殷	33 師克殷, II	47 此鼎
6 裘衛盃	20 師晨鼎	34 師毀殷	48 休盤
7 裘衛鼎, I	21 師旂殷, I	35 逆鐘	49 番匊生壺
8 齊生魯彝	22 諫殷	36 伊殷	50 寰盤
9 裘衛鼎, II	23 癩鬲	37 無異殷	51 伯寬父鬲
10 走殷	24 散季殷	38 鬲攸从鼎	52 善夫山鼎
11 趙曹鼎, II	25 師旂殷, II	39 克鬲	53 師匄殷
12 師虎殷	26 伯碩父鼎	40 伯克壺	54 師鼎殷
13 留鼎	27 王臣殷	41 頌鼎	55 鄒殷
14 吳方彝	28 師克殷, I	42 兮甲盤	56 柞鐘

As a guide to the use of lunar phase terms denoting lunar "quarters" in inscription dates, I offer here a tentative analysis of the similar but more complex system used in accounts of the Zhou conquest campaign, which I date to Xia months 11 to 4, 23 December 1041 through 17 June 1040. F = *fei*; ZSh = *zaishengpo*; JSh = *jishengpo*; PSh = *pangshengpo*; DZ = Dong Zhi (winter solstice); JPSH = *jipangshengpo*; CF = Chun Fen (spring equinox); JW = *jiwang*; Jsi = *jisipo*; Psi = *pangsipo*; LC = Li Chun (beginning of spring); LX = Li Xia (beginning of summer).<sup>17</sup> First days of *qi* periods are underlined, the Muye victory being on Qing Ming Day.

	Month 11	Month 12	Month 1	Month 2	Month 3	Month 4
1	(05) 23 Dec	(34) 21 Jan	(04) 20 Feb	(33) 21 Mar	(03) 20 Apr	(32) 19 May
2	(06) F	(35)	(05) F	(34)	(04) F	(33)
3	(07)	(36) F	(06)	(35) F	(05)	(34) F
4	(08)	(37)	(07)	(36)	(06)	(35)
5	(09)	(38)	(08)	(37)	(07)	(36)
6	(10) ZSh	(39)	(09) ZSh	(38)	(08) ZSh	(37)
7	(11) JSh	(40) ZSh	(10) JSh	(39) ZSh	(09) JSh	(38) ZSh
8	(12)	(41) JSh	(11)	(40) JSh	(10)	(39) JSh
9	(13) PSh	(42)	(12) PSh	(41)	(11) PSh	(40)
10	(14) DZ	(43) PSh	(13)	(42) PSh	(12)	(41) PSh
11	(15)	(44) JPSH	(14)	(43) JPSH	(13)	(42) JPSH 1
12	(16)	(45)	(15)	(44)	(14)	(43) 2
13	(17)	(46)	(16)	(45) CF	(15)	(44) 3
14	(18)	(47)	(17)	(46)	(16)	(45) 4
15	(19) JW	(48)	(18) JW	(47)	(17) JW	(46) 5
16	(20)	(49) JW	(19)	(48) JW	(18)	(47) JW 6
17	(21)	(50)	(20)	(49)	(19)	(48)
18	(22)	(51)	(21)	(50)	(20)	(49)
19	(23)	(52)	(22)	(51)	(21)	(50)
20	(24)	(53)	(23)	(52)	(22)	(51)
21	(25)	(54)	(24)	(53)	(23)	(52)
22	(26)	(55)	(25)	(54)	(24)	(53)
23	(27)	(56)	(26)	(55)	(25)	(54)
24	(28) JSi	(57)	(27) JSi	(56)	(26) JSi	(55)
25	(29) Psi	(58) JSi	(28) Psi	(57) JSi 1	(27) Psi	(56) JSi
26	(30) Start	(59)	(29)	(58) 2	(28)	(57)
27	(31)	(60) LC	(30)	(59) 3	(29)	(58)
28	(32)	(01)	(31)	(60) 4	(30)	(59)
29	(33)	(02)	(32)	(01) Muye 5	(31) LX	(60)
30		(03)		(02)		(01)

<sup>17</sup> The term *zaishengpo* occurs rarely. It may name a period of time rather than a day; the period would have to be five days, *fei* through the day before *jishengpo*; but it must include the 6<sup>th</sup> or 7<sup>th</sup>, as shown here.

One must reconcile several accounts, some of them garbled by passing through hands of persons who did not understand the dates. The "Wu Cheng" as quoted by Liu Xin says that Wu Wang started from his capital on *guisi* (30), the day after *pangsipo* (PSi), in the "1<sup>st</sup> month." Using the "Zhou Benji," we can correct this to "11<sup>th</sup> month." *Yi Zhou shu*, "Shi Fu," dates this action to *dingwei* (44), the day after *pangshengpo* (PSh), in the "1<sup>st</sup> month." Here "1<sup>st</sup> month" together with the statement that Wu Wang was beginning his march repeats the quoted "Wu Cheng" error; but the rest of this date is meaningful, because Liu (not giving his source) says that on *bingwu* (43) Wu Wang "rejoined his army" (or reached his army), which must have been already in the field ahead of him; and my analysis shows that *pangshengpo* in my (i.e., Xia) "12<sup>th</sup> month" was in fact day *bingwu*. This can be known from more of what Liu Xin quotes from the "Wu Cheng": "In the 4<sup>th</sup> month, six days (inclusive) after *jipangshengpo* (JPSH), day *gengxu* (47), Wu Wang offered a holocaust in the Zhou ancestral temple," i.e., after the victory and back in his capital. *Jipangshengpo*, "the expansion of the birth of the (*po* =) gibbous moon having occurred," ought to be the next day after *pangshengpo*. (I assume that in the 2<sup>nd</sup> "quarter," which is eight days, "*pang*" is two days after "*ji*," whereas in the "4<sup>th</sup> quarter," only six days long, it is the next day in a short month, but absent in a long month, as seems required by the date of the victory at Muye, "five days (inclusive) after *jisipo*" near the end of the "2<sup>nd</sup> month.") The "Shi Fu" confirms that the 4<sup>th</sup> month here begins with *yiwei* (32), because it starts "4<sup>th</sup> month, *yiwei* day: Wu Wang had completed his mastery of the world," etc.; and there can be no reason for "*yiwei*" other than to date the beginning of the 4<sup>th</sup> month, in which the victory rites were performed.

Characters for lunar phase terms found here and elsewhere are as follows (in the order of their possible occurrence in a lunar month):

*ji ri* 吉日 (first day of the month)

*chuji* 初吉 (first quarter, or first day thereof)

*fei* 朏 (day of the appearance of the new moon)

*zaishengpo* 在生霸 (see note 17)

*jishengpo* 既死生霸 (second quarter, or first day thereof)

*pangshengpo* 旁生霸 (third day of second quarter)

*jipangshengpo* 既旁生霸 (day after *pangshengpo*)

*jiwang* 既望 (third quarter, or first day thereof)

*jisipo* 既死霸 (fourth quarter, or first day thereof)

*pangsipo* 旁死霸 (second day of fourth quarter)

(*Pang* 旁 can probably be written 方; *po* 霸 is also written 白鬼.)



## Appendix 7: The Slip Text of the *Bamboo Annals*

The problems that I address here are certain puzzles and disagreements about the state of the *Annals* text as discovered in ca. 280 CE.

First: I have argued that the misplaced slip discovered by Shaughnessy had already been shifted before the text was buried. It has been pointed out to me that this hypothesis requires me to assume not only that Xun Xu's description "40 graphs per slip" is exact, and not a round number; but also that it was adhered to strictly, whereas discoveries of slip texts in recent times exhibit much variation from slip to slip, with graphs taking up uneven amounts of space. Further, I must assume that because this was a royal library, this standard was maintained for all its texts, and was maintained over a long period of time, since I am holding that the slip may have been moved many decades before 299 BCE. It is also objected that I overlook the likelihood that the books were in great disorder, the thongs rotted away, the slips perhaps so water-soaked that they resembled a mass of spaghetti; and that it is this likelihood that makes Shaughnessy's hypothesis tempting: the Jin court editors had to rebuild the texts that they were working on, and so could easily have made mistakes.

I contend, on the contrary, that the essential strength of Shaughnessy's hypothesis that a slip was moved is that context requires the slip in Cheng 15-16-17, and will not allow it in the Wu chronicle; and further, that when *ganzhi* graphs are removed at the beginning of the Cheng chronicle, there are exactly 10 x 40 graph-spaces down to the point where the slip should be reinserted. These reasons for accepting Shaughnessy's idea have nothing to do with the condition of the book at the time of discovery; but if one is also to say that the move was made in Warring States, it is necessary to suppose that a standard graph count was observed in the Wei royal library over a long period of time.

This seems right. The fact that the Di Gui chronicle, which must have been inserted in the text long before burial, counts out in exactly 8 x 40 graph spaces, requires that the standard applied at the time. And this is not the only case. For example, in the present text the Kang Wang chronicle has several graphs too many; and it also dates the death of Bo Qin to Kang 19, whereas Kang 16 is correct. I argue that the incorrect date is generated by the 3-year slip (i.e., it is a residue of the date shifts caused by the move, that remained uncorrected). It will be found that if the correction is made -- restoring the original wording of the text -- then the graph count becomes correct. This chronicle began at the top of a slip, and ended half-way down a slip; and the same was true of the Cheng chronicle, and originally also of the Wu chronicle. These features could not reveal themselves unless a standard 40-graph format had been used over a long period.

As for the condition of the books: Shu Xi, another scholar who worked on the texts, has a biography in the *Jin shu*. There it is said that the thieves who broke into the tomb (if tomb it was) in their haste used books as torches to light their way in. This indicates that the site was not an excavation on level ground -- which might well have been flooded -- but was tunneled into a hillside; and was completely dry, so that bundles of slips would

burn readily. Further, the picture we get indicates that the book-slips were found by the thieves already bundled up: i.e., the thongs binding slips together in most cases were intact. The site is said to have been near the western boundary of Ji Commandery, which was not low ground but was hilly (probably loess, in which people excavate dwellings, even to this day).

It can be supposed that some of the texts were not in as good condition, and examination of the portion of the *Annals* covering most of the last century reveals as much: there, one finds a date for every year, some dates being without content. Evidently the scholars had to sort out disordered slips, assigning events to years by trial and error, sometimes noting that the assignment of an event to a given year was uncertain. But this is not true of the earlier parts of the *Annals*, where one usually does not assume each year to have some event anyway. (The condition of the fourth century material suggests that the "modern text" is a copy of the Jin scholars' work when it was still unfinished. See Appendix 8.)

Legge's "Prolegomena" discusses the adding of *ganzhi* for years, pointing out (of course correctly) that this must have been done in Six Dynasties. He then properly asks whether more may have been changed by post-discovery editorial attention. And he thinks that changes were indeed made, even in reign lengths, "so that the value of the chronicle as a guide in chronology, is altogether taken away" (p. 182). He has two reasons for this view. First, he finds that the totals of years for each dynasty in the summaries at the end of each do not accord with the sums of the reign lengths. Second, he cites the statement by Shu Xi (quoted in his biography) that the Xia Dynasty was longer than the Shang Dynasty, in the *Annals*; whereas the reverse is the case (as the summaries seem explicitly to indicate).

As to the first matter: Legge has not studied the summaries with sufficient care. They are a consistent set: Xia, 471 years, being 2029-1559; Shang, 496 years, being 1558-1063; and Western Zhou, 292 years, being 1062-771. (They are consistent in another way: the first two occupy exactly one half slip each; and the last, when the phrases containing *ganzhi* are deleted, makes up exactly one whole slip.) But the first year of the Xia chronicle is 1989, not 2029. And the last year of the Shang chronicle is 1051, not 1063. So Legge complains, failing to notice that in the *Annals* 2029 is a first year for Xia in an important sense, being the year when Yu was assigned direction of the realm by Shun; and 1062 can be taken as a first year for Zhou in a sense, being the year when Wu Wang succeeded to power on his father's death in the third month. There is a problem (which I have addressed) why this should have been taken as the first year of Zhou; but it was, and that disposes of Legge's objection.

Shu Xi's statement is more interesting, and it has puzzled many. The explanation is surprising, and is going to resolve two other puzzles. The first: In his record of his inspection of the *Annals* soon after its discovery, Du Yu says that it covered Xia, Shang and Zhou, i.e., it began with Xia. But in fact it begins with Huang Di, with what amounts to a new beginning with Yao, where absolute dates for first years begin to be given. The second: While the Zhou chronicle begins with the conquest year (in the present ordering

of the text at least), the Shang chronicle begins with the year after Tang's conquest of Xia, leaving the conquest year as the last year of Xia.

The first puzzle has two parts. The very brief pre-Yao part of the *Annals* must have been handled separately from the remainder, perhaps by other scholars; so that when Du Yu paid his visit he happened to see only the part that (later) acquired *ganzhi* dates for first years. Xun Xu's testimony quoting He Qiao is decisive on the matter of the pre-Yao portion being a part of the *Annals*; but it is (now) different in form from the rest, and apparently Du didn't see it. But why did he say that this remainder began with Xia?

*Because he was taking the Yao and Shun chronicles to be the introductory part of the whole account of Xia:* for it is in these that the story of the career of Yu, the first Xia king, begins; and it is not possible to give a comprehensible account of Xia without including them (compare *Mencius* 7B38: "From Yao and Shun to Tang ..."). When one does include them, then in the *Annals* "Xia" (so conceived) is indeed longer than Shang, just as Shu Xi said.

The proof that this was the concept can be seen from a reexamination of my own reconstructions of pre-Shang chronologies, as presented in Appendix 3. In the earliest, the first year of Yao is 2026, and the last year of Xia -- *if we were to take this year to be the pre-conquest year* -- would be 1556. This is exactly 471 years, which is the length of Xia in the present *Annals*, as given in the summary. Next, one may ask what would be the date exactly 471 years before 1589, my reconstructed intermediate first year for Shang. This will be the year 2060, which in the intermediate and also in the final chronologies is Yao 86. And what is supposed to have happened in Yao 86? Legge (p. 114): "In his 86<sup>th</sup> year, the superintendent of Works" -- i.e., Yu of Xia -- "had an audience, using for his article of introduction a dark-coloured mace." On this matter, see *Early China* 9-10, article by David W. Pankenier, p. 179, who argues that this actually refers to the same event as recorded in the *Annals* at Shun 14 (2029), i.e., Shun's turning over authority to Yu (Yao 86 being year 14 counting from Yao 73, when "Yao had 'resigned' in Shun's favor"); the "dark sceptre" (Legge: "dark-coloured mace") Pankenier argues is code for the conjunction of February 1953 (as at p. 178), marking Heaven's grant of authority to Yu. This argument of Pankenier's has been called merely "suggestive" by one condescending critic; but it can now be seen to be exactly right. One can now see how and why the *Annals* date got doubled, as both Shun 14, = 2029, and Yao 86 (as Shun 14), = 2060. The Yao date is just 31 years earlier than the Shun date, just as (and because) the intermediate Shang 1 is 31 years earlier (the length of the fictitious "Di Gui" reign) than the present *Annals'* Shang 1. It seems that the equation "Xia = 471 years" had a life of its own, recurring with different contents in successive chronologies; and in the earliest one the 471 years (=Xia) included all of Yao and Shun.

All this, of course, validates my analysis as well as Pankenier's, and shows again the "rosetta stone" aspect of the *Annals*. It also shows that Shaughnessy's slip must have been moved before 299 BCE, and that there can have been no rewriting of the *Annals* in or after 280 CE of a kind such that "the value of the chronicle as a guide in chronology is altogether taken away."

## Appendix 8: The Wei Revision of the *Annals* and the "Modern Text"

The text of the *Bamboo Annals* as buried obviously cannot have reached its final form until 299 BCE. One detail in it suggests that the entire rewriting that joined a Wei chronicle to a previously existing earlier chronicle down to 784 BCE was the work of specialists working for Xiang Wang of Wei after his succession in 318. That detail is the record, under the year 327, of the loss of the nine cauldrons of Zhou in the Si River. This "event" may or may not be mythical, but it quickly became widely believed. (The First Emperor of Qin sent a thousand divers to try to recover them, or on some accounts one of them.) One account of the loss is found in the *Shiji* (28.8a-b, "Feng Shan Shu") only as what "some say"; Sima Qian really assumes that the cauldrons were taken to Qin after the fall of West Zhou. The date assigned in the *Annals* appears to be invented, for it is exactly 700 years after the *Annals'* record of the formal placing of the cauldrons in Luoyang in 1027; and this date too must be incorrect. One must ask what the revisers in Xiang's reign -- if this is when they did their work -- were trying to do.

Why have a chronicle at all? If the objective were merely to have a history of the state, why not begin it with 453, the date of the victory that created Wei? The parent state Jin had pretensions; it had held the handles of power in 770, when Ping Wang was established in Luoyang. Zhi Bo, had he won the power struggle within Jin in 453, might well have gone on to unify China again. Wei inherited these hopes. Its hopes can be seen in the names of its rulers: it had had a "Wen" (Wen Hou, 445-396?), and a "Wu" (Wu Hou, 395-370); and when Wu Hou's successor, perhaps to have been named "Hui Hou," had taken the title "*wang*" probably in 335, with first calendar year 334, he had added "Cheng," the name of the next of the Zhou founding kings; or it had been added for him posthumously. The chronicle had to be a continuation of the history of all earlier Chinese rulers, as a claim to Wei's legitimacy. The concept that Zhou was to last for 30 generations and 700 years is found in the *Zuo zhuan* (Xuan 3.4), completed about the same time as the *Annals*, and the 30<sup>th</sup>-generation Zhou king was Xian Wang, 368-321. The idea that a new royal power is overdue in 700 years is echoed by Mencius, in a recorded conversation of around 313-312 (2B13). So "700" was an important number for historical numerology; and the experts who produced the *Annals* worked with it.

A clue is found in a problem that has caused the spilling of much ink. When Du Yu, Western Jin general who subdued the southern state of Wu, returned north to his historian's labors on the *Zuo zhuan* in 280, he stopped at the capital and saw the recently discovered text of the *Annals*. His description of it is found in his concluding note to his commentary on the *Zuo*, obviously written later. One of the first things that caught his eye was the revelation that the *Shiji* had been wrong in saying that "King Hui of Liang" had died in 335; the subsequent calendar, 334-319, sixteen years, was not Xiang Wang's, but Huicheng's, as king. Du says so, and gives the figure "sixteen." But "sixteen," true in fact, seems not to have been what was actually in the *Annals*, for in the *Shiji jijie* by Pei Yin in the next dynasty, two Jin court scholars, Xun Xu and He Qiao, are apparently quoted as maintaining that Huicheng Wang died in the seventeenth year of his royal calendar. (At least one other quotation from the original *Annals* gives the same

chronology. See Fan p. 65; Fang & Wang pp 135-137.) These quotations have to be accepted as telling us what the exhumed text did say, for they give the reading of persons who were not just tourists like Du Yu but had primary responsibility for the transcription of the recovered text of the *Annals*. They must have known what they were talking about; Du Yu probably simply took note of the big surprise, that the supposed reign of Xiang was actually a continuation of Hui as king, and when he got home and wrote up his account (which he dates two years later) he applied his knowledge of the *Shiji*, which gives -- almost certainly correctly -- the length of the reign as sixteen years.

But the modern text agrees with the quoted original: both contain a line saying that Hui as lord of Wei renamed his 36<sup>th</sup> year his first year as king; in the modern text this year is 335, and the seventeenth year counting from that 36<sup>th</sup> = 1<sup>st</sup> year is the year of Huicheng's death. Further, the year of his death seems not in doubt: he died in 319 BC. It follows that his first calendar year as lord of Wei would be 370 BCE. This date 370 (i.e., Zhou Lie Wang 6) is stated in the *Shiji*, and is so stated in the modern text.

370 BCE, however, is wrong. The Tang Dynasty book on portents, *Kaiyuan zhan jing*, quotes the original *Annals* as saying that in Hui's first year "it was dark in the daytime" (*zhou hui*), and this is a conventional phrase that always refers to a solar eclipse. This eclipse occurred on 11 April 369 BC, and it is also recorded as on that date in the *Shiji*, "Liu Guo Nianbiao" for Qin. The eclipse was ring-form, occurring in early afternoon in north China, and was visible in both the Qin capital and the Wei capital.

So the revision engineered in Xiang Wang's reign did more than just fuse a Jin-Wei chronicle onto an earlier (Zhou, etc.) royal one: It also inserted the cauldron story, with date, and at the same time re-dated Huicheng's death to his supposed "17<sup>th</sup> year." This alteration had the effect (there are a few exceptions) of re-dating all events in the Wei chronicle back one year, from the beginning of that chronicle down to the end of Huicheng's reign. The text apparently switched from a Jin chronicle to a Wei chronicle beginning with the reign of Hui's predecessor Wu Hou. Wu Hou's dates ought to be 26 years, 395-370; but in both the modern text and in the *Shiji* they are 16 years, 386-371. In the buried text they were 26 years, by implication 396-371. The setting back of dates by one year is explicit in the modern text, since that text translates Wei dates into absolute dates (i.e., Zhou dates). It is simply implied in the original text. The *Shiji* misdates Hui's succession year to 370 because it took "36<sup>th</sup> year" as the year of Hui's death, and as the year before "year 1", wrongly assigned to Xiang Wang. But this is not the explanation for the modern text's date 370. Inspection of dates in Huicheng's second calendar, as given in the modern text as compared with *Shiji* dates for events in the calendar it wrongly assigns to Xiang Wang will show that the real source of the trouble is the *Annals'* giving Huicheng a "17<sup>th</sup> year." Dates of events in this second Hui era bear this out: in most cases where an event is recorded both in the *Shiji* and in the *Annals* in this period, the *Annals* date is one year earlier; the original text of the *Annals* must have done the same.

My charge against even the original text -- i.e., the text as edited near the end of Xiang Wang's reign -- is then that it has systematically falsified the dates in the entire Wei

chronicle, moving dates back one year simply by tucking in an extra year at the end of Huicheng Wang's reign. This would seem *prima facie* reasonable to a point: Huicheng undoubtedly really did announce in 335 that he was inaugurating a royal calendar -- to begin in 334, which would have been his 36<sup>th</sup> year, counting from 369. But why would the Wei editors want to do this? The clue is the line dating the loss of the cauldrons to 327. That date wasn't moved back from anything: it was invented, then and there, to match the date 1027, which was also the work of the Wei editors. Apparently Xiang Wang's editors were adjusting the dates in Huicheng's reign as they worked out dates for the conquest era at the beginning of Zhou, and were trying to make them fit together.

That complex of dates includes the date 1035 BCE, as the date of the appointment of Tang-shu Yu as first lord of Jin, obviously fixed as 700 years before 335 taken as Huicheng Wang's first year. 1035 is false even seen relatively to the *Annals'* other Conquest era dates: the appointment occurred during the Zhou Gong Regency; but in the *Annals* it is after the Regency. Why, then, did the editors have to make it 1035? Why not 1034, leaving the Huicheng dates as they were? Because -- as the *Guo yu*, "Jin Yu" 4, says (probably correctly) -- at the time of the appointment Jupiter was in station Da Huo, "Great Fire" (station 10); and as the *Guo yu*, "Zhou Yu" 3 says (certainly incorrectly, but the Wei editors didn't know this) when Wu Wang launched his campaign to conquer Shang Jupiter was in Chun Huo, "Quail Fire" (station 7). If 1035 was a Da Huo year, then 1050, the *Annals'* date for the conquest, was a Chun Huo year. If Huicheng 1 were allowed to be 334, then Tangshu's appointment would have to be 1034, and the conquest year would have to be 1049. But the editors would know that they couldn't allow that. The re-dating they did for Zhou reigns from Mu Wang back shows that they were crossing out mourning periods, while letting Cheng Wang's first year remain 1037, taken as his first "majority" year of 30. They then adopted the idea that the seven-year Regency preceded Cheng Wang's own 30 years, and also the idea that had been validated by the moving of the slip from the Cheng chronicle to the end of the Wu chronicle, that Wu Wang had died not two years but five years after the conquest. Therefore, in the editors' construction, the conquest year *had to be 1050*, and could not be 1049. So Huicheng Wang's "first year" had to be the year when (probably in fact) he had announced his claim to kingship, i.e., 335, and not the actual first calendar year 334. Actually, if one follows the fictitious astronomy in *Guo yu* "Zhou Yu" 3 strictly, the Chun Huo year must be the year before the conquest year; but this would have required dating Tangshu to 1036, and making Huicheng's royal first year 336; and there was no way to do that.

I have assigned the reasoning that I have just run through to minds active in the late fourth century BCE, in the mid Warring States era. That reasoning could only have been guided by motives that belong to that era, obviously, and not to the age -- third century CE -- of the recovery of the text; and still less to some imaginative (and imaginary) faker of a still later date. But there are two features of the "modern text" that this analysis of Warring States motives doesn't explain: (1) the listing of each year, from Xian Wang 1 = 368 BCE on, even if empty of content; (2) the fact that a large amount of material, especially for the fourth century BCE, is found in quotations from the *Annals* (the "ancient text") but is not found in the modern text.

The likely explanation is that the "modern text," or at least this part of it, is a (perhaps pirated) copy of the text of the Jin court scholars before they had finished their work of reconstitution. The listing of each year from Xian Wang 1 on probably indicates that the copy is in effect a snapshot of research in progress. If the later Jin and Wei parts of the chronicle were in disorder, the scholars would set up a table (perhaps literally) with a space for each year, identified as a royal Zhou year (as in the *Shiji*, "Liu Guo Nianbiao") and sort data into it. The copier, reaching the Xian Wang reign, found that material for this period on to the end was rich (even in this still incomplete state), so that there was only an occasional "empty" year. So from here on he simply copied the table verbatim. But Zhou reigns were the researchers' dating structure from 784 to 368 as well. This can be seen from the entry at An Wang 21 = 381: "Han extinguished Zheng, and Ai Hou (of Han) entered (the capital of) Zheng." By the time the Jin scholars were finished, they had ascertained that (contrary to the *Shiji*) Wu Hou had 26 years (not 16), so that "year 21" must be Wu Hou 21 (properly 375), as a *guben* fragment now reveals. The copier's work was done before this mindless error was discovered and corrected, and before dates from 784 to the end were translated back into the Jin-Wei dates used in the *guben*.

One telling example shows the impossibility of late invention of this text, or even late reconstitution of it. The entry for year 16 of Zhou king Zhending Wang (468-441 BCE) reads as follows: "16<sup>th</sup> year. (22<sup>nd</sup> year of Chu Gong of Jin.)" *Nothing more*. Why? This is merely a "place-holding" entry for the date, which is 453 BCE, the date of the victory over Zhi Bo that created Wei as an independent state, i.e., the *most important date* in the entire *Annals*. A post-Tang forger would have given more, because the first place he would look for material would be the *Shiji*. The *Shiji*'s chronology is confused: in the "Jin Shijia" (39.36b) it calls the date the 4<sup>th</sup> year of Ai Gong (perhaps a puppet of Zhi Bo); but the *Shiji*'s "Nianbiao" shows that Chu Gong 22 would be the same year. And after the brief account of the battle in the "Shijia", a *soyin* entry says "according to the *Annals* this event occurred in Chu Gong 22." This would have been more than enough for a creative antiquarian reconstituting or forging an "*Annals*" later on; he would have filled it all in. But the Jin scholars were being careful; they had found enough scraps of text about the battle to be sure that the correct Jin date was Chu Gong 22 (contrary to the *Shiji*); but they hadn't yet figured out how to put it together, and so had entered nothing more than the date, when the copy was made that became the "modern text."

After this copy was made, the corps of court scholars continued to work, piecing in much more material, including material that Sima Zhen was able to read when he wrote his *Shiji soyin*. The longer more fully reconstituted text has been lost, except for the quoted fragments we now call the "*guben*" ("ancient text"). The bibliographical history that we have is the history of this lost text, breaking off after the Northern Song Dynasty except for a few non-chronicle pieces of it still known in Song bibliographies, but now lost. But the premature copy, still using the researchers' Zhou dating, by luck survived. A Yuan or early Ming print is known to have existed (Chen 1993, p. 99). A text turned up in late Ming and began to be printed and reprinted as what we call the "*jinben*" or "modern text." Thus the reign dates in this text (except for some confusions in Wei chronology between 453 and 370) are the same as in the ancient text. That is why I have been able to use it as the key to the chronology of the Three Dynasties.

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HJ: see Guo.

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(Abbreviated titles (in my text) of collections of oracle inscriptions follow Keightley, *Sources*, pp. 229-31, Wade-Giles changed to Pinyin. References to *Shiji* and *Han shu* are to the (Taipei) Yiwen Yinshuguan photographic reprints: *Shiji*, of the Wuyingdian edition of Qianlong 12 (1747); *Han shu*, of Wang Xianqian 王先謙: *Han shu bu zhu* 漢書補注, Guangxu 26 (1900). All citations to the *Han shu* are to 21B, i.e., "Treatise on Harmonics and Calendrical Astronomy" ("Lü Li Zhi" 律歷志,) Part 2; in this chapter Ban Gu presents Liu Xin's *Shi jing* 世經 ("Canon of Generations"), 45a and following pages.)

GLOSSARY

(Omitted: names of kings; names of Lu dukes; titles of Classics, Standard Histories, and chapters thereof; names of Warring States; *ganzhi*, ancient philosophers.)

- Ai Gong ("duke" of Jin, 456 BCE --) 哀公
- Ban Gu (historian, 32-92 CE) 班固
- bo (title: lord, "elder") 伯
- Bo Qin (first "duke" of Lu) 伯禽
- bu (76 years = 27759 days) 部
- Chu Gong ("duke" of Jin, 474 BCE --) 出公
- chuji (lunar first quarter) 初吉
- Chun Fen (spring equinox qi period) 春分
- Chun Huo (7<sup>th</sup> Jupiter station) 鶉火
- Chun Shou (6<sup>th</sup> Jupiter station) 鶉首
- cuo xing (successive heliacal risings) 錯行
- Da Ding (son of Tang) 大丁
- Da Huo (10<sup>th</sup> Jupiter station) 大火
- "Da Ming" (ode #236 in the *Shi*, in "Da Ya") 大明
- dan (dawn) 旦
- Dan Fu (grandfather of Wen Wang) 亶父
- Dan Zhu (exiled son of Yao) 丹朱
- di (title: emperor) 帝
- di (posthumous sacrifice to a ruler) 禘
- Di wang shiji (lost book by Huangfu Mi) 帝王世紀

Du Yu (general and historian, 222-284 CE) 杜預  
Fang (4<sup>th</sup> lunar lodge, at Antares) 房  
fei (p. 49: new moon day) 朏  
Fen (River) 汾  
"Feng Bao" (chapter 21 in *Yi Zhou shu*) 豐保  
ganzhi (gan + zhi, numbers in the cycle of 60) 干支  
gong (I use "duke"; many object) 公  
gong dian (rite, late Shang) 工典  
Gong He (Regent, 841-828 BCE) 共和  
guben (ancient text) 古本  
gui (tureen: type of bronze vessel) 殷  
Guo yu (Warring States historical book) 國語  
He Qiao (Jin Dynasty court scholar) 和嶠  
Hong Fan zhuan (lost book by Liu Xiang) 洪範傳  
Hou Ji (Zhou royal ancestor) 后稷  
Hu (prince b. 864 BCE, later Li Wang) 胡  
Huai (Village) 槐  
Huangfu Mi (Jin Dynasty historian) 皇甫謐  
Huicheng Wang (of Wei) (魏) 惠成王  
Ji (Commandery, where *Annals* was found) 汲  
ji (20 bu, = 1520 years) 紀  
ji (rite, late Shang) 祭  
"Ji Xia" (chapter in *Lu shi chungiu*) 季夏  
jishengpo (lunar second quarter) 既生霸

- jisipo* (lunar fourth quarter) 既死霸  
*jiwang* (lunar third quarter) 既望  
*jinben* (modern text) 今本  
"Jin Yu" (part of the *Guo yu*) 晉語  
*Jing* (22<sup>nd</sup> lunar lodge) 井  
*Jing xing xian yu Yi* (see p. 35) 景星見于翼  
*Kaiyuan zhan jing* (Tang book on portents) 開元占經  
*Kong Yingda* (Tang classical scholar, 574-648) 孔穎達  
*Li Wang ji wei sanshi nian* (p. 9) 厲王卽位三十年  
*Liu Xiang* (scholar-bibliographer, 79-8 BCE) 劉向  
*Liu Xin* (astronomer, etc., son of Liu Xiang) 劉歆  
*Lu Fu* (= Wu Geng, son of Di Xin) 祿父  
*Lu shi* (ancient history by Luo Bi) 路史  
*Lü shi chungiu* (miscellany, mid-3<sup>rd</sup> century BCE) 呂氏春秋  
*Luo Bi* (historian, 12<sup>th</sup> century CE) 羅泌  
*Mao Gong ding* (bronze vessel, ca. 783-781) 毛公鼎  
*Mao Qian* (middle Western Zhou general) 毛遷  
*Mao Shi* (*Book of Odes*, Mao text and commentary) 毛詩  
*Mu Tianzi zhuan* (p. 1; (stories about King Mu)) 穆天子傳  
*Pei Yin* (5<sup>th</sup> century CE commentator) 裴駰  
*Pi-fang* (= Xiao Wang) 辟方  
*po* (probable meaning: gibbous moon) 霸, 魄  
*qi* 氣 center; p. 27; *qi* period: 24<sup>th</sup> of a solar year

- Qi (Zhou capital under Dan Fu) 岐  
Qing Ming (qi-period after Chun Fen) 清明  
Ren Fang (eastern border people, late Shang) 人方  
Shang Jia Wei (Shang royal ancestor) 上甲微  
Shang-shu (duke of Jin, 784-781 BCE) 殤叔  
Shang shu da zhuan (early Han commentary on Shang shu) 尚書大傳  
Shen Yue (Liang Dynasty scholar, 441-513) 沈約  
"Shi Fu" (chapter 37 in Yi Zhou shu) 世俘  
Shi Gui (father of Tang) 示癸  
Shi He Fu (Gong He) 師和父  
Shiji jijie (notes on Shiji by Pei Yin) 史記集解  
Shiji ~~s~~oyin (notes on Shiji by Sima Zhen) 史記索隱  
Shiji zhengyi (notes on Shiji by Zhang Shoujie) 史記正義  
Shi Lu (Palace, 9<sup>th</sup> century BCE) 師采宮  
Shu Xi (Jin Dynasty court scholar) 東督  
shuo (1<sup>st</sup> of lunar month syzygy) 朔  
Si (River) 泗  
si (sacrificial year) 祀  
si fa Da Shang, hui chao Qing Ming (p. 8) 肆伐大商, 會朝清明  
Sima Gong (probably = Gong He) 司馬共  
Sima Zhen (Tang commentator, 8<sup>th</sup> century) 司馬貞  
Song Ping Gong (duke, Song state, 575-532) 宋平公  
sui (year; years of age) 歲  
sui liu yue ("next year, 6<sup>th</sup> month") 歲六月



- Tang-shu Yu (brother of Cheng Wang) 唐叔虞  
Tian you wang bo (see p. 47) 天佑王伯  
Wang Hai, Zi Hai (father of Shang Jia) 王亥, 子亥  
Wei (River) 渭  
"Wen Zhuan" (chapter 25 in Yi Zhou shu) 文傳  
Wenwu Ding ("Wen Ding" or "Tai Ding") 文武丁  
Wenwu Di Yi (probably = Wenwu Ding, = Di Yi) 文武帝乙  
Wu Geng (= Lu Fu, last Shang pretender) 武庚  
Wu Hou (of Wei) (魏) 武侯  
Xiang Wang (of Wei) (魏) 襄王  
"Xiao Kai" (chapter 23 in Yi Zhou shu) 小、開  
xiao wang ("expectant king") 小王  
xie (rite, late Shang) 劓  
Xu (11<sup>th</sup> lunar lodge) 虛  
Xu Yan Wang (regional ruler, 10<sup>th</sup> century BCE) 徐延王  
xun (10-day period, days jia to gui) 旬  
Xun Xu (Jin Dynasty court scholar) 荀勗  
Yang Liang (9<sup>th</sup> century CE, commentator on Xunzi) 楊倞  
Yi (27<sup>th</sup> lunar lodge) 翼  
yi (rite) 翌  
yi, Yi Fang (= Ren Fang) 夷, 夷方  
Yi Yin (minister to Tang) 伊尹  
Yi Zhou shu (ancient book, "Surviving Zhou Texts") 逸周書

- Yin Jia (= Jin, 13<sup>th</sup> Xia king) 胤甲  
Yin Li (ancient chronology) 殷曆  
Ying Shi (13<sup>th</sup> lunar lodge) 營室  
yong (rite, late Shang) 彤  
Youli (where Wen Wang was imprisoned) 羑里  
Yu Fang (enemies of Shang, He-Wei area) 盂方  
yue xiang (lunar phases) 月相  
yuan (first (year)) 元  
zai (rite, late Shang) 賁  
zaishengpo (day or period before jishengpo) 在生霸  
zhang (19 years, = 235 lunar months, = 6940 days) 章  
Zheng (royal residence, Mu Wang and later) 鄭  
Zhi Bo (Jin lord destroyed in 453 BCE) 知伯  
"Zhi Yue" (section in "Ji Xia") 制樂  
Zhong Zong (temple name of Zu Yi) 中宗  
zhou hui ("daytime darkness" = solar eclipse) 晝晦  
Zhou Gong (regent 1037-31 BCE) 周公  
Zhou Wen Wang ... (fn.3) 周文王立國八年歲六月文王寢疾  
"Zhou Yu" (part of Guo yu) 周語  
zhu hou lai chao (see p. 8) 諸侯來朝  
Zhushu jinian (Bamboo Annals) 竹書紀年  
Zong Zhou (Western Zhou capital) 宗周  
Zu Ji (son of Wu Ding) 祖己  
Zuo Che (minister of Huang Di) 左徹

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