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Source: *Iran*, Vol. 32 (1994), pp. 83-98

Published by: Taylor & Francis, Ltd.

Stable URL: <http://www.jstor.org/stable/4299907>

Accessed: 11-01-2018 21:02 UTC

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THE CHINESE-UGHUR ANIMAL CALENDAR IN PERSIAN HISTORIOGRAPHY OF THE MONGOL PERIOD

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I

The expansion of the Mongol empire throughout Asia was accompanied by a breaking down of political, commercial and intellectual barriers from China to the Crimea. The prominence of Turks as the most influential group in the empire, both culturally and politically, has been noticed by various scholars, and Professor Buell's account of the Turkicisation of international cuisine provides a case in point.¹ One of the least conspicuous but most durable results of the Mongol conquest of Iran was the introduction of the "Turkish" twelve-animal calendar. Little attention has been paid to this aspect of the Mongol legacy; indeed, a recent survey concludes that "There can be no doubt . . . that the original Chinese-Uighur form of this calendar was never used by Iranians, either in the Mongol period or later".² In fact, the Chinese-Uighur calendar was quite systematically if not extensively used in Iran for about a century and, as Abdollahy notes, the basic twelve-year animal cycle continued to be employed, with an important modification, until it was abrogated in March 1925, on the eve of the new Pahlavi era. Indeed, in the seventeenth century, the Safavid historian Iskandar Munshī wrote that if he adopted the *hijrī* year beginning in Muḥarram for his chronicle, "most of the people of Iran would not understand". He therefore settled on the Turkī (i.e. animal) year, with which the general public were more familiar.³

A knowledge of the calendars used in the documents of different periods is a basic requirement for the chronological reconstruction of their history, a task that is still far from complete in many points of detail. Twenty years ago, Louis Bazin drew the attention of historians to the question of dates given according to both the Chinese-Uighur twelve-animal calendar and the Muslim *hijrī* calendar. Working on the basis of a short list provided by Osman Turan,⁴ Bazin discussed a few examples of the parallel use of *hijrī* and animal dates ranging from 633 to 873 A.H., including two events of particular relevance here, namely the birth of Ghazan Khan, and the date of his accession to the throne. Bazin's analysis of these dates raised several interesting points, and the recent publication of his masterly study, *Les*

systèmes chronologiques dans le monde turc ancien, reinforces their claim on our attention. His work ends by underlining the desirability of a systematic survey of the animal dates appearing in Islamic documents, for the light this would throw on the history of the calendar in the Muslim context.⁵ Such an investigation also offers the more immediate possibility of examining the precise date of certain events in the history of Mongol Iran.

At the same time, because the inauguration of a new calendar generally reflects political and sometimes administrative changes, the introduction and use of the Chinese-Uighur calendar is a facet of Mongol rule and symbolic of a new phase in Persian history. The destruction of the Abbasid caliphate in 1258 and the establishment of a Mongol dynasty under Hülegü Khan marked the temporary eclipse of Islamic rule and the advent of a new imperial power with its own imperial calendar and system of government.⁶ Knowledge of the Chinese-Uighur calendar was not limited to the astronomers; it is also found in the works of court historians of the Mongol period, clearly reflecting current usage in certain quarters.

The purpose of this paper is therefore to examine the extent and accuracy of the use of the Chinese-Uighur calendar in Persian historical literature, and to note other examples in documents issuing from the Mongol chancery. The manner and duration of its use allow some passing comments on the Mongol presence in Iran. Lack of space prevents us pursuing this topic beyond the end of the fourteenth century, and the systematic survey of dates is restricted to the Ilkhanid period.

II

It might be helpful first to clarify briefly what is meant by the Chinese-Uighur animal calendar in this context. The Chinese civil calendar employs an abstract duodecennial cycle of twelve *chih* (branches) in conjunction with a decennial series of ten *kan* (trunks) to give a sixty-year cycle, which is used to classify years, months, days and hours. The year is luni-solar, i.e. containing twelve lunar months of 29 or 30 days, adjusted periodically by the insertion of an additional lunar month to keep

the year in phase with the sun. The beginning of the year is taken to be the arrival of the sun at 15° Aquarius (mean date 27 January (Julian calendar) in the thirteenth-fourteenth centuries).⁷ The start of the Chinese lunar month is also calculated, and does not depend on the actual sighting of the new moon, unlike the Islamic lunar month, which thus normally begins one or two days later.⁸

The adoption of the Chinese calendar by the neighbouring steppe people was a measure of China's success in imposing its authority and the benefits of its civilisation upon the "barbarians". Professor Bazin has demonstrated with a wealth of detail how the eastern Turks adapted the Chinese civil calendar, replacing the abstract, official twelve-year cycle by its popular equivalent, namely, the Chinese astrological cycle of twelve animals, which was not used for dating by the Chinese themselves. The ten and sixty-year elements of the Chinese system were dropped but the "Turkish" animal cycle continued to correspond with the twelve-year cycle of the Chinese civil calendar, despite the disharmony between the astronomically-determined start of the Chinese year and the Turkish nomadic traditions of the year starting at the beginning of spring. As we shall see, the Turko-Mongols in Iran eventually strayed back to the spring equinox as the start of their year, partly no doubt as ties with China weakened and partly because they found a similar indigenous tradition in the Persian solar calendar.

There is evidence of the use of the animal calendar among the Uighur Turks from the eighth century onwards, and particularly from their sedentary civilisation centred in Qocho in the Turfan depression from the end of the ninth century. On the eve of Mongol expansion, a Uighur almanac from Qocho, containing a calendar for the year 1202, shows a complete correspondence with the Chinese civil calendar, even down to the most complicated astrological details. The Mongols in turn adopted this Turkish (animal) version of the Chinese calendar from the Uighurs, who played an important role in the Mongols' administration and cultural formation, not least in providing them with the Uighur vertical script.⁹ The first precisely attested date in the Mongols' *Secret History* is the year of the Cock (A.D. 1201).¹⁰ The Chinese-Uighur (sometimes referred to as the Uighur-Mongol) calendar of the twelve animals was introduced throughout the Mongol empire and was observed as the civil calendar among the Mongol and Turko-Mongol ruling classes. At about the same time, from the establishment of the Yüan dynasty in northern China in 1215 (and the elimination of the Sung dynasty in 1279), the Mongols acquired their own official Chinese civil calendar, in conformity with their status as a Chinese imperial power.

The official Chinese calendar of the Mongol Yüan dynasty and the Chinese-Uighur (Uighur-Mongol) calendar of the twelve animals, therefore, share a common astronomical base. Despite the sophistication of the Uighur scholars' knowledge of the Chinese calendar, it was sufficient for general use to indicate dates by the name of the animal year, the number of the lunar month, and the day of the month. The lunar months are numbered by the Turkish ordinals, from first to twelfth.¹¹ It is in this skeletal and simplified form that the Chinese-Uighur calendar mainly appears in the narrative histories of the Ilkhanid period; the years are sometimes given their Turkish names, sometimes the Mongol equivalents. In practice, these dates conform to the official calendar of the Yüan dynasty of China.¹² The scientific community in Iran, as represented particularly by Naṣīr al-Dīn Ṭūsī, was introduced to the new calendar system not only in its Turkish guise but also in its full astronomical complexity.

The introduction of the twelve-animal calendar into Iran

As well as marking a change of dynasty, the introduction of the Chinese calendar system into Iran can be located in the context of the impetus given to Islamic astronomy in the Turko-Mongol world of the thirteenth-fifteenth centuries. This impetus was driven by a deep interest in astrology on the part of royal patrons, who gave support to scientists in a field that was to some extent frowned on by orthodox Islamic opinion. The creation of *vaqf* (endowment) funds for the maintenance of the observatories at Marāgha, Tabrīz and Samarqand is evidence of the commitment shown by Mongol rulers, which permitted teams of astronomers to work over the long periods required for their observations to be completed.¹³ One of the most famous products of these observatories, namely the astronomical handbook (*zīj*) of Naṣīr al-Dīn Ṭūsī, contains a detailed account of the Chinese calendar, and work done at Marāgha made contributions to astronomical calculations that transcend their applications to dating. This work may in turn have had an impact on Chinese science during the Yüan period.¹⁴

The story of the foundation of the Marāgha observatory, and of Naṣīr al-Dīn's instruction in Chinese astronomy by the Chinese scholar Fūmanjī (Fu Meng-chi) is too well known to need repeating here.¹⁵ Ṭūsī is said to have encouraged Hülegü's support by pointing out that by studying the stars he would be able to foretell the monarch's future, the length of his life, auspicious days for his journeys, and so on. Hülegü's belief in astrology and his dependence on the judgement of Naṣīr al-Dīn Ṭūsī are borne out by other sources.¹⁶ Ṭūsī

incorporated what he had learnt of the Chinese calendar (*tārīkh-i qatā'iyān va turkān*), which he says is the one employed by the rulers of Iran (*pādshāhān-i mā*),¹⁷ into the first chapter of the *Zīj-i Ilkhānī*. He concludes his description with a table covering the period of 100 years from the start of Chinggis Khan's reign in the year of the Pig, A.D. 1203 (599 A.H.), to the year of the Dragon, A.D. 1304 (703 A.H.). This was designed to aid conversion from the *hijrī* to the Chinese calendar, because the *hijrī* calendar was the one best known to "our astronomers".¹⁸

Naṣīr al-Dīn Ṭūsī's *Zīj-i Ilkhānī* achieved considerable renown and, despite its revision and the work of other astronomers in the thirty years after his death (in 672/1274), probably remained the standard work on the subject. It is likely that any attempts to calculate conversions between the animal and *hijrī* calendars during the Ilkhanid period would have been based on Ṭūsī's tables or on others for which his was the ultimate source.¹⁹

The use of the animal calendar in Persian historiography

Rashīd al-Dīn was informed about the nature as well as the advent of the Chinese calendar, which he describes in his section on China in the *Universal History*.²⁰ He also uses it himself, in its simplified form, in the parts of this work that deal with the history of Chinggis Khan, his successors, and the Mongols in Iran.²¹ It is with this latter portion, containing the history of the Ilkhans down to the death of Ghazan in 703/1304, that we are chiefly concerned. There are two reasons for this. Firstly, whereas in chronicling events elsewhere in the Mongol empire, Rashīd al-Dīn never gives more than the *year* according to the animal calendar (and sometimes the season),²² when dealing with the history of the Ilkhans he often gives the day, month (*āy*) and year (*yīl*) according to the Chinese-Uighur system, together with the *hijrī* equivalent.²³ It is only from such precise information that we can see how accurately the two calendars were used together. Secondly, it is the use of the animal calendar to date events in *Persian* history that is at issue here, both as an aspect of the Mongol presence in Iran and because it is only in this field that I can claim an adequate knowledge of the sources to offer explanations and corrections for dates that appear to be in error.

Dates are also given by their "Turkish" month and animal year in Abu 'l-Qāsim Kāshānī's *History of Öljeitü* (regn. 1304–16), the brother and successor of Ghazan Khan.²⁴ So far as I am aware, this method of dating is restricted to these two court chronicles,²⁵ which between them provide about eighty examples of pairs of dates in the *hijrī* and animal

calendars. These dates are listed in Table 1, which gives rise to several points to be discussed in the second part of this paper.

III

With very few exceptions, the events recorded in the animal calendar all concern the activities of the Mongol ruling class: births, marriages, deaths and accessions to the throne are regularly dated this way, as well as visits of ambassadors from other Mongol states, and, more occasionally, the movements of the khan's ordu or military actions. The exceptions are the deaths in 707/1308, of two Muslim notables, namely Tāj al-Dīn Mu'minī Qazvīnī and Malik Fakhr al-Dīn Ḥasan, reported by Kāshānī (nos. 65, 66). The former was an agent of Shams al-Dīn Juvainī and the latter was governor of Rayy and Varāmīn. Both were therefore closely attached to the ruling élite; in addition, Fakhr al-Dīn Ḥasan was a specialist in Mongol culture and chancery practice, and knew the Mongol (i.e. Uighur) script.²⁶

From this, it is clear not only that the Chinese-Uighur calendar was indeed actively used by the Mongols in Iran but also that the historians probably relied on the oral evidence of sources at court for the information recorded in this way. Rashīd al-Dīn mentions the Mongols' celebration of the New Year (Turkish: *kūn yankilāmishī*,²⁷ Persian: *sar-i sāl*) several times in passing, with or without *hijrī* equivalents,²⁸ and it was clearly a living tradition, not just an abstract feature of the calendar.

As for the question of sources, it is well known that Rashīd al-Dīn had the benefit of the knowledge of Pūlād Āqā Chinksank (*cheng-hsiang*), representative of the Great Qa'an at the Ilkhanid court, and of Ghazan Khan himself for information on early Mongol history and traditions, as well as access to the imperial archives.²⁹ For the period before Rashīd al-Dīn's own time, such information would naturally be dated according to the Mongols' own calendar and presumably reported in the same form by the historian. This is illustrated by the fact that, with one exception,³⁰ in all the pairs of dates between 631 and 669 A.H., the Chinese-Uighur element comes first. There follows a transitional period, between the accession of Abaqa (669 A.H.) and the accession of Aḥmad (681 A.H.), when the *hijrī* date tends to come first, but the animal date is given by preference for certain events, such as the sack of Bukhara in 671/1273, the movements of Abaqa's ordu, the death of a *noyan* and the quriltay that decided on the election of Aḥmad Tegüder (nos. 21, 22, 24, 27, 30).³¹ From the reign of Aḥmad onwards, paired dates are all given with the Muslim date coming

TABLE 1

Dates reported in the hijrī and Chinese-Uighur calendars

No.	<i>hijrī</i> date year/month/date	A.D. equivalent	Chinese-Uighur date day/month	year	A.D. equivalent	Source
1.	631 Jumādā I	beg. 2 Feb. 1234	28 Ārām	Yünd	27 Feb. 1234	RD, 95
2.	650 Dhu 'l-Ĥ.	beg. 2 Feb. 1253	end of	Hūkār	ends 20 Jan. 1254	RD, 24
3.	651 Dhu 'l-Ĥ.	beg. 22 Jan. 1254	autumn of	Bārs	autumn 1254	RD, 24
4.	654 Shawwāl 2 [Sn]	23 Oct. 1256 (M)	24 Ūtūnj	Lū	12 Nov. 1256 (Sn)	RD, 13
5.	654 Dhu 'l-Ĥ. 27 [M]	15 Jan. 1257 (M)	New Year's Day		17 Jan. (1257) (W)	RD, 36
6.	655	beg. 19 Jan. 1257	(...)	Lū	ends 16 Jan. 1257	RD, 44
7.	656 Muḥarram 9	16 Jan. 1258	11 Jaqshābāt	Mughā	16 Jan. 1258	RD, 54
8.	656 Muḥarram 15	22 Jan. 1258	17 Jaqshābāt	Mughāy	22 Jan. 1258	RD, 55
9.	658	beg. 18 Dec. 1259		Bījīn	beg. 13 Feb. 1260	RD, 70
10.	660 Pisces 5	beg. 13 Feb. 1262	25 Ārām [S]	Dāqīqū	25 Feb. 1261 (F)	RD, 195n
11.	660 Shawwāl 2	20 Aug. 1262	Sikisīnj		beg. 17 Aug. (1262)	RD, 87
12.	663 Rabī' II	beg. 21 Jan. 1265	start of	Gāv	beg. 19 Jan. 1265	RD, 93
13.	663 Rabī' II 28	17 Feb. 1265	1 Īkindī		18 Feb. (1265)	RD, 94
14.	663 Jumādā I 19	9 Mar. 1265		Hūkār	beg. 19 Jan. 1265	RD, 100
15.	663 Ramaḍān 1	17 June 1265	2 Shūn	Hūkār	16 June 1265	RD, 94
16.	663 Ramaḍān 3	19 June 1265	5 Shūn [F]	Hūkār	19 June 1265 (F)	RD, 95, 101
17.	663 Shawwāl 3	19 July 1265	4 Āltīnj	Hūkār	18 July 1265	RD, 103-4
18.	664	beg. 13 Oct. 1265	spring of	Gāv	beg. 19 Jan. 1265	B, 427
19.	669 Rabī' II 10 [W]	26 Nov. 1270 (W)	(...)	Mūrīn	beg. 23 Jan. 1270	RD, 139
20.	670 Rabī' I 29 [F]	4 Nov. 1271 (W)	1 Bīr Yīkūmīnj	Qūyīn	4 Dec. 1271 (F)	RD, 248
21.	671 Rajab 1	22 Jan. 1273	Ārām	Dāqīqū	beg. 21 Jan. 1273	RD, 141-2
22.	674	beg. 27 June 1275		Tūnqūz	beg. 29 Jan. 1275	RD, 151
23.	675 Dhu 'l-Q. 10 [F]	15 Apr. 1277 (Th)	12 Ūtūnj	Hūkār	16 Apr. 1277 (F)	RD, 144
24.	676	beg. 4 June 1277		Hūkār	beg. 5 Feb 1277	RD, 146
25.	677 Muḥarram 1	25 May 1278		Tāvushqān	beg. 13 Feb. 1279	RD, 152
26.	677 Winter	Winter 1278/79		Pārs	beg. 25 Jan. 1278	RD, 151
27.	679 Šafar	beg. 2 June 1280		Lū	beg. 2 Feb. 1280	RD, 153
28.	680 Rajab 14 [Th]	29 Oct. 1281 (W)	17 Tūqsūnj	Mughāy	30 Oct. 1281 (Th)	RD, 162
29.	680 Dhu 'l-Ĥ. 20 [W]	1 Apr. 1282 (W)	21 Īkindī	(...)	31 Mar. (1282) (Tu)	RD, 95, 164
30.	681 Muḥarram 26	6 May 1282	7 Ūjunj	Qūyīn	6 Apr. 1283	RD, 169
31.	682 Shawwāl 27	18 Jan. 1284	New Year's Day	Bījīn	19 Jan. 1284	RD, 177
32.	683 Jumādā I 26 [Th]	10 Aug. 1284 (Th)	28 Āltīnj	Dāqīqū	31 July 1285 (Tu)	RD, 194
33.	683 Jumādā I 27 [F]	11 Aug. 1284 (F)	29 Āltīnj	Dāqīqū	1 Aug. 1285 (W)	RD, 198-9
34.	689 Rabī' I 9 [W]	22 Mar. 1290 (W)	2 Īkindī	Bārs	14 Mar. 1290 (Tu)	RD, 220
35.	690 Rabī' I 7 [S]	10 Mar. 1291 (S)	8 Īkindī	(...)	9 Mar. (1291) (F)	RD, 195n, 226
36.	690 Rabī' I 12 [Th]	15 Mar. 1291 (Th)	13 Īkindī		14 Mar. (1291) (W)	RD, 227
37.	690 Rajab 24 [Sn]	23 July 1291 (M)	25 Āltīnj	Taulī	22 July 1291 (Sn)	RD, 230, 233
38.	691 Šafar 29	20 Feb. 1292 (W)	2 Īkindī [Th]	Lū	21 Feb. 1292 (Th)	RD, 7
39.	691 Rajab 12 [Sn]	29 June 1292 (Sn)	14 Āltīnj	Lū	29 June 1292 (Sn)	RD, 236
40.	693 Dhu 'l-Q. 2 [F]	24 Sept. 1294 (F)	Tūqsūnj	(...)	beg. 21 Sept. (1294)	RD, 241
41.	694 Rabī' II 28 [Th]	17 Mar. 1295 (Th)	end of Īkindī	(...)	ends 16 Mar. (1295)	RD, 243
42.	694 Jumādā I 6 [Th]	24 Mar. 1295 (Th)	7 Ūjunj	(...)	23 Mar. (1295) (W)	RD, 244
43.	694 Rajab 1 [Tu]	17 May 1295 (Tu)	2 Shūn		17 May (1295) (Tu)	RD, 288
44.	694 Dhu 'l-Ĥ. 23 [Sn]	3 Nov. 1295 (Th)	23 Tūqsūnj	Qūyīn	1 Nov. 1295 (Tu)	RD, 302
45.	702 Jumādā II 1 [Sn]	21 Jan. 1303 (M)	New Year's Day		19 Jan. (1303) (S)	RD, 352
46.	703 Dhu 'l-Ĥ. 15 [M]	19 July 1304 (Sn)	18 Āltīnj	Lū	21 July 1304 (Tu)	K, 24
47.	704 Muḥarram 6 [Sn]	9 Aug. 1304 (Sn)	7 Yitīnj	Yīlān	28 July 1305 (W)	K, 31
48.	704 Šafar 17 [S]	19 Sept. 1304 (S)	19 Bīr Yīnkizmīnj		16 Dec. (1304) (W)	K, 31
49.	704 Jumādā I 10 [W]	9 Dec. 1304 (W)	10 Bīr Yīnkizmīnj	Yīlān	26 Nov. 1305 (F)	K, 41-2
50.	704 Dhu 'l-Q. 8 [W]	2 June 1305 (W)	1 Īkindī		24 Feb. (1305) (W)	K, 44
51.	705 Muḥarram 1	24 July 1305	Yitīnj	Yünd	beg. 10 Aug. 1306	K, 45
52.	706 Muḥarram	beg. 13 July 1306	Āltīnj	Qūs	beg. 30 June 1307	K, 52
53.	706 Šafar 24 [M]	4 Sept. 1306 (Sn)	25 Yitīnj		3 Sept. (1306) (S)	K, 52
54.	706	beg. 13 July 1306	Sikisīnīnj	Qūs	beg. 29 Aug. 1307	K, 53
55.	706 Jumādā I 21 [Tu]	28 Nov. 1306 (M)	20 Unūnch		26 Nov. (1306) (S)	K, 53
56.	706 Jumādā II 18 [Sn]	25 Dec. 1306 (Sn)	19 Bīr Yīnkūmīnj	Qūs	14 Dec. 1307 (Th)	K, 53

No.	<i>hijrī</i> date year/month/date	A.D. equivalent	Chinese-Uighur date day/month	year	A.D. equivalent	Source
57.	706 Rajab 7 [F]	12 Jan. 1307 (Th)	9 Chaqshābāt		13 Jan. (1307) (F)	K, 54
58.	706 Rajab 29 [Tu]	3 Feb. 1307 (F)	1 Ārām		3 Feb. (1307)	K, 54
59.	706 Shawwāl 5 [Sn]	9 Apr. 1307 (Sn)	6 Uchūnch		8 Apr. (1307) (S)	K, 54
60.	706 Dhu 'l-Q. 13 [Tu]	16 May 1307 (Tu)	14 Tūrtūnch	Qūyi	16 May 1307	K, 61
61.	706 Dhu 'l-H. 24 [Tu]	26 June 1307 (M)	6 Bīshīnj		6 June (1307) (Tu)	K, 62
62.	706 Dhu 'l-H. 17 [Tu]	19 June 1307 (M)	20 Bīshīnj		20 June (1307) (Tu)	K, 66
63.	707 Muḥarram 1	3 July 1307		Tāvushqan	beg. 5 Feb. 1315	K, 72
64.	707 Rabī' I 8 [Th]	7 Sept. 1307 (Th)	10 Sikīšīnj		7 Sept. (1307)	K, 73
65.	707 Rajab 25 [Tu]	20 Jan. 1308 (S)	26 Chaqshābāt		20 Jan. (1308)	K, 74
66.	707 Sha'bān 20 [W]	14 Feb. 1308 (W)	22 Ārām		14 Feb. (1308)	K, 75
67.	708 Muḥarram 1	21 June 1308		Dāqīqū	beg. 11 Feb. 1309	K, 82
68.	709 Muḥarram 1	11 June 1309		Īt	beg. 31 Jan. 1310	K, 87
69.	710 Muḥarram 1	31 May 1310		Tūnghūz	beg. 20 Jan. 1311	K, 109
70.	711 Muḥarram	beg. 20 May 1311		Qūluqana	beg. 8 Feb. 1312	K, 121
71.	712 Muḥarram	beg. 9 May 1312		Ūt	beg. 27 Jan. 1313	K, 136
72.	712 Dhu 'l-H. 10 [Sn]	8 Apr. 1313 (Sn)		Ūt	beg. 27 Jan. 1313	K, 144
73.	713 Muḥarram	beg. 28 Apr. 1313		Bārs	beg. 17 Jan. 1314	K, 151
74.	714 Muḥarram	beg. 17 Apr. 1314		Tāvushqan	beg. 5 Feb. 1315	K, 165
75.	715 Muḥarram	beg. 7 Apr. 1315		Lū	beg. 25 Jan. 1316	K, 173
76.	716 Muḥarram	beg. 26 Mar. 1316		Yīlān	beg. 14 Jan. 1317	K, 199
77.	716 Ramaḍān 27 [W]	13 Dec. 1316 (M)	Chaqsābāt	Yīlān	beg. 3 Jan. 1318	K, 222

Notes:

- Hijrī* and animal dates are given exactly as found in the texts, with their A.D. equivalents. For corrections, see Table 3.
- The names of months and years of the Chinese-Uighur dates are transliterated directly from the original Persian text, which allows misreadings and the range of spellings to be readily apparent. Standard spellings are provided in Tables 2 and 3.
- (...) indicates a lacuna in the text.

- Only days of the week that are mentioned in the Persian text are given [in square brackets]; when this follows the animal rather than the *hijrī* date, this indicates that the animal date comes first. The corresponding weekday in the Christian calendar is also shown (in round brackets). Sn = Sunday, S = Saturday, etc.
- Years in brackets indicate the correct year, when no animal year is mentioned. In fact, an incorrect animal year is generally implied by the sequence in Kāshānī.
- Sources: RD = Rashīd al-Dīn, ed. 'Alizada; B = Banākātī; K = Kāshānī.

first, with only one exception (no. 38), concerning an event within the immediate orbit of the ruling class.³² There are also one or two instances when Kāshānī mentions events outside Ilkhanid territory, using the animal date only and with no precise *hijrī* equivalent.³³

It is easy enough to see why the Chinese-Uighur animal date was reported in those cases where it is found; it is rather harder to explain why it was not given more often. There are numerous occasions when one might expect a date to be given in the animal calendar, but in vain.³⁴ It is doubtless partly a question of the sources of information available to Rashīd al-Dīn and Kāshānī; but they must also have exercised their own conscious decision to omit animal dates, for we may presume that, if the animal calendar was in use, it was used systematically and not at random. Animal dates must have been known or recoverable for most of the Ilkhans' dynastic history. To pursue the question of sources would lead us too far away from our subject; it seems clear, at least, that the normal use of the Muslim *hijrī* calendar continued unaffected by the

introduction of the Mongols' own calendar and that the two existed side-by-side.

This raises the further question of whether our historians converted dates from one calendar to the other, or merely repeated the information they received. The relative paucity of recorded animal dates suggests the latter. Once Rashīd al-Dīn came to cover his own times, he generally put the *hijrī* date first when paired with an animal one, and this was also the practice of Kāshānī, as we have seen. Had they been used to offering conversions as a matter of course, rather than on the few occasions when the Chinese-Uighur date was available, we would expect them to have done so far more systematically. When Kāshānī does come to provide a systematic equivalent, it is for the year only, as will be discussed below. On the other hand, for many of the events in the *earlier* period, the Mongol (Chinese-Uighur) date must have been the only date available, making it necessary to calculate the *hijrī* equivalent.

Bazin, in his discussion of pairs of animal-*hijrī* dates issuing from the Turko-Mongol milieu, comes

to the conclusion that, in cases of doubt, when the two dates do not correspond, it is generally best to rely on the date given according to the twelve-animal calendar rather than the *hijrī* equivalent, reconstructed *a posteriori*. His view is based on evidence of faulty calculations, or “the imperfection of the tables consulted”.³⁵ Unfortunately, I am not at present in a position to test the latter opinion. As noted above, the set of tables most likely to have been consulted at this period is the one given in Naṣīr al-Dīn Ṭūsī’s *Zīj-i Ilkhānī*. This is certainly the only contemporary conversion table that has been identified. It has not been edited, let alone translated and subjected to critical examination.³⁶ It is designed to convert *hijrī* dates into the Chinese-Uighur calendar, not *vice-versa*. It would be desirable to use Ṭūsī’s table to check all the pairs of dates listed in Table 1. This might reveal a systematic source of error, but until it is tried, it seems more charitable to assume that Ṭūsī’s tables are accurate.³⁷ It is very likely that other almanacs containing the imperial Chinese(-Uighur) calendar were available among the administrative and literate classes, but one would not expect these to have been inaccurate either.³⁸ On the whole, faulty calculation rather than faulty tables seems the likelier explanation for incorrect conversions, but various other sources of error can be imagined.

In fact, Table 1 reveals a generally close and often exact correspondence between the *hijrī* and animal dates provided, whether as a result of calculation or not. We can pass over those that agree without further comment. Those that do not agree need to be investigated, partly because we are faced with a choice of which date to accept as the correct one, and partly because it is interesting to try to explain the discrepancy. In doing so, we cannot assume that the given dates have a sort of absolute sanctity, for otherwise elaborate theories could be advanced to interpret the non-correspondence of two dates in terms of calendar irregularities or imperfect conversion tables, when all the time either or both of the pair are simply mistakes arising from other causes. Factual errors are usually difficult to verify, because both authors mention many events that are not found or not precisely dated in other sources. Many mismatching pairs can be attributed to scribal errors or imperfect manuscripts. Other, more regularly-occurring disparities are probably due to the nature of the two calendar systems themselves, and perhaps also to a misunderstanding of them on the part of the authors or their sources.

It is not possible in the space available here to discuss all these scribal, factual, or systematic errors, more than one of which might be compounded in any individual case. Table 3 provides a summary of all the dates given in Table 1,

corrected where necessary so that both the *hijrī* and animal elements can be reconciled with each other. Some representative examples are examined below, which may help to explain the rest. Standardised spellings of the names of the months and years have been adopted, as shown in Table 2.

Hülegü’s departure for Iran. Rashīd al-Dīn’s dates for the start of Hülegü’s expedition to Iran (nos. 2, 3) are irreconcilable. Having left Möngke’s court, Hülegü returned to his own ordu at the *beginning* of Hükār-yīl (Year of the Ox), not the end. From this error stems the further mistake of putting Hülegü’s departure the following animal year (Tiger), whereas in fact it should have been the autumn of the same year. Rashīd al-Dīn’s date in Dhu ’l-Hijja coincides with late winter. A far more precise account is given by Juvainī, who unfortunately does not use the animal calendar.³⁹

The birth, accession and death of Arghun. There is no compatibility between the two dates given for the birth of Arghun (no. 10). The animal date, which comes first, is most probably correct, although 25 February 1261 was a Friday, not a Saturday. The Islamic date, with an astrological motif, is imprecise and is probably a later reconstruction.⁴⁰ Neither date conforms well with the tradition that Arghun died aged 33, but the Uighur-Mongol date is more nearly correct. However, the “33 years” can be best explained by suggesting that the year of Arghun’s birth should actually be the Monkey (Bichin), see below; this would be equivalent to Pisces in 658 A.H.

TABLE 2

*The Turkish months and twelve-year animal cycle**

Months	Years		Animal (Persian)
	(Turkish)	(Mongol)	
1. Aram	Sichgan	Qulugana	Rat
2. İkinci	Ud	Hükār	Ox (Gāv)
3. Üçüncü	Bars/Pars	Bars	Tiger
4. Dördüncü	Tavishgan	Tulai	Hare
5. Besinci	Lu	Lu	Dragon
6. Altıncı	Yilan	Mogai	Snake
7. Yetinci	Yunt	Morin	Horse
8. Sekizinci	Qoy(un)	Qonin	Sheep
9. Toksuncı	Bichin/Pichin	Bichin	Monkey
10. Onuncı	Takagu	Takiya	Cock (Dāqīqū)
11. Bir Yegirminci	It	Noqai	Dog
12. Chaqshapat Shun**	Tonguz	Gaqai	Pig

* The spelling of these terms differs not only in the Persian sources (see Table 1) but also in all the secondary works dealing with this topic. See e.g. the tables in Abdollahy (p. 667) and E. Chavannes, “Le Cycle turc des douze animaux”, *T’oung Pao*, VII (1906), p. 52. The spelling adopted here is based on that of Bazin, *Systèmes*, simplified slightly. The Persian equivalents are sometimes found, as indicated in brackets.

** Shun is the intercalary month, see Doerfer, III (1967), pp. 327–8.

TABLE 3
Reconciled hijrī-animal dates from Table 1

No.	Event	Muslim A.H. date	Turko-Mongol date	A.D. equivalent
1.	Birth of Abaqa Khan	631 Jumādā I	28 Aram	Yunt 1234 Feb. 27
2.	Hülegü camps	650 Dhu 'l-Ḥ.	beginning	Hükär 1253 Feb.
3.	Hülegü leaves for Iran	651 Shawwāl	autumn	Hükär 1253 autumn
4.	Birth of Möngke Temür	654 Shawwāl 22	24 Onunch	Lu 1256 Nov. 12
5.	New Year	654 Dhu 'l-Ḥ. 29	(1 Aram	Mogai) 1257 Jan. 17
6.	Caliph's embassy to Hülegü	655		Mogai 1257
7.	Mongols to Baghdad	656 Muḥarram 9	11 Chaqshapat	Mogai 1258 Jan. 16
8.	Hülegü to E. Baghdad	656 Muḥarram 15	17 Chaqshapat	Mogai 1258 Jan. 22
9.	Various deaths	658		Bichin 1260
10.	Birth of Arghun	658 Pisces	25 Aram	Bichin 1260 Mar. 8
11.	Hülegü to Alātāgh	660 Shawwāl 2	Sekizinch	(It) 1262 Aug. 20
12.	Hülegü ill	663 Rabī' II	start of	Hükär 1265 Jan.
13.	Death of Arian Khatun	663 Rabī' II 29	1 Ikindi	(Hükär) 1265 Feb. 18
14.	Abaqa moves camp	663 Jumādā I 19		Hükär 1265 Mar. 9
15.	Death of Doghuz Khatun	663 Ramaḍān 1	2 Shun	Hükär 1265 Jun. 16/17
16.	Accession of Abaqa	663 Ramaḍān 3	5 Shun	Hükär 1265 Jun. 19
17.	Expedition against Golden Horde	663 Shawwāl 3	4 Altinch	Hükär 1265 Jul. 18/19
18.	Abaqa moves ordu	664	spring	Bars 1266 spring
19.	Re-accession of Abaqa	669 Rabī' II 10	(Onunch)	Morin 1270 Nov. 26
20.	Birth of Ghazan	670 Rabī' II 29	1 Bir Yegirminch	Qoy 1271 Dec. 4
21.	Sack of Bukhara	671 Rajab 1	Aram	Takagu 1273 Jan. 22
22.	Winter quarters	674		Tonguz 1275/76 winter
23.	Battle of Albistān	675 Dhu 'l-Q. 10	12 Üchünch	Hükär 1277 Apr. 16
24.	Abaqa to Alātāgh	676		Hükär 1277 summer
25.	Abaqa leaves for Khurāsān	678 Muḥarram 1		Tavishgan 1279 May 14
26.	Nikūdārī raids	677 winter		Bars 1278/79 winter
27.	Death of Abatai Noyan	679 Šafar		Lu 1280 June
28.	Battle of Hims	680 Rajab 14	17 Toksunch	Mogai 1281 Oct. 30
29.	Death of Abaqa	680 Dhu 'l-Ḥ. 20	21 Ikindi	(Yunt) 1282 Mar. 31
30.	Election of Aḥmad	681 Muḥarram 6	7 Üchünch	Yunt 1282 Apr. 16
31.	New Year's Day	682 Shawwāl 28	(1 Aram)	Bichin 1284 Jan. 19
32.	Death of Aḥmad	683 Jumādā I 26	28 Altinch	Bichin 1284 Aug. 10
33.	Accession of Arghun	683 Jumādā I 27	29 Altinch	Bichin 1284 Aug. 11
34.	Arghun marries Bulughan Khatun	689 Rabī' I 9	10 Ikindi	Bars 1290 Mar. 22
35.	Death of Arghun	690 Rabī' I 6	8 Ikindi	(Taulai) 1291 Mar. 9
36.	Despatch of messengers	690 Rabī' I 11	13 Ikindi	(Taulai) 1291 Mar. 14
37.	Election of Gaikhatu	690 Rajab 23	25 Altinch	Taulai 1291 Jul. 22
38.	Death of Toqtani Khatun	691 Šafar 29	2 Ikindi	Lu 1292 Feb. 21
39.	Coronation of Gaikhatu	691 Rajab 12	14 Altinch	Taulai 1292 Jun. 29
40.	Death of Anbarji	693 Dhu 'l-Q. 2	Toksunch	(Morin) 1294 Sep. 24
41.	Despatch of amirs to Baidu	694 Rabī' II 28	end Ikindi	(Qoy) 1295 Mar. 16/17
42.	Death of Gaikhatu	694 Jumādā I 6	8 Üchünch	(Qoy) 1295 Mar. 24
43.	News of Ghazan's advance	694 Rajab 1	2 Shun	(Qoy) 1295 May 17
44.	Coronation of Ghazan	694 Dhu 'l-Ḥ. 26	28 Toksunch	Qoyun 1295 Nov. 6
45.	New Year's Day	702 Jumādā I 29	(1 Aram	Taulai) 1303 Jan. 19
46.	Coronation of Öljeitü	703 Dhu 'l-Ḥ. 15	16 Altinch	Lu 1304 Jul. 19
47.	Öljeitü moves camp	704 Muḥarram 6	8 Yetinch	Lu 1304 Aug. 9
48.	Arrival of Mongol embassies	704 Šafar 17	19 Sekizinch	(Lu) 1304 Sep. 19
49.	Arrival of Holden Horde embassy	704 Jumādā I 10	11 Bir Yegirminch	Lu 1304 Dec. 8/9
50.	Öljeitü marries Bulughan Khatun	704 Dhu 'l-Q. 29	1 Altinch	(Yilan) 1305 Jun. 23
51.	Öljeitü moves camp	705 Muḥarram 1	Yetinch	Yilan 1305 Jul. 24
52.	Beginning of hijrī year	706 Muḥarram	Altinch	Yunt 1306 July
53.	Öljeitü moves camp	706 Šafar 24	25 Yetinch	Yunt 1306 Sep. 3/4
54.	Death of Du'a	706	Sekizinch	Yunt 1306 Sep.
55.	Öljeitü at winter quarters	706 Jumādā I 21	22 Onunch	(Yunt) 1306 Nov. 28
56.	Arrival of envoy	706 Jumādā II 18	19 Bir Yegirminch	Yunt 1306 Dec. 25
57.	Arrival of envoys	706 Rajab 8	9 Chaqshapat	(Yunt) 1307 Jan. 13
58.	Arrival of envoy	706 Rajab 29	1 Aram	(Qoy) 1307 Feb. 3

No.	Event	Muslim H. date	Turko-Mongol date	A.D. equivalent
59.	Orduqiya to ordu	706 Shawwāl 5	6 Üchünch (Qoy)	1307 Apr. 8/9
60.	Öljeitü on Gilan expedition	706 Dhu 'l-Q. 13	14 Tortunch Qoy	1307 May 16
61.	Öljeitü enters Gīlān	706 Dhu 'l-H. 4	6 Besinch (Qoy)	1307 Jun. 6
62.	Raid in Gīlān	706 Dhu 'l-H. 18	20 Besinch (Qoy)	1307 Jun. 20
63.	Start of <i>hijrī</i> year	707 Muḥarram 1	Qoy	1307 Jul. 13
64.	Öljeitü goes hunting	707 Rabī' I 8	10 Sekizinch (Qoy)	1307 Sep. 7
65.	Death of Tāj al-Dīn Mu'minī	707 Rajab 25	26 Chaqshapat (Qoy)	1308 Jan. 20
66.	Death of Malik Fakhr al-Dīn	707 Sha'bān 20	22 Aram (Bichin)	1308 Feb. 14
67.	Start of <i>hijrī</i> year	708 Muḥarram 1	Bichin	1308 Jun. 21
68.	Start of <i>hijrī</i> year	709 Muḥarram 1	Takagu	1309 Jun. 11
69.	Start of <i>hijrī</i> year	710 Muḥarram 1	It	1310 May 31
70.	Start of <i>hijrī</i> year	711 Muḥarram	Tonguz	1311 May 20
71.	Start of <i>hijrī</i> year	712 Muḥarram	Qulugana	1312 May 9
72.	Feast of Sacrifice	712 Dhu 'l-H. 10	Ud	1313 Apr. 8
73.	Start of <i>hijrī</i> year	713 Muḥarram	Ud	1313 Apr. 28
74.	Start of <i>hijrī</i> year	714 Muḥarram	Bars	1314 Apr. 17
75.	Start of <i>hijrī</i> year	715 Muḥarram	Tavishgan	1315 Apr. 7
76.	Start of <i>hijrī</i> year	716 Muḥarram	Lu	1316 Mar. 26
77.	Death of Öljeitü	716 Ramaḍān 30	Chaqshapat Lu	1316 Dec. 16

Notes:

a. *Hijrī* dates are taken to refer to the standard civil calendar, beginning 16 July 622.

b. Animal years missing from Table 1 are supplied in brackets.

Arghun's accession to the throne (no. 33) is dated first by the Islamic date. The Uighur-Mongol date is in perfect agreement if the year is changed, from the Year of the Cock to the Year of the Monkey (1284). An error of one year is not uncommon in these combinations, as we shall see.⁴¹ In this case, therefore, the *hijrī* date is preferred.⁴²

The *hijrī* date of Arghun's death (no. 35) is given first; the animal year is not mentioned, but it should be the Hare. The two dates are one day apart, as is often the case. Since the Islamic Saturday begins at sunset on Friday, and the Chinese-Uighur Friday ends at midnight, it is implied that Arghun died between sunset and midnight on Friday 9 March 1291. Both dates could therefore be correct, but there are grounds for proposing the Muslim date should be 6 Rabī' I, which would denote that Arghun died during the day.⁴³

Arghun is said to have reigned seven years and to have died aged 33.⁴⁴ Seven years is an acceptable approximation (690–683 = 7, 1291–1284 = 7), but according to the Chinese-Uighur way of reckoning, which counts *inclusively*, his reign would be eight years. This has a bearing on the figure of thirty-three years for his life, which would only be thirty-one according to our reckoning (1291–1260 = 31), or thirty-two lunar years (690–658 = 32). According to the Chinese-Uighur dates provided, Arghun was born in the Year of the Cock and came to the throne in the Year of the Cock (though in reality perhaps both should be the Year of the Monkey). He was thus “25” (two full cycles of

twelve, plus one, inclusive). His reign was then “8” years (Year of the Monkey to Year of the Hare, inclusive). The sum of twenty-five and eight gives our “33”, whereby the year of his accession is counted twice. This solution relies on the year of Arghun's birth being 658 A.H./the Monkey; it may be considered preferable to retain the Mongol date given for his birth, and ignore the reference to his death aged 33, an error which would then require an even more tortuous explanation.⁴⁵

The decision to enthrone Aḥmad Tegüder. The dates given for the decision to elect Aḥmad (no. 30) are confused. Apart from the year, there is an obvious discrepancy in the day of the month, for the 26th of the “Muslim” moon cannot correspond with the 7th of the (same) “Chinese-Uighur” moon. The year is easily disposed of, and we should substitute the Year of the Horse (1282) for the Year of the Sheep (1283); this may be a scribal error or a systematic error (Rashīd al-Dīn is also a year ahead in dating Arghun's coronation, as seen above). Either way, the Year of the Horse is correctly given by Banākatī.⁴⁶ With the day of the month, we have a choice. 26 Muḥarram is equivalent to 27 Üchünch-āy (6 May 1282), and we could therefore propose a simple scribal error, restoring **bīst-u-haftum*. Alternatively, 7 Üchünch-āy is equivalent to 6 Muḥarram (16 April), and it would then be necessary to remove the *bīst* from the *hijrī* date. Banākatī, unfortunately, merely increases the uncertainty, by giving 17 Üchünch-āy (26 April), equivalent to 28 Muḥarram (8 May). This confirms the element of 7

in the Mongol date, but also the 20 in the Muslim one. In this case, since the animal date comes first and the quriltay is a “Mongol” event *par excellence*, the animal date seems preferable. Although a careless scribe is perhaps more likely to have omitted a *bīst* from the Mongol date than to have added it to the *hijrī* one (as in no. 50, see below), another example of the same mistake is found elsewhere (no. 61, see below).

Arghun's marriage to Bulughan Khatun. The mismatch between the dates given here (no. 34) can be explained by a simple scribal error. The Muslim date, which comes first, is accurate, as is confirmed by the correct day of the week. 22 March corresponds to 10 İkindi-āy, and we may therefore propose **dahum* for *duvrum*.⁴⁷

The first enthronement of Gaikhatu Khan. The *hijrī* date for the election of Gaikhatu (no. 37) comes first, but the Uighur-Mongol date is probably more reliable, for it corresponds with the correct day of the week (Sunday), which was considered the most auspicious day for coronation.⁴⁸ Although other sources follow Rashīd al-Dīn in giving 24 Rajab, the correct date is probably 23 Rajab, Sunday 22 July.⁴⁹

The coronation of Öljeitü and his departure for Tabrīz. These dates (nos. 46, 47) need to be considered in combination to understand the difficulties that are frequently posed by Kāshānī's careless chronology. In the first place, the coronation on 15 Dhu 'l-Hijja is said to have been a Monday, whereas 19 July was actually a Sunday. This might suggest 16 Dhu 'l-Hijja/Monday 20 July as the “correct” date, to be explained by a possible delay in the local sighting of the new moon of Dhu 'l-Hijja.⁵⁰ Such a solution could be applied to other dates in the month, though here Kāshānī is erratic.⁵¹ It is also consistent with Kāshānī's date for the departure of Öljeitü for Tabrīz: if 16 Dhu 'l-Hijja 703 was a Monday then 6 Muḥarram 704 was indeed a Sunday.⁵² The Mongol date for Öljeitü's departure is the wrong year: it should still be Lu (Dragon), but Kāshānī mechanically introduces a new animal year with the change of *hijrī* year. The corrected date, Saturday 8 August, corresponds to the beginning of the Muslim Sunday, i.e. after sunset on the evening of Saturday. However, since it is unlikely that Öljeitü set off in the evening, a more accurate animal date would be 8 Yetinch-āy (Sunday 9 August). We might therefore propose **hashtum* for *haftum* Yetinch-āy, either as a scribal or a calculation error.⁵³

The Mongol date for Öljeitü's coronation does not in itself resolve whether 15 or 16 Dhu 'l-Hijja is correct, because it is either one or two days out. 18 Altinch-āy is possibly a straight-forward mistake on Kāshānī's part, but *hijdahum* is a plausible scribal error for *hifdahum*, and 17 Altinch-āy corresponds to 20 July or 16 Dhu 'l-Hijja.⁵⁴ Monday 16 Dhu 'l-

Hijja/17 Altinch for the coronation is also consistent with Sunday 6 Muḥarram/8 Yetinch for Öljeitü's departure for Tabrīz.

This “solution”, which attempts to reconcile both pairs of dates, requires the correction of elements of three out of the four, and might seem over-elaborate. Furthermore, there is considerable support for the date 15 Dhu 'l-Hijja for the coronation in other contemporary sources.⁵⁵ One would expect the Muslim date to be the most reliable, and despite the arguments outlined above, it seems preferable to take 15 Dhu 'l-Hijja (19 July) as the correct date, altering Kāshānī's “Monday” to a Sunday. Sunday was a good day for coronations, and the 15th day of the month was auspicious too.⁵⁶ This still requires the modification of both the Uighur-Mongol dates, and leads us to conclude that, right from the outset of Öljeitü's reign, there are great problems with the accuracy and internal consistency of Kāshānī's dating.

Öljeitü's marriage to Bulughan Khatun Khurāsānī. Kāshānī's dates for this ceremony are on the face of it irreconcilable (no. 50). However, as we have seen, he is very careless in the matter of chronology, and in this case again several corrections are needed. It is clear from the context that Öljeitü's wedding followed his arrival in Tabrīz on 20 Dhu 'l-Qa'da, and a *bīst* seems to have dropped out. 28 Dhu 'l-Qa'da is equivalent to Tuesday 22 June 1305. The Mongol year is not stated, but it should be the Year of the Snake. Rather than the second month, June falls in the sixth month, and we may therefore suggest 1 *Altinch-āy, which is equivalent to Wednesday 23 June 1305. The correspondence is still not exact, and we may further refine the *hijrī* date, partly because, for an event like this, one might expect the (corrected) Mongol date to be accurate, partly because Kāshānī's internal inconsistencies are so marked. He notes that Öljeitü's wedding was on a Wednesday and that 26 Dhu 'l-Qa'da was a Sunday. The date of the wedding should therefore be Wednesday 29 Dhu 'l-Qa'da/23 June.⁵⁷

Öljeitü's operations in Gīlān. Similar problems arise with Kāshānī's dating of the events on the Gīlān campaign (nos. 61, 62).⁵⁸ In both cases, the Uighur-Mongol date is preferable (the year, which is omitted, is the Year of the Sheep), reinforced by the fact that they are consistent with each other, which the *hijrī* dates are not. Öljeitü entered Gīlān on 6 June/4 Dhu 'l-Hijja, so that a *bīst* has been added. This was a Tuesday. Kāshānī then reports a raid led by amir Sevinch on Tuesday 17 Dhu 'l-Hijja, but that Tuesday would have been the 18th, which is confirmed not only by the animal date but also by other dates given on the same page.⁵⁹

These are some of the more striking examples of the need to take the Chinese-Uighur date into

consideration, and often to retain it in preference to the Muslim *hijrī* date.⁶⁰ They reveal a mixture of scribal and factual errors, some of which can be resolved by reference to other accounts. They also show that the lack of direct correspondence between *hijrī* and Chinese-Uighur dates can be due to more systematic differences.

In the first place, since the Chinese-Uighur day, like our own, starts at midnight, whereas the Muslim "day" starts at sunset the previous day, there is often an ostensible difference of one day between the two calendars that does not require correction (e.g. no. 15, 17, 29, 35, 36, 41, 42, 53, 59). These dates are usually left as pairs on Table 3. The implication is that events dated this way occurred between sunset and midnight at the end of the Mongol day and the beginning of the Muslim day, as with the death of Abaqa (no. 29). However, this is often demonstrably not the case, and the disparity might represent a mechanical application of conversion tables that were not sufficiently discriminating; in all these cases, the Mongol date should probably be advanced (or the *hijrī* date reduced) by one day. It is noteworthy that sometimes within the same year, exact diurnal correspondences are found as well as the "nocturnal" overlaps, so that there is no discernible standard method of computation at work. This is particularly true of Kāshānī's annal for 706 A.H., the last year for which he used the Chinese-Uighur calendar regularly. The difficulties which he was having might have encouraged him to abandon it.

As already noted, the problem of the disparity of one day between the dates given also raises the possibility that the chronicles do not always relate to the standard *hijrī* era, starting on 16 July 622. In some of the cases discussed above, the differences could be resolved with reference to the "astronomical" calendar, starting the previous day, 15 July 622. When the weekday is given, this can help to distinguish which calendar is being used. On the other hand, the uncertainty remains that some discrepancies are simply the product of errors or of delays in sighting the new moon; furthermore, admitting the possibility that the chroniclers were inconsistent in their use of the two *hijrī* calendars has unwelcome implications, even for those dates that appear to be accurate according to the civil calendar. It is easier, if less rigorous, to assume (as here) a certain consistency in the use of the civil calendar throughout, while remembering that this may in fact be yet another possible variable in some instances.

Another type of purely calendrical problem, referred to above, is that the start of the Muslim lunar month might on occasions have been delayed by the late sighting of the new moon, which would lead to a difference of a day (or even two) between

the local date and the standard *hijrī* calendar. The days of the week, however, would naturally carry on regardless. This sort of problem could explain the discrepancies found in nos. 38 and 57, and also in the dates given for the battles of Albistān (no. 23) and Ĥimş (no. 28), although in the last two cases, the *hijrī* dates are confirmed by numerous Arabic sources.⁶¹

As in the case of days and months, there is normally a period of overlap between the two calendar years, since the year starts at a different point in each. In his history of the Ilkhans,⁶² Rashīd al-Dīn generally gives the correct animal year correspondence, but in four cases (nos. 25, 30, 32, 33) the animal year is anticipated. These might be simple mistakes, but the same problem recurs in a far more systematic and conspicuous way in the chronicle of Kāshānī, who appears to mention the correct animal year only by chance. Kāshānī's twelve-animal year coincides with the Islamic year in which it begins, but the reverse is not true. This is most evident in the last few annals of Kāshānī's chronicle, from 708/Takagu to 715/Lu, when the start of the Islamic year (mentioned first) is matched to the animal year beginning *later* in the same *hijrī* year, and not to the animal year in which it actually began. This systematic error helps to explain why he misdates Öljeitü's death, for he mechanically associates 716 A.H. with Yilan-yīl, the next in the animal cycle.⁶³ Apart from blatant mistakes, this error of anticipation in the Uighur-Mongol year is the *only* type of error found in these pairs of dates, from 677/Tavishgan to 716/Yilan. It suggests a mechanical one-to-one correlation between the *hijrī* and the Mongol year, whereas, the one being lunar and the other solar, they cannot be kept in phase so easily. This raises the possibility of the existence of simplified tables, the use of which would gradually lead to greater and greater inaccuracy.

While there is no other evidence for the existence of such simplified tables, it could be noted that these difficulties are not peculiar to Kāshānī. It is beyond the scope of this paper to examine in detail the continuing use of the twelve-animal cycle by the late fourteenth-century historians, but a preliminary review shows that the same element of seemingly mechanical correlation does sometimes occur, when the *hijrī* year is mentioned first and the Mongol year is apparently anticipated (and the error never occurs the other way round). However, the correspondences between *hijrī* and animal years given by Nizām al-Dīn Shāmī and 'Alī Yazdī are generally accurate, and in most cases where more precise (*hijrī*) dates are given, they do fall in the animal year mentioned.

Since the twelve-animal cycle was the only feature of the Chinese-Uighur calendar used by

later Persian annalists, it is worth looking a little more closely at another aspect of this question. As noted above, the Chinese-Uighur year adopted by the Mongols began when the sun entered 15° Aquarius, that is approximately six weeks before the spring equinox. By the Safavid period, the animal year was taken to start at the spring equinox (Naurūz: then falling on 10/11 March of the Julian calendar). It is not clear precisely when this change took place, and the official Chinese astronomical calculation of the new year gave way to the Turko-Mongol and native Persian tradition of the year starting in spring.

Bazin considers this a late development, and rightly notes that, in astronomical circles at least, the Chinese system was preserved, as in Ulugh Beg's *zīj* dating from about 841/1437.⁶⁴ However, it is evident from the dating in Yazdī's *Ẓafar-nāma* that the animal year is taken to start at the vernal equinox, at least by the end of the fourteenth century, and this seems also to be the case in the earlier *Ẓafar-nāma* by Shāmī.⁶⁵ The Timurid historian Ḥāfiẓ-i Abrū implies that the animal year started in spring, though he also refers to the celebration of the Mongol New Year.⁶⁶ His dating in both the cases cited is inaccurate, which suggests, if nothing else, that some uncertainty lingered round the complex relationship between the two systems. The disuse of the imperial calendar in the western Mongol lands might have coincided with the expulsion of the Yüan dynasty from China in 1368, though this cannot be demonstrated.

We may also conjecture that the introduction of the Khānī era on 12 Rajab 701/13 March 1302 was the first stage in the process whereby the start of the animal year became popularly associated with Naurūz during the fourteenth century. Following the conversion of Ghazan Khan in 1295, the new era marked a change in the outward style of the dynasty and at the same time attempted to solve fiscal difficulties created by the disparity between the *hijrī* lunar year and the agricultural year of solar seasons.⁶⁷ The Khānī year was solar, starting at Naurūz, and adopted the names of the Turkish months, "as was appropriate for a calendar instituted by Mongol kings".⁶⁸ It is not used by Rashīd al-Dīn, who is supposed to have introduced it, nor by Kāshānī, though it was current in Abū Sa'īd's reign, as is attested by his coinage.⁶⁹ References to the Khānī year in the mid-fifteenth century show it used in parallel with the animal year, demonstrating that certainly by this time they both started together at Naurūz.⁷⁰

We may draw some more general conclusions from these examples of the historians' use of the twelve-animal calendar. First, the period for which we have dates in the full Chinese-Uighur form (day, month, year) extends from 631/1234 to

716/1316. Rashīd al-Dīn uses the Chinese-Uighur calendar sparingly, in order to date events in the early history of the Ilkhanid dynasty, from the birth of Abaqa to the accession of Ghazan Khan. In this period, the Mongol date is often authoritative, and probably reflects the form in which his information reached him. A conversion from Mongol to Islamic dates was needed for the early period, and these conversions, perhaps on the basis of Tūsī's tables, are generally accurate.

Rashīd al-Dīn stops using the animal calendar for the reign of Ghazan. This surely reflects the fact that, after Ghazan's conversion to Islam and a certain distancing of the Ilkhanate from the rest of the Mongol empire,⁷¹ there was less emphasis on the Chinese (-Uighur) civil calendar of the parent Yüan dynasty in China. Kāshānī's continuing use of the animal calendar for Öljeitü's reign, however, shows that the Islamisation of the Hūlegüid ruling family remained superficial. For a brief period of about three years (704-7 A.H.) he uses it quite frequently, compared with Rashīd al-Dīn, for events both in Iran and elsewhere in the Mongol world. This reflects the situation at the beginning of Öljeitü's reign, when there was something of a renewal of pan-Mongol solidarity. Envoys arrived from the Great Qa'an, the Chaghatay Khanate and the Golden Horde, one consequence of which was Öljeitü's Gīlān campaign of 706/1307. The lack of further Chinese-Uighur dates soon afterwards is suggestive. It is also well known that there was a revulsion against Islam and a desire to revert to traditional Mongol practices in the early years of the reign, resolved by Öljeitü's adoption of Shī'ism in 709/1310.

Although Kāshānī's chronology is frequently faulty, his animal dates are sometimes more reliable than their *hijrī* equivalents. Kāshānī's inaccuracies might be due to the unrevised nature of his work, but they might also indicate a general decline in the use of the official calendar, and a greater ignorance of its characteristics, especially after the start of the new Khānī era. Also, it may be just a coincidence, but Tūsī's conversion table ends with 703 A.H./Lu-yīl (the Year of the Dragon, 1304), precisely the point from which Kāshānī's chronology develops serious inconsistencies.

Taken on its own, the use of the Chinese-Uighur calendar by the historians, and its rapid abandonment after the fall of the Ilkhanate, might be taken to indicate a steady erosion of its political importance. On the other hand, the Mongol New Year evidently continued to be celebrated by the Mongols themselves.⁷² Furthermore, the picture of the decline of the Chinese-Uighur calendar is not borne out by the evidence of material issuing from the Ilkhanid chancery.

Various documents have survived, including

TABLE 4
Dates from Mongol chancery documents

Document	Animal Year	Other details (day/month)	Equivalent (A.D.)	Ref.
Hülegü to Louis IX	Dog 1262	10 April, 10th year of reign (1262)	= 10 Apr. 1262	M
From Möngke Temür	Hare 1267	4th <i>qaghuchid</i> , 1st autumn month 27th day 7th month	= 18 Aug. 1267	MC2
Abaqa to Clement IV	Dragon 1268	23rd day, Altinch-āy 6th month	= 3 Aug. 1268	T
Safe-conduct from Abaqa	Hare 1267 1279	16th day, 1st winter month 10th month	= 3 Nov. 1267 = 21 Nov. 1279	MC1
Arghun to Philip the Fair	Ox 1289	6th <i>qaghuchid</i> , 1st summer month 25th day 4th month	= 15 May 1289	MC2
Arghun to Nicholas IV	Tiger 1290	5th day, 1st summer month 4th month	= 14 May 1290	MC1
Ghazan to Boniface VIII	Tiger 1302	14th day, 3rd spring month, 701 A.H. 3rd month	= 12 Apr. 1302	MC1
Öljeitü to Philip the Fair	Snake 1305	8th <i>qaghuchid</i> , 1st summer month, 704 A.H. 23rd day 4th month	= 16 May 1305	MC2
Decree of Abū Saʿīd	Monkey 1320	8th <i>qaghuchid</i> , 2nd autumn month, 720 A.H. 23rd day 8th month	= 25 Sept. 1320	C
Decree of Abū Saʿīd	Ox 1325	9th <i>qaghuchid</i> , 1st autumn month 22nd day 7th month 21 Ramadan 725	= 30 Aug. 1325 = 31 Aug. 1325	HD1
Decree of Yisun Temür	Hare 1339	24th day, 2nd spring month 2nd month	= 3 Apr. 1339	LC
Golden Horde to Simon Ivanovich	Pig 1347	5th <i>qaghuchid</i> , 8th month 26th day	= 4 Oct. 1347	MC2
Golden Horde	Horse 1354	2nd <i>qaghuchid</i> , Aram-āy 1st month	= 22 Feb. 1354	MC2
Decree of Shaikh Uwais	Dog 1358	15th day, 2nd autumn month 8th month 13 Dhu 'l-Qaʿda 759	= 18 Sept. 1358 = 17 Oct. 1358	HD2

Sources:

M = Meyvaert; C = Cleaves; MC1 = Mostaert and Herrmann and Doerfer, "725/1325"; HD2 = Herrmann and Cleaves, "Trois documents"; MC2 = Mostaert and Doerfer, "Şeyh Oveys"; see note 73. Cleaves, "Lettres"; LC = Clark; T = Tisserant; HD1 =

letters addressed to the rulers of Europe by different Ilkhans; see Table 4.⁷³ These documents are interesting, in the present context, for several reasons, which we should note briefly. In the first place, the Chinese-Uighur animal year is used consistently and without interruption, from the time of Hülegü to the time of Abū Saʿīd, in combination with the *hijrī* year from the reign of Ghazan. Secondly, the chancery documents differ from the chronicles in the way they express the lunar months, and sometimes also the days. Whereas the chroniclers invariably employ the form of months numbered one to twelve, in the chancery documents we often find expressions such as "the first summer month", "the second spring month", "the

second autumn month", and so on.⁷⁴ There is also evidence of a complicated system of retrogressive numbering for the last ten days of the month.⁷⁵ While the dating method employed by the chancery conforms to the Chinese-Uighur calendar, it would appear to preserve characteristics that are more peculiarly Turkish than Chinese.⁷⁶

It is not clear to me why the administration employed a dating system different from the one apparently in more popular use: possibly it reflects the ethnic composition of the scribal classes. But evidently the same "four seasons" system continued in use in the chanceries of the western Mongol states, and particularly by the Golden Horde, for at least twenty years after the collapse of

the Ilkhanate,⁷⁷ which might indicate a conservative attachment to the imperial administrative practices of the parent Yüan dynasty in China, at least until 1368.

Thus, despite the broader political trends hinted at by the declining use of the Chinese-Uighur animal calendar in the chronicles, there is evidence of greater continuity in its use in the administration. Juvainī's complaint that a knowledge of the Uighur script was a passport to advancement was probably as true at the end of the Ilkhanate as at the beginning. This reinforces other indications that the traditional Persian bureaucracy was perhaps not quite so vital to the functioning of Mongol government in Iran as they would like us to suppose.⁷⁸

ACKNOWLEDGEMENTS

I would like to thank Professor Louis Bazin for responding very generously and in great detail to my numerous enquiries, and Professor Edward S. Kennedy for his unstinting assistance and encouragement. Both have also made helpful comments on the final draft, and are largely responsible for anything remotely numerate about this paper (except the errors). An early version of this paper was presented at a conference at the School of Oriental and African Studies, University of London, on "The Mongol Empire and its Legacy" in March 1991; I am grateful to David Morgan for allowing me to withdraw it from the projected conference proceedings for which it was originally prepared.

¹ Igor de Rachewiltz, "Turks in China under the Mongols: a Preliminary Investigation of Turco-Mongol Relations in the 13th and 14th Centuries", in *China Among Equals*, ed. M. Rossabi (Berkeley, Los Angeles and London, 1983), pp. 281-310; P. D. Buell, "Pleasing the Palate of the *Qan*: Chang-ing Foodways of the Imperial Mongols", *Mongolian Studies*, XIII (1990), pp. 57-81.

² R. Abdollahy, "Calendars, ii. Islamic Period", in *Elr*, IV (1990), p. 671; *idem* ('Abdallāhī), *Tārīkh-i tārīkh dar Īrān* (Tehran, 1366/1987), pp. 326-7.

³ See R. D. McChesney, "A Note on Iskandar Beg's Chronology", *JNES*, XXXIX/i (1980), pp. 53-63 [esp. 56-7]. A table of the *hijrī* dates corresponding to the start of the Turkī new year from 1495 to 1925 is given by 'Alī Akbar Khān Muḥammadī, "Sāl-shumār-i taṭbiqī-yi sālḥā-yi turkī va hijrī qamarī", *Tārīkh-i mu'āshir-i Īrān*, I (Tehran, 1368/1989), pp. 95-119. I am grateful to Jean Calmard for this reference; the table, however, is not entirely reliable.

⁴ O. Turan, *Oniki hayvanlı Türk takvimi* (Istanbul, 1941). Thanks to Metin Kunt for going through this with me.

⁵ Bibliotheca Orientalis Hungarica, XXXIV (Budapest and Paris, 1991), a revised version of Bazin's doctoral thesis (Lille, 1972, publ. 1974); see esp. pp. 405-10, 557. Certainly it is only in the area of Islamic sources that Bazin's work is less than exhaustive.

⁶ According to Saif-i Munajjim, *Zij-i Ashrafi*, Bibliothèque Nationale, Paris Ms. Pers. Suppl. 1488, fol. 3a, a new "era of Hülegü" started on 1,592,087 + 322 days after the Flood, = 11 January 1258 (Julian), i.e. during the siege of Baghdad. This era does not seem to be attested in the chronicles, and Hülegü's reign is generally taken to start in 652/1254 (cf. n.15). Rashīd al-Dīn, *Jāmi' al-tavārikh*, ed. E. Quatremère (Paris, 1836), pp. 60-3, is also aware of the start of a new era, *tārīkh*, which he dates back to Chinggis Khan.

⁷ For fuller details of the calendar see, P. Hoang, *A Notice of the Chinese Calendar and a Concordance with the European Calendar* (Zi-Ka-Wei, 1885); J. Needham, *Science and Civilisation in China*, III (Cambridge, 1959), esp. pp. 396-406.

⁸ It should be borne in mind that there is a difference between the civil or popular *hijrī* calendar, beginning on Friday 16 July 622, and the astronomical reckoning, based on the true conjunction of the new moon the previous day, 15 July 622. Throughout this paper, the *hijrī* date is taken to refer to the civil calendar, but the discrepancy between the two could explain some of the inconsistencies discussed below. Conversions are taken from G.S.P. Freeman-Grenville, *The Muslim and Christian Calendars* (London, 1963).

⁹ De Rachewiltz, "Turks in China", pp. 283-7; see also the paper by Thomas T. Allsen, "The Yüan Dynasty and the Uighurs of Turfan in the 13th Century", esp. p. 266-7, in the same volume. The vital role of the Khitans has also been stressed by P. D. Buell, "Sino-Khitans Administration in Mongol Bukhara", *JAH*, XIII/ii (1979), esp. p. 124.

¹⁰ Bazin, *Systèmes*, pp. 390-403.

¹¹ *Ibid.*, pp. 294, 354-5, 556. The first and the twelfth months derive from Buddhist/Iranian and Soghdian respectively. See Table 2.

¹² All conversions in this paper are taken from P. Hoang, *Concordance des chronologies néoméniques chinoise et européenne* (Chang-hai, 1910), partial dynasty Yüan, pp. 473-81, principal dynasty Yüan, pp. 267-78.

¹³ A. Sayılı, *The Observatory in Islam* (Ankara, 1960), esp. pp. 224-5, 233-6.

¹⁴ E. S. Kennedy, "The Chinese-Uighur Calendar as Described in the Islamic Sources", *Isis*, LV (1964), pp. 435-43. On the debated question of the influence of Islamic astronomy on China, see Needham, pp. 49-50, 372-82; Sayılı, p. 207; and J. A. Boyle, "The Longer Introduction to the 'Zij-i-Ilkhānī' of Naṣīr-ad-Dīn Tūsī", *Journal of Semitic Studies*, VIII (1963), pp. 244-54 (p. 254).

¹⁵ Sayılı, pp. 189-91. The main Persian source is Rashīd al-Dīn, ed. Quatremère, pp. 324-7; ed. A. A. 'Alizada (Baku, 1957), pp. 66-7; cf. tr. K. Jahn, *Die Chinesgeschichte des Rasīd al-Dīn* (Vienna, 1971), pp. 21-3. See also Rashīd al-Dīn, *Tanksūq-nāma ya tibb-i ahl-i khatā*, ed. M. Minovi (Tehran, 1350/1972), p. 16. Rashīd al-Dīn's account is followed by Banākātī, *Tārīkh*, ed. J. Shi'ār (Tehran, 1348/1969), p. 338. 'Abdallāhī, *Tārīkh*, p. 324, seems to regard Banākātī as the superior source. Banākātī, p. 420, puts the founding of the Marāgha observatory in the 57th year of the era of Chinggis Khan (starting in 599 A.H.). Rashīd al-Dīn says work was completed in the seventh year of Hülegü's reign, which was taken to begin in 652/1254, i.e. in 659/1261. Vaṣṣāf, *Tajziyat al-amṣār va tajziyat al-a'sār* (lith. Bombay, 1269/1852), pp. 51-2, puts the foundation of the observatory in 657/1259, and says it remained unfinished on Hülegü's death in 663/1265.

¹⁶ Vaṣṣāf, *loc. cit.*, echoes Tūsī's own views on the value of observing the stars, as put forward in the *Zij-i-Ilkhānī*, B.L. (India Office) Ms. Or. 7464, fols. 2b-3a. Although giving a detailed account of the work of the observatory and the contents of Tūsī's *zīj*, Vaṣṣāf does not specifically refer to the study of the Chinese calendar, nor does he use it in his chronicle. For Hülegü's reliance on astrologers, see e.g. Sayılı, pp. 192, 202.

- ¹⁷ *Zij-i Ilkhānī*, Or. 7464, fol. 17a (misplaced in the Ms.); cf. Paris Ms. Ancien Fonds 163, fol. 5a, Cambridge Ms. Browne 0.2 (7), fol. 3b; 'Abdallāhī, p. 323.
- ¹⁸ Or. 7464, fol. 13a, followed by the table on fols. 13b–16a. 'Abdallāhī seems at least partly to underrate the use of the Chinese–Uighur calendar on the grounds that it was little known when it first appeared in Iran.
- ¹⁹ According to the Timurid prince Bābur, Tūsī's *zīj* remained in general use until it was replaced by Ulugh Beg's *Zij-i Gurgānī*, see Sayılı, p. 264 and *ibid.*, pp. 211–18, on later work at Marāgha. A comprehensive list of zijes is given by E. S. Kennedy, "A Survey of Islamic Astronomical Tables", *Trans. Amer. Philosoph. Soc.*, XLVI (1956), pp. 123–77. Of these, the *Zij-i khāqānī* of Jamshīd al-Kāshī (1413) has tables for conversion from *hijrī* to Chinese dates for the period 801–901 A.H., India Office Lib. Persian Ms. Ethé 2232, fols. 17a–18a.
- ²⁰ Tr. Jahn, *Chinageschichte*, pp. 22–3, followed in essence by Banākātī, pp. 25, 339–40.
- ²¹ These sections of the *jāmi' al-tavārīkh* are conveniently brought together in the "edition" of B. Karīmī (Tehran, 1338/1959), I, pp. 165–679, from the editions by I. N. Berezin and E. Blochet, and vol. II (from Quatremère and K. Jahn).
- ²² 'Abdallāhī, p. 326, refers only to this limited use of the animal calendar, citing the translation by J. A. Boyle, *The Successors of Genghis Khan* (New York and London, 1971).
- ²³ For the terms *āy* and *yīl*, see G. Doerfer, *Die türkischen Elemente im Neupersischen*, II (Wiesbaden, 1965), pp. 169–70, IV (1975), pp. 243–51, and Bazin, *Systèmes*, esp. pp. 44–9, 65–71.
- ²⁴ Kāshānī, *Tārīkh-i Uljāitū*, ed. M. Hambly (Tehran, 1348/1969).
- ²⁵ Banākātī also occasionally uses the animal calendar, generally following Rashīd al-Dīn, but sometimes able to provide corrections or alternatives. The edition should be used with caution: for example, on p. 427, Banākātī says Abaqa returned to Tabriz from Māzandarān in the spring of the Year of the Ox (*bahār-i gāw*) 664 A.H., which does not correspond; Rashīd al-Dīn, ed. Baku, p. 103, has spring (*bahār gāh*) 663, which is inaccurate: it should be spring 664/1266 (Year of the Tiger); cf. Table 1, no. 18.
- ²⁶ Kāshānī, pp. 74, 75. For Mu'minī, see also Mustaufī, *Tārīkh-i guzīda*, ed. 'A. Navā'ī (Tehran, 1362/1983), p. 813. Fakhr al-Dīn is also commemorated in a poem that appears to give his death as 25 Sha'bān. These are the last complete dates Kāshānī gives by the Chinese–Uighur calendar; it is possible that Fakhr al-Dīn was one of his sources of information. According to Ibn al-Fuwaṭī, *Talkhīs majma' al-ādāb fi mu'jam al-alqāb*, IV/3, ed. M. Jawād (Damascus, 1965), pp. 149–50, Fakhr al-Dīn died in 709 A.H., but here Kāshānī's dating is preferable.
- ²⁷ See Doerfer, *Elemente*, III (1967), pp. 657–60.
- ²⁸ In addition to nos. 5, 31 and 45 on Table 1, see Rashīd al-Dīn, ed. 'Alizada, p. 283 for New Year's day in 694 A.H., i.e. 17 January 1295. Boyle's reference (*CHr*, V, Cambridge, 1968, p. 396) to Ghazan's celebration of the New Year on 1 Jumādā II, 703/10 January 1304, however, is an error: the celebrations were to mark Abū Yazīd's birthday, cf. Rashīd al-Dīn, ed. 'Alizada, p. 363; the Mongol New Year was on 6 February in 1304.
- ²⁹ E.g. Rashīd al-Dīn, ed. Quatremère, pp. 74–9, ed. 'Alizada, p. 379.
- ³⁰ The birth of Möngke Temür in 654 A.H. (no. 4). The Mongol date however, is preferable, see Table 3. The prince is said to have lived 26 years and 2 months, which is nearly correct according to the lunar calendar.
- ³¹ The death of Abaqa (no. 29) is given twice, once with the animal date first, once with the *hijrī*.
- ³² The death of Toqtani (or Toqiti) Khatun, one of Hülegü's concubines; the text ed. Quatremère, p. 94, puts her death on a Monday. Thursday is correct, as confirmed by the Mongol date, which is to be preferred (see Table 3); the *hijrī* date is one day early, perhaps to be explained by a delay in the sighting of the new moon of Šafar (or of Rabī' I).
- ³³ Kāshānī, p. 38, for the arrival of an Ilkhanid embassy in Peking, and the death of Temür Qa'an; also p. 54 for the death of the Chaghatayid ruler Kunjak son of Du'a.
- ³⁴ Occasionally there are blanks in the Mss. of Rashīd al-Dīn, indicating the intention to supply the Mongol date, e.g. ed. 'Alizada, pp. 93 (death of Hülegü), 169 (enthronement of Aḥmad). Other such lacunae are indicated by (...) on Table 1.
- ³⁵ Bazin, *Systèmes*, pp. 409–10, with particular reference to dates for Ghazan's birth and accession (nos. 20, 44). It should be noted, however, that the correct month of Ghazan's birth (Rabī' II) is found in one Ms.: *Tārīkh-i Ghāzānī*, ed. K. Jahn (London, 1940), p. 3. This highlights the more likely source of error, namely scribal inaccuracy. The correction to the date of Ghazan's accession (see Table 3) is based on the view that it took place on a Sunday, as mentioned in the sources. Rashīd al-Dīn's dates for the events of Dhu 'l-Hijja 694 lack internal consistency, and there is disagreement too among other sources. Banākātī, p. 456, puts Ghazan's coronation on Sunday 28 Dhu 'l-Hijja; Mustaufī, p. 602, has the end of the month.
- ³⁶ A paper in preparation by Mustafa K. Saiyid, E. S. Kennedy and Benno van Dalen will largely rectify this.
- ³⁷ Tūsī's tables for conversions between the Chinese–Uighur and Yazdagird calendars are entirely consistent, which inspires confidence. Furthermore, some trial conversions of *hijrī* dates from the first folio of Tūsī's table into the Chinese–Uighur calendar agree with modern tables (Kennedy, *pers comm.*). Further progress awaits an accurate transcription of the rest of Tūsī's table. Cf. previous note.
- ³⁸ See above, note 19, for subsequent work in the Ilkhanid period. Āmulī, *Nafā'is al-funūn*, ed. Abū 'l-Ḥasan Sha'rānī, III (Tehran, 1379/1960), p. 459–61, describes the art of constructing almanacs, in which the "Turkish" years and months are featured. The author died at Shirāz in 753/1352.
- ³⁹ Juvainī, *Tārīkh-i Jahān-gushāy*, ed. M. M. Qazvīnī, III (London, 1937), pp. 95–6; tr. J. A. Boyle, *The History of the World Conqueror* (Manchester, 1958), II, pp. 610–11. Elsewhere, Rashīd al-Dīn himself puts Hülegü's departure west in the Year of the Ox, see ed. Karīmī, I, p. 600, tr. Boyle, *Successors*, p. 223.
- ⁴⁰ The Saturdays in Pisces 660 were 18 and 25 February, 4 and 11 March 1262. The only concrete information is that the sun was 5° over the horizon, i.e. he was born about 20 minutes after sunrise.
- ⁴¹ There is an overlap, for the last month of 683 A.H. does fall in the first month of the Year of the Cock. Professor Bazin (*pers. comm.*) has suggested that the animal year of both Arghun's birth and accession might have been falsified deliberately, the Cock being a far more illustrious sign than the Monkey. If we take the Monkey (1260) as the year of Arghun's birth, there is still poor agreement with the day of the week: 25 Aram/8 March 1260 was a Monday.
- ⁴² Banākātī, p. 441, follows Rashīd al-Dīn's *hijrī* and animal dates; Vaṣṣāf, p. 137 has 7 Jumādā I (22 July), as does Aḥarī, *Tārīkh-i Shaikh Uvais*, ed. and tr. J. B. van Loon (The Hague, 1954), p. 138/tr. p. 40. K. Jahn's edition of Rashīd al-Dīn (The Hague, 1957), p. 60, has 9 Altinch-āy (22 July). July 22 was a Saturday, and this would be a plausible alternative, except that it does not fit with the death of Aḥmad the previous day. See also B. Spuler, *Die Mongolen in Iran* (Berlin, 1955), pp. 81–2; he does not refer to the animal date.
- ⁴³ Vaṣṣāf, p. 245, has 6 Rabī' I. The day of the month is missing from Rashīd al-Dīn's text, ed. 'Alizada, p. 226, but the time is given as mid-morning (*jāshtgāh*). For internal consistency, the following *hijrī* date (no. 36) should also be altered in order to allow a true diurnal correspondence with the Chinese–Uighur date.
- ⁴⁴ Banākātī, p. 446, says he ruled 7 years, 9 months and 20 days,

- which is one year too many. According to the lunar calendar, he ruled 6 years, 9 months and 9 days.
- ⁴⁵ I am indebted for this ingenious explanation of the 33 years to Professor Bazin. We may also note that according to correct Mongol reckoning, Arghun would have been 33 lunar years, inclusive.
- ⁴⁶ Banākātī, p. 437.
- ⁴⁷ In my article "Boloḡān Kātūn" in *Elr*, IV (1989), pp. 338–9, I wrongly said 22 March was Naurūz; Naurūz in 1290 was 13 March.
- ⁴⁸ Cf. Bazin, p. 409; see also M. J. L. Young, "An Arabic Almanac of Favourable and Unfavourable Days", *JSS*, XXVIII/ii (1982), pp. 261–79 (p. 273).
- ⁴⁹ *Ibid.*, p. 278, confirms that the 23rd of the month is "excellent for every matter", while the 24th is "continuously inauspicious". Banākātī, p. 447 has Sunday 24 Rajab, but the year is given as Qoyi (*sic*, Sheep) for Taulai (Hare); Āharī, p. 140/tr. p. 43 also has 24 Rajab. Vaṣṣāf, p. 260, merely has Rajab 690, and appears to think it was spring! The same author puts Gaikhātu's second coronation (no. 39), in Jumādā II, 691, which he also says was springtime. Concerning this later event, it should be noted that in Jahn's edition (1957, p. 85) 12 Rajab is equivalent to 4 Altinch-āy (19 June); the correct correspondence, 14 Altinch-āy, is given in the Baku edition (p. 236).
- ⁵⁰ I.e. so that "Monday 15th" was really Monday 16th, according to the standard civil calendar.
- ⁵¹ On p. 30, he says that 17 Dhu 'l-Hijja was a Wednesday, which is consistent with his Monday 15th. On the other hand, on p. 23, he says 2 Dhu 'l-Hijja was a Monday, which would make the 15th a Sunday.
- ⁵² Otherwise, Kāshānī is again inconsistent here, unless he took Dhu 'l-Hijja to be 29 days; but in 703, which was a leap-year, it had 30 days.
- ⁵³ A difference of two days between the start of Muḥarram and the start of Yetinch-āy could be expected because the previous months were of unequal length: Altinch-āy had 29 days, and Dhu 'l-Hijja 30.
- ⁵⁴ Whereas it is an unlikely scribal error for *shānzdahum* (= 16) Altinch-āy (equivalent to 15 Dhu 'l-Hijja).
- ⁵⁵ Banākātī, p. 474, Mustaufī, p. 606 and Vaṣṣāf, p. 467. Kāshānī and Banākātī both have *muntāṣaf* (middle of) Dhu 'l-Hijja, which would normally be the 15th, or sometimes 14th, of a lunar month. The Muslim "Monday" begins at *sunset* on Sunday, but it is stated by Banākātī that the coronation occurred in the morning, which is what one would expect. Āharī, p. 147/tr. p. 49 has 2 Dhu 'l-Hijja, clearly in error.
- ⁵⁶ Cf. note 48. The 15th is a good day, but the 16th is "continuously inauspicious", Young, pp. 276–7. The sources confirm that the day was specially selected by the astrologers.
- ⁵⁷ A further correction is therefore needed to Melville, "Boloḡān Kātūn", p. 339.
- ⁵⁸ Resolved without explanation in *idem*, "The Itineraries of Sultan Öljeitü, 1304–16", *Iran*, XXVIII (1990), pp. 55–70 (p. 65). The same paper (p. 66 and note 137) discusses the correct date for Öljeitü's death (no. 77).
- ⁵⁹ Kāshānī, p. 66, refers to Wednesday 19 and Thursday 20 Dhu 'l-Hijja.
- ⁶⁰ The Chinese-Uighur dates are studiously ignored by historians of the Ilkhanid period, hence the lack of previous discussion of the subject. The question is briefly aired by R. Stephen Humphreys, *Islamic History. A Framework for Inquiry* (London, 1991), p. 130.
- ⁶¹ For the death of Toqtani Khatun, see above, note 32, and for the two battles, Abu 'l-Fidā, *al-Mukhtaṣar fī tārīkh al-bashar* (Cairo, 1907), IV, pp. 9, 15, following earlier sources. In Jahn's edition of Rashīd al-Dīn (1957, p. 31) the battle of Albistān is put in Onunch-āy (10th month), but is correctly Otunch/Üchünc (3rd month) in the Baku ed., p. 144.
- ⁶² But not in earlier parts of the work, see the constant corrections provided in Boyle's *Successors*.
- ⁶³ The Mongol month is probably accurate, so the Muslim date also needs correcting; cf. above, note 58.
- ⁶⁴ Bazin, pp. 410–12, is unaware of the Safavid use of the animal calendar (cf. above, note 3). He discusses an example (p. 406) that appears to confirm a continuing adherence to the Chinese calendar in 831/1428; we may also recall Bābūr's reference to the continuing popularity of Naṣīr al-Dīn Tūsī's tables (see note 19), though this does not specifically concern the animal calendar.
- ⁶⁵ 'Alī Yazdī, *Zafar-nāma*, ed. M. 'Abbāsī (Tehran, 1336/1957), II, pp. 170, 249, is unambiguous for 1400 and 1401, and a spring start to the year is also implied e.g. by the dates given for Timur's departure for Moghulistān in 776/1375 (I, 189). Yazdī's dating is generally more precise than Shāmī's *Zafar-nāma*, ed. F. Tauer (Prague, 1937, 1956). Tauer wrongly takes Naurūz to be 21 March at this period. I intend to review the chronology of these two sources elsewhere.
- ⁶⁶ Ḥāfiẓ-i Abrū, in Shāmī, ed. Tauer, II, pp. 35 (concerning 1374) and 119 (1396): the Mongol (Chinese) New Year was on 10 February in 1396, nowhere near the beginning of 798 A.H. (which started in October 1395).
- ⁶⁷ Banākātī, p. 26, incorrectly puts the start of the Khānī era at the end of 699 A.H. See also S. H. Taqizadeh, "Various Eras and Calendars Used in the Countries of Islam", *BSOAS*, IX (1937–9), pp. 903–22 (pp. 118–20); *idem* (Taqizāda), *Gāh-shumārī dar Irān-i qadīm* (Tehran, 1316/1938), pp. 161–4, 296–7; 'Abdallāhī, pp. 328–30. The correct date for the start of the Khānī era, given by Mustaufī, p. 606, is confirmed by al-Kāshī, *Zīj-i Khāqānī*, fol. 22a. I am most grateful to Prof. Kennedy for performing Kāshī's calculations for me. Kāshī says the start of the new era coincided with Ghazan's succession, which is incorrect. See also Shams-i Munajjim Wābkanwī, *Zīj al-muḥaqqaq al-sultānī*, Aya Sofya, Istanbul, Ms. 2694, fol. 28a. Despite a detailed account of the new calendar, which he helped to create, Wābkanwī does not specify the *hijrī* date on which the Ghazanī era began.
- ⁶⁸ Wābkanwī, fol. 29a, also Sayılı, p. 229. The Turkish months were associated with the zodiacal signs, thus Aram-āy was equivalent to Ḥamal (Aries), and 1 Aram was now identical to 1 Farvardīn, rather than the beginning of the Chinese-Uighur year. See also al-Kāshī, *loc. cit.*; Taqizāda, p. 164.
- ⁶⁹ Wābkanwī, fol. 36, says it remained little known, cf. Sayılı, p. 230; see also G. C. Miles, "The Inscriptions of the Masjid-i Jami' at Ashtarjān", *Iran*, XII (1974), pp. 96–7, for Abū Sa'īd's coinage, which includes issues from 31 to 35 Khānī (1332–6), some of which are dated by both Khānī and *hijrī* dates. This type is also marked by a revival of Uighur script on the coinage. The Khānī era is frequently used by Vaṣṣāf, who was a revenue official in Fars, and by Mustaufī, *Dhail-i tārīkh-i guzida*, ed. and (Russian) tr. M. D. Kyazimova and V. Z. Pirieva (Baku, 1986).
- ⁷⁰ Taj al-Dīn Ḥasan Yazdī, *Jāmi' al-tavārīkh-i Ḥasanī*, ed. H. M. Ṭabāṭabā'ī and Īraj Afshār (Karachi, 1987), e.g. pp. 46, 47, 48. The use of the Khānī era is not always accurate, see pp. 56, 57, 95, and it is dropped from the reckoning towards the end of the work.
- ⁷¹ Spuler, p. 91; for the evidence of Ghazan's coinage, see Sheila S. Blair, "The Coins of the Later Ilkhanids: A Typological Analysis", *JESHO*, XXVI/iii (1983), esp. p. 297. Ghazan's coins nevertheless continued to use the Uighur script (696–703 A.H.). For the revival of links under Öljeitü, see e.g. Boyle, "Dynastic and Political History of the Ilkhans", *CHIr*, V (Cambridge, 1968), pp. 398–9; for the date of the letter referred to there, see below (note 75 and Table 4). Öljeitü revived the use of Uighur script on his coins from 709 until 713 A.H.
- ⁷² Cf. above, note 66. Such references are disappointingly few.
- ⁷³ P. Meyvaert, "An Unknown Letter of Hulagu, Il-Khan of

Persia, to King Louis IX of France", *Viator*, XI (1980), pp. 245–59; E. Tisserant, "Une lettre de l'Ilkhan de Perse Abaga, adressée en 1268 au Pape Clément IV", *Le Muséon*, LIX (1946), pp. 547–56; A. Mostaert and F. W. Cleaves, "Trois documents mongols des Archives secrètes vaticanes", *HJAS*, XV (1952), pp. 419–506; *idem*, *Les Lettres de 1289 et 1305 des ilkhan Aryun et Öljeitü à Philippe le Bel* (Harvard, 1962); Cleaves, "The Mongolian Documents in the Musée de Téhéran", *HJAS*, XVI (1953), pp. 1–107; G. Herrmann and G. Doerfer, "Ein persisch-mongolischer Erlass aus dem Jahr 725/1325", *ZDMG*, CXXV (1975), pp. 317–46; *idem*, "Ein persisch-mongolischer Erlass des Galāyeriden Seyh Oveys", *CAJ*, XIX (1975), pp. 1–84; Larry V. Clark, "On a Mongol Decree of Yisün Temür (1339)", *CAJ*, XIX (1975), pp. 194–8.

⁷⁴ For other examples, see Mostaert and Cleaves, "Lettres", pp. 52–3. Herrmann and Doerfer, "Seyh Oveys", pp. 57–8, also draw attention to this difference between the documents and the chronicles, but do not offer an explanation. Neither do they appear to notice that the dates in the decree of 759/1358 are not equivalent: the Mongol date should be the third autumn month, not the second (yielding 18 October 1358), and even then there is a discrepancy of one day.

⁷⁵ For a discussion of the term *qaghuchin/qaghuchid*, see Mostaert and Cleaves, "Lettres", pp. 49–54. Only the bilingual decree of 725/1325 edited by Herrmann and Doerfer allows an exact concordance between the two calendars, and confirms that the *qaghuchid* are the last ten days of the month, numbered backwards, i.e. 21st = 10 *qaghuchid*, 22nd = 9, etc. In fact, the correspondence is only exact if the Muslim date on the decree is taken to be according to the astronomical era; otherwise, there is a "nocturnal" rather than diurnal agreement. However, the agreement is worse using any of the alternative theories about the term *qaghuchid*, such as that it refers to the second half of the month, or that it is not numbered retrogressively.

The other *qaghuchid* dates are therefore converted according to this method in Table 4. This allows a definitive solution to the date of Öljeitü's letter to Philip the Fair, written on 16 May 1305 at Barzand, which exactly fits his movements, see Melville, "Itineraries", p. 64 and note 93. It will also be

noted, however, that there are substantial differences between the calculations given in Table 4, and those found in H. F. Schurmann, "Mongolian Tributary Practices of the Thirteenth Century", *HJAS*, XIX (1956), pp. 304–89 (esp. 341–3), citing Priselkov; cf. Mostaert and Cleaves, "Lettres", p. 53.

⁷⁶ *Eidem*, "Trois documents", p. 445, following Pelliot, suggest this seasonal dating was a Uighur characteristic and not necessarily exactly in line with the Chinese standard calendar. Bazin's researches confirm the Turkish character of the calendar based on the four seasons (*Systèmes*, esp. pp. 430–51, concerning this usage among Comans (Qipchaq) of northern Crimea), but here it is used together with the twelve-animal calendar, which aligns it with the Chinese calendrical system. The first spring month is equivalent to the first Chinese month, etc., as confirmed by the concordance of the dates on the decree of 725/1325 (see above).

⁷⁷ For the Golden Horde, see Schurmann, pp. 340–8, Mostaert and Cleaves, "Lettres", p. 53; for the Chaghatay, Clark, pp. 194–5; and for the Jalayirids, Herrmann and Doerfer, "Seyh Oveys". In later Jalayirid decrees, there is only a *hijrī* date: see H. Massé, "Ordonnance rendue par le prince ilkanien Ahmad Jalāir en faveur du Cheikh Sadr-od-Dīn (1302–1392)", *JA*, CCXXX (1938), pp. 465–8 (concerning a decree dated 773/1372), and G. Herrmann, "Ein Erlass des Galāyeriden Solṭān Hoseyn aus dem Jahr 780/1378", in *Erkenntnisse und Meinungen*, I, ed. G. Wiessner, *Göttinger Orientforschungen*, I (Syriaca), 3 (Wiesbaden, 1973), pp. 135–63 (pp. 136–8).

⁷⁸ Juvainī, tr. Boyle, I, pp. 6–8. On the element of continuity, see A. K. S. Lambton, *Continuity and Change in Medieval Persia* (Albany, 1988), pp. 50–68, 297–8, 305–9. For some doubts, see D. O. Morgan, "Prelude: The Problems of Writing Mongolian History", in *Mongolia Today*, ed. S. Akiner (London, 1991), pp. 1–8 [esp. pp. 5–6]. For the continuing importance of Mongolian in diplomatic relations, see D. P. Little, "Notes on Aitamiš, a Mongol Mamlūk", *History and Historiography of the Mamluks* (Variorum Reprints, London, 1986), no. VI, esp. pp. 392–6. The continuing use of Uighur on late Ilkhanid coinage also points in the same direction, though Blair, p. 305, considers Abū Sa'īd's last issue a "throwback".