

# Chinese Astronomical Records on Comets and 'Guest Stars'

In the Official Histories  
of Ming and Ch'ing and other Supplementary Sources

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The official dynastic histories are the primary sources on Chinese Astronomical records available to us. Among these records those on comets and 'guest stars' have attracted much attention from astronomers in the study of periodic comets, supernovae and pulsars. There is now sufficient evidence to prove that those given in the last official dynastic history, the *Ming-shih* and the subsequent draft dynastic history of the Ch'ing Dynasty, the *Ch'ing-shih kao* do not take in completely all the relevant data originally preserved in the Astronomical Bureau. It is our purpose here to discuss the supplementary sources to these two dynastic histories and to provide a list of comets and 'guest stars' for the period covered, i.e. 1368 to 1911.

The *Ming-shih*, as remarked by Wolfgang FRANKE, is one of the most carefully compiled official histories<sup>1</sup>. Its Astronomical Chapters were written systematically, maintaining the traditional style of keeping observational records of celestial and other natural anomalies. The inclusion of astronomical records was not so much for the pursuance of truth and knowledge but as a spontaneous practice born of social needs. The observations of the irregularities in the sky were used mainly for astrological interpretations pertaining to mundane affairs in general and the vicissitudes of the imperial court in particular. Among the celestial phenomena observed, comets and 'guest stars' were much dreaded, being considered as signs of impending calamities. 'Guest stars' included novae, variable stars and even comets and meteors. The untoward appearance of a comet in 1368, for example, was interpreted as having caused the downfall of the Yüan dynasty<sup>2</sup>. Thus, it was only natural for the succeeding dynasty to pay more attention to the irregularities in the heavens, particularly the comets and the 'guest stars'. Official astronomers had to be vigilant in keeping track of these celestial admonitions in order to take counter-measures as quickly as possible. They had to be precise in presenting their observation data. Even at time when the

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<sup>1</sup> Wolfgang FRANKE, *An Introduction to the Sources of Ming History*, University of Malaya Press, Kuala Lumpur, 1968, p. 48.

<sup>2</sup> See for example *Tsul-wei-lu*, p. 2a.

physical sciences were at a low ebb in China, one finds some very accurate and detailed descriptions of comets and 'guest stars' in the *Ming-shih*<sup>3</sup>.

It has been pointed out by Hsi Tsê-tsung that the 1574 Tycho's nova was only mentioned in the *Chronicle of the Emperor Shen-tsung* of the draft version of the history of the Ming Dynasty, i. e. the *Ming-shih kao*, but was omitted in the same part of the *Chronicle* of the official history, i. e. the *Ming-shih* itself.<sup>4</sup> Indeed, a much more detailed account of the Tycho nova can be found in that part of the veritable records of the Ming dynasty, i. e. the *Ming Shih-lu*, completed and presented to the emperor in 1598 by CHAO Chih-kao *et al.* Unfortunately, besides this record this important historical source contains very few other entries of comets and novae. We have found still further evidence to show that the records on comets and 'guest stars' in the *Ming-shih* are incomplete. Our information comes from an unofficial history of the Ming dynasty, the *Tsui-wei-lu*, compiled earlier than the official history itself. A word about the background of the writer will be necessary in order to assess the reliability of the text.

The *Tsui-wei-lu* was the work of CHA Chi-tso<sup>[3]</sup> (1601—1676), a scholar who saw the downfall of the Ming dynasty and experienced the rule of the Manchus. Cha Chi-tso became known as a writer at the age of fifteen and at the age of eighteen, he began to compete in the local examinations<sup>5</sup>. His flair for writing enabled him to find his way to the bureaucratic circle where he was engaged as secretary by high officials. He acquired wealth and enjoyed the company of his congenial group of gentry friends. But the halcyon days were rather short-lived for the Manchus soon took over the control of the empire. Cha Chi-tso, being a Ming loyalist, buried all his personal manuscripts and went into hiding. This had adverse effect on him, causing the confiscation of most of his property and his imprisonment in 1649. Fortunately he was released through the influence of certain friendly officials. Thereafter, he turned to writing and teaching.

About a decade later, Cha Chi-tso was listed as one of the eighteen assistant collators of the *Ming-shih chi-lüeh*<sup>[4]</sup>, a comprehensive history of the Ming period.<sup>6</sup> The work, which is now partially extant, provoked in 1661—1663 the famous case of literary inquisition which caused the death of a total of some seventy persons and the exile of many others. Cha Chi-tso announced immediately, in no uncertain terms, that he had no part in the work and that his name was used without his knowledge. This timely denial saved him and his family from execution.<sup>7</sup>

<sup>3</sup> See for example the description of the comet of 1472; Ho Peng-yoke, "Ancient and Mediaeval Observations of Comets and Novae in Chinese Sources", *Vista in Astronomy*, 1964, vol. 5, p. 206. See also Joseph NEEDHAM, *Science and Civilisation in China*, vol. 3, p. 430—431.

<sup>4</sup> See Hsi Tse-tsung, "A New Catalogue of Ancient Novae", *Smithsonian Contribution to Astronomy*, 1958, 2, 109; Ho Peng-yoke, *op. cit.*, p. 212.

<sup>5</sup> Arthur W. HUMMEL (ed.) *Eminent Chinese of the Ch'ing Period*, Vol. 1, pp. 18—19.

<sup>6</sup> For information about the book see Wolfgang FRANKE, *op. cit.*, p. 47.

<sup>7</sup> See under the name of CHUANG T'ing-lung, *Eminent Chinese of the Ch'ing Period*, pp. 205—206.

Whether or not Cha Chi-tso had participated in the compilation of the *Ming-shih chi-lüeh* will never be known. Even if he had no part in the compilation, he must have had such a distinguished reputation as to warrant the necessity of having his name included in the publication. It is, however, evident that he had sufficient amount of the Ming materials at his disposal and that he was capable enough to sort them out intelligently. This culminated in the compilation of *Tsui-wei-lu* by him single-handedly. The text was completed around 1670 but was never printed for fear of offending the Manchu authorities. The fact that it was written in the pattern of the official histories and that it was written before the *Ming-shih* assures one of a certain degree of reliability.

The information on the appearance of a comet or a 'guest star' was simplified considerably. The position was seldom given in relationship to any constellation while the date was very often given in year and month only. This is quite different from the practice of the official history where an observation made was normally accompanied by further information, such as the time and duration of its appearance, its position in the heaven, its brightness and colour. Nevertheless, the *Tsui-wei-lu* records more than forty appearances of both comets and 'guest stars'. While the majority of them only serve to confirm the official records in the *Ming-shih*, a few others furnish additional information on some comets and 'guest stars' sighted either earlier or later than those found in the official history. Surprisingly enough, four of these entries are found omitted in the official Ming History, including the draft version; one of which (i. e. that referring to the comet of March 1382) is confirmed by a parallel Korean observation.

Besides the four primary Ming sources mentioned above, a list of comets from the Astronomical Chapters of the *Ming-shih* and from materials elsewhere, compiled by LUNG Wên-pin<sup>[6]</sup> (1821—1893; 1865 cs) is included in the *Ming Hui-yao*<sup>[6]</sup> (1887). Although the versions were very much simplified, three records of comets which are found missing in the official history are brought to light. In works written in the annalistic pattern, comets and 'guest stars' were often singled out for mention, particularly for their astrological significance. Among them, the *Ming T'ung-chien*<sup>[7]</sup> (ca. 1870) seems to be the best example. It mentions almost all the existing records of comets and 'guest stars' and provides critical annotations to a few of them. There is, however, no new record of comets and 'guest stars'.

The official records of comets and 'guest stars' during the Ch'ing dynasty are far from being complete. For the period of nearly three centuries, the *Ch'ing-shih kao* (Draft History of the Ch'ing Dynasty) provides records of comets and 'guest stars' for only the first part of the Manchu rule. Furthermore, nearly all the records were obtained from the reigns of the two most distinguished monarchs of the dynasty, namely, K'ang-hsi (1661—1722) and Ch'ien-lung (1736—1796). The compiler abruptly concluded his astronomical chapters with a note saying that there were no further authentic records on astronomy for the official dynastic history soon after the Ch'ien-lung reign.

[ 5 ] 龍文彬

[ 6 ] 明會要

[ 7 ] 明通鑑

This does not in any way suggest that there was a break in astronomical tradition nor was it due to the negligence on the part of the observers or the mishandling on the part of the recorders. In fact, judging from the records presented by the Astronomical Bureau prior to this period, there are good reasons to believe that the observers were diligent and faithful to their work and that a considerable amount of actual observation must have been maintained in the archives of the astronomical bureau. It was primarily due to the chaotic disturbance of the Boxers' Uprising in 1900 that these well-preserved records were destroyed<sup>8</sup>. The compiler of the *Ch'ing-shih kao* might have had access to the remnants and if so he must have left the existing gap unfilled as the remnants available were apparently mutilated and incomplete as he would have thought that they would no longer serve any useful purpose in an official history reference<sup>9</sup>. Some of these omissions can be traced back to the fundamental source of the official history, namely, the *Ta Ch'ing Li-ch'ao shih-lu*<sup>10</sup> (Veritable Records of Successive Reigns of the Ch'ing dynasty). Unfortunately, the compilers, in the interest of brevity, frequently excised parts of the reports handed to them by the Astronomer-Royal. More often than not, the position and the magnitude of the comets were not indicated, the records merely set down under the proper date. However, a few of those which appear in the form of edicts or memorials to the throne for their particular astrological significances are more complete. Some variations in the reports of comets are also noted in the *Shih-erh-ch'ao Tung-hua lu*<sup>10</sup> (Tung-hua records of twelve reigns) which was based on the *Shih-lu* and was also arranged in the same annalistic style as the *Shih-lu*.<sup>10</sup> Like the *Shih-lu*, some of the comets were not necessarily recorded under the date on which they actually appeared, but under the day they were reported and referred to in the edicts and memorials.

While official records on comets and 'guest stars' are still lacking, the only book which can help to close the gap is Liu Chin-tsao's *Ch'ing-ch'ao Hsü Wên-hsien t'ung-k'ao*<sup>(10)</sup> (Encyclopaedia of the Historical Records of the Ch'ing Dynasty, Continued) patterned after the *Ch'ing-ch'ao Wên-hsien t'ung-k'ao* which keeps historical records only up to 1785. The compiler derived materials from all reliable sources for the period 1786—1910 includ-

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<sup>8</sup> *Ch'ing-ch'ao Hsü Wen-hsien t'ung-k'ao* (Kuo-hsüeh chi-pen ts'ung-shu series) ch. 303, p. 10471. See also CHU Wen-hsin, *Li-fa t'ung-chih*, Commercial Press, Shanghai, 1934, p. 30.

<sup>9</sup> In his article "The Organisation of Chinese Official Historiography: Principles and Methods of the Standard Histories from the T'ang through the Ming Dynasty", *Historians of China and Japan*, ed. W. G. BEASLEY and E. G. PULLEYPLANK (Oxford University Press: London, 1961), pp. 45—59, Lien-sheng YANG gives two main principles embodied in the Standard Histories, namely, that of continuity of the record and that of transmission of useful reference.

<sup>10</sup> For information regarding the *Tung-hua lu* and the *Shih-lu*, see for example, Knight BIGGERSTAFF, "Some Notes on the Tung-hua lu and the Shih Lu," *Harvard Journal of Asiatic Studies*, vol. 4, pp. 101—115.

ing records on comets and 'guest stars' which were obviously salvaged from fragmentary sources in the Astronomical Bureau. A few of the records on comets are actually too brief and abbreviated to offer any useful reference. On the other hand, those made on the first decade of the 19th century are, however, surprisingly elaborate with a certain degree of precision. Whether brief or detailed, they are chronologically presented in the following list:

### Abbreviations

- B(1) «Catalogue des Étoiles extraordinaires observées en Chine depuis les temps anciens jusqu'à l'an 1203 de notre ère,» *Connais. Temps*, 1846, Additions, p. 60.  
(by Bior, M. E.)
- B «Catalogue des Comètes observées en Chine depuis l'an 1230 jusqu'à l'an 1640 de notre ère», *Connais. Temps*, 1846, Additions, p. 60.  
«Recherches faites dans la grande collection des Historiens de la Comète de Halley», *Connais. Temps*, Additions, p. 69. (by Bior, M. E.)
- CHTK *Ch'ing-ch'ao Hsü Wên-hsien t'ung-k'ao*.  
(by Liu Chin-tsao, in *Kuo-hsüeh ts'ung-shu* series)
- CSL *Ta Ch'ing Li-ch'ao shih-lu*.  
(Taiwan reprint, *Hua-lien ch'u-pan-she*, Taipei, 1964)
- CSK *Ch'ing-shih kao*  
(by CHAO Erh-sun *et al*, 1914. Cast-print, Hong Kong)
- CWHTK *Ch'ing-ch'ao Wên-hsien t'ung-k'ao*.  
(by Chi Huang *et al*, the Ch'ien-lung period, *Kuo-hsüeh ts'ung-shu* series)
- H "Ancient and Mediaeval Observations of Comets and Novae in Chinese Sources," *Vistas in Astronomy*, vol. 5, 1964.  
(by Ho Peng-yoke).
- Hsi "A New Catalogue of Ancient Novae",  
*Smithson. Contr. to Astrophys.*, 2, 109, 1958.  
(by Hsi Tse-tsung)
- HWHTK *Hsü Wen-hsien t'ung-k'ao*,  
(by WANG Ch'i, in *Kuo-hsüeh chi-pen* series, No. 6)
- L "Suspected New Stars recorded in Old Chronicles and among Recent Meridian Observations,"  
*Publ. Astron. Soc. Pacific*, 33, 225, 1921  
(by LUNDMAX, K.)
- MHY *Ming Hui-yao*  
(by LUNG Wen-pin, 1887, modern reprint in two vols., Peking-Shanghai, 1958)
- MS *Ming-shih*  
(by CHANG T'ing-yü and others, in *Po-na-pên* series)
- MSL *Ming Shih-lu*  
(The new Taiwan edition, 1961)

MSK	<i>Ming-shih kao</i> (by WANG Hung-hsü and others, 1723, <i>Ching-shen-t'ang</i> edition; photographic reprint in 7 vols., Taipei, 1963)
MTC	<i>Ming T'ung-chien</i> (by Hsia Hsieh, ca. 1870; modern reprint in 4 vols., Peking-Shanghai, 1959)
THL	<i>Shih-erh-ch'ao Tung-hua lu</i> (by CHIANG Liang-ch'i and others; the new <i>Wen-hai Ch'u-pan-she</i> edition)
TWL	<i>Tsui-wei-lu</i> (by CHA Chi-tso, around 1670; Commercial Press, Shanghai, 1936)
W	<i>Chinese Observations of Comets</i> , London, 1871. (by WILLIAMS, J.)

The primary source of each entry is indicated at the end of the translated passage. Subsequent sources, if available, are also included to furnish either additional information or varied presentation. The number nearest to the name of the source refers to the chapter and the number furthest away to the page. In the case of the *Tung-hua lu* of the Kuang-hsü reign, the present *Wên-hai* edition did not give the original numbering of the 220 chapters of the movable-type edition as it was published in Shanghai in 1909. Hence, when reference is made to this source, the page number follows that of the *Wên-hai* edition.

(1) 7th February, 1368. "On a *kêng-yin* day in the first month of the Chih-chêng reign-period a (*hui*) comet appeared between the *Mao* and the *Pi* (18th and 19th lunar mansions)." (*Yüan Shih* 47/11a; MS 27/9a; HWHTK 212/63a com.; MYH p. 1317; B; W 296; H 469)

(2) 8th April, 1368. "On a *hsin-mao* day in the third month of the first year of the Hung-wu reign-period a (*hui*) comet was seen at the north of the *Mao* (18th lunar mansion) between *Ta-Ling* and *T'ien-Ch'uan*, measuring over 8 ft and pointing towards *Wên Ch'ang*. It went close to *Wu-Ch'é*. On a *chi-yu* day in the fourth month [26th April] the comet went out of sight at the north of *Wu-Ch'é*." (MS 27/9a; YS 47/12a; HWHTK 212/63a com.; B; W 297; H 470)

The HWHTK says that the comet first appeared on a *kêng-yin* day [7th April].

(3) April-May, 1373. "During the fourth month of the sixth year of the Hung-wu reign-period [23rd April to 22nd May] a (*hui*) comet entered the *Tzu-Wei* Enclosure three times." (MS 27/9a; HWHTK 212/63b; MYH p. 1317; B; W 298; H 472)

(4) 22nd June, 1376. "On a *wu-tzu* day in the sixth month of the ninth year of the Hung-wu reign-period a star as large as a pellet and with a white colour stopped at *T'ien-Ts'ang*. It passed *Wai-P'ing* and *Chüan-Shê*, entered the *Tzu-Wei* Enclosure, swept *Wên-Ch'ang* and pointed towards *Nei-Ch'u*. It then entered the *Chang* (26th lunar mansion). On an *i-hai* day [8th August] it went out of sight." (MS 27/6b; HWHTK 215/32a; B; W 345; H 474)

The *MHY* says, "During the seventh month of the ninth year of the Hung-wu reign-period [17th July to 15th August] a (*po*) comet was seen at *Pei-Tou*." (*MHY* p. 1317.)

(5) 26th September, 1378. "On a *chia-hsü* day in the ninth month of the 11th year of the Hung-wu reign-period a star appeared at the NE of *Wu-Ch'ê*. It emitted rays over 10ft long and swept *Nei-Chieh*. It then entered the *Tzu-Wei* Enclosure, swept the five stars of *Pei-Chi*, trespassed against the star *Shao-Tsai* at the Eastern Wall and then entered the *T'ien-shih* Enclosure. It was trespassing against the *T'ien-Shih* Enclosure until it went out of sight on a cloudy (night) on a *chi-wei* day in the tenth month [10th November]." (*MS* 27/6b; *HWHTK* 215/32a; *B*; *W* 346; *H* 475)

*HWHTK* calls it a "guest star".

(6) February—March, 1382. "During the second month (of the 15th year of the Hung-wu reign-period) [14th February to 15th March], a (*hui*) comet was seen." (*TWL* 1/5 b) *H* 478 gives a parallel Korean observation.

(7) 23rd October, 1385. "On a *wu-yin* day in the ninth month of the 18th year of the Hung-wu reign-period a star appeared at the *T'ai-Wei* Enclosure. It trespassed against *Yu-Chih-Fa* and left by the 'Main-Gate' (*Tuan-Mên*). On an *i-yu* day [30th October] it entered the *I* (27th lunar mansion) measuring over 10 ft. On a *kêng-yin* day in the tenth month [4th November] it trespassed against *Chün-Mên* and swept *T'ien-Miao*." (*MS* 27/6b; *HWHTK* 215/32b; *B*; *W* 347; *H* 481)

(8) 29th March, 1388. "On a *ping-yin* day in the second month of 21st year of the Hung-wu reign-period a star appeared at the *Tung-Pi* (14th lunar mansion)." (*MS* 27/7a; *B*; *W* 348; *L*; *Hsi*; *H* 482)

(9) 23rd May, 1391. "On a *ping-tzu* day in the fourth month of the 24th year of the Hung-wu reign-period two (*hui*) comets were seen. One entered the *Tzu-Wei* Enclosure by the *Ch'ang Ho-Mên* and trespassed against *T'ien-Ch'uang*. The other trespassed against *Liu-Chia* and swept *Wu-Ti-Nei-Tso*." (*MS* 27/9a; *HWHTK* 212/63b; *MHY* p. 1318; *B*; *W* 299; *H* 483)

(10) 14th November, 1404. "On a *kêng-ch'en* day in the tenth month of the second year of the Yung-lo reign-period a star like a lamp appeared at the south-east of *Nien-Tao*. It was yellow in colour and very bright, but remained stationary." (*MS* 27/7a; *HWHTK* 215/29b; *Hsi*; *H* 490)

(11) 14th December, 1407. "On an *i-ch'ou* day in the eleventh month of the 5th year [in the Yung-lo reign-period] an imperial decree was written to give order to Kao Sui, the Prince of Chao, saying: "The Director of the Astronomical Bureau reported the sighting of a comet in the division of *Yen* (i. e. between *Scorpio* and *Sagittarius*). I hereby require you to take special care and keep close vigilance on all movements in and out of our frontiers and to observe my wish without fail." (*MSL*, *T'ai-tsung Yung-lo Shih-lu* 73/2b)

15th December, 1407. "On a *ping-yin* day in the 11th month of the fifth year of the Yung-lo reign-period a (*hui*) comet was seen." (*MS* 27/9a; *HWHTK* 212/63b; *MHY* p. 1318; *W* 300; *H* 491)

*WILLIAMS* gives 14th December.

The *MSL* (73/4a) says: "On the night of the *ping-yin* day, the comet was not seen."

(12) September, 1415. "During the eighth month of the 13th year of the Yung-lo reign-period [3rd September to 2nd October] a (*hui*) comet appeared at the *Nan-Tou* (eighth lunar mansion)." (MHY p. 1318; H 494)

(13) 9th September, 1430. "On a *kêng-yin* day in the eighth month of the fifth year of the Hsüan-tê reign-period a star appeared by the side of *Nan-Ho*. It was as large as a pellet and its colour was dark-blue. After 26 days it went out of sight." (MS 27/7a; HWHTK 215/32b; B (1); L; W 349; Hsi; H 500)

(14) 14th November, 1430. "On a *ping-shen* day in the tenth month of the fifth year of the Hsüan-tê reign-period a (*p'êng-hsing*) comet appeared at the south of *Wai-P'ing* moving in a SE direction. It passed *T'ien-Ts'ang* and *T'ien-Yü* and went out of sight after eight days." (MS 27/7a; HWHTK 215/32b; B; W 350; H 501)

(15) 4th January, 1431. "On a *ting-hai* day in the 12th month of the fifth year of the Hsüan-tê reign-period a star like a pellet appeared by the side of *Chiu-Yu*. It was yellowish-white and very bright. It disappeared after 15 days. [It] again appeared on a *jen-wu* day in the third month of the sixth year [29th April]." (MS 27/7a; HWHTK 215/30a; L; W 351; Hsi; H 502)

WILLIAMS gives 3rd January.

(16) 15th May, 1431. "On a *wu-hsü* day in the fourth month of the sixth year of the Hsüan-tê reign-period a (*po*) comet appeared at the *Tung-Ching* (22nd lunar mansion). It measured over 5ft (*ch'ih*)." (MS 27/9a; HWHTK 212/63b; MHY p. 1318; B; W 301; H 503)

Bior gives 27 th March.

(17) 3rd February, 1432. "On a *jen-hsü* day in the first month of the seventh year of the Hsüan-tê reign-period a (*hui*) comet appeared at the E measuring over 10ft (1 *chang*). Its tail swept *T'ien-Chin* and its course was towards the SE. During the tenth month [24th October to 22nd November] it went out of sight. On a *wu-tzu* day in the same month [26th October] (it) again appeared at the west, but went out of sight after 17 days." (MS 27/9a; HWHTK 212/63b; MHY p. 1318; B; W 302; W 303; H 504)

The *Ming-shih kao* also gives the same account as above. The HWHTK renders the record as "... The comet went out of sight after the tenth day. On a *wu-tzu* day in the same month [29th March] (it) again appeared at the west, but went out of sight after 17 days."

(18) 15th September, 1433. "On a *jen-tzu* day in the intercalary eighth month of the eighth year of the Hsüan-tê reign-period a (*hui*) comet appeared by the side of *T'ien Ts'ang* measuring over 10ft (1 *chang*). On a *chi-ssu* day [2nd October] it entered *Kuan-So* and swept *Ch'i-Kung*. On a *chi-mao* day [12th October] it again entered the *T'ien-Shih* Enclosure and swept the star *Chin* (k Ophiuchi). It went out of sight after 24 days." (MS 27/9a; HWHTK 212/63b; MHY p. 1318; B; W 304; H 505)

(19) 25th March, 1439. "On a *chi-ch'ou* day in the intercalary second month of the fourth year of the Chêng-t'ung reign-period a (*hui*) comet as large as a pellet appeared beside the *Chang* (26th lunar mansion). On a *ting-yu* day [2nd April] it measured over 50 ft. (5 *chang*) and moved towards the west sweeping *Chiu-Ch'i*. It extended northwards and trespassed against

the *Kuei* (23rd lunar mansion)." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; B; W 305; H 511)

(20) 12th July, 1439. "On a *wu-yin* day in the sixth month of the fourth year of the Chêng-t'ung reign-period a (*hui*) comet appeared by the side of the *Pi* (19th lunar mansion), measuring over 10 ft. (1 *chang*) and pointing SW. It went out of sight after a total of 55 days." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; W 306; H 511)

(21) 6th August, 1444. "On a *kêng-wu* day in the seventh month of the ninth year of the Chêng-t'ung reign-period a (*hui*) comet appeared at the eastern wall of the *T'ai-Wei* (Enclosure). It measured over 10 ft (1 *chang*); its length was increasing daily. On a *chi-mao* day in the intercalary seventh month [15th August] it entered the *Chio* (first lunar mansion) and went out of sight." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; B; W 307; H 513)

(22) 20th December, 1449. "On a *jen-tzu* day in the 12th month of the 14th year of the Chêng-t'ung reign-period a (*hui*) comet appeared at the *T'ien-Shih* Enclosure by the side of *Shih-Lou*. It passed the longitudes of the *Wei* (sixth lunar mansion), measuring over 2 ft. It went out of sight on an *i-hai* day [12th January, 1450]." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; B; W 308)

"On a *jen-wu* day in the first month of the first year of the Ching-t'ai reign-period [19th January, 1450] a (*hui*) comet appeared outside the *T'ien-Shih* Enclosure, sweeping *T'ien Chi*." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; B; W 309; H 514)

(23) 21st March, 1452. "On a *chia-wu* day, the first day in the third month of the third year of the Ching-t'ai reign-period a (*po*) comet appeared at the *Pi* (19th lunar mansion)." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; B; W 310; H 515)

(24) 4th January, 1453. "On a *kuei-wei* day in the 11th month of the third year of the Ching-t'ai reign-period a star appeared at the (*Yü-*) *Kuei* (23rd lunar mansion) by the side of *Chi-Shih*. It moved slowly towards the west." (MS 27/7b; HWHTK 215/32b; B; W 352; H 516)

(25) 27th May, 1456. "On a *jen-hsü* day in the fourth month of the seventh year of the Ching-t'ai reign-period a (*hui*) comet appeared at the NE at the *Wei* (17th lunar mansion), measuring 2 ft and pointing SW. On a *kuei-yu* day in the fifth month [7th June] its length increased to over 10 ft (1 *chang*). On a *wu-tzu* day [22nd June] it appeared at the NW at the *Liu* (24th lunar mansion) measuring over 9 ft, sweeping and trespassing against the stars of *Hsien-Yüan*. On a *chia-wu* day [28th June] it appeared at the *Chang* (26th lunar mansion) measuring over 7 ft, sweeping the north of the *T'ai-Wei* (Enclosure) and moving SW. On a *jen-yin* day in the sixth month [6th July] it entered the *T'ai-Wei* Enclosure and measured over 1 ft." (MS 27/9b; HWHTK 212/64a; MHY p. 1318; W 311; H 517)

This is Halley's comet.

(26) 14th January, 1457. "On a *chia-yin* day in the 12th month of the seventh year of the Ching-t'ai reign-period a (*hui*) comet again appeared at the *Pi* (19th lunar mansion) measuring 5 in. (*ts'un*). It moved towards the SE

and gradually increased in length. On a *kuei-hai* day [23rd January] it went out of sight." (MS 27/10a; HWHTK 212/64b; B; W 312; H 518)

(27) 15th June, 1457. "On a *ping-hsü* day in the fifth month of the first month of the first year of the T'ien-shun reign-period a (*hui*) comet appeared at the *Wei* (12th lunar mansion) and seemed to be vibrating. It moved 1 degree (*tu*) to the east; its rays measured 5 in. (*ts'un*) and pointed towards the SW. On a *kuei-ssu* day in the sixth month [22nd June] it measured over 10 ft (1 *chang*) and concealed the (*Ying-*) *Shih* (13th lunar mansion). It moved from the *Wei* (12th lunar mansion) to the *Tung-Pi* (14th lunar mansion). It trespassed against *T'ien-Ta-Chiang-Chün*, the third star of *Chüan-Shê* the (*Tung-*) *Ching* (22nd lunar mansion) and the second star in the south of *Shui-Wei*." (MS 27/10a; HWHTK 212/64b; MHY p. 1319; B; W 313; H 5/9)

Bior gives 15th May.

(28) 26th October, 1457. "On a *chi-hai* day in the tenth month of the first year of the T'ien-shun reign-period a (*hui*) comet appeared at the *Chio* (first lunar mansion) measuring over 5 in. (*ts'un*) and pointing north. It trespassed against the northern star of the *Chio* (first lunar mansion) and the eastern star of *P'ing-Tao*." (MS 27/10a; HWHTK 212/64b; W 314; H 520)

(29) 24th December, 1458. "On a *kuei-mao* day in the 11th month of second year of the T'ien-shun reign-period a star appeared at the *Hsing* (25th lunar mansion). It was white in colour and was pointing towards the west. On a *ping-wu* day [27th December] its body became smaller and appeared like loose-cotton by the side of *Hsien-Yüan*. On a *kêng-hsü* day [31st December] it developed a ray measuring 5 in. (*ts'un*) and trespassed against the northwestern star of *Kuan-Wei*. On a *jen-hsü* day in the 12th month [12th January, 1459] it went out of sight at the *Tung-Ching* (22nd lunar mansion)." (MS 27/7b; HWHTK 215/33a; B; W 353; H 521)

(30) October — November, 1459. "During the tenth month of the third year of the T'ien-shun reign-period, a *Chi-mao* year [26th October to 24th November], a (*hui*) comet appeared." (TWL 1/11a)

(31) 30th July, 1461. "On a *jen-ch'en* day in the sixth month of the fifth year of the T'ien-shun reign-period a star as white as powder appeared by the side of *Tsung-Chêng* in the *T'ien Shih* Enclosure. On an *i-wei* day [2nd August] it turned into a white vapour and went out of sight." (MS 27/7b; HWHTK 215/33a; B; W 354; L; Hsi; H 522)

(32) 5th August, 1461. "On a *wu-hsü* day in the sixth month of the first year of the T'ien-shun reign-period a (*hui*) comet appeared at the E and pointed SW. It entered the longitudes of the (*Tung-*) *Ching* (22nd lunar mansion). On a *ping-yin* day in the seventh month [2nd September] it went out of sight." (MS 27/10a; HWHTK 212/64b; MHY p. 1319; B; W 315; H 523)

(33) 29th June, 1462. "On a *ping-yin* day in the sixth month of the sixth year of the T'ien-shun reign-period a star appeared by the side of *Ts'ê-Hsing*. Its colour was darkish-white. It entered the *Tzu-Wei* Enclosure and trespassed against *T'ien-Lao*. On a *kuei-wei* day [16th July] it stayed below *Chung-T'ai* and gradually became smaller." (MS 27/7b; HWHTK 215/33a; B; W 355; H 524)

(34) March, 1465. "During the second month of the first year of the Ch'êng-hua reign-period [25th February to 26th March] a (*hui*) comet was seen. It appeared again during the third month [27th March to 24th April] at the NW measuring over 30 ft. After three months it went out of sight." (MS 27/10a; HWHTK 212/65a; MHY p. 1319; B; W 316; H 525)

(35) 18th September, 1468. "On a *chi-wei* day in the ninth month of the fourth year of the Ch'êng-hua reign-period a star appeared at the 5th degree (*tu*) of the (*Ch'i-*) *Hsing* (25th lunar mansion) moving towards the NE. After five days its rays exceeded 30 ft in length and its tail was pointing SW. By then it had changed into a (*hui*) comet. Henceforth it appeared in the morning at the east and at dusk at the south of the (*Ying-*) *Shih* (13th lunar mansion). It trespassed against *San-Kung*, the star *Yao-Kuang* in *Pei-Tou* and *Ch'i-Kung*. Then it turned and entered the *T'ien-Shih* Enclosure. After leaving this Enclosure it gradually diminished in size and trespassed against the first star at the west of *T'ien-P'ing*. It went out of sight on a *kêng-ch'en* day in the eleventh month [8th December]." (MS 27/10a; HWHTK 212/65a; B; W 317; H 526)

The MHY gives a slightly different version saying, "During the seventh month of the fourth year of the Ch'êng-hua reign-period [19th July to 17th August] a (*po*) comet was observed at (*Pei-*)*Tou* and (*San-*) *T'ai*. On a *kuei-hai* day in the ninth month [22nd September] a 'guest star', greyish-white in colour, with rays measuring 30 ft and pointing SW, changed itself into a (*hui*) comet. It swept *San-T'ai* and went out of sight after 58 days." (MHY p. 1319)

(36) 9th April, 1471. "On a *jen-ch'en* day (in the third month of the seventh year of the Ch'êng-hua reign-period) . . . , there was a (*po*) comet at *T'ien-T'ien*." (TWL 1/12b)

(37) 16th January, 1472. "On a *chia-hsü* day in the 12th month of the seventh year of the Ch'êng-hua reign-period a (*hui*) comet appeared at *T'ien-T'ien* moved northwards trespassing against *Yu-Shê-T'i* and sweeping *Shang-Chiang* in the *T'ai-Wei* Enclosure. It reached *Hsing-Ch'en*, *T'ai-Tzu* and *Ts'ung-Kuan* with its tail pointing W and sweeping transversely the *T'ai-Wei* Enclosure and *Lang-Wei*. On a *chi-mao* day [24th January] its rays grew in length and stretched across the heavens from east to west. It moved northwards for over 28 degrees (*tu*). It trespassed against *T'ien-Ch'iang*, swept *Pei-Tou*, *San-Kung* and *T'ai-Yang* before it entered the *Tzu-Wei* Enclosure. It even appeared in midday. It had trespassed against the stars of *Ti-Hsing*, the 'box' of *Pei-Tou*, *Shu-Tzu*, *Hou-Kung*, *Kou-Ch'en*, *T'ien-shu*, *San-shih*, *T'ien Lao*, *Chung-T'ai*, *T'ien-Huang-Ta-Ti*, *Shang-Wei*, *Ko-tao*, *Wen-Ch'ang* and *Shang-T'ai*. On an *i-yu* day [27th January] it moved south and trespassed against the *Lou* (16th lunar mansion), *T'ien-Ho*, *T'ien-Yin*, *Wai-P'ing* and *T'ien-Ch'ün*. On a *ping-wu* day in the first month of the eighth year [17th February] it passed the *K'uei* (15th lunar mansion) and *Wai-P'ing*. Gradually its size diminished, but it took a long time to disappear altogether." (MS 27/10b; HWHTK 212/65a; MHY p. 1319; B; W 318; H 530)

(38) 6th November, 1489. "On a *wu-hsü* day in the tenth month (of the second year of the Hung-chih reign-period), a (*hui*) comet was seen. During

the eleventh month [23rd November to 21st December], a 'guest star' was seen in the *T'ien-Shih* Enclosure." (TML 1/16a)

(39) 31st December, 1490. "On a *wu-hsü* day in the 11th month of the third year of the Hung-chih reign-period a (*hui*) comet appeared at the south of *T'ien-Chin* with its tail pointing NE. It trespassed against *Jen-Hsing* and passed *Ch'u-Chiu*. On a *wu-shen* day, the first day in the 12th month [10th January, 1491] it entered the *Ying-Shih* (13th lunar mansion). On a *kêng-shen* day [22nd January] it trespassed against *T'ien-Ts'ang*." (MS 27/10b; HWHTK 212/65b; MHY p. 1319; B; W 319; H 534)

(40) 19th January, 1491. "On a *ting-ssu* day in the 12th month of the third year of the Hung-chih reign-period a star appeared at the *T'ien-Shih* Enclosure moving towards the SE. On a *wu-ch'en* day [30th January] it appeared below *T'ien-Ts'ang* and gradually faced the *Tung-Pi* (14th lunar mansion)." (MS 27/7b; HWHTK 215/33a; B; W 356; H 535)

This looks very much like the same comet as No. 39.

(41) 7th January, 1495. "On a *ping-yin* day in the 12th month of the seventh year of the Hung-chih reign-period a star appeared beside *T'ien-Chiang* moving slowly and approached the (*Nan-*) *Tou* (eighth lunar mansion). On a *kêng-hsü* day in the first month of the eighth year [20th March] it entered the *Wei* (12th lunar mansion)." (MS 27/7b; HWHTK 215/33a; B; W 357; H 536)

(42) 16th August, 1499. "On a *wu-ch'en* day in the seventh month of the 12th year of the Hung-chih reign-period a star appeared beside *Tsung-Hsing* in the *T'ien-Shih* Enclosure. It entered the eastern wall of the *Tzu-Wei* Enclosure, passed *Shao-Tsai* and *Shang-Shu* and reached *T'ai-Tzu* and *Hou-Kung*. It left from the western wall by the side of *Shao-Fu*. On a *chi-ch'ou* day in the eighth month [6th September] it went out of sight." (MS 27/8a; HWHTK 215/33b; B; W 358; H 537)

(43) 8th May, 1500. "On a *chia-wu* day in the fourth month of the 13th year of the Hung-chih reign-period a (*hui*) comet appeared above *Lei-Pi-Chen*. It got between the (*Ying-*) *Shih* and the (*Tung-*) *Pi* (13th and 14th lunar mansions) and increased its length to over 3 ft (*ch'ih*) pointing towards *Li-Kung* and sweeping *Tsao-Fu*. After passing the *T'ai-Wei* Enclosure it became smaller. Then it entered the *Tzu-Wei* Enclosure, approached *Nü-Shih* and trespassed against *Shang-Shu*. On a *ting-yu* day in the sixth month [10th July] it went out of sight." (MS 27/11a; HWHTK 212/66a; MHY p. 1319; B; W 320; H 538)

(44) 28th November, 1502. "On a *wu-ch'en* day in the tenth month of the 15th year [of the Hung-chih reign-period] a star appeared by the side of *T'ien-Miao* reaching the *I* (27th lunar mansion) from the *Chang* (26th lunar mansion) and then receded back to the *Chang* (26th lunar mansion). It disappeared on a *wu-yin* day [8th December]." (MS 27/8a; HWHTK 215/33b; B(1); W 359; H 539)

(45) 31st July, 1506. "On a *chi-ch'ou* day in the seventh month of the first year of the Chêng-tê reign-period a star like a pellet and with a darkish-white colour appeared outside the western wall of the *Tzu-Wei* (Enclosure). A few days later it developed some faint rays and appeared between the *Shen*

and the (*Tung-*) *Ching* (21st and 22nd lunar mansions). Its length gradually increased to 2 ft like a broom, and then it reached *Wên-Ch'ang* in the north-west. On a *kêng-tzu* day [11th August] the comet showed a bright ray extending SE to a length of 3 ft. After three days it measured about 5 ft and swept the uppermost star of *Hsia-T'ai*. (Finally) it entered the *T'ai-Wei* Enclosure." (MS 27/11a; HWHTK 212/66a; MHY ch. 68; B; W 231 and W 322; H 540)

WILLIAMS splits this into two entries and gives 10th August for the second date.

(46) January-February, 1520. "A (*hui*) comet was observed during the first month of the 15th year (of the *Chêng-tê* reign-period) [20th January to 18th February]." (MS 27/11a; HWHTK 212/66a; MHY ch. 68; B; W 323; H 541)

(47) 7th February, 1521. "On a *chia-yin* day, the first day in the first month of the 16th year of the *Chêng-tê* reign-period a star like a fire appeared in the SE. It turned white, measuring 6 to 7 ft, and stretched from E to W. It then became bent like a hook and disappeared after some time." (MS 27/8a; HWHTK 215/33b; MHY ch. 68; B(1); H 360; H 542)

Could this be an auroral display?

(48) July-August, 1523. "During the sixth month of the second year of the *Chia-ching* reign-period [13th July to 10th August] a (*po*) comet appeared at the *T'ien-Shih* (Enclosure)." (MS 27/11a; HWHTK 212/66b; MHY ch. 68; B; W 324; H 543)

(49) 9th February, 1529. "On the *li-ch'un* day in the first month of the eighth year of the *Chia-ching* reign-period a (*ch'ang-hsing*) comet stretched across the heavens." (MS 27/8a; B(1); W 361; H 544)

WILLIAMS gives the date as 5th February.

(50) 5th August, 1531. "On an *i-ssu* day in the intercalary sixth month of the tenth year [of the *Chia-ching* reign-period] a (*hui*) comet appeared at the *Tung-Ching* (22nd lunar mansion) measuring over 1 ft and brushing the first star of *Hsien-Yüan*. Its rays increased in length. When it reached the *I* (27th lunar mansion) it measured over 7 ft and swept *T'ien-Tsun* at the NE. It entered the *T'ai-Wei* Enclosure, swept across *Lang-Wei* and then brushed the second star from the north of the *K'ang* (second lunar mansion) at the SE as it moved to the longitudes of the *Chio* (first lunar mansion). It gradually diminished (in size) and went out of sight after 34 days." (MS 27/11a; HWHTK 212/66b; MHY ch. 68; B; W 325; H 547)

This is Halley's comet.

(51) 9th March 1532. On a *jen-wu* day in the second month of the 11th year in the *Chia-ching* reign-period, during the 5th watch of the night (03.00 to 05.00 hrs.) a star was seen in the SE direction, showing a greyish-white colour and with small pointed rays. It only went out of sight after nineteen days. (MSL, *Shih-tsung Chia-ching Shih-lu*, 135/1a; MS 27/8a; HWHTK 215/33b; B(1); W 362; H 548)

(52) 2nd September, 1532. "On a *chi-mao* day in the eighth month of 11th year (of the *Chia-ching*) reign-period a (*hui*) comet appeared at the *Tung-Ching* (22nd lunar mansion) measuring about 1 ft. Later it moved NE and passed *T'ien-Chin*. It then gradually increased to over 10 ft and swept across the various stars in the *T'ai-Wei* Enclosure, the *Chio* (first lunar mansion)

and *T'ien-Mên*. (It appeared) until a *chia-hsü* day in the 12th month [21st December] and went out of sight after 115 days." (MS 27/11b; HWHTK 212/66b; MHY ch. 68; B; W 326; H 550)

The MHY says that the comet lasted 155 days.

(53) 1st July, 1533. "On a *hsin-ssu* day in the sixth month of the 12th year (of the Chia-ching reign-period) a (*hui*) comet measuring over 5 ft appeared at *Wu-Ch'ê*, sweeping *Ta-Ling* and *T'ien-Ta-Chiang-Chün*. Its length gradually increased to over 10 ft. Then it swept *Ko-Tao* and trespassed against *T'êng-Shê*. On a *wu-hsü* day in the eighth month [16th September] it went out of sight." (MS 27/11b; HWHTK 212/66b; MHY ch. 68; B; W 327; H 551)

The MHY says, "During the sixth month of the 12th year a (*hui*) comet appeared at the *Mao* and the *Pi* (18th and 19th lunar mansions) with its rays pointing towards the Milky Way. During the eighth month it again was seen at the *Tung-Ching* (22nd lunar mansion)."

(54) 12th June, 1534. "On a *ling-mao* day, the first day in the fifth month of the 13th year [of the Chia-ching reign-period] a star appeared at *T'êng-Shê*. It passed *T'ien-Chiu* and entered *Ko-Tao*, and went out of sight after 24 days." (MS 27/8a; HWHTK 215/33b; B (1); W 363; H 552)

(55) 24th March, 1536. "On a *wu-wu* day in the third month of the 15th year (of the Chia-ching reign-period) a star appeared by the side of *T'ien-P'ou*. It moved eastward, passed *T'ien-Ch'u* and entered the Milky Way from the west. On a *jen-ch'en* day in the fourth month [27th April] it went out of sight." (MS 27/8a; HWHTK 215/33b; MHY ch. 68; B (1); W 364; H 553)

(56) 30th April, 1539. "On a *kêng-hsü* day in the fourth month of the 18th year (of the Chia-ching reign-period) a (*hui*) comet was seen. It measured about 3 ft, while its rays pointed SE and swept the eighth star of *Hsien Yüan*. After ten days it went out of sight." (MS 27/11b; HWHTK 212/66b; MHY ch. 68; B; W 328; H 556)

(57) 26th December, 1545. "On a *jen-wu* day in the 11th month of the 24th year (of the Chia-ching reign-period) a star appeared at *T'ien-P'ou*. It entered the *Chi* (seventh lunar mansion) and turned to a NE course. In the following month it went out of sight." (MS 27/8a; HWHTK 215/34a; B (1); W 365; H 557)

(58) 23rd June, 1554. "On a *kuei-hai* day in the fifth month of the 33rd year (of the Chia-ching reign-period) a (*hui*) comet appeared beside *T'ien-Ch'uan* [ $\delta$  UMa] trespassing against *Wên-Ch'ang*. It then moved near the horizon (*shu*) and disappeared after 27 days." (MS 27/11b; HWHTK 212/67a; MHY ch. 68; B; W 329; H 559)

WILLIAMS interprets the word "*shu*" as the star  $\alpha$  Serpentis.

(59) 1st March, 1556. "On a *kêng-ch'en* day in the first month of the 35th year (of the Chia-ching reign-period) a (*hui*) comet appeared by the side of *Chin-Hsien* measuring about 1 ft and pointing SW. It gradually increased to over 3 ft and swept (the star) *Tz'u-Hsiang* in the *T'ai-Wei* Enclosure. (Then it moved) NE and entered the *Tzu-Wei* Enclosure, trespassing against *T'ien-Ch'uang*. On the second day in the fourth month [10th May] it went out of sight." (MS 27/11b; HWHTK 212/67a; MHY ch. 68; B; W 330; H 560)

(60) 10th October, 1557. "On a *wu-ch'en* day in the ninth month of the 36th year [of the Chia-ching reign-period] a (*hui*) comet appeared by the side of *Lieh-Ssu* in the *T'ien-Shih* Enclosure pointing NE. It disappeared on the 23rd day in the tenth month [13th November]." (MS 27/11b; HWHTK 212/67a; MHY ch. 68; B; W 331; H 561)

(61) 9th November, 1569. "On a *hsin-ch'ou* day in the tenth month of the third year of the Lung-ch'ing reign-period a (*hui*) comet appeared at the *T'ien-Shih* Enclosure pointing NE. It went out of sight on a *k'eng-shen* day [28th November]." (MS 27/12a; HWHTK 212/67a; MHY ch. 68; B; W 332; H 564)

(62) 8th November, 1572. On a *ping-ch'en* day, the third day of the eleventh (should be amended to read tenth) month [of the sixth year of the Lung-ch'ing reign-period] a 'guest star' appeared in the night at the NE like a pellet. It came out beside the *Ko-Tao* asterism (in Cassiopeia) at the (same) longitude as the *Tung-Pi* lunar mansion (determinant star:  $\gamma$  Peg.). It gradually developed small pointed rays and shone with some brightness. Until the nineteenth day of the month, a *jen-shen* night (24th. Nov.) this star showed a reddish-yellow colour and became as large as a lamp, with bright rays radiating out in all directions . . . This star diminished in brightness only at the second month of the first year of the Wan-li reign-period (March 1573). It then went out of sight during the fourth month of the second year (April/May 1574). (MSL, *Shen-tsung Wan-li Shih-lu*, 6/12a & 12b)

The MSK says, "In winter, on a *ping-ch'en* day in the tenth month [of the sixth year of the Lung-ch'ing reign-period] a (*hui*) comet appeared in the NE. It went out of sight only during the fourth month of the second year of the Wan-li reign-period [21st April to 19th May, A. D. 1574]." (16/1b.)

It is curious that this important record is mentioned only in the *Chronicle of the Emperor Shen-tsung* of the draft version of the history of the Ming Dynasty, but is omitted in that part of the *Chronicle* of the official history itself. The astronomical chapters in the official history, however, says, "There are also [stars] that did not exist before. The 'guest star' beside *Ts'e-Hsing* [ $\alpha$  Cas] first appeared during the first year of the Wan-li reign-period. At the beginning it was large, but now it is small." (MS 25/5b.)

This has been identified as Tycho's nova, a supernova and also a radio point source. (Hsl.)

(63) July-August, 1576. "During the seventh month of the fourth year of the Wan-li reign-period [26th July to 23rd August] a (*hui*) comet was seen." (MHY ch. 68; H 566)

(64) 14th November, 1577. "On a *wu-tzu* day in the tenth month of the fifth year of the Wan-li reign-period a (*hui*) comet was seen in the SW. It was of a darkish-white colour and measured several tens of feet. The vapour forms a white 'rainbow' stretching from the *Wei* and the *Chi* (sixth and seventh lunar mansions), crossed the (*Nan*-) *Tou* and the (*Ch'ien*-) *Niu* (eighth and ninth lunar mansions) and reached the (*Hsü*-) *Nü* (tenth lunar mansion). It went out of sight after 1 month." (MS 27/12a; HWHTK 212/67a; MHY ch. 68; B; W 333; H 568)

(65) 22nd February, 1578. "On a *wu-ch'en* day in the first month of the sixth year of the Wan-li reign-period a large star like the sun came out from the west, encircled by a number of stars at the west." (MS 27/8b; HWHTK 215/34a; B(1); W 366; L; Hsi; H 569)

(66) 1st October, 1580. "On a *kêng-shen* day in the eighth month of the eighth year (of the Wan-Li reign-period) a (*hui*) comet appeared at the SE. It increased in length every night and stretched across the Milky Way. After more than 70 days it went out of sight." (MS 27/12a; HWHTK 212/67b; MHY ch. 68; B; W 334; H 570)

(67) April-May, 1581. "During the third month of the ninth year of the Wan-li reign-period [3rd April to 2nd May], a (*hui*) comet was seen in the Tzu-Wei Enclosure with the rays of its tail pointing towards NW." (MHY p. 1321)

(68) 20th May, 1582. "On a *ping-ch'en* day in the fourth month of the tenth year (of the Wan-li reign-period) a (*hui*) comet appeared in the NW like a chain with its tail pointing towards Wu-Ch'ê. After more than 20 days it went out of sight." (MS 27/12a; HWHTK 212/67b; MHY ch. 68; B; W 335; H 571)

(69) 11th July, 1584 (Gregorian Calender.) "On a *chi-yu* day in the sixth month of the 12th year [of the Wan-li reign-period] a star appeared at the Fang (fourth lunar mansion)." (MS 27/8b; HWHTK 215/34a; B(1); W 367; L; Hsi; H 572)

(70) 13th October, 1585. "On a *wu-tzu* day in the ninth month of the 13th year (of the Wan-li reign-period) a (*hui*) comet appeared by the side of Yü-Lin measuring about 1 ft. Every evening it was found moving eastward and diminishing in size. It went out of sight on a *kuei-yu* day in the tenth month [27th November]." (MS 27/12a; HWHTK 212/67b; MHY ch. 68; B; W 336; H 573)

(71) 13th April, 1591. "On a *ping-ch'en* day in the third month of the 19th year (of the Wan-li reign-period) a star appeared in the NW. It looked like a (*hui*) comet and measured about over 1 ft. It passed the Wei, the (*Ying*-) *Shih* and the (*Tung*-) *Pi* (12th, 13th and 14th lunar mansions) and then measured about 2 ft. On a *ping-yin* day, the first day in the intercalary third month [23rd April] it entered the Lou (16th lunar mansion)." (MS 27/12a; HWHTK 212/67b; MHY ch. 68; B; W 337; H 576)

(72) 30th July, 1593. "On a *i-mao* day in the seventh month of the 21st year [of the Wan-li reign-period] a (*hui*) comet appeared at the *Tung-Ching* (22nd lunar mansion). On an *i-hai* day [19th August] it retrograded and entered the Tzu-Wei Enclosure, trespassing against *Hua-Kai*." (MS 27/12a; HWHTK 212/67b; MHY ch. 68; B; W 338; H 578)

(73) 5th August, 1596. "On a *ting-ch'ou* day in the seventh month of the 24th year [of the Wan-li reign-period] a (*hui*) comet like a pellet appeared in the NW. When it entered the I (27th lunar mansion) it measured over 1 ft. It was moving NW." (MS 27/12b; HWHTK 212/68a; MHY ch. 68; B; W 339; H 579)

(74) 10th October, 1604. "On an *i-ch'ou* day in the ninth month of the 32nd year [of the Wan-li reign-period], a star as big as a pellet and reddish-yellow

in colour appeared in the division of of the *Wei* (sixth lunar mansion) in the SW. It went out of sight during the tenth month [21st November to 20th December]. On a *hsin-yu* day in the twelfth month (3rd February, 1605) it changed and appeared in the SE, still in the division of the *Wei*. It grew dim gradually in the second month of the following year (19th March to 17th April, 1605) and disappeared on a *ting-mao* day of the eighth month (7th October)." (MS 27/8b; see also MSK 3/17a; HWHTK p. 4562)

This has been identified as Kepler's nova<sup>11</sup>.

(75) 21st September, 1607. "On a *hsin-yu* day, the first day of the eighth month of the 35th year [of the Wan-li reign-period], a (*hui*) comet appeared at the *Tung-Ching* (22nd lunar mansion). It was pointing towards the SW and moving slowly towards the NW. On a *jen-wu* day (12th October) it moved from the *Fang* (fourth lunar mansion), passed the *Hsin* (fifth lunar mansion) and then went out of sight." (MS 27/12b; MSK 3/15b; HWHTK p. 4525; MHY p. 1322; MTC p. 2857)

The MTC says: "On a *Hsin-yu* day in the eighth month of the 35th year, a (*hui*) comet appeared at the *Tung-Ching* (22nd lunar mansion) with its tail pointing SW. It was of a pale colour, measuring about 2 feet and moving slowly towards the SW. On a *ting-ch'ou* day (7th October), it passed the *Fang* (fourth lunar mansion)."

The CSK says: "On a *ping-shen* day in the ninth month of the *ting-wei* year during the (reign of) the T'ai-tsu (26th Oct., 1607) a (*hui*) comet was seen in the east." (CSK 14/194)

This is Halley's Comet<sup>12</sup>.

(76) 1609. "During the 37th year [of the Wan-li reign-period], a large star appeared in the SW, casting its pointed rays in all directions." (MS 27/8b; HWHTK p. 4562)

(77) 26th November, 1618. "On an *i-ch'ou* day in the tenth month of the 46th year [of the Wan-li reign-period], a (*hui*) comet appeared at the *Ti* (third lunar mansion) measuring over 10 feet and pointing SE. It then gradually pointed towards the NW and (the tail) swept and trespassed against the star *T'ai-yang-Shou*. As it entered the longitude of the *K'ang* (second lunar mansion) in the NW, it swept the *Hsüan-Chi* (i.e. the 'box') of the *Pei-Tou* ('Northern Dipper') and the asterisms *Wên-Ch'ang* and *Wu-Ch'ê* and approached the right-hand-side of the *Tzu-Wei* Enclosure. On a *chia-ch'en* day in the eleventh month (4th January, 1619) it went out of sight." (MS 27/12b; MSK 3/15b; HWHTK p. 4526; MTC p. 2937)

The *Ming-chi pei-lüeh* (p. 9), the history of the last part of the Ming dynasty (i.e. 1616 to 1644), quotes a passage from an unofficial history which says: "During the eighth month of the 46th year [of the Wan-li reign-period] a *wu-wu* year [19th September to 17th October], a (*hui*) comet rose from the east, measuring a few hundred feet in length and four to five feet in width. Its body was massive and its tail sharp, shaped like a knife, (moving) from NE to SW.

<sup>11</sup> See Ho Peng-yoke, "Ancient Chinese astronomical records and their modern application", *Physics Bulletin* (in the press).

<sup>12</sup> See Chu Wên-hsin, *T'ien-wen k'ao-ku-lu*, Commercial Press, Shanghai, p. 76.

Its rays shone with brilliance. This is called a 'banner of *Ch'i-Yi*'. First appearing at the beginning of the eighth month, it went out of sight at the end of the tenth month. [17th November to 16th December]<sup>13</sup>."

This appears to be the same comet first observed by the Ming astronomer in September of the same year.

The CSL says: "On a *ping-yen* day in the tenth month of the third year of the T'ien-ming reign-period (27th November, 1618), a (*hui*) comet measuring 5 feet in width was seen in the east. It moved towards the *Pei-Tou* asterism (Northern Dipper) each night for 19 days. It went out of sight when it passed the 'tail' of the *Pei-Tou*. (*T'ai-tsu Shih-lu* 5/26a).

The CSK gives an almost similar version as the CSL but adds that the comet was 50 feet in length. (CSK 14/194.)

(78) February-March 1619. "At the end of the first month of the 47th year [of the Wan-li reign-period] [14th February to 15th March], a (*hui*) comet appeared in the SE, measuring a hundred feet. It cast its rays downwards and its tail was bent and sharp-pointed. In one moment, it was seen in the NE and at another it was seen in the W." (MS 27/12b; MSK 3/15b; HWHTK p. 4526; MHY p. 1322; MTC p. 2938)

(79) November, 1633. "During the tenth month of the sixth year (of the Ch'ung-chen reign-period) [2nd to 30th November], a (*hui*) comet appeared." (TWL 1/29a)

(80) July-October, 1639. "In the autumn (of the 12th year of the Ch'ung-chen reign-period) [30th July to 25th October], a (*hui*) comet appeared in the division of the *Shen* (21st lunar mansion) [Orion]." (MS 27/12b; MSK 3/15b; TWL 1/29a; HWHTK p. 4526; MHY p. 1322; MTC p. 3324)

(81) November (?), 1640. "On a *ping-hsü* day in the tenth month of the thirteenth year [of the Ch'ung-chen reign-period], a (*hui*) comet appeared." (MS 27/12b; MSK 3/15b; HWHTK p. 4526; MHY p. 1322; MTC p. 3342)

The date of the appearance of this comet was not correctly given but copyists seem to have perpetuated this mistake from the *Ming-shih kao* for there was no *ping-shü* day-cycle in the tenth month of that particular year. The nearest *ping-hsü* day-cycle fell on the ninth month on 22nd October and on the following month on 21st December, 1640.

(82) 22nd December, 1652. "On *kéng-yen* day in the eleventh month of the ninth year of the Shun-chih reign-period an extraordinary star with a pale vapour was seen in the *Shen* (21st lunar mansion). It moved towards the NW and entered the *Pi* (19th lunar mansion)." (CSK 14/194)

(83) 18th November, 1664. "On a *chi-wei* day, the first day of the tenth month of the third year of the K'ang-hsi reign-period, a (*hui*) comet was seen". (THL, the K'ang-hsi reign, 1/26b)

In the *K'ang-hsi Shih-lu*, the above comet was not recorded until the 12th month of the same year. The record says: "The comet was first seen during the first third of the tenth month of the third year of the K'ang-hsi reign-period. Up to now it has appeared for more than 50 days already. It has passed thirteen lunar mansions." (CSK 13/18b)

<sup>13</sup> CHI Liu-ch'i, *Ming-chi pei-lüeh*, Commercial Press, Shanghai, 1958, p. 9.

A detailed account of the above comet was given in the *CSK* and *CWHTK*. It reads as follows:

"On a *chi-wei* day, the first day in the tenth month of the third year of the K'ang-hsi reign-period, a comet appeared at the *Chen* (28th lunar mansion) in the east. On a *ting-mao* day (26th November) its tail, seven or eight inches in length, greyish in colour, was pointing towards the SW. On a *ting-hai* day (16th December), its tail was over three feet long and was pointing towards the NW. It retrograded and reached the *I* (27th lunar mansion). On a *wu-hsü* day in the eleventh month (27th December), its tail measured over five feet pointing towards the north. It reached the *Chang* (26th lunar mansion). On a *kêng-tzu* day (29th December), it reached the *Tung-Ching* (22nd lunar mansion). On a *kuei-mao* day (1st January, 1665), it moved towards the NW reaching the *Mao* (18th lunar mansion). On an *i-ssu* day, its tail pointed towards the NE (3rd January) and it reached the *Wei* (17th lunar mansion). On a *kêng-hsü* day (8th January), it reached the *Lou* (16th lunar mansion), with its tail pointing towards the east. It was blue in colour. On a *jen-hsü* day in the 12th month (20th January) it reached the *K'uei* (15th lunar mansion). Its body was small and its tail measured over two feet." (*CSK* 14/194; *CWHTK* 12/7251)

CHU Wen-hsin quoted seven gazetteer records to show conformity in their observation of the above comet<sup>14</sup>.

The *Shang-hai District Gazetteer* says: "In the winter of the third year of K'ang-Hsi reign-period, a comet was seen."

The *T'ung-shan District Gazetteer* says: "A comet appeared at the SE."

The *Sung-chiang District Gazetteer* says: "At the beginning, the comet was about 20 feet long. It gradually decreased to 5 or 6 feet."

The *Ch'uan-sha Sub-Prefecture Gazetteer* says: "The tail of the comet pointed towards the NW. A few days later it pointed towards the NE. It was over 30 feet but dim in appearance."

The *Tung-t'ai and Ch'ang-shu District Gazetteer* says: "During the tenth month, a comet appeared with its tail measuring about 20 feet and pointed towards the NW. It went out of sight after more than a month."

The *K'un-shan District Gazetteer* says: "On the first day in the eleventh month, a comet appeared. For the first ten days of the month it rose at dawn, measuring about 20 feet. For the last ten days of the month it was seen at dusk, measuring 5 or 6 feet. It went out of sight after a month."

The *Chiang-Yin and Chin-shan District Gazetteer* says: "A comet appeared at the *I* and *Chang* lunar mansions with a tail of over 30 feet pointing towards the NW. After more than 50 days, it went out of sight on reaching the *Lou* lunar mansion."

It is seen from the above that while the K'un-shan record gives the time of the comet's appearance, the Chiang-yin and Chin-shan record gives the position in relationship to the lunar mansion. It was precisely during that month (the 11th month) that the *I* was in the SE. This is in accordance with the statement given by the *T'ung-shan Gazetteer*. During the winter, the sun

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<sup>14</sup> CHU Wen-hsin, *op. cit.*, p. 126 — p. 127.

is at the SE. As the head of the comet is constantly facing the sun, its tail is therefore pointing towards the NW. When the comet was seen a dusk, the sun was at the SW and hence its tail pointed towards the NE. This agrees with the *Ch'uan-sha Gazetteer*.

(84) 28th March, 1665. "On a *chi-ssu* day in the second month of the fourth year of the K'ang-hsi reign-period, a comet was seen in the longitude of the (*Hsü-*) *Nü* (tenth lunar mansion.) On an *i-yu* day (13th April), it was at  $1^{\circ} 30'$  of the (*Tung-*) *Pi* (fourteenth lunar mansion) with its tail measuring more than 5 feet. On a *chi-ch'ou* day in the third month (17th April), it entered the *K'uei* (fifteenth lunar mansion)." (CSL, *K'ang-hsi Shih-lu* 14/12a, 16a & 17a).

A slightly different version, as follows, is given by CSK and CWHTK.

"On a *chi-ssu* day in the second month of the fourth year [of the K'ang-hsi reign-period], an extraordinary star appeared in the SE at the (*Hsü-*) *Nü* (tenth lunar mansion). On a *chia-hsü* day (2nd April) its tail, seven inches in length and of greyish-white in colour was pointing towards the SW. On a *ling-ch'ou* day (5th April) its tail was over a foot long. It moved towards the NE and reached the *Hsü* (11th lunar mansion). On a *hsin-ssu* day (9th April) it reached the (*Ying-*) *Shih* (13th lunar mansion). Its body increased in size gradually and its tail extended over eight feet. On an *i-yu* day (13th April) it reached the (*Tung-*) *Pi* (14th lunar mansion) with its tail measuring over five feet." (CSK 14/194; CWHTK 12/7251)

(85) 7th March, 1668. "On a *chia-tzu* day in the first month of the seventh year [of the K'ang-hsi reign-period] there was a stretch of white light in the SW measuring over six feet and with its tail pointing towards the SE. Books of prognostication call this a 'Celestial Javelin', *T'ien-Ch'iang*, (a type of comet). On an *i-hai* day (18th March) it extended to over forty feet, sweeping *T'ien-Yüan*, *Chiu-Yu* and *Chün-Ching*. On a *ling-hai* day (30th March) it went out of sight." (CSK 14/194)

(86) 15th March — 9th May 1673. "On a *kuei-ssu* day in the second month of the twelfth year [of the K'ang-hsi reign-period], an extraordinary star appeared at the *Lou* (16th lunar mansion). It was as big as a walnut, white in colour and with a tail measuring more than a foot pointing towards the east. It could still be seen on a *chia-wu* day (the following day)." (CSK 14/194).

(87) 18th February, 1676. "On a *wu-tzu* day in the first month of the fifteenth year [of the K'ang-hsi reign-period], an extraordinary star, white in colour, was seen to the NE of *T'ien-Yüan*." (CSK 14/194)

(88) 23rd November, 1680. "On a *wu-tzu* day in the tenth month of the nineteenth year of the K'ang-hsi reign-period, a (*hui*) comet was seen in the longitude of the *I* (27th lunar mansion) . . . On a *ping-ch'en* day of the eleventh month, the comet was seen in the West." (CSL, *K'ang-hsi Shih-lu*, 6/38a & 39b; THL 92/14b & 93/1b).

The CSK gives the following account:

23rd November, 1680. "On a *wu-tzu* day in the tenth month of the nineteenth year [of the K'ang-hsi reign-period], a (*hui*) comet, white in colour, appeared at *Yu-Chih-Fa*. Its tail was more than a foot long and was pointing

towards the west. It moved rather rapidly towards the east. On a *jen-yin* day (7th December) it went near the sun and could not be seen. On a *ping-ch'en* day, the first day of the eleventh month (21st December), the star itself was seen, darkish-white in colour and its tail, measuring more than 60 feet long and over 2 feet wide, was pointing towards the NE." (CSK 14/194)

(89) 26th August, 1682. "On a *chi-ssu* day in the seventh month of the 21st year of the K'ang-hsi reign-period, a (*hui*) comet was seen in the longitude of the (*Tung-*) *Ching* (22nd lunar mansion). Its tail was over two feet long." (CSL, K'ang-hsi *Shih-lu*, 103/20b; *THL* 7/20b)

A more detailed account of the comet was given in the CSK and CWHTK. It is as follows:

"On a *chi-ssu* day in the seventh month of the 21st year (of the K'ang-hsi reign-period), a (*hui*) comet was seen to the north of *Pei-Ho*. It was white in colour and had a tail over 2 feet long pointing towards the SW. It moved towards the NE rather rapidly. On a *jen-shen* day (29th August), it entered the *Wu* hour-angle sequent (i. e. between the 24th lunar mansion *Liu* and the 26th lunar mansion *Chang*) with a tail of over 6 feet in length." (CSK 14/194; CWHTK 12/7252)

This is Halley's comet.

(90) 2nd August, 1683. "On a *keng-hsü* day in the intercalary sixth month of the 22nd year [of the K'ang-hsi reign-period] an extraordinary star, white in colour, was seen to the north of *Wu-Ch'ê* and east of *Pa-Ku*. It retrograded moving towards the SW. On *wu-ch'en* day (10th August) it entered the *Wu-Ch'ê* asterism." (CSK 14/194)

(91) 1st July, 1684. "On a *chia-shen* day in the fifth month of the 23rd year [of the K'ang-hsi reign-period], an extraordinary star was seen to the east of *T'ai-Wei* Enclosure within the region of the *Chen* (28th lunar mansion). It was white in colour and appeared very bright. It moved towards the NS. On an *i-yu* day (2nd July) it had moved a distance covering more than four degrees, coming beneath the asterism *Yu-Shê-T'i*." (CSK 14/194)

(92) 26th August, 1686. "On a *keng-yin* day in the seventh month of the 25th year [of the K'ang-hsi reign-period] an extraordinary star, white in colour, was observed in the east near the horizon. It moved eastwards slowly. On a *ting-yu* day (3rd September), it had moved for a total of 16 degrees. When it reached the *Liu* (24th lunar mansion), it showed traces of a tail. On a *jen-yin* day (8th September) it gradually went out of sight." (CSK 14/194)

(93) 2nd November, 1688. "On a *chi-yu* day in the tenth month of the 27th year [of the K'ang-hsi reign-period], an extraordinary star, appeared at the *K'uei* (15th lunar mansion). It was white in colour and was seen for three nights." (CSK 14/194)

(94) 29th September, 1690. "On a *chi-yu* day in the eighth month of the 29th year [of the K'ang-hsi reign-period], an extraordinary star appeared at the *Chi* (7th lunar mansion). It was yellow in colour and was seen for two nights." (CSK 14/194)

There was no *chi-yu* day-cycle in the month mentioned above. This can easily be a mistake for *i-yu* as the characters *chi* and *i* look very much alike

and are often confused for each other. The date was very probably 29th September.

(95) 11th October, 1723. "On a *chi-ch'ou* day in the ninth month of the first year of the Yung-ch'eng reign-period, an extraordinary star appeared beneath *Hu* and *Shih*. It was white in colour and small in size. Its rays measured over a foot long and pointed towards the NW. It retrograded and reached the (*Tung-*) *Ching* (22nd lunar mansion)." (CSK 14/194)

(96) 7th July, 1737. "On a *ting-mao* day in the sixth month of the second year of the Ch'ien-lung reign-period, an extraordinary star was observed to the east of *Yu-Keng*. It was white in colour and was lying within (the same longitudes as) the *Lou* (16th lunar mansion). It moved towards the SW and could still be seen on a *ping-tzu* day (16th July)." (CSK 14/194)

(97) 2nd March, 1742. "On a *ping-hsü* day in the first month of the seventh year of the Ch'ien-lung reign-period, a (*hui*) comet was seen." (THL, Ch'ien-lung reign, 5/11a)

The appearance of the above comet was recorded in the official history a day later. It says:

"On a *ting-hai* day in the first month of the seventh year [of the Ch'ien-lung reign-period] (3rd March, 1742), an extraordinary star was observed in the SE. On a *wu-tzu* day (4th March), it was over twenty-seven degrees above the horizon. It was as large as a pellet and was yellow in colour. Its tail measuring over four feet, was pointing towards the SW. It was lying within the *ch'ou* hour-angle segment (i. e. between the 9th lunar mansion *Ch'ien-Nu* and the 8th lunar mansion *Nan-Tou*) outside the *T'ien-Shih* Enclosure. It retrograded for more than forty days before disappearing." (CSK 14/194)

(98) 4th January, 1744. "On a *chi-hai* day in the eleventh month of the eighth year of the Ch'ien-lung reign-period, a (*hui*) comet was seen." (THL, Ch'ien-lung reign, 6/16a)

The CSK and CWHTK give the following version:

"On a *chi-hai* day in the eleventh month of the eighth year [of the Ch'ien-lung reign-period] a (*hui*) comet was seen between the *K'uei* (15th lunar mansion) and the *Pi* (19th lunar mansion). It was as large as a pellet and was yellowish-white in colour. Its tail measuring over a foot long, pointed towards the east. It was lying within the *Hsü* hour-angle segment (i. e. between the 15th lunar mansion *K'uei* and the 16th lunar mansion *Lou*). It retrograded until the *hsin-mao* day in the first month of the ninth year (25th February). By then, it had travelled for 53 days, covering a distance of more than 29 degrees." (CSK 14/194; CWHTK 12/7252)

(99) 26th April, 1748. "On a *kuei-ch'ou* day in the third month of the thirteenth year [of the Ch'ien-lung reign-period], an extraordinary star as big as a hazel-nut and with a yellow colour was seen in the east. Its tail, measuring more than two feet and pointing towards the SW, was seen to the south of the third star of *Li-Kung*. It moved forward until the *chia-yin* day, the first day of the fourth month (27th April). After it had travelled for three degrees, its tail was over a foot long and it dwindled in size and became dimmer. On a *jen-hsü* day (5th May), it reached *T'êng-Shê*. On an *i-ch'ou*

day (8th May), it reached *Wang-Liang*. It went out of sight on a *ping-yin* day (9th May)." (CSK 14/194)

(100) 21st June, 1740. "On a *ping-yin* day in the first month of the eighteenth year [of the Ch'ien-lung reign-period], an 'auspicious star' appeared in the east. It was as large as a hen's egg, oblong in shape. It was pale yellow in colour and showed a flossy lustre. It was moving slowly. Leaving *T'ien-chin*, it entered the *Ch'u-Kao*. According to the books of prognostication, this was a *Han-Yü* star." (CSK 14/194).

(101) 8th April, 1759. "On a *jen-ch'en* day in the third month of the 24th year [of the Ch'ien-lung reign-period], a (*hui*) comet was observed in the SE. On a *chia-wu* day (10th April) it appeared beneath the first star of the *Hsü* (11th lunar mansion). It was as big as a hazel-nut, darkish-white in colour. Its tail measuring over a foot long pointed towards the SW. On a *kuei-mao* day (19th April) it became small and dim. It was moving forward with its tail measuring only three or four inches. On a *wu-shen* day (24th April), it disappeared completely." (CSK 14/194; CWHTK 12/7253)

The *Tung-hua lu* of the Ch'ien-lung reign recorded the appearance of the comet two days later, i. e. the *Chia-wu* day of the same month (10th April). (THL 18/8b)

(102) 14th May, 1759. "On a *wu-ch'en* day in the fourth month [of the 24th year of the Ch'ien-lung reign-period], a (*hui*) comet appeared in the SW above the second star of the *Chang* (26th lunar mansion). On a *chi-ssu* day (16th May) it moved six degrees away from the *Chang*. (26th lunar mansion). It was as big as a hazel-nut, greyish-yellow in colour. The brightness of its tail spread out. It was over two feet long and pointed towards the SE. It moved forward and dwindled on a *jen-shen* day (19th May). On a *ting-ch'ou* day (24th May), it became even smaller. It began to disappear gradually on a *chi-mao* day (26th May). On a *jen-wu* day in the fifth month (28th May) it went out of sight completely." (CSK 14/194; CWHTK 12/7253)

(103) 9th January, 1760. "On a *wu-ch'en* day in the eleventh month [of the 24th year of the Ch'ien-lung reign-period], an extraordinary star appeared in the SE, below the fourth star of the (*Tung*-) *Ching* (22nd lunar mansion). It was as big as a hazel-nut, greyish-yellow in colour, moving towards the NW. On a *kuei-yu* day (14th January) it had moved four degrees and reached the *Wei* (6th lunar mansion) showing only a slight trace of a tail. On a *ting-ch'ou* day, the first day of the 12th month (18th January) it disappeared altogether." (CSK 14/194)

(104) 28th August, 1769. "On a *ting-wei* day in the seventh month of the 34th year of the Ch'ien-lung reign-period, a (*hui*) comet was seen . . . On a *kuei-ch'ou* day in the tenth month (2nd November) the comet appeared again." (THL, Ch'ien-lung reign, 25/17a & 22a)

The account given by the CSK and CWHTK is as follows:

"On a *chia-ch'en* day in the seventh month of the 34th year [of the Ch'ien-lung reign-period] (25th August, 1769), a (*hui*) comet appeared in the SE. On a *ting-wei* day (28th August), it was as large as a pellet, darkish white in colour. Its tail measured three feet, pointing towards the SW. It moved forward rather rapidly. On a *ting-mao* day in the eighth month (17th Sep-

tember), it was in the same hour-angle segment as the sun and so was not seen. On a *hsin-hai* day in the tenth month (30th October) it appeared in the west, beneath the second star of *Lieh-Ssu*. It was small in size with a tail of one foot in length. On a *ping-tzu* day (25th Nov.) it disappeared completely." (CSK 14/194; CWHTK 12/7253)

(105) 26th June, 1770. "On a *chi-yu* day in the intercalary fifth month of the 35th year [of the Ch'ien-lung reign-period] an extraordinary star appeared in the SE. It was as large as a pellet, greyish-yellow in colour. It appeared to the west of the first star of the *T'ien-Pien* asterism. On a *kuei-ch'ou* day (30th June) it travelled 32 degrees to the north. On an *i-ch'ou* day (12th July), it went out of sight." (CSK 14/194; CWHTK 12/7253)

(106) 8th January, 1771. "On an *i-ch'ou* day in the eleventh month [of the 35th year of the Ch'ien-lung reign-period], a (*hui*) comet was observed in the SE measuring over a foot. On a *ping-yin* day (9th January) it appeared beneath the second star of the *Liu* (24th lunar mansion). On a *wu-ch'en* day (11th January), it was darkish-white in colour and its tail was pointing towards the SE. It travelled a distance of over ten degrees each day towards the NW. On a *k'eng-wu* day (13th January) it grew dimmer, on a *hsin-wei* day (14th January) it went out of sight." (CSK 14/194; CWHTK 12/7253)

(107) 20th February, 1821. "On a *ting-ch'ou* day in the first month of the first year of the Tao-kuang reign-period (27th February), an edict was given to the Grand Council saying, "According to the memorial of the Director of the Astronomical Bureau, a (*hui*) comet was sighted at the west at the *yu* double-hour (i. e. 17:00 and 19:00 hours) on the 18th day of the first month." (CSL, *Tao-kuang Shih-lu*, 12/39a; THL 1/13b; CHTK 10/10488)

(108) January, 1823. "During the twelfth month of the third year [of the Tao-kuang reign-period] (1st to 30th January), a (*hui*) comet was observed." (CHTK 10/10488)

(109) February — March, 1826. "During the first month of the sixth year [of the Tao-kuang reign-period] (7th February to 8th March), a (*hui*) comet was observed." (CHTK 10/10488)

(110) 5th August, 1835. "On the 11th day in the intercalary sixth month of the 15th year [of the Tao-kuang reign-period] a (*hui*) comet was observed." (CHTK 10/10488)

(111) January — February, 1843. "During the first month of the 23rd year [of the Tao-kuang reign-period] (30th January to 28th February), a large (*hui*) comet was seen in the day time." (CHTK 10/10488)

(112) October — November, 1858. "During the ninth month of the eighth year (of the Hsien-fêng reign-period) (7th October to 5th November), a large (*hui*) comet was seen." (CHTK 10/10489)

(113) 1859. "During the ninth year [of the Hsien-fêng reign-period] a (*hui*) comet was seen." (CHTK 10/10489)

A note in the *CHTK* says that the Astronomer-Royal reported to the Emperor that the light of the comet (probably its tail) swept the *Kuan-So* asterism in Corona Borealis.

(114) June-July, 1861. "During the fifth month of the 11th year [of the

Hsien-fêng reign-period] (8th June to 7th July), a large (*hui*) comet was observed in the NW." (CHTK 10/10489)

The above appears only as a foot-note in the CHTK.

(115) 19th August, 1862. "On an *i-ssu* day in the seventh month of the T'ung-chih reign-period, a (*hui*) comet was seen in the NW." (CSL, T'ung-chih Shi-lu, 35/14a)

The THL says: "On a *ping-wu* day in the seventh month of the T'ung-chih reign-period (20th August) a (*hui*) comet was seen in the NW." (THL, T'ung-chih reign, 11/10b)

The CHTK says: "In the nights of the 25th and 26th days in the seventh month of the first year of the T'ung-chih reign-period (20th and 21st August), a (*hui*) comet appeared in the NW." (CHTK 10/10489)

(116) November — December, 1871. "During the tenth month [of the tenth year of the T'ung-chih reign-period] (13th November to 11th December), a (*hui*) comet was seen." (CHTK 10/10490)

(117) 1st July, 1874. "On a *chi-wei* day in the fifth month of the thirteenth year of the T'ung-chih reign-period, a (*hui*) comet was seen." (CSL, T'ung-chih Shih-lu, 366/21b.)

The CHTK gives the same version but adds that the comet was seen in the direction of the NW. (CHTK 10/10490)

(118) January — February, 1880. "During the twelfth month [of the fifth year of the Kuang-hsü reign-period] (12th January to 9th February), a large (*hui*) comet was seen in the evening at the SW." (CHTK 10/10490)

(119) February — March, 1881. "During the second month of the seventh year [of the Kuang-hsü reign-period] (28th February to 29th March), a (*hui*) comet was seen." (CHTK 10/10490)

(120) 30th May, 1881. "On a *chia-tzu* day in the fifth month of the seventh year of the Kuang-hsü reign-period, a (*hui*) comet was seen in the NE." (THL, Kuang-hsü reign, p. 1070)

The CSL says: "On a *chi-hai* day in the sixth month of the seventh year of the Kuang-hsü reign-period (4th July, 1881) an edict was issued to the Grand Secretariat saying that a (*hui*) comet was seen in the north for the past few days." (CSL, Kuang-hsü Shih-lu, 131/5a)

The CHTK says: "In the summer [of the seventh year of the Kuang-hsü reign-period], a large (*hui*) comet, purple in colour, was seen. It went out of sight in the seventh month of the following year (14th August to 11th September 1882)." (CHTK 10/10490)

A note in the CHTK says that the comet was seen in the NW.

(121) 5th October, 1882. "On a *ting-ch'ou* day in the eighth month of the Kuang-hsü reign-period, an edict was issued to the Grand Secretariat saying: "When a (*hui*) comet was sighted last year, an imperial decree was written to the palace and court officers ordering them to perform their respective duties conscientiously. In the second third of this month, the comet was seen again in the SE. This must be due to frequent mistakes committed by those employed in the administration; the hardship of the village folks had not been adequately presented to the throne. Order is now given to make a thorough investigation." (CSL, Kuang-hsü Shih-lu 150/15b)

The *THL* says: "On a *ting-ch'ou* day [in the eighth month of the eighth year of the Kuang-hsü reign-period], Hung Liang-P'in memorialised the Emperor saying, "During the sixth month of last year, a (*hui*) comet was seen in the north. Consequently, there was a big flood in every province this year causing the people to disperse. Presently, the comet has been seen again in the east. Its shape is like a chain and its tail measuring more than a few *chang*, swept across the SW direction. When the sun was about to appear, the comet was in such brilliance comparable to that of the sun." (*THL*, Kuang-hsü reign, p. 1375)

The *CHTK* says: "On the 24th day in the eighth month of the eighth year [of the Kuang-hsü reign-period], a (*hui*) comet was seen." (*CHTK* 10/10490)

A note in the *CHTK* says that the comet was seen in the SE.

(122) September, 1883. "During the eighth month of the ninth year [of the Kuang-hsü reign-period] (1st to 30th September), a (*hui*) comet was seen." (*CHTK* 10/10490)

(123) May-June 1886. "During the fourth month of the 12th year [of the Kuang-hsü reign-period] (4th May to 1st June), a (*hui*) comet was seen." (*CHTK* 10/10490)

(124) September — October, 1887. "During the eighth month of the 13th year [of the Kuang-hsü reign-period] (17th September to 16th October), a (*hui*) comet was seen." (*CHTK* 10/10490)

(125) March — April, 1892. "During the third month of the 18th year [of the Kuang-hsü reign-period] (28th March to 26th April), a (*hui*) comet was seen." (*CHTK* 10/10490)

(126) October — November, 1893. "During the ninth month of the 19th year [of the Kuang-hsü reign-period] (10th October to 7th November), a (*hui*) comet was seen." (*CHTK* 10/10490)

(127) 22nd January, 1910. "At the first and second *k'ê* of the *Yü* double-hour (i.e. between 17:00 and 17:30 hours) on the 12th day in the 12th month of the first year of the Hsüan-t'ung reign-period, an extraordinary star appeared slightly to the south of west. Its tail measured over 10 feet. It became dimmer day after day until it went out of sight on the fourth day in the first month of the second year (13th February, 1910)" (*CHTK* 10/10490)

(128) 10th May, 1910. "At the first *k'ê* of the *Yin* double-hour (i.e. 03:15 hours) in the fourth month of the second year [of the Hsüan-t'ung reign-period] a (*hui*) comet was observed among the clouds in the NE with its tail pointing towards the SW. Its position could not be ascertained as it was in the clouds. At the first *k'ê* of the *Yin* double-hour (03:15 hours) on the fifth day (13th May), the (*hui*) comet appeared at the NE, to the north of *Wai-P'ing*. Its tail was pointing towards the SW, between the *Wei* (12th lunar mansion) and *T'u-Kung-Li*. The comet was observed at an altitude of four degrees, 15 degrees North of East. It went out of sight after 16 days." (*CHTK* 10/10490)

(129) 26th May, 1910. "At the first *k'ê* of the *hsü* double-hour (19:45 hours) on the eighteenth day of the fourth month [of the second year of the Hsüan-t'ung reign-period] a (*hui*) comet was seen in the direction south of west, within the *Liu* (24th lunar mansion), The tail of the comet was pointing

towards the SE between the *I* (27th lunar mansion) and *Ming-T'ang*. The position of the comet was observed and found to have an altitude of 26 degrees, and a direction 12 degrees South of West. Gradually, it became dimmer and went out of sight on the 30th day of the fifth month (6th July).” (CHTK 10/10491)

(130) 2nd October, 1911. “At the second *k'ê* of the *hsü* double-hour (19:30 hours) on the eleventh day in the eighth month of the third year [of the Hsüang-t'ung reign-period] an extraordinary star was observed in the north of west. It was during the full moon when it first appeared and so it was not possible to ascertain its position. On the 21st day (12th October) when the weather was fine, observations carried out at the third *k'ê* of the *Yü* double-hour (17:45 hours) found the comet in the north of west at the *Ch'ang-Ch'en* asterism, with a tail of over 10 feet pointing towards *San-Kung*. At 19:00 hours it went below into the horizon. At the second *k'ê* of the *Yin* double-hour (03:30 hours) on the following day it appeared again to the north of east. Its body was extremely small and at the beginning of the *mao* double-hour (i.e. after 05:00 hours) it went out of sight.” (CHTK 10/10491)

It is believed that further records of comets and 'guest stars' can still be found among the general literature and the many provincial and local gazetteers of the Ming and Ch'ing periods. Unless and until efforts are made to exhaust all these materials, the list of comets and 'guest stars' for the whole of these two periods will remain incomplete. This also leads one to suspect that if the *Ming-shih*, which is considered as the most elaborate and the most reliable of all the Standard Histories compiled after the Han period<sup>15</sup>, could have such omissions in its Astronomical Chapters, similar omission might well occur in other preceding official dynastic histories. It is hoped that attempts will be made to delve into the relevant sources of the dynasties concerned and bring out observational records of comets and 'guest stars' that might have been omitted by the official compilers for one reason or another.

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<sup>15</sup> Wolfgang FRANKE, *op. cit.*, p. 6.

## Appendix I

List of the Emperors of the Ming Dynasty and their Designations of Reign.

<i>Emperor</i>	<i>Reign-Title</i>	<i>Reign-Period</i>
T'ai-tsu	Hung-wu	1368—1398
Hui-ti	Chien-wen	1399—1402
Ch'eng-tsu	Yung-lo	1403—1424
Jen-tsung	Hung-hsi	1425
Hsüan-tsung	Hsüan-tê	1426—1435
Ying-tsung	Cheng-t'ung	1436—1449
Tai-tsung	Ching-t'ai	1450—1456
Ying-tsung	T'ien-shun	1457—1464
Hsien-tsung	Ch'eng-hua	1465—1487
Hsiao-tsung	Hung-chih	1488—1505
Wu-tsung	Cheng-tê	1506—1521
Shih-tsung	Chia-ching	1522—1566
Mu-tsung	Lung-ch'ing	1567—1572
Shen-tsung	Wan-li	1573—1619
Kuang-tsung	T'ai-ch'ang	1620
Hsi-tsung	T'ien-ch'i	1621—1627
Chuang-lieh-ti	Ch'ung-chen	1628—1644
Fu-wang	Hung-kuang	1645
T'ang-wang	Lung-wu	1645—1646
Kuei-wang	Yung-li	1647—1661

## Appendix II

List of the Emperors of the Ch'ing Dynasty and their Designations of Reign.

<i>Emperor</i>	<i>Reign-Title</i>	<i>Reign-Period</i>
T'ai-tsu	T'ien-ming	1616—1626
T'ai-tsung	T'ien-tsung	1627—1635
	Ch'ung-tê	1636—1643
Shih-tsu	Shun-chih	1644—1661
Sheng-tsu	K'ang-hsi	1662—1722
Shih-tsung	Yung-chêng	1723—1735
Kao-tsung	Ch'ien-lung	1736—1795
Jen-tsung	Chia-ch'ing	1796—1820
Hsüan-tsung	Tao-kuang	1821—1850
Wen-tsung	Hsien-fêng	1851—1861
Mu-tsung	T'ung-chih	1862—1874
Te-tsung	Kuang-hsü	1875—1908
	Hsüan-t'ung	1909—1911

APPENDIX III

Key to Chinese Characters (except star-names given in Appendix IV)

Cha Chi-tso	查 繼 佐
<u>chang</u>	丈
Ch'ang-shu	常 熟
Chang T'ing-yü	張 廷 玉
<u>ch'ang-hsing</u>	長 星
Chao Erh-sun	趙 爾 巽
Chao Chih-kao	趙 志 皋
Chi Huang	嵇 璜
Chi Liu-ch'i	計 六 奇
Chiang Liang-ch'i	蔣 良 琪
Chiang-yin	江 陰
<u>Ching-shen-t'ang</u>	敬 慎 堂
<u>ch'ih</u>	尺
Chin-shan	金 山
Ch'ing	清
<u>Ch'ing-ch'ao Wên-hsien t'ung-k'ao</u>	清朝文獻通考
<u>Ch'ing-shih kao</u>	清史稿
Chu Wên-hsin	朱文鑫
Ch'uan-sha	川 沙

Hsi Tse-tsung	席澤宗	
Hsia Hsieh	夏燮	
Hsu	庠	
<u>Hsu Wên-hsien t'ung-k'ao</u>	續文獻通考	
hui	羣	
<u>K'ang-hsi Shih-lu</u>	康熙實錄	
k'o	刻	
<u>Kuang-hsi Shih-lu</u>	光緒實錄	
K'un-shan	崑山	
<u>li-ch'un</u>	立春	
<u>Li-fa t'ung-chih</u>	立層法通志	
Liu Chin-tsao	劉錦藻	
Lung Wên-pin	龍文彬	
Mao	卯	
Ming	明	
<u>Ming-chi pei-lüeh</u>	明季北略	
<u>Ming Hui-yao</u>	明會要	
<u>Ming-shih</u>	明史	
<u>Ming-shih chi-lüeh</u>	明史輯略	
<u>Ming Shih-lu</u>	明實錄	
<u>Ming T'ung-chien</u>	明通鑑	

<u>p'eng-hsing</u>	蓬屋						
<u>po</u>	字						
<u>Po-na-pen</u>	百衲本						
<u>Shen-tsung Shih-lu</u>	神宗	實錄					
<u>Shih-êrh-ch'ao Tung-hua lu</u>	十	二	朝	東	華	錄	
<u>Sung-chiang</u>	松江						
<u>Ta Ch'ing Li-ch'ao Shih-lu</u>	大	清	歷	朝	實	錄	
<u>T'ai-tsung Yung-lo Shih-lu</u>	太	宗	永	樂	實	錄	
<u>Tao-kuang Shih-lu</u>	道	光	實	錄			
<u>T'ien-wên k'ao-ku-lu</u>	天	文	考	古	錄		
<u>Tsui-wei-lu</u>	罪	惟	錄				
<u>ts'un</u>	寸						
<u>tu</u>	度						
<u>T'ung-chih Shih-lu</u>	同	治	實	錄			
<u>T'ung-shan</u>	銅	山					
<u>Wang Ch'i</u>	王	圻					
<u>Wang Hung-hsü</u>	王	鴻	緒				
<u>Yüan-shih</u>	元	史					

APPENDIX IV

Index for the identification of stars or asterisms

<u>Stars or Asterisms</u>	<u>Position in modern constellations</u>
Chang (26th lunar mansion) 張	Hydra
Chen (28th lunar mansion) 軫	Corvus
Chi (7th lunar mansion) 箕	Sagittarius
Chi-Shih 積尸	Cancer
Chio (first lunar mansion) 角	Spica and Vir
Chiu-Ch'i 酒旗	Leo
Chiu-Yu 九旒	Eridanus
Chung-T'ai 中台	$\lambda$ and $\mu$ UMa
Chün-Ching 軍井	Lepus
Chün-Men 軍門	possible two stars in Hydra
Ch'ang-Ch'en 常陳	Canes Venatici
Ch'i-Hsing (25th lunar mansion) 七星	Hydra
Ch'i-Kung 七公	Hercules, Bootes
Ch'ien-Niu (ninth lunar mansion) 牽牛	Capricornus
Ch'u-kao 芻藁	Cetus
Fang (fourth lunar mansion) 房	Scorpius
Hsia-T'ai 下台	$\nu$ and $\xi$ UMa
Hsien-Yüan 軒轅	Leo
Hsin (fifth lunar mansion) 心	Antares and others
Hsü (11th lunar mansion) 虛	Aquarius
Hsü-Nü (tenth lunar mansion) 須女	Aquarius
Hu 弧	Puppis, Canis Major

Stars or AsterismsPosition in modern constellations

I (27th lunar mansion)	翼	Crater
Jên-Hsing	人星	Pegasus
K'ang (second lunar mansion)	亢	Virgo
K'uei (15th lunar mansion)	奎	Andromeda, Pisces
Ko-Tao	開道	Cassiopeia
Kou-Ch'en	鈞陳	Ursa Minor
Kuan-So	貫索	Corona Borealis
Lang-Wei	郎位	Coma Berendices
Lei-Pi-Chen	壘壁陣	Capricornus, Aquarius
Li-Kung	離宮	Pegasus
Lieh-Ssu	列肆	λ and 21 Ser
Liu (24th lunar mansion)	柳	Hydra
Lou (16th lunar mansion)	婁	Aries
Mao (18th lunar mansion)	昴	the Pleiades
Ming-T'ang	明堂	Leo
Nan-Ho	南河	Canis Minor
Nan-Tou (eighth lunar mansion)	南斗	Sagittarius
Nei-Chieh	內階	Ursa Major
Nei-Ch'u	內廚	Draco
Nien-Tao	輦道	Cygnus, Lyra
Nü-Shih	女史	γ Draconis
Pa-Ku	八穀	Camelopardus, Auriga

Stars or Asterisms

Pei-Tou	北斗	
Pi (19th lunar mansion)		畢
P'ing-Tao	平道	
San-Kung	三公	
San-T'ai	三台	
Shang-Shu	尚書	
Shang-T'ai	上台	
Shao-Fu	少府	
Shen (21st lunar mansion)		參
Shih	勢	
Shui-Wei	水位	
Shih-Lou	市樓	
Ta-Ling	大陵	
T'ai-Tzu	太子	
T'ai-Yang-Shou	太陽守	
T'ai-Wei (Enclosure)	太微	
T'êng-Shé	騰蛇	
T'ien-Chi ("Celestial Fowl")	天雞	
T'ien-Chiang	天江	
T'ien-Chin	天津	
T'ien-Chiu	天廐	
T'ien-Ch'u	天廚	

Position in modern constellations

the Plough; Ursa Major
Taurus
Virgo
Canes Venatici; also Virgo
Ursa Major
UMa IXh 201 Piazzzi
l and k UMa
3 Dra; also 24 UMa
Orion
Leo Minor
Canis Minor
Ophiuchus
Perseus
Leo; also $\gamma$ UMi
Ursa Major
Coma Berenices, Virgo, Leo
Lacerta, Cassiopeia, Andromeda
Sagittarius
Ophiuchus
Cygnus
Andromeda
Draco

Stars or AsterismsPosition in modern  
constellations

T'ien-Chün	天 園	Cetus
T'ien-Ch'uan	天 船	Perseus
T'ien-Ch'uang	天 牀	Ursa Minor, Draco
T'ien-Huang-Ta-Ti	天 皇 大 帝	32 Dra
T'ien-Lao	天 牢	Ursa Major
T'ien-Mên	天 門	Virgo
T'ien-Miao	天 廟	possibly in Argo, Hydra;
T'ien-Pien	天 辨	Aquila, Scutum
T'ien-P'ou	天 枹	Draco
T'ien-Shih (Enclosure)	天 市	Hercules, Aquila, Serpens Cauda, Ophiuchus, Serpens Caput
T'ien-Ta-Chiang-Chün	天 大 將 軍	Andromeda
T'ien-T'ien	天 田	Virgo; also Capricornus
T'ien-Ts'ang	天 倉	Cetus
T'ien-Yüan ("Celestial Orchard")	天 園	Eridanus
Tsao-Fu	造 父	Cepheus
Ts'ê-Hsing	策 星	$\alpha$ Cassiopeiae
Tsung-Hsing	宗 星	Hercules
Tung-Ching (22nd lunar mansion)	東 井	Gemini
Tung-Pi (14th lunar mansion)	東 壁	Pegasus
T'u-Kung-Li	土 功 吏	Pegasus
Tzu-Wei (Enclosure)	紫 微	Draco, Ursa Minor, Camelopardus
Tz'u Hsiang	次 相	$\delta$ Virginis

Stars or AsterismsPosition in modern  
constellations

Wai-P'ing	外屏	Pisces
Wang-Liang	王良	Cassiopeia
Wei (12th lunar mansion)	危	Pegasus
Wei (17th lunar mansion)	胃	Aries
Wên-Ch'ang	文昌	Ursa Major
Wu-Ch'ê	五車	Auriga
Wu-Ti (Nei-Tso)	五帝 (內座)	Cepheus
Yao-Kuang	搖光	$\eta$ UMa
Ying-Shih (13th lunar mansion)	營室	Pegasus
Yu-Chih-Fa	右執法	Zavizava
Yu-Kêng	右更	Piscis
Yu-Shê-T'i	右攝提	$\eta$ , $\gamma$ and $\nu$ Boo

Index for the identification of stars or asterisms  
( a supplement to Appendix IV )

<u>Stars or Asterisms</u>		<u>Position in modern constellations</u>
Chin-Hsien	進賢	613 III Vir
Ch'nan-Shé	卷舌	Perseus
Ch'ang-Ho-Mén	閻閻	space between $\alpha$ and $\iota$ Dra
Ch'u-Chiu	杵臼	eight small stars in Pegasus, Cygnus and Lacerta
Hua-Kai	華蓋	Cassiopeia
Hou-Kung	后宮	b 3162, or b, or 4 Umi
Hsing-Ch'en	幸臣	(209) Leo
Hs'nan-Chi	璇璣	$\beta$ & $\gamma$ Uma
Kuan-Wei	權位	$\psi$ Gem and $\phi$ , $\lambda$ and $\psi$ Can
Liu-Chia	六甲	six small stars in Camelopardus
Pei-Ho	北河	Gemini
Pei-Chi	北極	Ursa Minor
San-Shih	三上師	three small stars in Ursa Major
Shang-Chiang	上將	$\alpha$ Com
Shang-Wei	上衛	$\alpha$ Cam
Shao-Tsai	少宰	$\theta$ Dra
Shu-Tzu	庶子	a 3233, or A, or 5 Umi
Ti (third lunar mansion)	天氏	Libra
Ti-Hsing	帝星	Possibly the Polaris
T'ai-Yang	太陽	k Lib
T'ien-Ch'iang	天槍	Ophiuchus
T'ien-Ho	天河	62 Ari
T'ien-Ping	天屏	$\epsilon$ and $\mu$ Lib
T'ien-Shu	天樞	$\alpha$ Uma
T'ien-Tsun	天鐻	Gemini
T'ien-Yin	天陰	Ophiuchus, Sagittarius
T'ien-Yü	天庾	$\mu$ , $\omega$ and $\theta$ For
Tsung-Cheng	宗正	Ophiuchus
Ts'ung-Kuan	從官	4 & 5 Lup
Yü -Lin	羽林	Aquarius