

# Chinese Stars and Constellations in 22 Maps

by

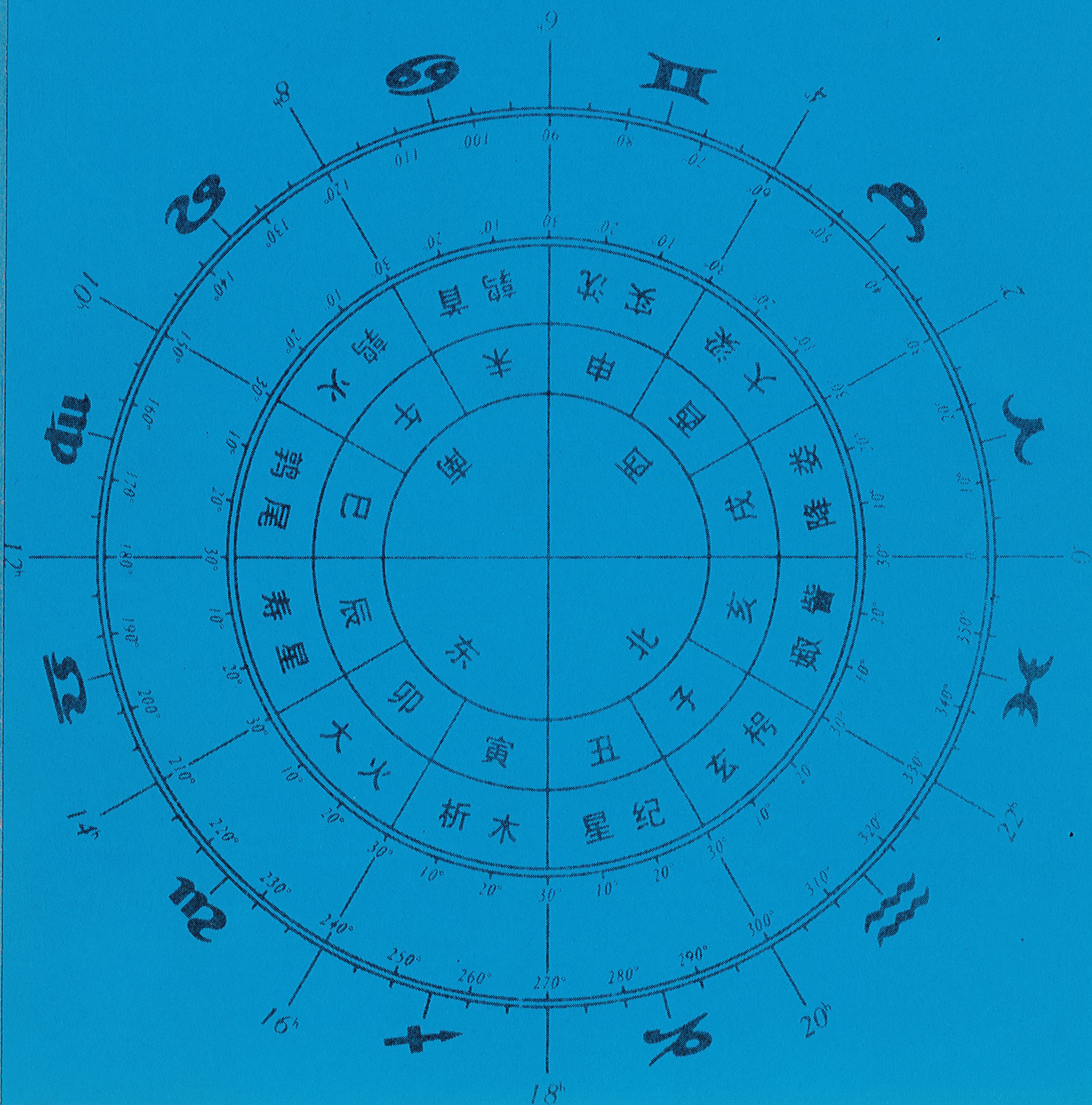
Yi Chi-Tong

Ancient Astronomical Observatory, Beijing

and

J. Kistemaker

FOM-Institute for Atomic and Molecular Physics, Amsterdam





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With explanatory notes

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## Introduction

In October 1982 one of us (J.K.) visited Beijing as a guest of the Chinese Ministry of Education to give lectures on physics topics. During that month the Ancient Astronomical Observatory (Planetarium) was under reconstruction and could not be visited. Because of our desire to get acquainted with traditional Chinese astronomy, and thanks to Dr. Wang Zong-li of the Physics Dept., Normal University Beijing, we nevertheless got in contact. Yi Chi-tong gave his 22 stellar maps as a present, to be investigated in the Netherlands. A very generous present indeed. He had been working on them since 1958. Actually they were officially published in China in 1983. The unique character of the maps was apparent from the very beginning. For the first time, since Ch'hen Cho started to make a stellar map in the 4th century after Christ, a full presentation of Chinese Celestial symbolism was done on the basis of reliable positional star-maps.

Chinese stellar maps were of an explanatory character, like pictographs in written language. They were telling something about life on earth. Traditional stellar maps were not presenting data of positional astronomy but they had a political and astrological character. Because of the Chinese sense for details and precision the observational records dating from more than two thousand years ago contain very valuable information about Chinese culture. Already in 654 B.Chr. the *Tso Chuan* records (reign of a duke named Hsi) contain data taken with a gnomon to determine mid-winter. In 1193 A.Chr. an instruction for a young prince was engraved in stone in Kiansu (Soochow Astronomical Chart), containing all the details of traditional cosmology and cosmography in order to be used for the government of China. It contains a very elaborate stellar map in addition. W. Carl Rufus and Hsing-Chih Tien published it in 1945.

The Yi Chi-tong maps are the first Chinese positional stellar maps, covering Northern- and Southern-hemispheres. They include more than 3000 stars for the epoch 1950. Names and numerals for about 1800 of these stars are given, in addition to 300 constellations. The total picture is projected on a



network of countours of "Western" constellations, which makes it convenient to locate them. The normal astronomical abbreviations of the Latin names for the "Western" constellations are on each map together with their Chinese translations.

In this publication we present lists of translations for each map. For convenience of "Western" readers we grouped the translations per "Western" constellation. The conventional numbering in "Western" astronomy, as presented in Yi Chi-tong's maps, is maintained in the translation, which will help the reader to find his way through the Chinese celestial landscape. The total picture is a remarkable scroll of East-Asian cosmology, ceremonies, rituals and folklore.

The story which the maps tell us is a condensate of human culture during a period of more than 4500 years. Stellar names along the trajectory of the pole (Map 0) suggest observations in the 3rd and even 4th millenium before Christ. The value of these 22 maps is primarily cultural much more than astronomical. They open the door for a study of Chinese culture in a period where no or only scarce written documentation is available. For archeological expeditions along the celestial landscape participants must be able to date their discoveries. For this purpose they can use the precession-clock.

This astronomical clock is given by the swirling motion of the axis of the spinning earth. Its full period is 26000 years. During this time the pole of the celestial equator describes a circle around the pole of the celestial ecliptic with a radius of  $23^{\circ}30'$ . In the same time the celestial equator follows this motion which causes one full rotation of the intersecting line of the planes of the celestial equator and ecliptic. The two points where this line penetrates the celestial globe are the spring- and autumn-equinoxes. Thus the spring-equinox moved since 4500 B.Chr. from the border between Gemini and Taurus ( $+23^{\circ}$  Decl.; 6h Longitude) all along the celestial ecliptic to its present position in Pisces ( $0^{\circ}$  Decl.; 0h Longitude). As the traditional Chinese astronomical system probably always has been an equatorial pole-coordinate system it seems logic that the nomination of the cardinal-points along the celestial trajectories of pole and equinoxes can be traced in the names



of stars and constellations. This gives a possibility for dating.

Another effect which might have had some influence over periods of 4000 to 6000 years are the randomly directed proper motions of important clear stars. We present here some positional displacements at 2300 B.Chr., Hsia-dynasty, as an illustration:

$\alpha$ Boo, Arkturus,	5.6 moon diameters
$\alpha$ Lyr, Vega ,	0.8 " "
$\alpha$ CMa, Sirius ,	3.3 " "
$\alpha$ CMi, Procyon ,	3.1 " "
$\alpha$ Aql, Altair ,	1.6 " "
$\alpha$ Leo, Regulus ,	0.6 " "
$\beta$ Gem, Pollux ,	1.6 " "
Ursa Major Group,	0.2 to 0.3 " "

It is questionable if such effects should be ignored, as has been done up to now. Their importance depends on the accuracy of observations in ancient times, as well as on the declinations of the stars, especially the so-called Regulator-stars.

Yi Chi-tong based his calculations on two catalogs from the Chin-dynasty: The *Vixian Kaocheng* (1757 A.Chr.) and the *Vixian Kaochen Xuibian* (1844 A.Chr.). Moreover he used the modern Western General Catalog of Boss and the Atlas of Heavens by Becvar, both for the epoch 1950 A.Chr., for comparison. In his postscript he reports extensively about his working procedure. We therefore present a translation of this postscript, somewhat abbreviated and rearranged. Moreover one of us (J.K.) added a short introduction about the History of Chinese Astronomy.

Our work as presented here was made possible by the help of several bi-lingual Chinese physicists, astronomers and linguists. They were:

- Dr. Yi-yan Bai, from Phys.Dept., Charbin Polytechnical School
- Dr. Ying Chun Tung, from Phys.Dept., Tsinghua Univ., Beijing
- Dr. Er Ma, from Astronomical Observatory, Beijing
- Dr. Li Zhi-sen, from Astronomical Observatory, Beijing
- Dr. John T. Ma, from Sinological Inst., University of Leyden



The master pieces about Chinese astronomy by Leopold de Saussure and Joseph Needham were brought to our attention by the sinologist Dr. William Mulder. The data on proper motions are from Dr. Gijs van Herk of the Leyden Observatory.



Zhang Yu-zhe, acting director of the Purple Mountain Observatory of Nanjing wrote in his Preface to the Chinese-Western Star Maps of Yi Chi-tong (1978):

*"These achievements of the Chinese Ancient Planetarium have made a great contribution to the world. Especially the vast amount of historical observations, transferred during successive dynasties, still plays a roll of importance in present day astronomy. But ancient Chinese constellation and star names are quite different from present day names in use in the world. It is therefore necessary to make this Chinese material available more easily. After the Ching-dynasty some similar books have been published in China. The authors did some pioneering work. But they do not meet practical needs due to the fact that either there are only tables and no maps, or the maps are too simple to be used. This Chart of Mr. Yi Chi-tong can certainly remedy these shortages. Especially the maps really fill a long time existing gap in this field inside as well as outside China. In this book there are 22 star maps including 3000 stars in the total sky. The maps are large in size, substantial in contents, accurate in drawing and very convenient to read. I have not seen any more exquisite book in China. The publication of this book will be beneficial for the study of Chinese constellation names during successive dynasties and also for comparison of star names in China and in the Western world. It will be of reference value for historical studies related to meteors, comets, variable stars and novae. I hope that the Chinese planetarium science will develop and that we will make more achievements to the realization of the Four Modernizations of China."*

Zhang Yu-zhe

February 1978



## I. POSTSCRIPT TO STELLAR MAPS

made by Yi Chi-tong, Beijing 1979, translated by  
Li Zhi-sen, Beijing 1983, excerpted by  
J. Kistemaker, Amsterdam 1984.

### THE CATALOGS FROM THE CHING DYNASTY

The first goal of this work was to investigate correspondencies between Chinese and Western star names and simplify comparison as much as possible. The excellent catalogs from the Ching-dynasty (1644 to 1911 A.Chr.) were the basis for this study.

The imperial astronomical office, Qin Tian Jian, has published three catalogs:

- 1) the "Lingtai Yixian Zhi" (1672-74)
- 2) the "Yixian Kaocheng" (1736-44)
- 3) the Yixian Kaocheng Xuibian" (1844)

The *Lingtai Yixian Zhi* (Annals of the imperial observatory) was compiled by 31 people. The missionary F. Verbiest was chief editor under the reign of the emperor Kang Xi. Much material originated from the *Xiu Guan-gi* Catalog which was edited partially by the missionary Johan Adam Schall von Bell (1631), and which contained information from the carved stone atlas of *Wutai Si* (five towers temple) in Huhtot, written in mongol-script (emperor Yong Zheng). This stone atlas was called *Qin Tian jan Huizhi tian wentu*, meaning "Celestial map drawn by the Imperial astronomical office".

Moreover the *Lingtai Yixian Zhi* contains instructions for the operation of six astronomical instruments designed by F. Verbiest. The precision of stellar positions was of the order of several arc minutes, claimed by Verbiest as such.

Verbiest also compared with the stellar data from the catalogs of Tycho Brahe and of Johannes Keppler.



All together the L.Y.Z. contained 1129 numerated (named) stars and 259 stellar constellations. The "*Bu Tian-ge*", which means "Song of Heavens", and which was made by Dan Yuan-zi during the Sui-dynasty ( ... .. ), contained 24 constellations and 335 stars less.

The *Vixian Kaocheng*, giving a historical investigation of astronomical instruments and stellar phenomena, contains a name-list of 26 authors, of whom 21 actually contributed like:

- I. Kögler, controller of Qin Tian-Jan
- A. von Hallerstein, controller of Q.T.J.
- A. Gogelsl, vice-controller of Q.T.J.

All three were missionaries. Kögler was also Adjunct to the Minister of Rites. Several other coworkers had positions in the Ministeries of Rites or of War.

Although the *Vixian Kaocheng* was finished in 1744, its publication was retarded till 1757 A.Chr., probably because of ceremonial reasons.

The Y.K. contains in total 300 stellar constellations and 3083 stellar positions. But only 1876 stars were named (nume-rated) which leaves about 1200 unnamed. Relative to the *Ling-tai Vixian Zhi* the number of named stars increased

- in the visible part of the sky with 597
- in the not-visible Southern sky with 150
- plus 23 constellations

The accuracy claimed in *Vixian Kaocheng* is in arc seconds instead of the arc minutes of L.Y.Z. This had two reasons:

- a) many results of F. Flamsteed's catalog from the Greenwich observatory were introduced, including
  - *Historia Coelestis Britannia*, 1712, and the
  - *Atlas Coelestis (Catalog)*, 1729.

Frequently invisible stars (7th magnitude) were copied and numbered in the same way as Flamsteed did, inclusive errors.

- b) to please the emperor, and get favours.



Accurate positional astronomy developed only late in China because of lack of telescopes. Real precision of the *Vixian Kaocheng* data is of the order of arc minutes.

In the Y.K. catalog the determinative star of the Shen lunar mansion (Girdle of Orion) was changed to ( $\zeta$  Ori) to avoid coincidence between the Shen and the Zui mansions (Hsiu).

The Y.K. catalog is the principal source of ancient Chinese star names, and a bridge between traditional astronomy and the 19th century accurate positional astronomy. As such it is the key to understanding of astronomical events reported in old times in specific constellations.

NOTE ADDED BY J. KISTEMAKER

*A remarkable development took place in the 15th Century A.C. in Islamic Central Asia. A mighty Altai-Turkish state existed in the area formally called Bactria, with Samarkand as its capital, north of Persia. There the descendants of Dzungis Khan were ruling. The grandson of Tamerlan, named Ulugh Beg, favoured astronomy and was very active himself. By his observatory the first really accurate star catalog was made between 1425 and 1437, based on direct observations. The best since Ptolemy's Almagest. This catalog is known as the "Zij Ulugh Beg".*

*In 1449 Ulugh Beg was murdered and his coworker Ali Kushchi fled to Istanbul where he published the Zij Ulugh Beg in Persian and other languages. These publications did not reach Western Europe until a visit of the Englishman John Greaves about 1640 to Istanbul. He discovered these manuscripts and brought them to Oxford, where they were published in 1648 (data about 1018 stars). In 1690 the Polish astronomer Jan Hevelius published Prodomus Astronomiae. It contains a complete comparison of the Zij Ulugh Beg with Tycho Brahe's, Riccioli's, Wilhelm IV of Hessen's and Hevelius' catalogs. These data were used by John Flamsteed (Greenwich Observatory) to make his Historia Coelestis Britannicae (1712). After 3 centuries Ulugh Beg's outstanding work reached the Beijing Astronomical world due to the missionaries Kögler c.s. Ulugh Beg was following Ptolemy's Star Maps and constellations of the Middle East.*



The *Vixian Kaocheng Xuibian* was a continuation and extension of the *Vixian Kaocheng*. It was published in the 25th year of the reign of emperor Dao Guang, in 1844 A.Chr. There were 38 fellows participating in the publication, among whom the Minister of International Affairs of the War-Ministry who was responsible for Qin Tian Jan (Imperial Astronomical Office).

The number of stars in the catalog adds up to 3240. Some 160 weak stars, mostly 7th magnitude, were added.

The only change in tradition was the transformation of Xuan Yuan 17, ( $\alpha$  Leo), into Yu Nü, Maid of Honour, according to the *Butian Ge* Catalog. The Xuan Yuan (Heen Yuen) constellation was not changed.

The 19th century Y.K.X. catalog is primarily interesting as a source of observational-accuracy in China during that period. All of the added stars were observed from the top of the Antique Observatory in Beijing by means of an equatorial armillary sphere instrument (Jiheng Fucheng Yi). The reading accuracy of this instrument was 10 arc seconds. But comparing the Y.K.X. data with those of the modern (20th cent.) General Catalog of Boss (Epoch 1950), after reduction for precession, we observe a spread in the data

for longitude of  $\pm 12$  arc minutes  
for latitude of  $\pm 6$  arc minutes.



Latitude errors are mostly due to instrumental reading errors. Those for longitude correspond with the reading of the positions of two stars (differential measurement) causing the double spread. The observatory had no astronomical clock in the first half of the 19th century. Nevertheless the Y.K.X. catalog reads in arc seconds instead of arc minutes to please the emperor and his authorities.

A huge stellar map of both sides of the celestial equator was constructed on the basis of the Y.K.X. catalog and is kept in the Archives of the Palace Museum in ( ?)

Modern bi-lingual studies of Qin Tian Jian catalogs  
(Chin-dynasty)

In the beginning of the 20th century the Japanese astronomer P. Tsuchihashi worked in the Shanghai Zo Se observatory, together with French and Chinese astronomers. They translated the *Vixian Kaocheng* catalog into French and compared it with Bradley's catalog. In 1914 they published a French-Chinese catalog in the Annals of the Zo Se observatory. It was the first introduction of Y.K. into the Western world but was hardly noticed. In front of their catalog the authors had a very simple stellar map with only primary stars at positions of the epoch 1744.

A second catalog, following the Y.K.X., with 4579 stars was published in 1920 by Zhang Fu-yuan, acting director of the Central Astronomical Observatory. It was also bi-lingual with Chinese and Western names for stars and constellations. But the describing text was in Chinese. There were no maps.

Both bi-lingual catalogs did not get any real spread in the world because of the absence of good stellar maps. At this point we want to emphasize the unique importance of the work which we present here, which started in 1958 and was finished in 1966. Due to the Cultural Revolution it was retarded ten years and got in the final process of publication about 1978.



### About the working procedure

Many errors slipped into the Ching catalogs because of wrong calculations, transcriptions of mistakes in the work done by preceding investigators and because of mistakes in writing or printing. Corrections for precession were sometimes neglected. Some stellar positions were very inaccurate, more than twelve arc minutes off. Sometimes stellar clusters or nebulae were recorded as stars. In total there were about 500 questions and errors to be checked out of about 3000 stellar positions given in the *Vixian Kaocheng* catalog. We based our work on this catalog as well as on the *Vixian Kaocheng Xuibian*. The procedure was as follows:

- 1) the equatorial coordinate of each star was corrected for the precession relative to the spring equinox (4th solar term), for the 1950 epoch.
- 2) the new position was compared with corresponding stellar positions at 1950 epoch in
  - a) General Catalog Star Map by B. Boss
  - b) Atlas Coeli Skalnat Pleso by A. Becvar
  - c) Atlas of the Heavens II by A. Becvar.The corresponding star was chosen according to position, relative distances and magnitude.
- 3) in case of non-correspondence the calculated Chinese star was inserted on our map as "Added Star", together with the most probable Western reference star.
- 4) the same projection method was used as in the 3rd edition of the Atlas Coeli Skalnat Pleso.

In case that more than one data source (calendar) was used we took the reliability of the source into account.

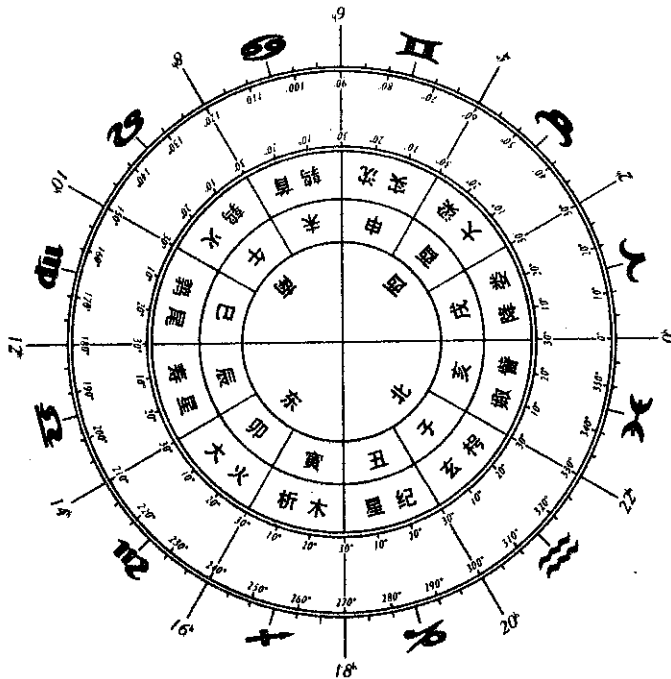
### About traditional calendar names and the beginning of the year

In both Ching-dynasty catalogs used by us we met the problem of traditional annotation of equatorial positions. In the 18th and 19th centuries the equator was divided into



twelve equal sectors, each of 30 degrees. This resembled the Western zodiacal division of the equator (ecliptic), but the traditional Chinese names had nothing to do with the Western equivalents. Our rosette figure makes it easy to see correlations, also with Western Zodiacal signs and Right-Ascensions measured in degrees from 0° to 360°, and with longitudes measured in hours. To make our stellar maps and charts understandable for Western readers we abandoned the traditional Chinese way of measuring positions inside each sector from 0° to 30°, and followed the monotonously increasing Western reading from 0° to 360° R.A.

Doing so there was one problem left, namely where to start the cycle? Where to begin a new epoch, a new year?



Rosette figure to compare traditional equatorial divisions with the "Western" measuring in right ascension degrees or longitude hours.



Table: Explanation of the Rosette figure

Inner Quadrant		Inner Circle		Middle Circle			Outer Circle	Periphery				
Chinese name	English equivalent	Chinese character	Traditional Lunar Calendar name	Earthly Branch	Chinese character	Traditional Solar Calendar name	Season Solar Calendar	English equivalent	Right Ascension	Zodiacal Sign	Solar term	
北 Bai	North	亥	Hai	12	懈	Ju	rain water	mouth	330 to 360	♋	2	
		子	Zi	1	管	Zi	begin spring	fish				1
		丑	Chou	2	玄	Xuan	great cold	black	300 to 330			24
东 Dong	East	寅	Yin	3	杞	Xiao	moderate cold	hole			23	
		卯	Mao	4	星	Xing	winter solstice	constellation	270 to 300			22
		辰	Chen	5	纪	Ji	great snow	law				21
南 Nan	South	巳	Si	6	析	Xi	little snow	broken	240 to 270		20	
		午	Wu	7	木	Mu	begin winter	wood				19
		未	Wei	8	大	Da	begin frost	big	210 to 240			18
西 Xi	West	申	Shen	9	火	Hue	cold dew	fire			17	
		酉	Yiu	10	寿	Shou	autumn equinox	long life	180 to 210			16
		戌	Xu	11	星	Xing	white dew	star				15
南 Nan	South	亥	Hai	12	犴	Chun	end warm season	quail	150 to 180		14	
		子	Zi	1	尾	Wei	begin autumn	tail				13
		丑	Chou	2	犴	Chun	great heat	quail	120 to 150			12
东 Dong	East	寅	Yin	3	火	Hue	moderate heat	heart			11	
		卯	Mao	4	犴	Chun	summer solstice	quail	90 to 120			10
		辰	Chen	5	畜	Shou	grain in ear	head				9
西 Xi	West	巳	Si	6	实	Shi	grain full	demigod	60 to 90		8	
		午	Wu	7	沈	Shen	begin summer	of T'san				7
		未	Wei	8	大	Da	rain on fresh fields	grand	30 to 60			6
南 Nan	South	申	Shen	9	梁	Liang	pure brightness	embankment			5	
		酉	Yiu	10	降	Jiang	spring equinox	descendant	0 to 30			4
		戌	Xu	11	委	Lou	waking of insects	of reaper				3



In both the Y.K. and the Y.K.X. catalogs the year began at the beginning of the Xing-solar term, i.e. at the beginning of the Winter Solstice term as indicated in our explicatory table. New year corresponded with the beginning of January of the Christian Gregorian calendar. It was introduced by the missionaries. We have not followed this method and restored the traditional Chinese new year at the beginning of the Zi-solar term, which is in China the beginning of Spring. This date corresponds with the middle of February according to the Christian Gregorian calendar. The numbering of the Solar terms in our table corresponds with this.

Our table is a translation and a linear transformation of the rosette figure. It gives direct access to traditional Earthly Branches of very ancient lunar calendar times, to be found in the inner circle. The traditional solar calendar names for the various seasons are in the middle circle. In the outer circle we see the corresponding Right Ascensions from  $0^{\circ}$  to  $360^{\circ}$ . Along the periphery we find the hours of Longitude (solar terms) and the "Western" zodiacal signs.



NOTE ADDED BY J. KISTEMAKER

The Soochow Astrological Chart, translated by W. Carl Rufus and Hsing-chih Tien, mentions:

The Periods of the Year

"Speaking of an entire year there is only one period or vital principle. This single period divides into 4 seasonal periods. But also the 12 solar months represent together six Yin and six Yan periods. Each of these 12 months contains a beginning and an end, together 24 solar periods. But each of these 24 periods includes 3 respondencies (hou) each of 5 days. Thus the Chinese year was divided into 72 respondencies."

The Twelve Earthly Branches

"The 12 branches (ch'en) are the sectors along the horizon (earthly) toward which the Regulators of Pei Tou\* point during the 12 months of the year. Each branch is also the place where the primordial spirit dwells during that month. In the first month the Regulators point to Yin (Ren) opposite the tail of the dragon. In the second month to Mao; in the third month to Ch'en, etc."

The Vitalizing Spirit

"The vitalizing spirit has no visible form to behold, but may be discerned by observing the branches to which the 7 Regulators of Pei Tou point. In Chien-Yin month the Regulator Shao ( $\eta$  UMa) points to Yin at evening twilight; at midnight the Regulator Hêng ( $\epsilon$  UMa) points to Yin, and at daybreak K'wei ( $\alpha$  UMa) points to Yin. Pointing to the branches by the Regulators is called Chien, i.e. regulating the months. Therefore we speak of Chien-Yin, Chien-Mao, etc. The stars K'wei, Heng and Shao are on a straight line (Pei). Depending on the time of the year Pei points to another part of the horizon at sunset. The combination of Chien with the 12 Earthly Branches is a sensitive indicator of the season. Yin (Ren) is East North East; Mao is East; Chen is East South East; etc."

The Twelve Positions

"The twelve positions (tz'u) are the places where Sun and Moon meet (conjunctions). During one year they meet 12 times. If a position (New Moon) occurs in a given branch then the tz'u is designated accordingly."

\* Pei Tou is Ursa Major, the Great Dipper.



The Kingdoms and Regions

"The 12 Kingdoms correspond to the 12 branches; the 12 Regions to the 12 positions. When Sun and Moon eclipse or another unusual phenomenon between stars and planets occurs, then the fortune or misfortune of the corresponding Kingdom or Region may be known by the correlation between:

- a) the compass direction (branch),
- b) the position in the sky,
- c) the kingdom
- d) the region."

Final remarks (by Yi Chi-tong)

The creation and compilation of the *Lingtai Vixian Zhi* and *Vixian Kaocheng* catalogs was stimulated enormously by the activities of Jesuit-missionaries in China. The names of Schall von Bell, Verbiest and Kögler will always be remembered. They studied traditional Chinese astronomy during their whole lives and made it available to us. They collected enormous amounts of nearly lost material, records, books and old maps including data obtained by the celestial globe in the Zheng tong and Cheng hua reign periods of the Ming dynasty. Thus they transmitted historical information invaluable for the study of traditional astronomy.

But reading their reports we must always be aware that they were missionaries of the Roman Vatican, bringing a foreign culture into China. Their preoccupation for zodiacal astronomy and the Ptolemaean astronomical system caused a lot of confusion and misunderstanding in 16th and 17th century China. But all over their activities have to be seen as positive. Thus Western sinology especially in the 19th century and thereafter became aware of the vast astronomical work which was done in China in the preceding millenia.

The study of ancient Chinese astronomy should be based on what the ancient astronomers really could see with their own eyes. That means that all weak stars (7th magnitude) which were added in the 18th and 19th centuries in the *Vixian Kaocheng* and *Vixian Kaocheng Xuibian* catalogs are of no value for the archeology of Chinese astronomy. The same is true for the stars near the celestial Southpole. They played no role in traditional Chinese astronomy.

"Many thanks are due to my colleagues who helped me, and especially to Zhang Yu-zhe, acting director of the Purple Mountain Observatory, in Nanjing."

Was signed by: Yi Chi-tong  
Beijing Planetarium,  
Spring 1979.



Note

In Yi Chi-tong's original version of his Chinese-Western starmaps (1979) a complete catalog with astronomical data for about 3000 stars is available. It can be obtained from the Beijing Planetarium Observatory. We did not include those lists of numbers here as they would not contribute to the primary purpose of this publication:

*"To make the historical material preserved in traditional Chinese astronomy available to Western scientists."*

This purpose is fully covered by the 22 precise stellar maps which contain all the information needed for astro-cultural studies.

But as an extension we present here three tables for the convenience of the "Western" reader, about numerals, lunar mansions and celestial palaces as presented in Yi Chi-tong's maps.

J. Kistemaker, Amsterdam,  
July 1984.

Table 1. Numerals

Chinese symbol	Chinese pronunciation	English translation	Chinese symbol	Chinese pronunciation	English translation
一	yi	one	一	zhi yi	eleven
二	er	two	二	zhi er	twelve
三	san	three	三	zhi san	thirteen
四	zhū	four			etc.
五	wu	five	二 +	er zhi	twenty
六	liu	six	二 + -	er zhi yi	twenty-one
七	chi	seven	二 + =	er zhi er	twenty-two
八	pa	eight			etc.
九	jiu	nine	三 +	sanzhi	thirty
十	zhi	ten	四 +	zhū zhi	forty

Table 2. Celestial Palaces

Chinese symbol	Chinese pronunciation	English translation	Astronomical position	Map nr.
<b>紫微</b>	Tsu-wei Yüan	Purple Palace	Around the North Pole mainly in the constel- lations Dra; UMi; Cam; Cas and Cep.	0 and 1
<b>天市</b>	T'ien-shih Yüan	Celes- tial Market	Mainly in the constel- lations Her; Oph and Ser.	13 and 14
<b>太微</b>	Tai-wei Yüan	Privy Council	Mainly in the constel- lations Leo; Vir and Com.	11 and 12

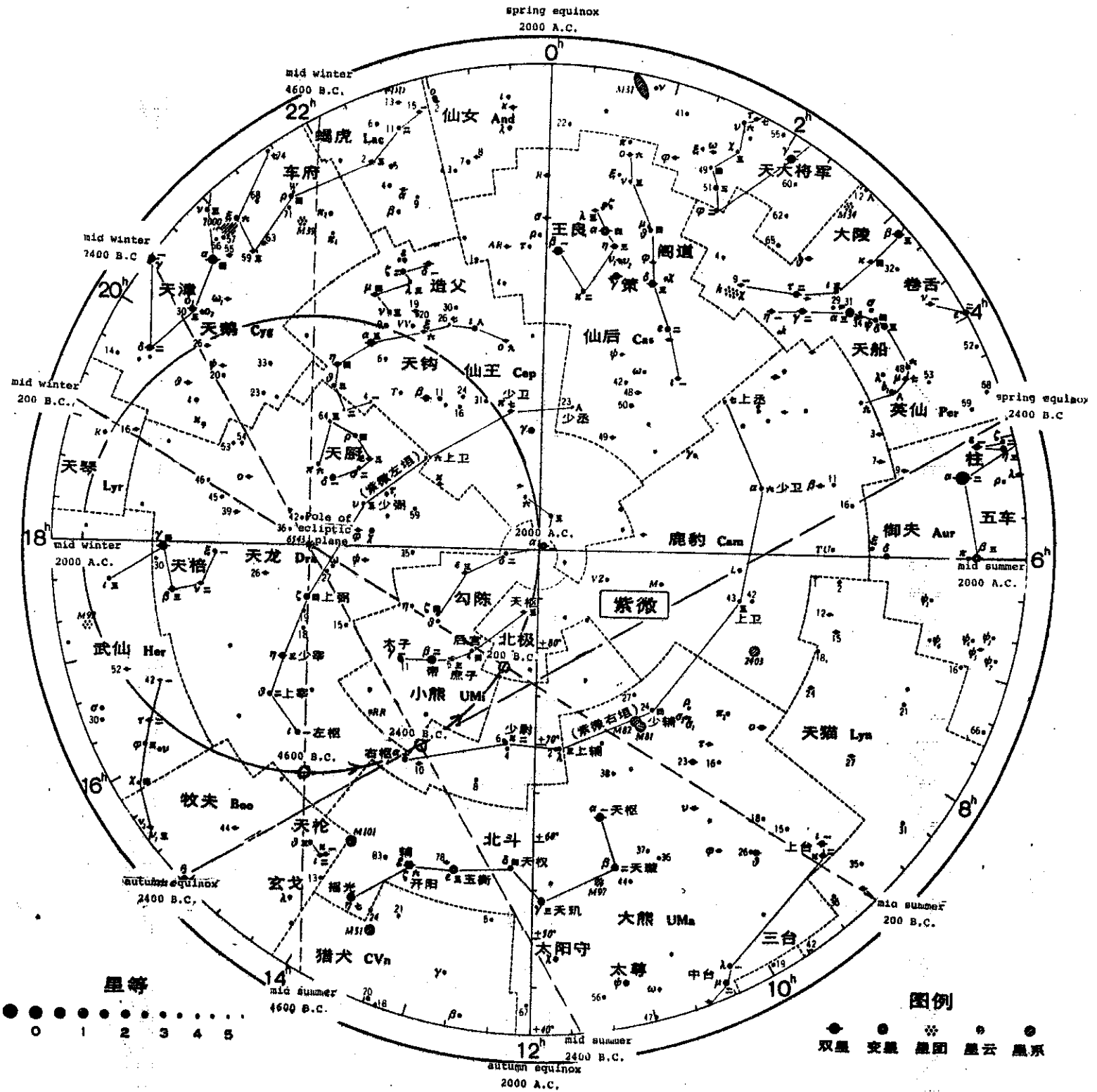
Yüan means encircled by a wall.



Table 3. Lunar Mansions (Hsiu)

Nr.	Chinese symbol	Chinese pronunciation	English meaning	Determinative star	Map nr.	Cardinal section of the sky. Mythological Animal
1	角	chio; kio	horn	$\alpha$ Vir	12	East Blue Dragon Ts'ang Lung (Ch'ing Lung) Extension 74°
2	亢	khang	neck	$\kappa$ Vir	12	
3	氐	ti; dsi	root; paw	$\alpha_2$ Lib	12	
4	房	fang	room; breast	$\pi$ Sco	20	
5	心	shin; hsing	heart	$\sigma$ Sco	20	
6	尾	wei; vi	tail	$\mu_1$ Sco	20	
7	箕	chi; kji	winnow basket	$\gamma$ Sag	21	
8	斗	nan tow	south dipper, measure	$\phi$ Sag	21	North Black Turtle Ling Kuei Extension 98°
9	牛	chhien niu	ox	$\beta$ Cap	14	
10	女	nū; niu	woman	$\epsilon$ Aqr	14	
11	虚	hsū; hui	emptiness; darkness	$\beta$ Aqr	15	
12	危	wei; gui	dangerous stone	$\alpha$ Aqr	15	
13	室	ying shih	encampment; house	$\alpha$ Peg	15	
14	壁	pi; peih	wall	$\gamma$ Peg	8	
15	奎	khuei; kwei	hind leg	$\eta$ And	2	West White Tiger Pai Hu Extension 78°
16	娄	low; lou	carve of a reaper	$\beta$ Ari	8	
17	胃	wei; chou	stomach	$41$ Ari	3	
18	昂	mao; mau	abundance; plenty, autumn	$\eta$ Tau	3	
19	毕	pi; peih	finish; net	$\epsilon$ Tau	9	
20	觜	tsui; tsok	beak; turtle	$\lambda$ 'Ori	9	
21	参	shen; tsan	ax; warrior	$\zeta$ Ori	9	
22	井	ching; jing	well	$\mu$ Gem	10	South Red Bird (Quail) Chu Chhiao (Chu Ch ũeh) Extension 110°
23	鬼	yū kuei	ghost vehicle	$\theta$ Cnc	10	
24	柳	liu	willow	$\delta$ Hya	10	
25	星	chhi hsing	seven stars	$\alpha$ Hya	11	
26	张	chang	bow; net	$\mu$ Hya	11	
27	翼	yi	wings	$\alpha$ Crt	11	
28	轸	chen	carriage	$\gamma$ Crv	12	

# 星图





## II. POSTSCRIPT ON THE HISTORY OF CHINESE ASTRONOMY

by J. Kistemaker

The astronomical literature in China is large but it misses chief landmarks. All the information was given as a part of historical records of the many dynasties, in chapters on calendars or almanacs. Astronomy was not of general use to the people but a privilege of the court. Therefore there was never an extensive literature. People who tried to work in astronomy were probably suspect.

The eldest roots go back to the legendary Sons of Heaven, Kings of Middle China, Yao, Shun and Yü the Great (2300 BC). The latter was the founder of the Hsia-dynasty. The positions of the determinative stars of the Hsiu (lunar mansions) fit best with the position of the equator in the 3rd millenium BC. They probably originate from that time. Another indication for this are the names of the stars along the trajectory which the pole of the earth followed during the last 6000 years. We can follow this trajectory on map nr. 0.

<i>(<math>\gamma</math> Dra)</i> is the Left Pivot ( <i>Zuo Shu</i> ),	<i>pole star 5000 BC</i>
<i>(<math>\alpha</math> Dra)</i> is the Right Pivot ( <i>You Shu</i> ),	<i>" " 2500 BC</i>
<i>(<math>\eta, \beta, 5, 4</math> UMi)</i> are the Royal family,	<i>" " in the Han-period</i>
<i>(4339 Cam)</i> is the Celestial Pivot ( <i>Tien Shu</i> ),	<i>" " 1000 AC</i>

All these stars are part of the Purple Court (*Tsu-wei Yüan*), complete with walls, dignitaries and the Pavilion Road (*Ge Dao*) visible on the maps nr. 1, 2 and 3.

From the Shang-dynasty (1500 to 1027 BC) many thousands of oracle bones were preserved, carrying the names of Hsiu constellations. They proof the existence of astronomical knowledge. Especially if the full moon appeared in the equinoxial Hsiu Hsin (*Antares,  $\alpha$  Sco*) and Pi (*Alderaban,  $\alpha$  Tau*) it was time for the refreshment of the fires.

From the early Chou (Tsow) dynasty (1027 to 771 BC) already much is known. The capital was Ch'angan on the river Wei (35° N.Latitude). It was the time of the legendary Luminous Hall which we find back as the celestial Ming Tang ( $\tau$ ,  $\upsilon$ , 87,  $\phi$  Leo) next to Tai-wei Yüan (Privy Council) in Virgo (Map nr.11). In the Ming Tang the King issued the holy calendar for the coming year in the middle of February, at Chinese New Year. In Yi Chi-tong's maps the full moon appears then in the Ming Tang, which is a direct proof of this legend. There are a few written documents from this period.

- a) *Shu Ching* (historical classic) of the 8th century BC telling about the commission of the legendary emperor Yao-tien (Hsia dynasty) to the astronomers Hsi and Ho (page 28).
- b) *Shih Ching* (book of odes) from 8th or 9th century BC, with folksongs containing the names of 8 Hsiu (lunar mansions).

During the later Chou (Tsow) dynasties (771 to 221 BC) many records were made which got lost, partially because of the turbulent years during the emperor Huang Ti (Ch'in) (221 to 206 BC). Then a revolution destroyed most of the imperial archives. Short after Huang Ti's death they were reproduced from memory by prominent men who had survived. Such documents are probably

- a) *Tso Chuan* (654 BC) which describes the use of the gnomon for the fixation of mid winter,
- b) *Hsiao Tai Li Chi* with observations and calendars from 500 to 200 BC,
- c) *Hsia Hsiao Chêng*, a farmer's calendar from 500 to 400 BC, and several more.

The period of the Han dynasty (206 BC to 220 AC) is rich in many manifestations. We mention

- a) *Hsing Ching*, an extensive star catalog made by three astronomers: Shih Shen, Kan Tê and Wu Hsien, based on instrumental observations in the time of Mêng Kho (Mencius, 4th century BC),



- b) *Shih Chi*, a historical record from 90 BC by the famous Ssuma Chhien giving a total review about stars, constellations and palaces of the sky.

The Chin period (265-419 AC) has

- a) *An Thien Lun* by Yü Hsi, about the discovery of the precession of the equinoxes,
- b) a first star map made by Chhen Cho based on the *Hsing Ching* catalog.

In the T'ang dynasty (618-960 AC)

- a) *Pu Thien Ko*, the song of the march of heavens by Wang Hsi Ming (600 AC) with a good description of many constellations,
- b) *Khai Yuan Chan Ching*, a compilation of Chou and Han star catalogs,
- c) *Ching Thang Shu*, which contains observations made by an astronomical expedition to observe the Southern hemisphere to 20 degrees distance from the celestial Southpole (map 22),
- d) the *Tun Huang* manuscript of 940 AC with star maps of the celestial Purple Palace (Tsu-wei Yüan) and the Great Dipper (Pei Tou) plus the Hsiu: Pi, Tsui and Shen, and the Hsiu: Ching and Kuei.

The Sung dynasty (960 - 1126 AC) produced

*Hsin I Hsiang Fa Yao* (1090 AC) with a description of an astronomical clock,

The following Chin dynasty (1115-1234 AC) is characterized by ..... , Instructions for a future emperor, dating from 1193 and engraved in stone in the Wên Miao temple near Soochow, Kiangsu\*).

Then comes the Yüan (Mongol) period (1280 to 1368 AC) during which Marco Polo stayed in China (1271 to 1295 AC). See also our remarks on page 8 about the *Zij Ulugh Beg*.

\* ) Translated by W.C. Rufus and Hsing-chih Tien. Published in 1945 at the Michigan Univ. Press of Ann Arbor.

- a) *Shou Shi Li* calendar (1281 AC),
- b) *Wēn Hsien Thung Khao* (1319 AC) by Ma Tuan-lin with lists of comets, meteors and novae.

The Ming dynasty (1368 to 1644 AC) is a period of stand still. But at the end of the 16th century the Jesuit missionaries brought new activity in astronomy. From that time dates

*Ku Chin Lü Li Khao* (investigation of the Chinese calendars) by Hsing Yün-lu (1600 AC), an excellent source for Chinese calendar questions. About the same time (1590-1600 AC) the frequently quoted Jesuit missionary Ricci described "the absurdities" of Chinese astronomy. Ricci still believed in the Ptolemaean-system. The Chinese were far ahead of him.

In 1631 A.C. the *Xiu Guan-gi* Catalog appeared, edited by Johan Adam Schall von Bell.

After this one should follow Yi Chi-tong's postscript.

Much of this information was derived from *Science and Civilisation* by J. Needham, and later by C.A. Rolan, published between 1950 and 1970.



LITERATURE USED IN THE PREPARATION OF THIS WORK

- 1) Chinese-Western Star Maps by Yi Chi-tong, publication of Ancient Astronomical Observatory of the Academia Sinica, Beijing 1979-83.
- 2) *Lingtai Vixian Zhi* catalog by F. Verbiest et al., Annals of Qin Tian Jan, Peking 1672-74.
- 3) *Vixian Kaocheng* catalog by I. Kögler et al., Annals of Qin Tian Jan, 1744-57.
- 4) *Vixian Kaocheng Xuibian* catalog, Publication of Qin Tian Jan, 1844.
- 5) General Catalog Star Map by B. Boss, 1936.
- 6) Atlas Coeli Skalnaté Pleso by A. Becvar, ...?
- 7) Atlas of Heavens II by A. Becvar, ...?
- 8) *Prodomus Astronomiae* by Jan Hevelius (1690), Tasjkent edition, edited by V.P. Shcheglov, Uzbek Akad. NAUK 1978, with information about Ulugh Beg.
- 9) *Star Names, Lore and Meaning*, by Richard H. Allen, Dover Publications, New York 1963 (based on same by G.E. Stechert 1899).
- 10) *Science and Civilisation in China*, by Joseph Needham. See Colin A. Ronan, volume 2, Cambridge University Press 1970.
- 11) *Les origines de l'astronomie chinoise*, par Léopold de Saussure, Librairie Orientale et Américaine, Editeurs Maison-neuve Frs., Paris 1925.
- 12) *The Soochow Astronomical Chart*, by W. Carl Rufus and Hsing-chih Tien, Ann Arbor, University of Michigan Press 1945.

CHINESE - WESTERN STAR MAPS

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by

Yi Chi-tong

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Ancient Astronomical Observatory

of

Academia Sinica

Beijing

People's Republic of China

Explanations organized and supervised

by

J. Kistemaker

Teyler Professor in Physics

at the Leyden University



In the *Shu Ching* (8th century B.C.) one can read

(Yao) commanded Hsi and Ho, in reverent accordance with the august heaven, to compute and delineate the sun, moon and stars and the celestial markers and so to deliver respectfully the seasons to be observed by the people.

He ordered Hsi to reside among the Yü barbarians at Yang-Ku and to receive as a guest the rising sun, to regulate the labours of the east (spring).

He further ordered Hsi to go and live at Nan-Chiao to regulate the works of the south and pay respectful attention to the (summer) solstice.

He ordered Ho to reside in the west at Mei-Ku and to bid farewell to the setting sun to regulate the western (autumnal) accomplishment.

He further ordered Ho to go and live to the north at Yu-Tu to supervise the works of the north.

Hsi-Ho is a mythological being, sometimes the "mother", sometimes the chariot driver of the sun.

The day of medium length and the star Niao adjust the middle spring...

The day of greatest length and the star Heo fix the middle of summer...

The night of medium length and the star Hsu adjust the middle of autumn...

The night of greatest length and the star Mao fix the middle of winter...

Mao corresponds with Pleiades

Hsu " "  $\beta$  Aqr

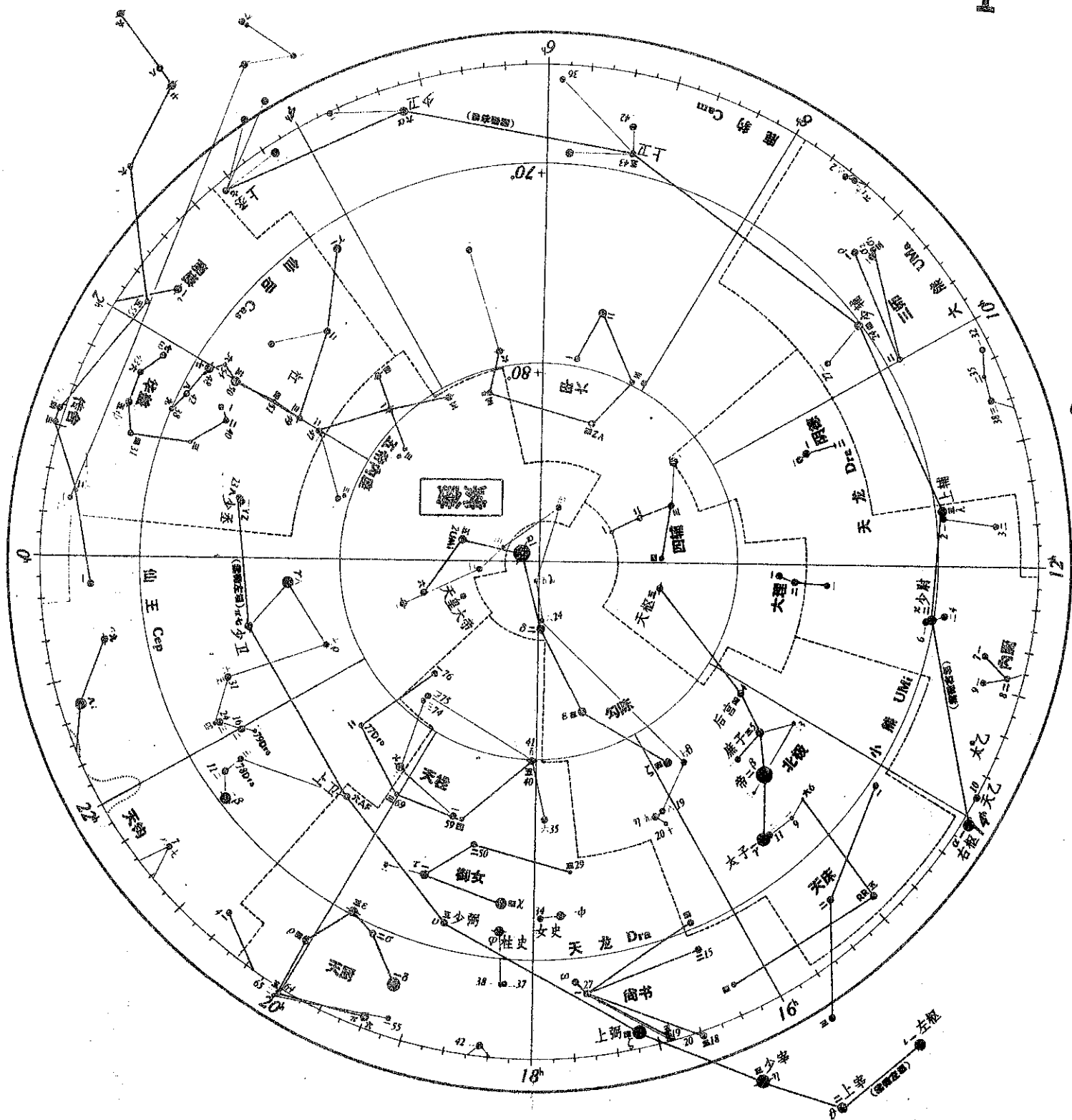
Heo " "  $\alpha$  Sco

Niao " "  $\alpha$  Leo

2400 B.C. Mao was close to the meridian at midwinter sunset hour.

### Legend

- Magnitude
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- 0
- Twin
- Variable
- Nova
- ⊕ Cluster
- ● Nebula
- Constellation boundary line
- Ecliptic
- ~ Milky Way
- ⊙ 二十八宿 Hsiu, Lunar Mansion





URSA MINOR (UMi), the lesser bear

$\alpha$ (UMi) (Polaris)	天皇大帝	pih keih ta shin ta ti tien hwang }	great imperial ruler of heaven big star grand emperor of august heaven (star near $\alpha$ (UMi))
$\beta$ "	帝	ti	emperor, King
$\gamma$ "	太子	tai tsze } tzu	crown prince
5	庶子	shu zi } tzu	concubine's son
4	后官	hou gong } how kung	empress; harem
$\gamma, \beta, 5, 4, 3$ (UMi)	北极	bei ji	north pole area
$\zeta, \epsilon, \delta, \alpha$ "	勾陈	kau chin } gou chen	line of guards
6, RR plus 4 more stars	天床	tien chuang	celestial bench

CEPHEUS (Cep), king of Ethiopia

$\pi$ (Cep)	少卫	shao wei	lower guard
$\delta, \zeta, \lambda, \mu, \nu$	造父	Tsao Foo } Zao Fu	royal charioteer (536 B.C.) (map 2)
star near $\alpha$ (UMi)	天皇大帝	tien huang dai di	celestial emperor of august heaven
$\sigma, \iota, \alpha, \eta, \theta$ (Cep)	天钩	tien gou	inner thrones for the five legendary emperors (map 7)
In Cepheus	紫微	Tsu-wei	Purple Court
	紫微左垣	tsu-wei zuó yúan	left wall of P.C.
	紫微右垣	tsu-wei you yúan	right wall of P.C.

CASSIOPEIA (Cas), the dark queen

$\lambda, \alpha, \eta, \kappa, \beta$ (Cas)	王良	Wang Liang Yüeh Lang	legendary and celebrated charioteer (map 2)
$\gamma$ (Cas)	象	tsih cè	(bamboo) whip ( " )
$\zeta$ "	附路	fu lu	by-path ( " )
$\sigma, \nu, \theta, \phi, \delta, \epsilon, \iota$	阁道	ko taou } ge dao	pavilion road ( " )
$\nu, \xi, \sigma, \pi$ (Cas)			porch, promenade ( " )
16, RU, 55 " } plus t (Cam)	传舍	chuan she	9 guest rooms (map 3)
$\omega, 43, \psi, 31, 40$	华盖	hwa kai	palanquin; state umbrella
38, 48, 50, 49	杠	gang	bar to close the gate
23, YZ (Cas)	少丞	shao chong	low coadjutor

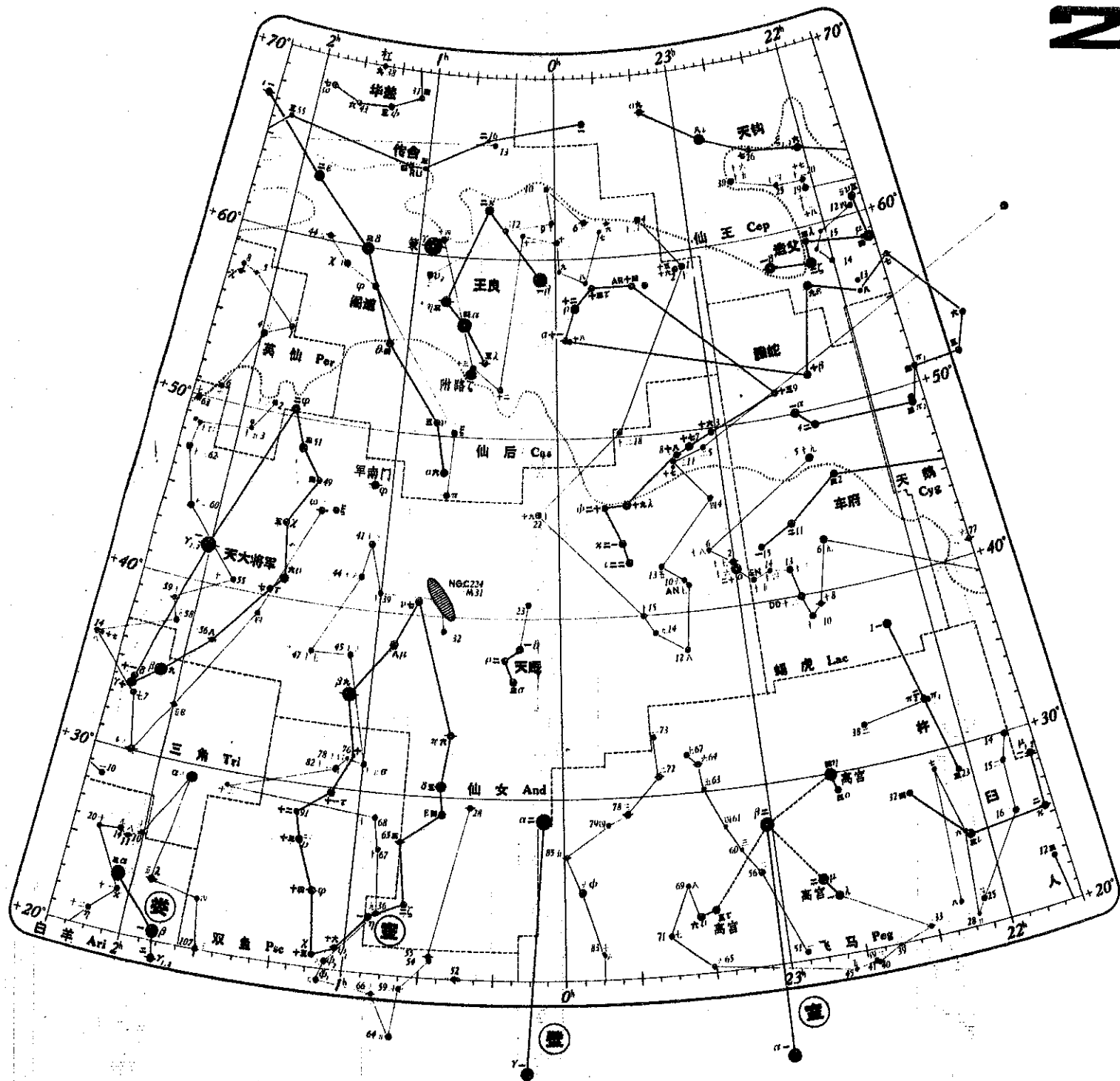
DRACO (Dra), the dragon

α (Dra) (Thuban)	右枢	yu choo you shu	right hand pivot	
ι "	左枢	tso choo zuo shu	left hand pivot	(map 6)
space between α and ι (Dra)		chung ho mun	central gate	
β, γ, ν, ξ (Dra) plus ι (Her)	天棓	tien kae, tian pei	flail	( " )
δ, σ, ε, ρ, 64, π	天厨	tien choo, tian chu	kitchen	
ζ (Dra)	上弼	shang pih	high minister	
η "	少宰	hea tsae, hao zai	low administrator	( " )
θ "	上宰	shang tsae	high administrator	( " )
ω, 27, 15, 18, 19	尚书	shang shu	5 historiographers	
10 (Dra)	天乙	tien yi	celestial unity	
? "	太乙	tai yi	august unity	
9, 8, 7 (Dra)	内厨	nei chu	interior kitchen	
λ "	上辅	shang poo shang fu	upper counsellor	
φ "	性史	shao pih; zhu shi	lower minister; chief censor	
ψ "	女史	niu she	palace governess; literary lady preceptress of the court ladies	
υ "	少弼	shao pih	low dignitarian	
χ, τ, 50, 29	御女	yu nu	4 court ladies	
40, 59, 69, 77, 76	天柱	tien zhu	5 consultants	
AF (Dra)	上卫	shang wei	high military officer	
κ "	少尉	shao wei	low military officer	
51, 48, 0, 39, 46	扶筐			(map 7)
	壁左星	wei zuo	left wall	

CAMELOPARDUS (Cam), the giraffe

α (Cam)	少卫	shao wei	low military officer	
τ "	上丞	shang cheng	high coadjutor	
43 "	上卫	shang wei	high military officer	
4339 "	天枢	tien shu	celestial pivot; polestar of the Han- period	
near 12 hours	四辅	sze fu	4 counsellors	
near 12 hours	大理	da li	mighty judge	
VZ near 6 hours	六甲	hwa kea	state umbrella	
	紫微	tsu wei, zi wei	purple court	
TU, 12, 14, 26, 7 (Cam) + ε, δ, 9 (Aur)	八谷	pa kuh	8 cereals	(map 3,4)
	壁右星	you wei	right wall	

2





PISCES (Psc), the fishes

α, υ, ζ, δ, ε (Psc)	外屏	wai ping	outer screen (roll)	(map 8)
β, γ, θ, ι, ω "	霹雳	peih leih	thunder	(map 15)
λ, 21, 12, κ "	云雨	yun yu	cloud and rain	( " )
45, 32, "	土公	Tu Gong	God of the Earth	(map 8)
ρ, η, π, ο, 104 "	右更	yew kang	right night watch with gong ( " )	
τ, υ, φ, χ, ψ plus β, υ, π, δ, η (And)	韃	kwei	sandal; hind leg; striding leg; pig	

ANDROMEDA (And), the chained woman

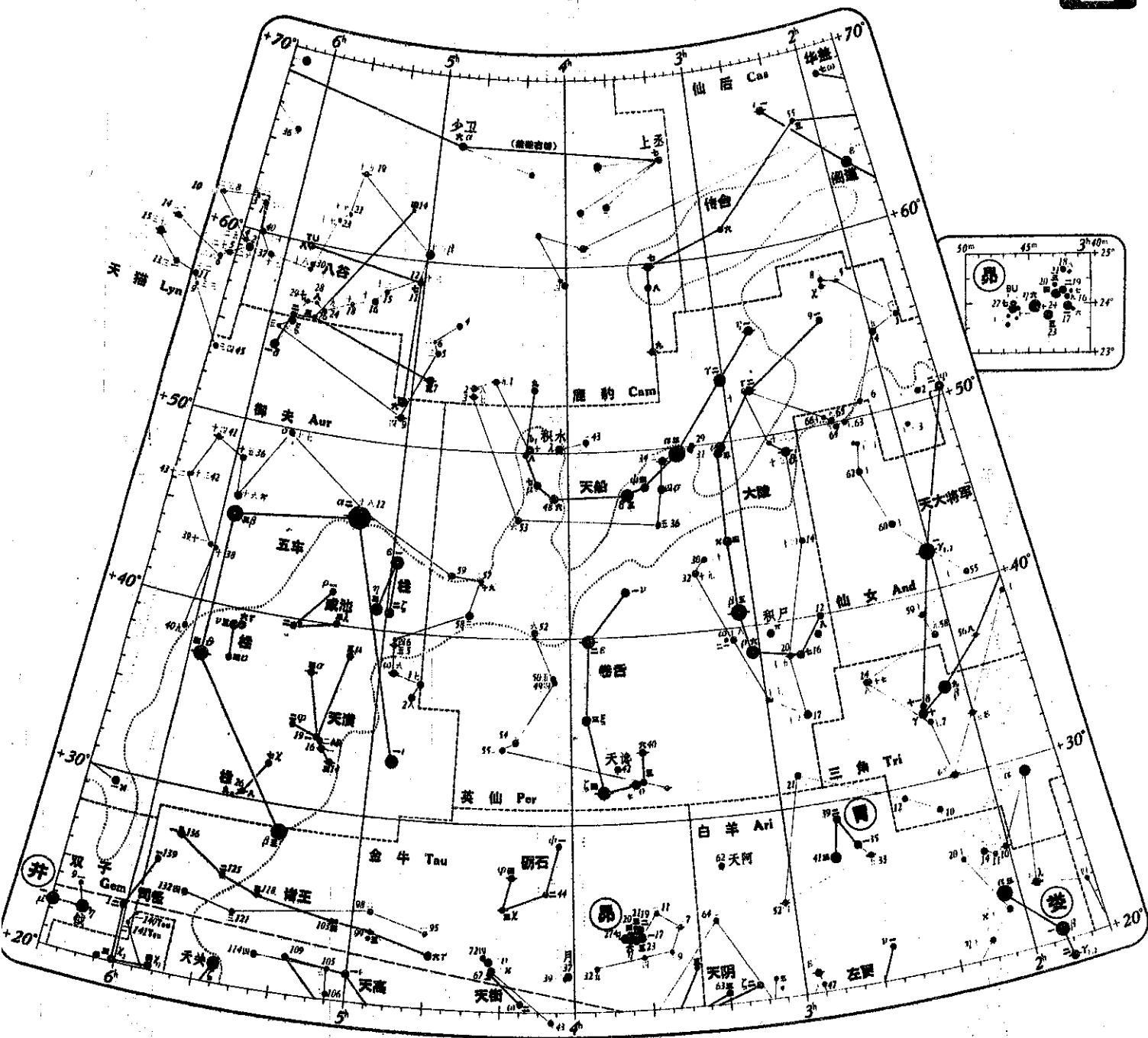
α (And) plus γ (Peg) } (Alpherat)	壁	peih; lek	wall; partition	
β, μ, υ, π, δ, ζ, η	韃	kwei kui	sandal; hind leg; striding leg; big pig	
γ, φ, χ, υ, τ (And)	天大将军	tien ta tseang, tian da jiang	heaven's great general	
θ, ρ, σ (And)	天廐	tien ke tian jiu	cattle shed	
φ "	军南门	keun nan mun	south gate of the camp of the chario- teers	

LACERTA (Lac), the lizard

15, 11, 2 (Lac) plus stars (Cyg)	车府	che fu	big yard for vehicles	
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PEGASUS (Peg), the winged horse

α, β (Peg) (α = Markab)	室	ying she shih	house	
γ (Peg) plus, α (And)	壁	peih, pi	wall; partition	
ε, θ (Peg) plus α (Aqr) }	危	wei, gui	steep; danger; dangerous cliff } imperial stone (map 15)	
ζ, ξ, σ, 55, 70	雷电	luy tien, lei dian	lightning	( " )
31, 36 (Peg)	土公吏	tu gong li	officer in charge of ceremonies for God of the Earth	(map 15)
12, 9, 1, 2 (Peg)	人	ren	human being	( " )
32, 1, κ plus μ (Cyg) }	臼	jiu	mortar	
23, π (Peg) plus 1 (Lac) }	杵	woo, chu	pestle	
λ, μ (Peg) η, ο " } υ, τ "	燕宫	li kung, li gong	group of palaces for relaxation summer houses	



AURIGA (Aur), the charioteer

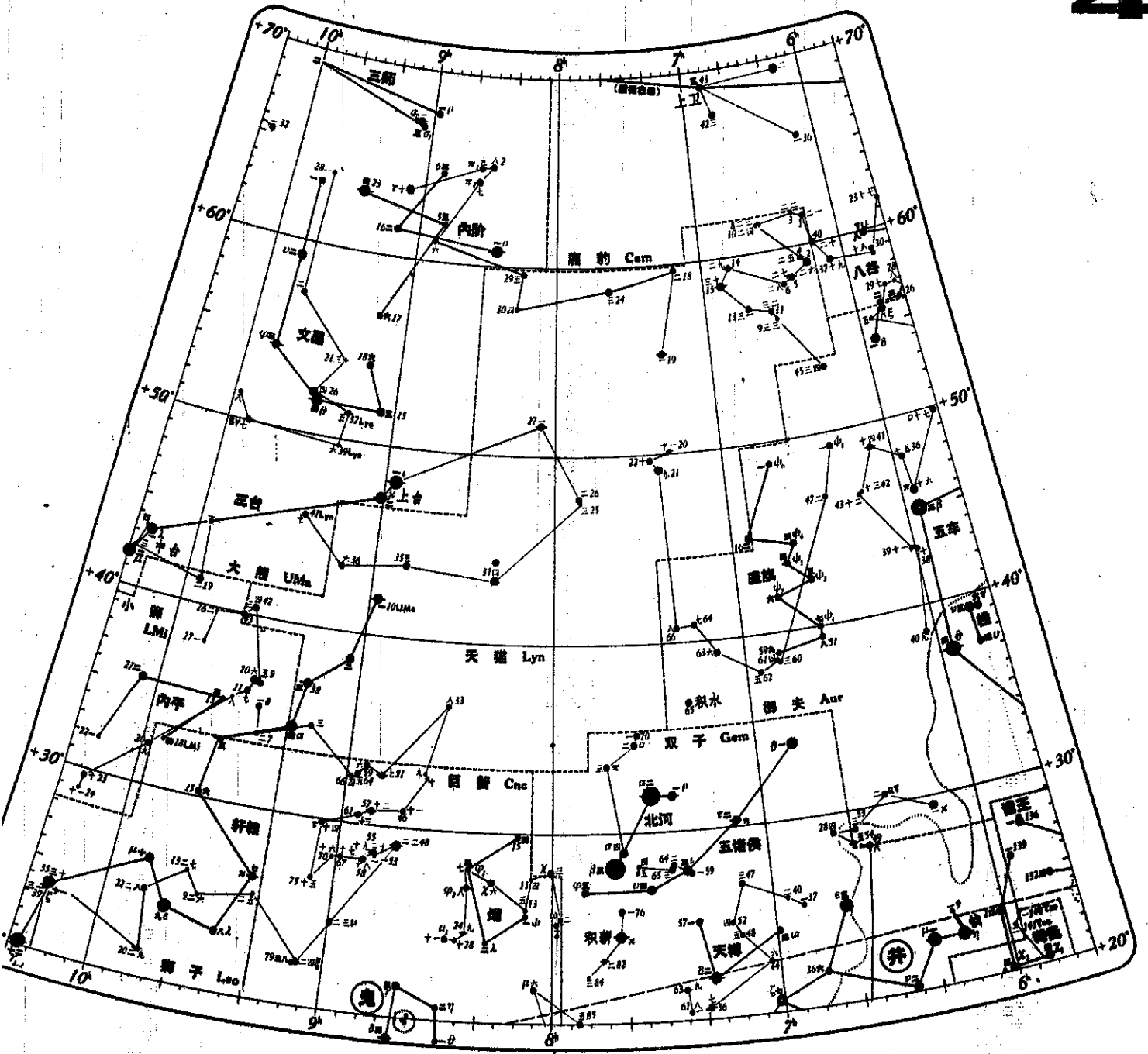
$\alpha, \beta, \theta, 1$ (Aur) } plus $\beta$ (Tau)	五车	woo chay, wu che	the 5 chariots of the 5 legendary emperors
$\delta, \epsilon, 9$ Aur plus $7, 26, 11, 14$ (Cam) }	八谷	pa kuh	8 cereals
$\eta, \epsilon, \zeta$ (Aur) $26, \chi$ " } $\nu, \upsilon$ " }	柱	3 zhu	3 poles to bind horses
$\rho, \lambda$ "	咸池	xian chi	watering place for the horses
$\mu, \sigma, \phi, 19, 14$ (Aur)	天潢	tien huang	deep pool; royal pond
$59, 51, \psi_n$ "	座旗	zuo qi	banner of the throne (map 4)
65 "	积水	ji shui	water reserve (store) ( " )

PERSEUS (Per), the champion

$\alpha, \gamma, \delta, \eta, \mu$ (Per)	天船	tien yuen } tian chuan }	celestial boat or enclosure
$\tau, \iota, \kappa, \beta, \rho, \lambda$ ( $\beta =$ Algol)	大陵	tseih she dai ling	piled up dead bodies large mausoleum, tomb
$\nu, \epsilon, \xi, \zeta, \theta, 40$	卷舌	keuen she } juan she }	tongue
42 (Per)	天谗	tian chan	celestial slander
$\lambda, \mu$ "	积水	tseih shwuy	stored water
$\tau, \theta$ " plus 65 (And)		ta ling	great mound
$\upsilon, \chi$ (Per)		fu shay	?
$\pi$ "	积尸	ji shi	pile of dead bodies

TRIANGULUM (Tri), the triangle

$\beta, \gamma, \delta$ (Tri) plus $\gamma, \sigma, \phi$ (And) }	天大将军	tien ta tseang, tian da jiang	big general
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GEMINI (Gem), the twins

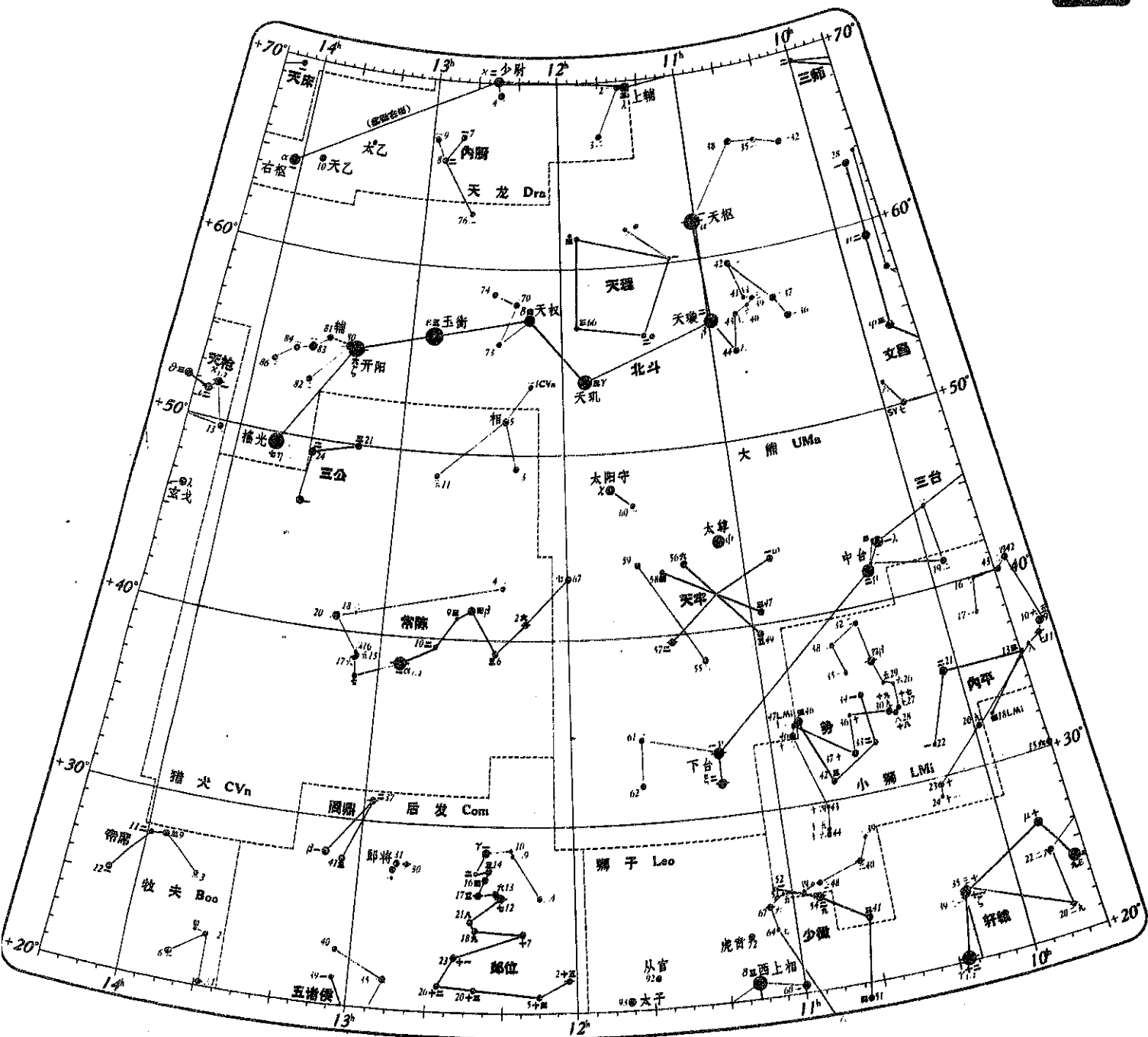
$\alpha, \beta$ (Gem) (Castor and Pollux) 北河		bei he pih ho ho choo	north river (Huang Ho) river land
$\omega, \delta, 57$ (Gem)	天樽	ta tsun tian zun	great wine-jar; cup (map 10)
$\epsilon, 36, \zeta, \lambda, \mu, \nu, \gamma, \xi$ (Gem)	井	tung tsing, jing	well ( " )
$\eta, 9$ (Gem)	鉞	yuē	battle-ax; dagger ( " )
$\theta, \tau, \iota, \upsilon, \phi,$ (Gem)	五诸侯	woo chow how wu zhu how	five legendary Lords; princes
$76, \kappa, 82, 84$ "	积薪	tseih tsing, ji xing	wood-pile; store of wood (fuel)

CANCER (Cnc), the crab

$\delta, \gamma, \eta, \theta$ (Cnc)	鬼	kuei, gui	ghost vehicle; cloud; (map 10) spectre
$\epsilon$ Praesepe (Cnc)	积尸	tseih she ke	exhalation of dead bodies; Po
$\psi, \lambda, \phi, 15$ "	熒	kwan wei	bright fire
$\xi$ "		tsu ke	flag

LYNX (Lyn), the lynx

$\alpha, 38$ (Lyn) plus 10 (UMA) }	轩镜	heen yuen, xuan yuan	shaft of imperial chariot
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URSA MAJOR (UMa), the greater bear

$\alpha$	(UMa) (Dubhe)	天枢	tien shu tien choo }	celestial pivot
		天理	K'uei Hsing } Kow Ching }	legendary assistant of Wen Ch'ang
$\beta$	"	天璇	tien hsuan	celestial temple (jade)
$\gamma$	"	天玑	tien chi	celestial armillary
			ki hsuan ki	armillary for time registration
$\delta$	"	天权	tien chhuan } tien kwam }	armillary authority; balance; pt. of rotation
$\epsilon$	"	玉衡	yu hêng (kang)	jade sighting tube; ts'ung
$\zeta$	" (Mizar)	开阳	khai yang	opener of heat (yang)
$\eta$	"	摇光	yao kuang	twinkling brilliance; revolving light
80	"	辅	gu; fu	associate
$\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta$		北斗	pei tou	northern dipper
66 (UMa) + 3 more stars		天理	tien li kwei; k'uei }	celestial judge; } assistant of centre of wisdom } Wen Ch'ang
star between $\epsilon$ and $\delta$ (UMa)			siang	minister of state
$\theta, \upsilon, \phi, 15, 18$ (UMa)		文昌	Wan Chang } Wen Ch'ang }	literary illuminate Prince of Glorious Wisdom (map 4)
$\iota, \kappa$ (UMa)		上台	shang tai	high dignitarian
$\lambda, \mu$ (UMa)		中台	chung tai	middle dignitarian
$\nu, \xi$		下台	hia tai	lower dignitarian
$\iota, \kappa, \lambda, \mu, \nu, \xi$		三台	san tai	three dignitarians
$\rho, \sigma$ , plus one		三师	san tsi	three instructors ( " )
$\tau, 23, \pi, 5, 16, 0, 17$		内阶	nuy kiai	inner steps ( " )
$\chi$ (UMa)		太阳守	tai yang show shaou we	sun guard sun governor
$\psi$ (UMa)		太尊	tai tsun } tien tsan }	extremely honorable and respected old man, first ancestor
$\omega, 47, 49, 56, 58, 57, 55$ (UMa)		天牢	tien laou	prison of heaven
24 (UMa)		少辅	shao fu	lower counsellor (map 1)

CANES VENATICI (CVn), the hunting dogs

21, 24 (CVn)		三公	san kung	3 honorary guardians of the heir
$\alpha, \beta, 6$ "		常陈	chang chen	seat
1, 3, 5, 11 (CVn)				

LEO MINOR (LMi), the lesser lion

13, 21, 22 (LMi)		内平	nuy ping	flat inner screen
46, 42, 33, 34 "		势	shi	authority





BOOTES (Boo), the herd

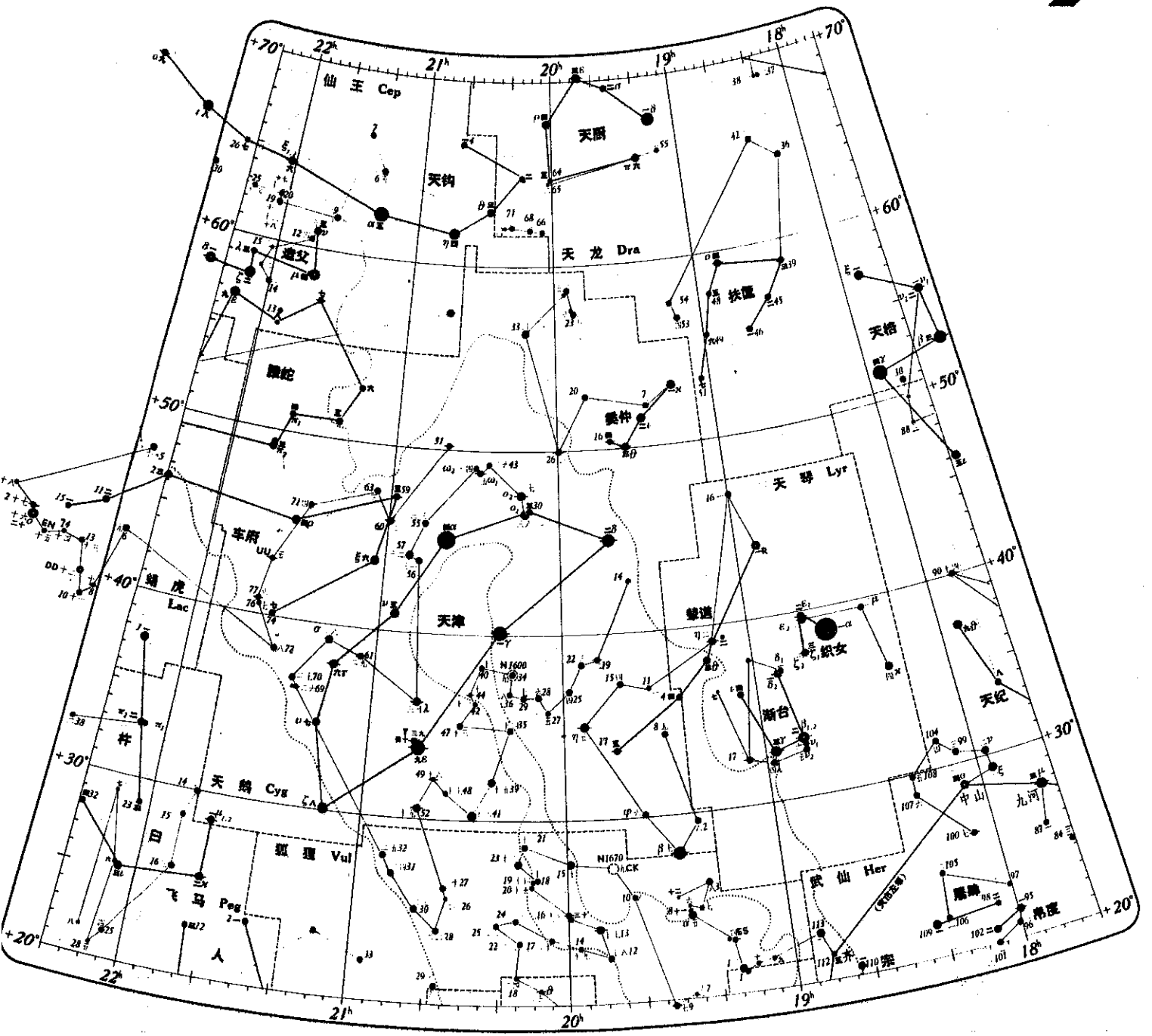
α	(Boo) (Arkturus)	大角	tae kio dai jiao	} great horn	(map 12)
14, 18, 20	"	亢池	kang che	} drought lake	( " )
η, τ, υ	"	右攝提	you she ti	} right regulator (leader)	( " )
ζ, ρ, π	"	左攝提	zuo she ti	} left regulator (leader)	( " )
β, γ, δ, μ	"	招搖	chaou yaou zhao yao	} waves; excitation; movement	
γ	"	招搖	heuen ko	} celestial spear	
δ, μ <sub>1</sub> , υ (Boo) plus, χ, φ, τ, 42 (Her)		七公	tseih kung qi gong	} 7 princes 7 old men	
ε, σ, ρ	(Boo)	權河	geng he kang ho	} handle of battle-ax	
θ, ι, κ	"	天槍	tseen tsang tian giang	} celestial battle-ax	
λ	"	玄戈	xuan gou	} lance	
12, 11, 9, 3	"				

HERCULES (Her), the sun god

α	(Her)	帝座	di zuo ti tso	} seat of the emperor (king)	(map 13)
β	"	河中	he zhong ho chung	} feudal state; also "in the river"	
γ	"	河間	he jian ho keen	} " " ; also "between the rivers"	(map 13)
κ	"	晉	jin	} " " ; ancestor star( " )	
δ	"	魏	wei	} " " ; ancestor star( " )	
λ	"	趙	zhao; chaou	} " " ; ancestor star( " )	
μ	"	九河	jiu he kew ho	} " " ; officer	
ο, ε, υ, 104, 107, 100		中山	zhong shan chung shan	} " " ; middle mountain	(map 7)
112	(Her)	齊	qi, qi	} " " ; middle mountain	( " )
θ, λ, ε, ζ	"	天紀	tien ke tien ji	} celestial record; place for registration of market business	
95, 102, 96, 101	"	帛度	bo du	} textile measure	(map 7)
98, 109, 105, 97	"	屠肆	tu si	} meat market	( " )
110, 111	"	宗	zong	} ancestor	( " )
ρ, 69, π	"	女床	nu chuang	} woman's bed; couch of the virgin	
42, τ, φ, χ (Her) plus υ <sub>1</sub> , μ <sub>1</sub> , δ (Boo)		七公	qi gong	} 7 old men; 7 princes or lords?	
ω, 49, 15, 29 (Her)		斗	dou	} bushel; measure	

CORONA BOREALIS (CrB), the northern crown

ρ, ι, ε, δ, γ, α, } (α=Gemma)	貫索	kwan soo guan su	} cord; chain
β, θ, π (CrB)			

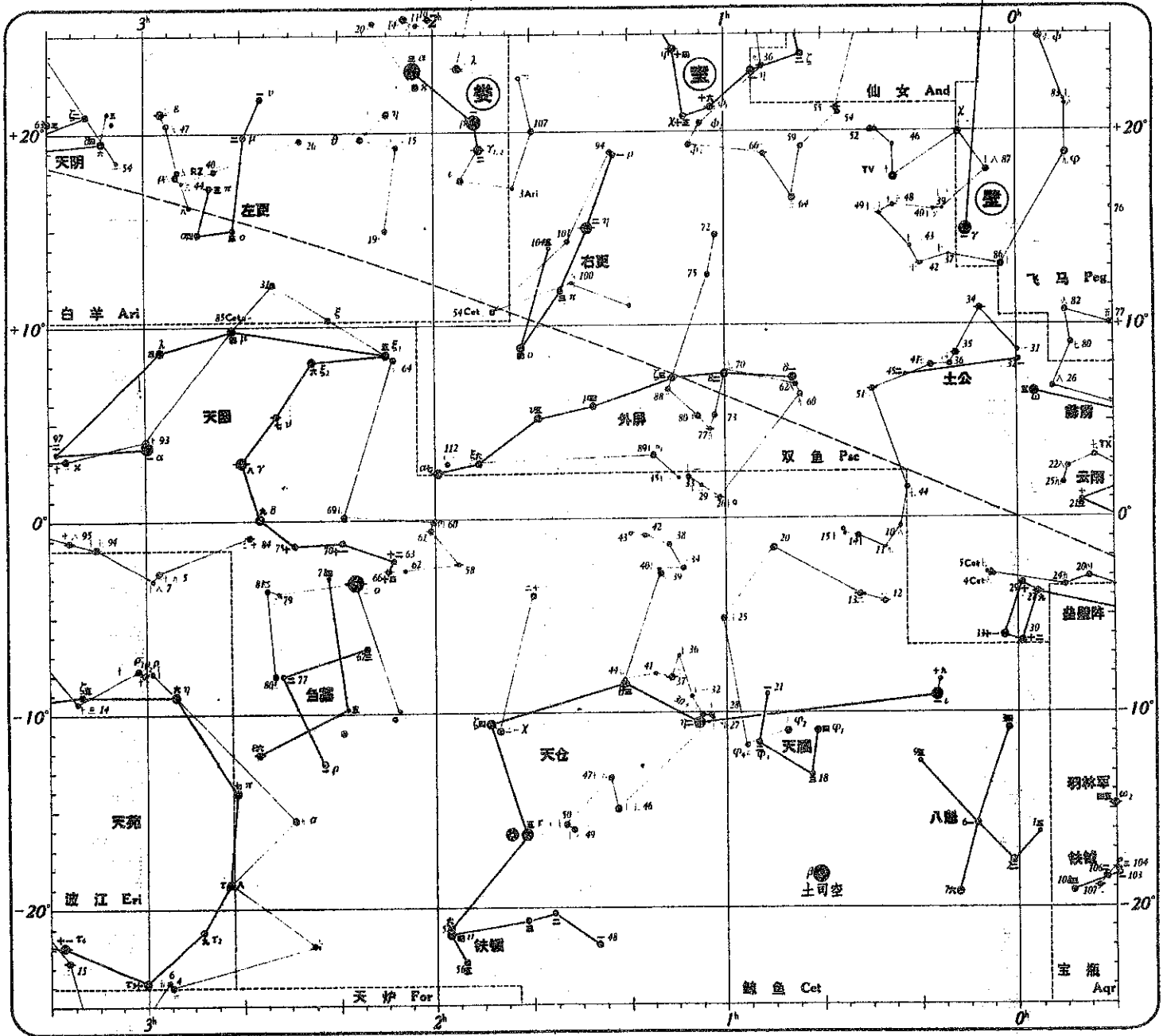


LYRA (Lyr), the lyre

$\alpha$ (Lyr) (Wega)	织女	zhi nū chih neu }	spinning damsel
$\alpha, \epsilon, \zeta$ (Lyr)			weaving sister with her two daughters
$\delta, \beta, \gamma, \iota, 17$ (Lyr)	渐台	tsan tae jian tai }	stairs descending to the river; terraces
R, $\eta, \theta$ (Lyr) plus } 4, 17 (Cyg)	辇道	nian dao	carriage road, exclusive for royalty

CYGNUS (Cyg), the swan

74, $\xi, 59, \rho$ (Cyg) plus } 2, 11, 15(Lac)	车府	che fu chay foo }	big yard for vehicles
$\alpha, \sigma, \delta, \gamma, \epsilon, \zeta, \nu$ plus } $\tau, \upsilon$ (Cyg) ( $\alpha$ =Deneb)	天津	tian jin	celestial ford; river crossing
16, $\theta, \iota, \kappa$ (Cyg)	奚仲	Gi Zhong Hsi Chung }	legendary chariot driver of the emperor
$\alpha, 4$ (Lac), $\pi_2, \pi_1$ (Cyg) plus $\epsilon$ (Cep), $\beta$ (Lac) plus $\sigma, \rho, \tau$ (Cas) plus 9(Lac) plus 3, 78, $\lambda, \psi, \kappa, \iota$ (And)	螭蛇	tang shay	flying serpent; flying dragon





ARIES (Ari), the ram

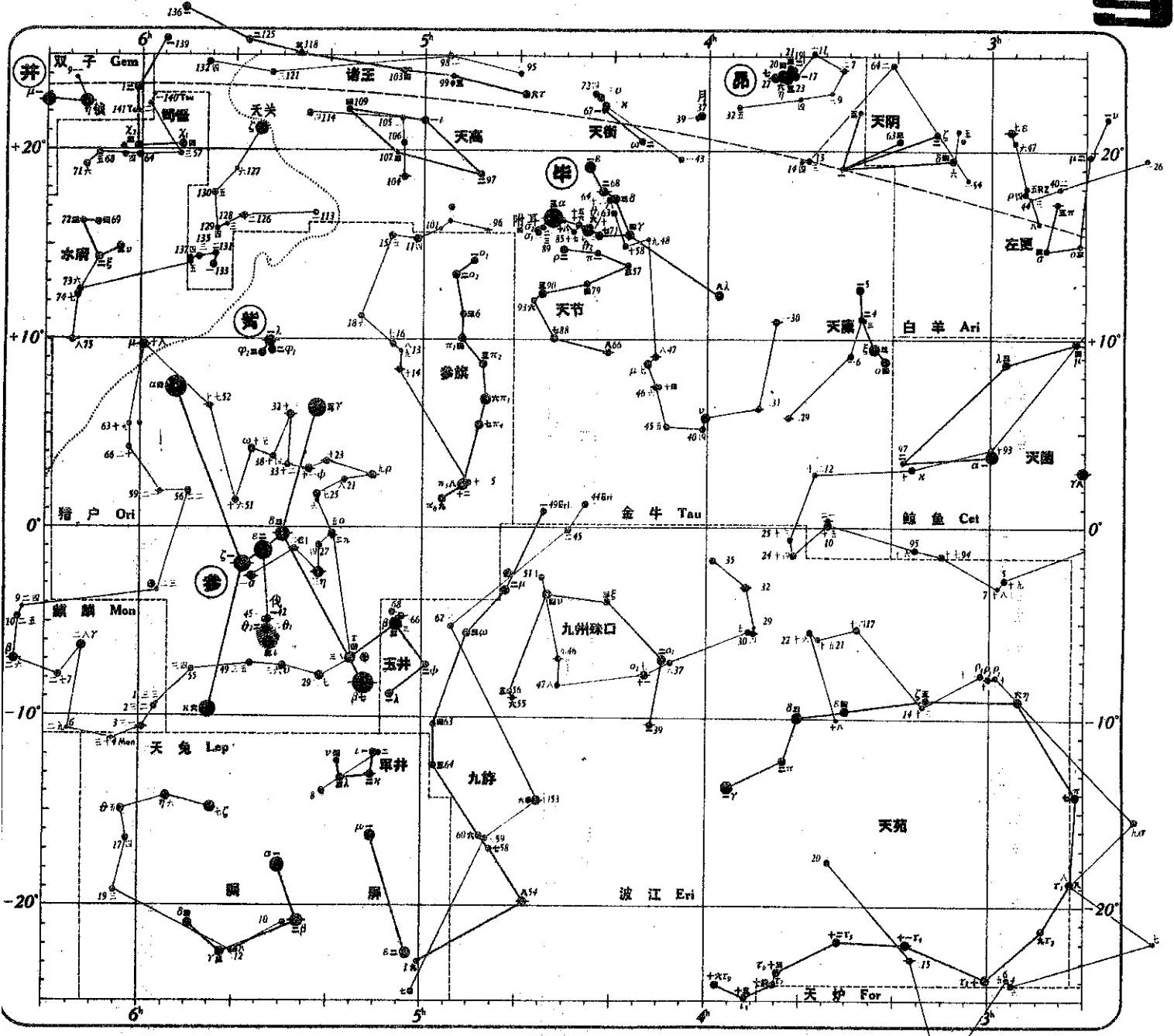
$\alpha, \beta, \gamma$ (Ari) ( $\alpha$ = Hamal)	𦉳	low, lou leu	lantern of night watch; carve or hook of a reaper
$\delta, \zeta, 63$ " } plus 2 stars (Tau)	天阴	tsin yin	celestial yin; autumn point (map 9)
$\pi, \sigma, \rho, \mu, \nu$ (Ari)	左更	zuo gang	left night watch with gong
41, 39, 35 " }	胃	wei chou	stomach; abdomen; belly (map 3)
62 " }		tien ai	celestial dike

PISCES (Psc), the fishes

$\alpha, \nu, \zeta, \delta, \epsilon$ (Psc)		wai ping	outer screen (roll)
$\beta, \gamma, \theta, \iota, \omega$ " }		peih leih	thunder (map 15)
$\lambda, 21, 12, \kappa$ " }		yun yu	cloud and rain
45, 32 " }		Tu Gong	God of the Earth
$\rho, \eta, \pi, \sigma, 104$ " }		yew kang	right night watch with gong
$\tau, \upsilon, \phi, \chi, \psi$ " } plus $\beta, \nu, \pi, \delta, \eta$ (And)		kwei	sandal; hind leg; striding leg; pig (map 2)

CETUS (Cet), the whale

$\alpha, \kappa, \lambda, \mu, \xi, \nu, \gamma, \delta$ (Cet)	天圆	tien kwan	celestial round granary
$\beta$ (Cet)	土司空	tu si kong } too sze kung }	master of constructions, earth works
$\epsilon, \rho, \sigma, 80$ (Cet)	鸟藩	tsow kaou	hay and straw
$\tau, \zeta, \theta, \eta, \iota$	天仓	tian cang } tian yuen }	barn
$\phi, \eta, 18, 21$ (Cet)	天潢	tien hwan	celestial sewer
56, $\upsilon, 48$ " }	铁钺	fu chih	ax and skewer
3, 6, 7, 2, 9 " }	八魁	ba kui	8 surveyors of constructions



ORION (Ori), the hunter

δ, ε, ζ (Ori)	參	tsan; sal; shen	the three stars side by side; warrior; military chief
α, γ, β, κ " (α = Betelgeuse)		shi shen	white tiger
42, θ, ι, υ "	伐	fa } jui }	middle-man; war-ax; sharp-edge
λ, φ <sub>1</sub> , φ <sub>2</sub> "	箕	tsee } tsuy he } tsok; keo } si ma tsien }	beak; pouting lips; birds bill turtle head of the tiger
ν, ξ, 72, 69 (Ori)	水府	shwuy foo	water depot; water mansion (map 10)
ο <sub>1</sub> , ο <sub>2</sub> , σ, π <sub>1</sub> to π <sub>6</sub>	參旗	tsan ke } tsen ki }	three flags
τ, 8 (Ori) plus β, ψ, λ (Eri) }	玉井	yu jing } yuh tsing }	jade well
χ <sub>1</sub> , χ <sub>2</sub> (Ori) plus 1 (Gem) plus 139 (Tau)	狗星	si kwai	animal tamer

TAURUS (Tau), the bull

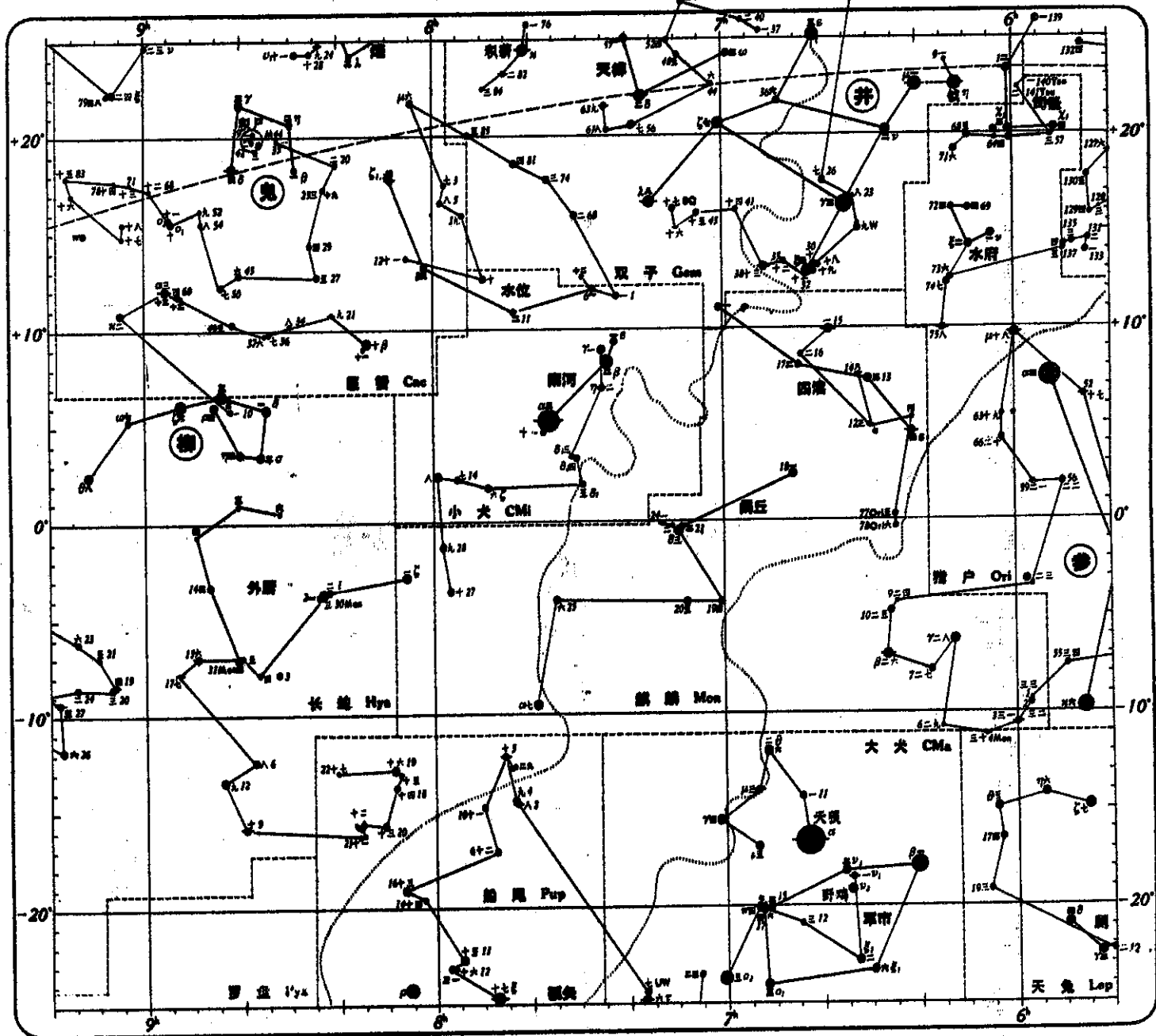
α, θ, 71, γ, δ plus (α = Alderaban)	畢	pi; pai; peih	finish; end; net to catch rabbits; hunter stars
68, ε, σ, λ (Tau)	天廡	tien lin	public green vegetable shop; vegetable granary
ο, ε, 4, 5 "	天廡	tien lin	attached ear
σ <sub>1</sub> , σ <sub>2</sub> "	附耳	fu er	attached ear
ρ, π, 57, 79, 90, 88, 66	天節	tien tsze	celestial festival
97, ι, 109, 107 (Tau)	天高	choo wang	many princes
ζ (Tau)	天关	tien kwan	gate (to heaven?)
τ, 99, 103, 136 (Tau)	诸王	Zhu Wang	legendary honest governor; head of the people (map 3)
υ, ω, 67 "	天街	tien keae	celestial street
φ, χ, 44, ψ "	砺石	li shi	coarse sandstone ( " )
η Pleiades "	昂	mao; mol; mau	plentiful; abundance 7 industrious sisters; mansion of the setting sun
37 "	月	yue	moon

LEPUS (Lep), the hare

α, β, γ, δ (Lep)	厠	tsih ce	toilet, in a shed
ν, λ, κ, ι "	軍井	jun jing kuen tsing	army well
ε, μ "	屏	ping	screen

ERIDANUS (Eri), the river Eridanus

α (Eri)	水臺	shwuy wei	water spring (map 16)
β, ψ, λ (Eri)	玉井	yuh tsing, yu jing	jade well
γ, δ, ε, η, τ <sub>n</sub> (Eri)	天苑	tien yuen, tian yuan	celestial garden
49, μ, ω, 63, 64, 60, 59, 54, 1	九旒	kew yew, jiu you	9 beautiful view points, vistas
ο, ε, ν, 56 (Eri)	九州殊口	jiu zhou zhu kou	9 outlets, waterfountains
υ <sub>n</sub> , γ, θ, κ, φ, χ	天園	tien yuan	celestial orchard (map 17)





CANIS MINOR (Cmi), the lesser dog

α, β, η (Cmi) (α = Procyon)	南河	nan ho nan he	south river (Jang tsekiang)
6, 11 plus 8, ζ (Cnc)	水位	shwuy wei	watery place

CANIS MAJOR (Cma), the greater dog

α (Cma) (Sirius)	天狼	tien lang	wolf of heaven
β, υ, 15, ο, ε (Cma)	罕市	kuen she, jun shi	soldiers market army market square
δ, η, ε, κ plus ο, ρ, π (Pup)	弧矢	hu shi, koo she	bow and arrow (map 18)
ο, π (Cma)	罕市	ya ki	wild cock
ζ, λ (Cma) plus δ, κ, θ (Col)	孙	sun	grandson; child ( " )

MONOCEROS (Mon), the unicorn

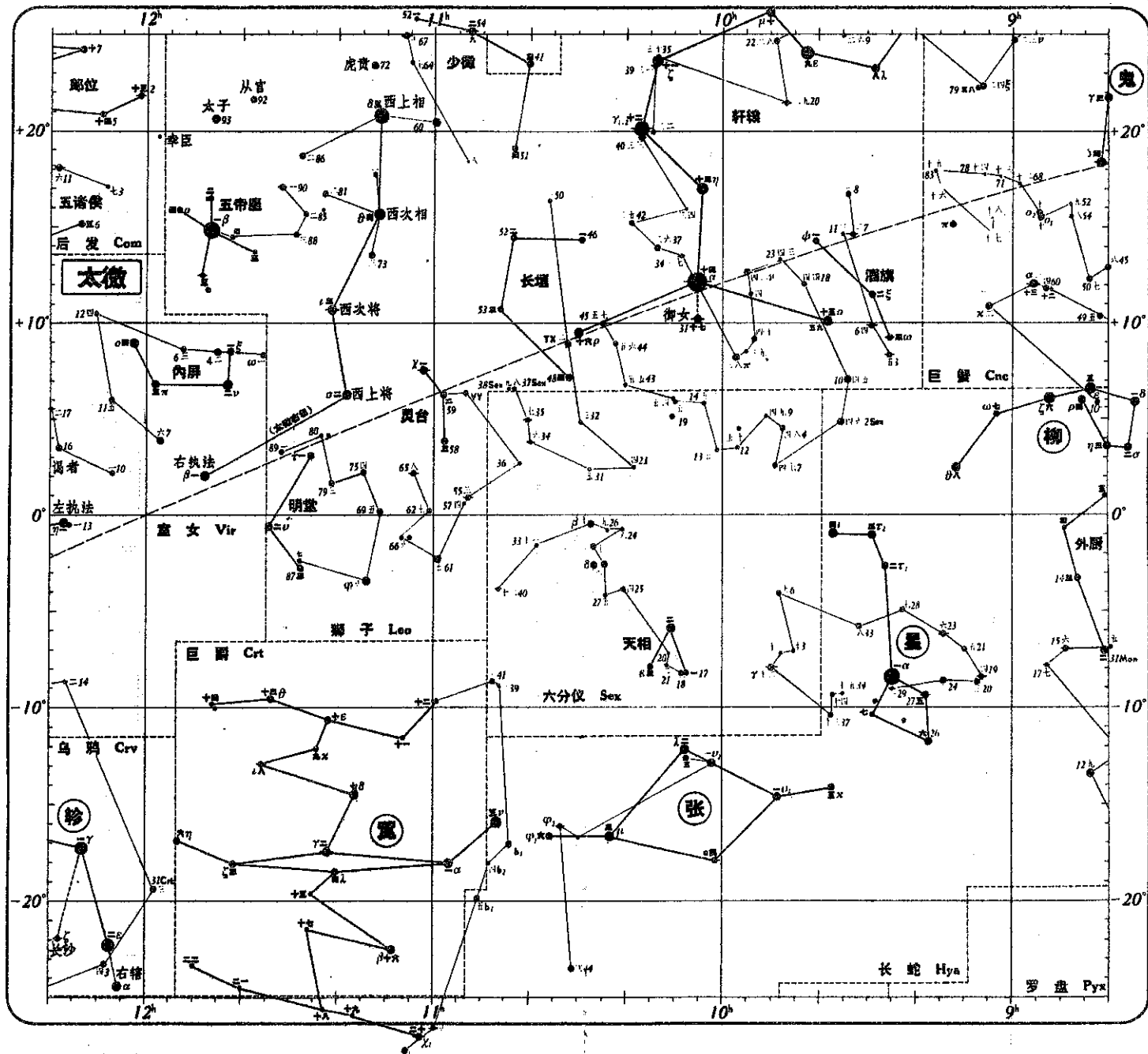
ε, 13, 17, 15 (Mon)	四渎	sze fūh, si du	4 great canals; ditches
α, δ, 18, 25, 19 "	闾丘	kwan kew, kwan kiu	digging on the hills; 4 plough furrows
10, β, 7, γ "		wae choo	outer kitchen

GEMINI (Gem), the twins

α, β (Gem) (Castor and Pollux)	北河	bei he pih ho ho choo	north river (Huang Ho) river land (map 4) ( " )
ω, δ, 57 (Gem)	天樽	ta tsun tian zun	great wine-jar; cup
ε, 36, ζ, λ, μ, υ, γ, ε (Gem)	井	tung tsing jing	well
η, 9 (Gem)	钺	yuē	battle-ax; dagger
θ, τ, ι, υ, φ (Gem)	五诸侯	woo chow how wu zhu how	five legendary Lords; princes ( " )
76, κ, 82, 84 "	积薪	tseih tsing ji xing	wood-pile store of wood (fuel) ( " )

CANCER (Cnc), the crab

δ, γ, η, θ (Cnc)	鬼	kuei gui	ghost vehicle; cloud; spectre
ε Praesepe (Cnc)	积尸	tseih she ke	exhalation of dead bodies; Po
ψ, λ, φ, 15 "	耀	kwan wei	bright fire (map 4)
ε "		tau ke	flag ( " )



LEO (Leo), the lion

α (Leo) (Regulus)	御女	yu nü niau	royal maid servant bird; quail
α, γ, ε, η, λ, ζ, χ, υ, ο, ρ (Leo)	軒轅	heen yuen	shaft of imperial chariot; water-chain pump?
β (Leo)	五帝座	wu di zuo	5 royal seats; with 12 other groups of officers and noble men around
δ "	西上相	shang seang shang xiang	high minister of state
ε "		ta tsze	crown prince
93 "	太子	tai zi	prince
θ "	西次相	ci xiang	adjunct minister of state
ι "	西次將	tsze tseang, ci jiang	subordinate general
π "		yu niu	honorable lady
σ "	西上將	shang jiang	higher general
χ "	灵台	ling tai	ancestor tablet, made in shape of a tower
ψ, ξ, ω (Leo) plus κ, ε (Cnc)	酒旗	tsew ke	wine flagon
72 (Leo)	虎贲	Hu Ben	legendary brave warrior with the heart of a tiger
τ, υ, 87, φ (Leo)	明堂	Ming Tang	luminescent bright Hall.
52, 54, 51 (Leo)	少微	sau wei	privy seal of secret action
92 "	从官	cong quan	footboy; page
46, 52, 53, 48 (Leo)	长垣	tsang yüan	long wall
	右垣	tai-wei you yüan	right wall of P.C.
In (Com)	太微	tai-wei	Privy Council

SEXTANS (Sex), the sextant

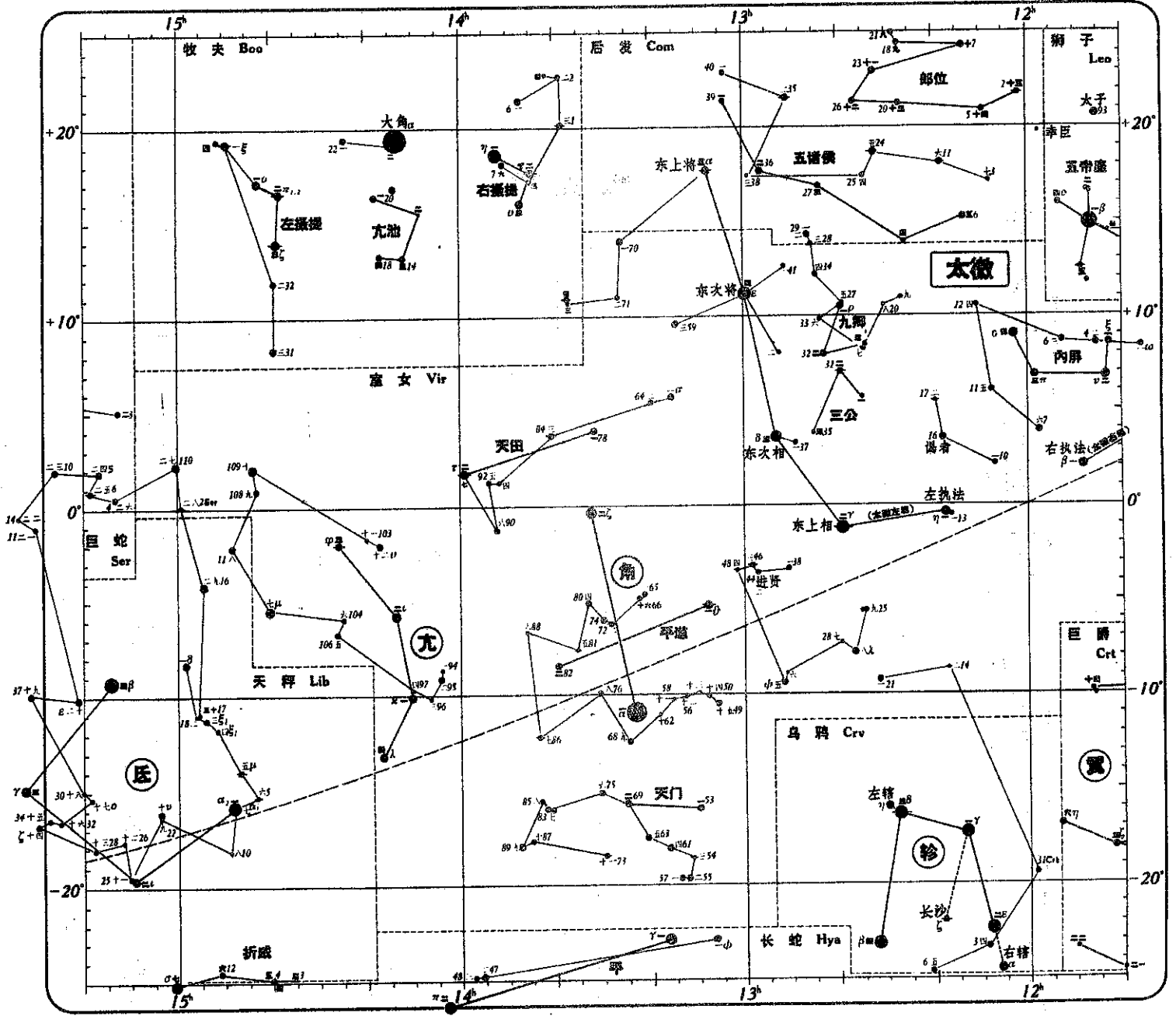
ε, α, 17 (Sex)	天相	tien siang	minister of state
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CRATER (Crt), the wine cup

many weak stars	翼	yih	wings
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HYDRA (Hya), the watersnake

δ, ε, ζ, ω, θ (Hya)	柳	liu } lieu }	willow branch; circular garland } beak of Bird
α, τ <sub>1</sub> , τ <sub>2</sub> (Hya) (α = Alphard)	星	sing; xing, chhi hsing }	star 7 stars } neck of Bird
κ, υ <sup>1</sup> , υ <sup>2</sup> , λ, υ, φ	张	chang; tjung; zhang	drawn bow, shooting at the sky dog; also called 'extended net'
β, ξ, ο (Hya)	青山	xing ku } tsing kew }	green hill (map 19)
γ, π "	平	ping	flat plain, to drive a carriage (map 12)
14 (Hya) ; 31, 30 (Mon)	外厨	wei zui	external kitchen for big parties



VIRGO (Vir), the virgin

α, ζ (Vir) (α = Spica)	角	kio jiao	horn
β "	右執法	yew chi fa you zhi fa	judge right-hand maintainer of the law
γ "	东上相	shang xiang	upper minister
φ, ι, κ, λ (Vir)	亢	kang	neck
69, 53 "	天门	tien mun, tian men	gate
82, θ "	平道	ping taou, ping dao	road (through gate?) plain way
ν, ξ, ο, π "	内屏	nuy ping, nei ping	inner screen
ρ "	九卿	kew heang	9 officers of state
σ, τ, 78 "	天田	tien teen	celestial fields
χ, ψ, 38, 46 "	进贤	tsin heen	herald, prominent messenger to the emperor
ε "	东次将	dong ci jiang	lower general
δ "	东次相	dong ci xiang	lower minister
η "	左執法	zuo ci fa	judge on the left side

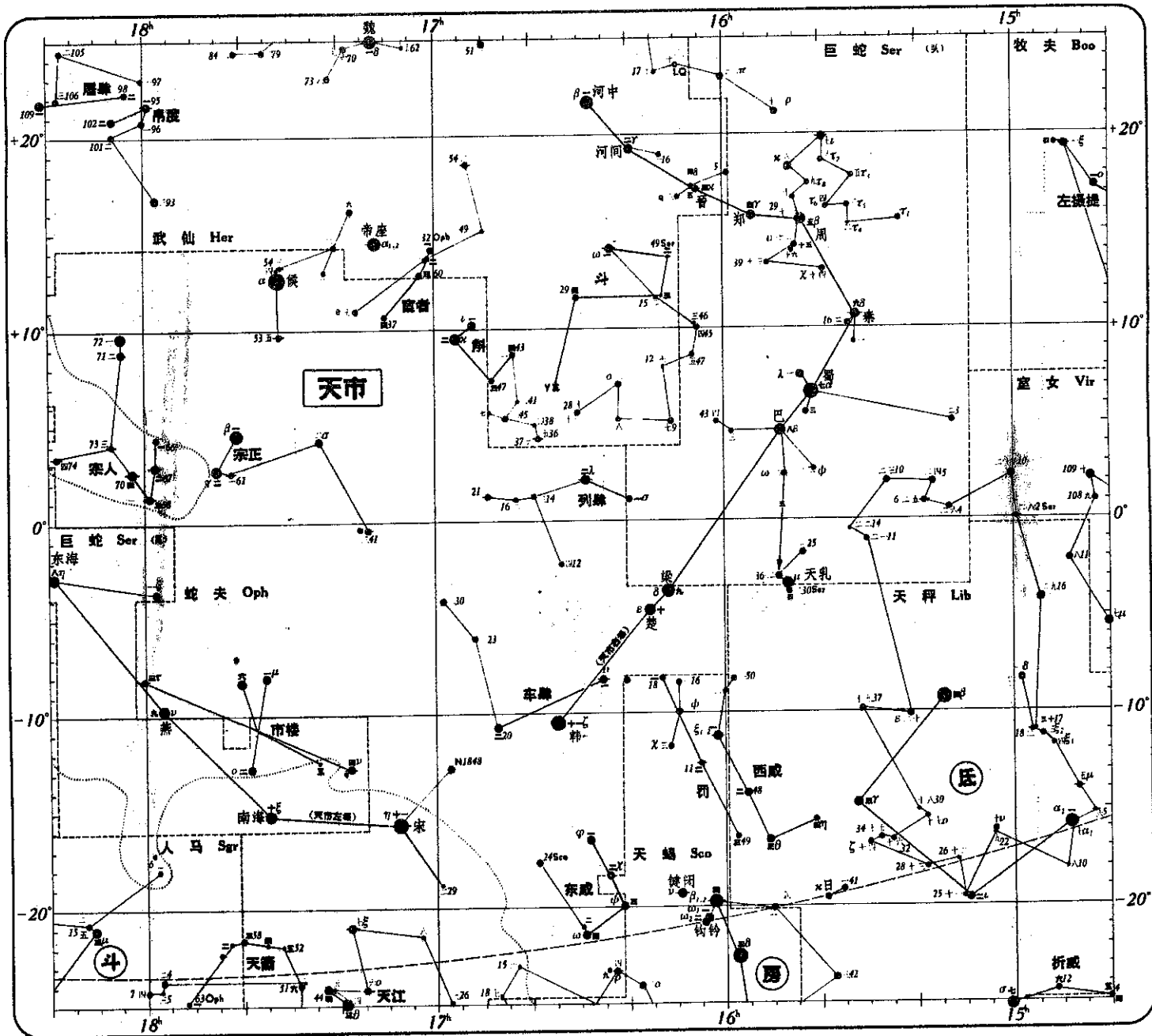
COMA BERENICE (Com), the hair of Ariadne

α (Com)	东上将	dong shang jiang shang tseang	upper general (east)
β, 37, 41 (Com)	鬲鼎	chow ting zhou ding	caldron of the Chow dynasty; ancient vessel (map 5)
31 "	郎将	lang jiang	general ( " )
26, 29 "	郎位	tsae ching	favorite vassal ( " )
39, 36, 27, 2, 6 (Com)	五诸侯	woo choo how	five officials, answering only to the emperor

CORVUS (Crv), the raven

α (Crv)	右辖	yew hea, you xia	right side linch-pin
η (Crv)	左辖	tso hea, zuo xia	leftside linch-pin
γ, ζ "		tchin, chen	cross-piece of a chariot
ζ "	长沙	zhang sha	sandbank; long stretch of sand
β, δ, γ, ε "	軫	chen	carriage





SERPENT (Ser), the serpent

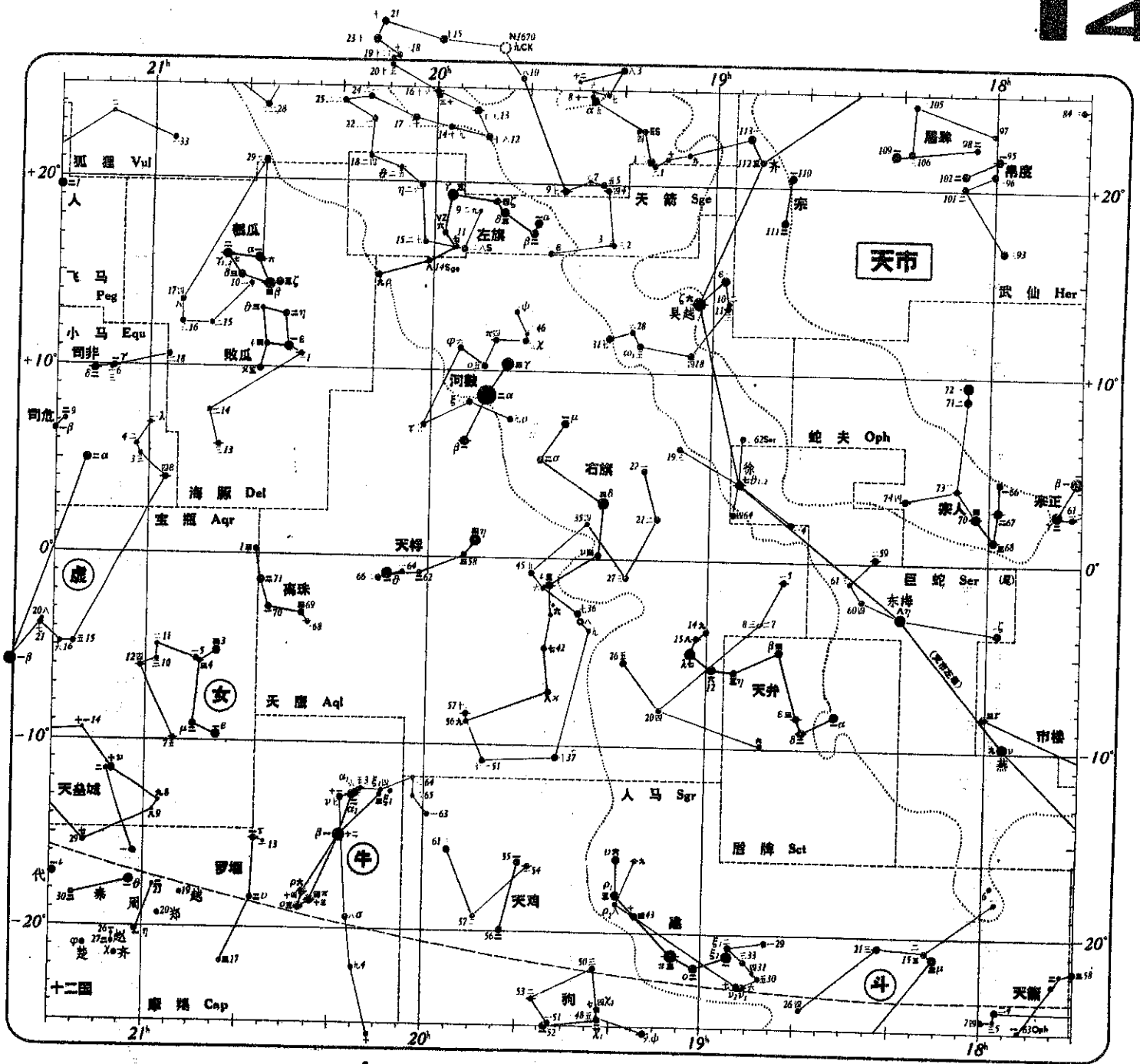
γ (Ser)	郑	zheng; ching	feudal state
β "	周	zhou; chow	" " ; imp. dynasty
δ "	秦	gin; tsin	" "
α, λ "	竖	shuh	" "
ε "	巴	ba; pa	" "
η(Ser) plus ζ, 60, 61, 59(Ser) }	东海	tung hae dong hai }	" " ; eastern sea (map 14)
θ (Ser)	徐	sen; xu	" " ( " )
ν (Oph)	燕	yan	" "
ξ (Ser)	南海	nan hai	" " ; south sea
η (Oph)	宋	sung, song	" " ( " )
ε (Aql)	吴越	wu; woo	" " ( " )
ζ (Aql)		yuē	" " ( " )
ν, ο (Ser) plus μ, τ (Oph)	市楼	cha sze ?	carriage shop ?
25, 36, μ (Ser)	天乳	tien ru	milk shop

LIBRA (Lib), the balance

α, ι, γ, β (Lib)	⊕	ti, dsi ishi }	root, paw, bottom
η, θ, 48, 50 (Lib) plus ξ (Sco) }	西咸	se han xi xian	district ? west harmony
κ, 41 (Lib)	日	jih	sun
ν, τ "	天辐	tien fu	spoke (map 20)
60, 2 (Lib) plus 58, 59 (Hya) }	战车	zhen che	battle chariot ( " )
σ, 12, 4, 3 (Lib), 50 (Hya)	折威	zhe wei	broken power; crash ( " )

OPHIUCHUS (Oph), the serpent charmer

α	(Oph)	侯	how huo, hou	duke in charge of the market
			hwan chay	attendant
β, γ	"	宗正	zong zheng tsung ching	lawyer
δ	"	梁	liang	feudal state; also a mast
ε	"	楚	chu; tsoo	" "
ζ	"	韩	han	" "
η	"	宋	sung; song	" "
θ, 44, 36	"	天江	tien kiang	celestial river (map 20)
ι, κ	" plus 43, 47 (Her)	斛	ho	square shaped measuring box for grain
λ (Oph), σ (Ser)		列肆	lie si lee sze	shops for jade curios
υ, 20	(Oph)	车肆	she low	tower at the vehicle market
φ, χ, ψ, ω	"	东咸	tung han dong xian	name of district? east harmony
66, 67, 68, 70	"	宗人	zong ren	royal ancestors
45	"	糠	bran	chaff (map 20)
ν	"	燕	yan	feudal state
37, 60, 32	"	宦者	huan zhe	servant for menial work
μ, τ (Oph) plus ο, υ (Ser)		市楼	shi lou	storey; meeting place to eat
63, 58, 52, 51	(Oph)	天籟	tian ?	? (map 20)
		天市右墙	tien shih you yüan	right wall of C.M.
		天市左墙	tien shih zuo yüan	left wall of C.M.
		<b>天市</b>	tien shih	Celestial Market



AQUILA (Aql), the eagle

α,β,γ	(Aql) (α=Altair)	河鼓	he gu ho koo	drum at the river (Vedic); river bed
α	"		chhien niu	herdsman of oxen
η,58,62,66	"	天枵	tien fu	celestial raft (float)
μ,δ,ν,ι,κ	"	右旗	yew ki	banner on right side
ρ(Aql) plus γ,δ,β,α (Sge)	}	左旗	zuo ki tso ke	banner on left side
14,15,λ,12(Aql) plus, η,β,δ,α(Sct)	}	天井	tien peen tseen peen	celestial casque; helmet
69,70,71(Aql) plus 1(Aqr)	}	离珠	li zhu	4 separate pearls

CAPRICORNUS (Cap), the capricorn

α,β,ε,ν,ρ,ο,π (Cap)	⊙	牛	keen niu niu	ox
τ,υ,17 (Cap)		罗堰	luo yan	network of dikes
μ(Cap) plus 38(Aqr)		哭	kuh	weeping; mourning place
46,λ,18,29(Cap) plus ε,ν(Aqr)		天竺城	tien luy ching	celestial walled castle (map 15)
ζ (Cap)		燕	yan	feudal state ( " )
η "		周	chow	" "
θ "		秦	tsin	" "
ι "		代	tai	" " ( " )
φ "		楚	wei	" "
χ "		齐	qi	" "
35 "		韩	wei	" " ( " )
33 "		魏	han	" " ( " )
36 "		晋	jin	" " ( " )
27,26 "		赵	zhao	" "
20 "		郑	zhang	" "
19 "		越	yue	" "
		十二国	shi er guo	12 feudal states
24,ω,ψ(Cap)3(PsA)		天田	tien tian	celestial field (map 21)

DELPHINUS (Del), the delphin

α,β,γ,δ,ζ (Del)		瓠瓜	kwa chaou kwa gua	gourd; good melon
ε,η,θ,ι,κ "		败瓜	pae chaou bai gua	bad, rotten melon

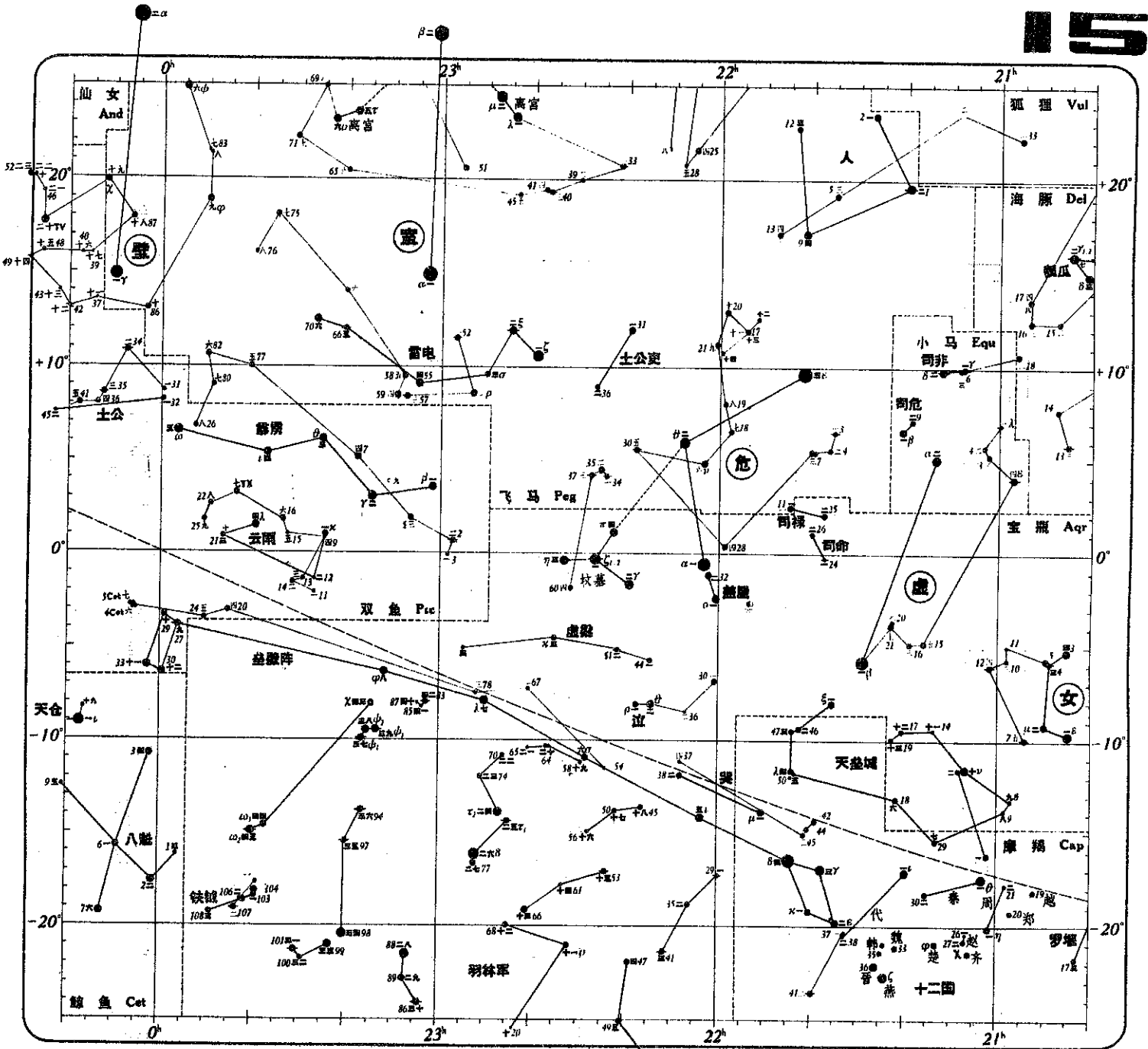


SAGITTARIUS (Sgr), the bowman

$\alpha, \beta$	(Sgr)	天淵	tian yuān	deep pool	(map 21)
$\delta, \epsilon, \eta$	"		feng shi	general of the wind	( " )
$\gamma, \delta, \epsilon, \eta$	"	箕	ki; ji	sieve with wind; winnow basket to clean the grains	( " )
$\gamma, \delta$ $\epsilon, \eta$	" } "			the mouth } of the basket (map 21) the heel }	
$\mu, \lambda, \phi, \sigma, \tau, \zeta$	"	斗	nan tow nan dou } }	ladle; measure; southern dipper; temple	( " )
$\psi, \chi, 52$	"	狗	kow gou } }	dog	
$\omega, 60, 59$	"	狗園	kow kwo gou guo } }	doghouse	( " )
near 6723, $\epsilon$ (CrA)		农丈人	nong zhang ren	farmer	( " )
$\xi, \nu, \rho, \pi, \rho, \upsilon$		廛	jian	building	
55, 56 (Sgr)		天鸡	tian ji	chicken	

EQUULEUS (Equ), the foal

$\alpha$ (Equ) plus; $\beta$ (Aqr)		虛	hsü; xü; hsü wei	emptiness; black night	
$\beta, 9$ (Equ)		司危	si wei	judge of danger	
$\delta, \gamma$ "		司非	si fei	judge of crimes	

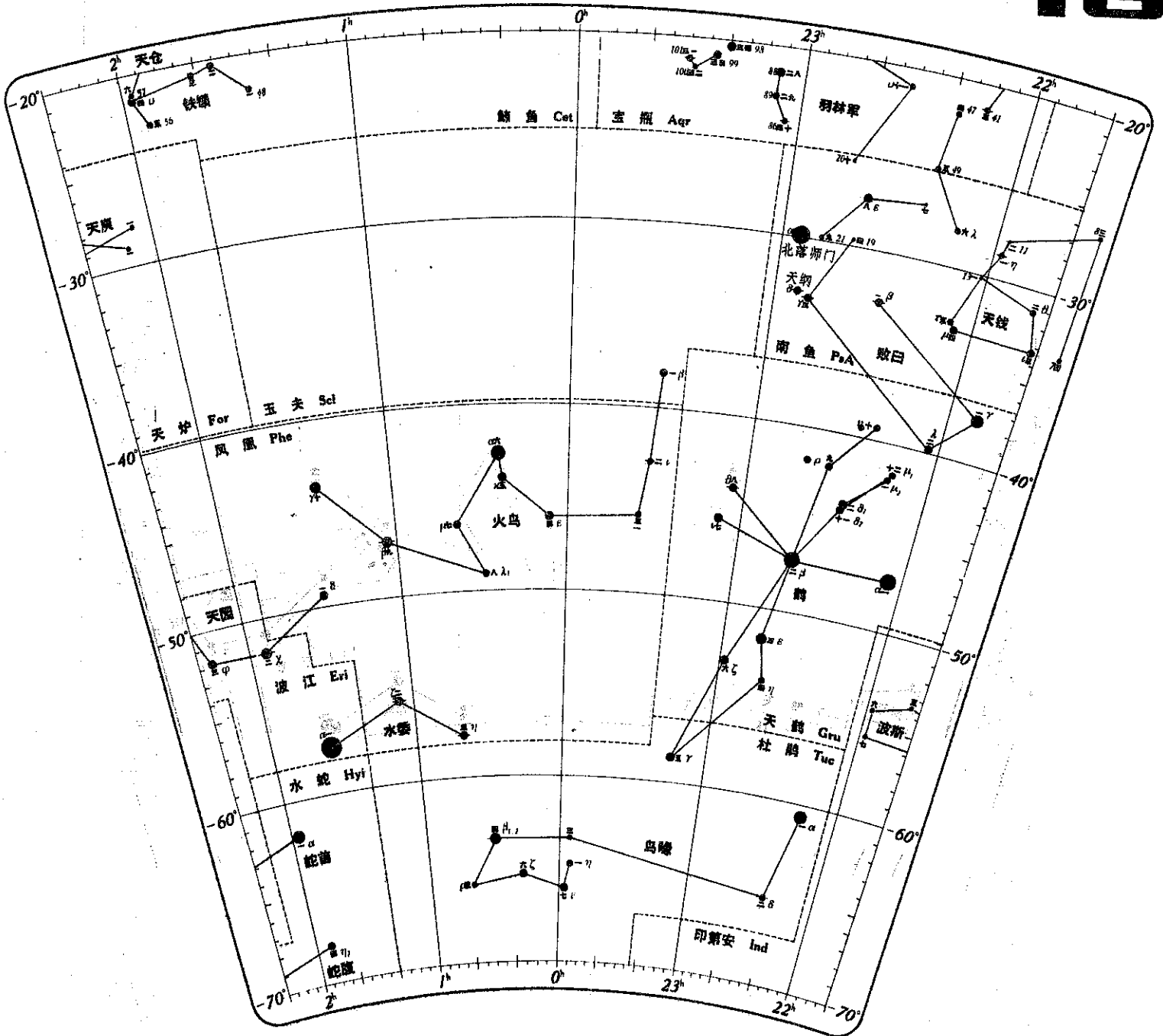


AQUARIUS (Aqr), the waterman

α (Aqr) plus, θ, ε (Peg)	危	wei gui	dangerous cliff; imperial stone; foundation
β (Aqr) plus, α (Equ)	虛	hsü; xü hiu; heu	emptiness, void darkness
γ, ζ, η, π (Aqr)	坟墓	fun mo	tomb; grave yard
ο, 32 "	廡	kai uh	roof of a shed
11 (Peg) plus 25 (Aqr)	司禄	si lu	judge of salary
24, 26 (Aqr)	司命	si ming	judge of fate, life or death
44, 51, κ (Aqr)	虚梁	xu liang	bridge to emptiness
ρ, θ, 30 "	泣	qi	weeping
τ, δ, 70, 45, 56, 53 66, 29, 41, χ, ω, ψ, 83, 87		yu lin keun	imperial guards; soldiers
68, 20, υ (Aqr)	羽林军	yu lin jun	guard of the king
104, 108 "	铁城	fu	cutlass; sickle shaped weapon
ρ, θ, 30 "	泣	lei	tear
ξ, υ, 18 " plus λ, 29 (Cap)	天竺城	tien luy ching	walled castle in heaven
38 (Aqr) plus μ (Cap)	哭	kuh	mourning place
ε, μ, 5, 3 (Aqr)	女	nü; nok niu; mo	woman; girl
φ, λ, σ, ι (Aqr) plus 27, 29, 30 (Psc) plus δ, γ, κ, ε (Cap)	垒壁阵	luy peih chin, lei bi zhen	camp with intrenched walls; battle array frontline

PEGASUS (Peg), the winged horse

α, β (Peg) (α = Markab)	室	ying she shih	house
γ (Peg) plus α (And)	壁	peih pi	wall; partition
ε, θ (Peg) plus α (Aqr)	危	wei gui	steep; danger; dangerous cliff } imperial stone
ζ, ξ, σ, 55, 70	雷电	luy tien lei dian	lightning
31, 36 (Peg)	土公夏	tu gong li	officer in charge of ceremonies for God of the Earth
12, 9, 1, 2 (Peg)	人	ren	human being
32, 1, κ " plus μ (Cyg)	臼	jiu	mortar (map 2)
23, π (Peg) plus ι (Lac)	杵	woo; chu	pestle ( " )
λ, μ (Peg) η, ο " υ, τ "	离宫	li kung li gong	group of palaces for relaxation summer houses (map 2)



PISCIS AUSTRALIS (Psa), the southern fish

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$\alpha$ (Psa) (Fomalhaut)	北落师门	pi lo sze mun bei luo shi men }	north gate of army camp
$\beta, 19, \gamma$ (Psa) plus $\gamma, \lambda$ (Gru) }	败臼	tien kang	celestial rope
$\eta, 13, \theta, \iota, \mu$ (Psa)	天钱	tien tsien	celestial cash

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GRUS (Gru), the crane

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$\alpha, \beta$ (Gru) plus more stars }	鹤	ke ki	crane
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PHOENIX (Phe), the phoenix

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$\alpha, \beta, \gamma$ (Phe)	火鸟	no neaou	fire bird
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FORNAX (For), the furnace

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$\alpha$ plus more stars (For)	天庾	tien yu	celestial temporary granary
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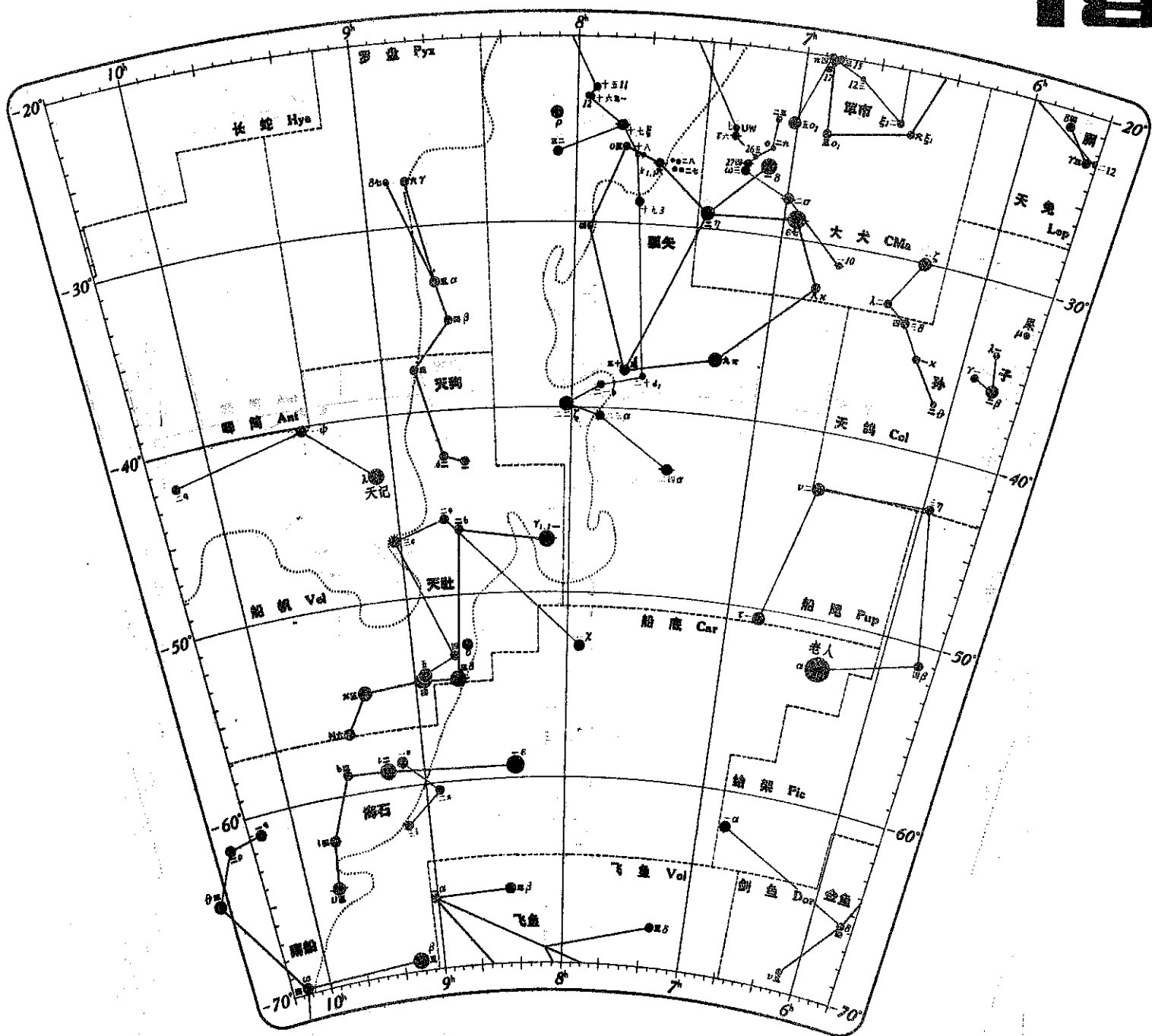
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COLUMBA (Col), the dove

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$\alpha, \epsilon$ (Col)	丈人	chang jin; zhang ren	old folks
$\lambda, \beta, \gamma$ "	子	zi tsze	son
$\theta, \kappa$ "	孙	sun	5 children
$\mu$ "	屎	shi	secretions from toilet

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PYXIS NAUTICA (Pyx), the nautical compass

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$\alpha, \beta, \delta, \gamma$ (Pyx)	天狗	tien gou tseen kow }	celestial sky-dog
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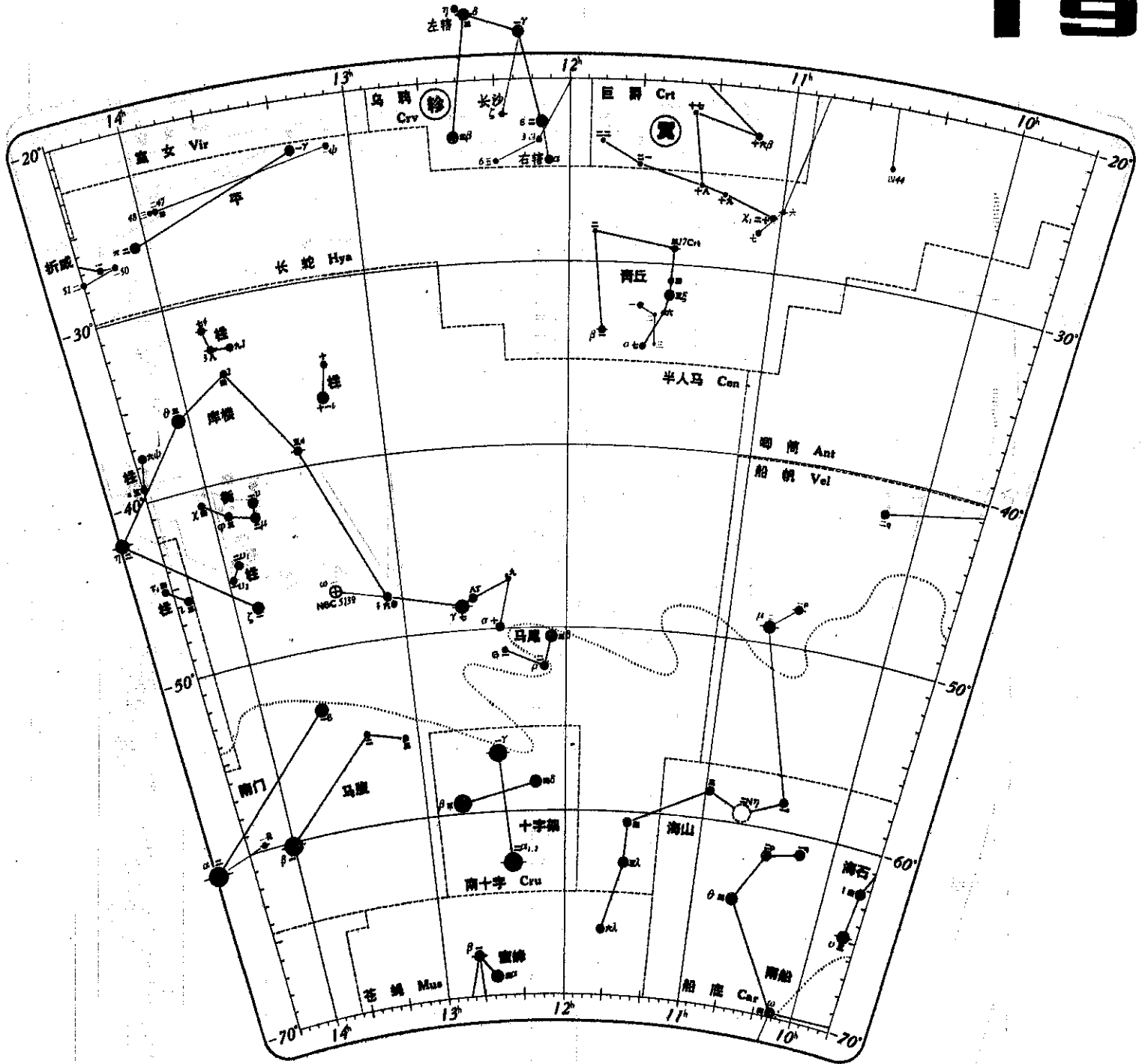
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VELA (Vel), the sail

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$\psi, \lambda$ (Vel)	天记	tseen ke	celestial registration table
$\gamma, \beta, \delta$ "	天社	tseen she tian ji }	celestial altar; epoch

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CENTAURUS (Cen), the horseman

$\alpha, \beta$	(Cen)	阳门	yang men	sun gate	(map 20)
$\gamma, \sigma, \tau$	"		koo low	arsenal tower	
$\delta, \rho$	"	马尾	ma wei	tail of a horse	
$\kappa$	"	骑官	ki guan	captain	
$\mu, \nu, \phi, \chi$	"	衡	wei	balance (for weighing)	
$\psi, \zeta, \iota, \epsilon, \tau, \upsilon, \eta$	"	柱	choo	5 poles to bind horses	
$\zeta, \eta, \theta, 2, \gamma$	"	库楼	ku lou	military storehouse	
$\alpha, \epsilon$	"	南门	nan mun	south gate	
$\beta$ , other stars (Cen)		马腹	mah fuh	belly of a horse	

$\alpha, \beta, \gamma, \delta$	(Cru)		shih tsze kia	southern cross	
			têng lung ku	lantern	





SCORPIO (Sco), the scorpion

$\alpha, \tau, \sigma$ (Sco) ( $\alpha$ = Antares)	心	ta shin xin; hsin }	heart
		ho sing	fire star
$\beta, \delta, \pi, \rho$ (Sco) plus $\lambda, 42$ (Lib)	房	fang fong }	room; house breast (of dragon)
$\beta$ (Sco)		tien sze }	celestial "4-horse-chariot" (map 13)
$\epsilon, \mu, \zeta, \eta, \theta, \iota,$ $\kappa, \upsilon, \lambda$ (Sco)	尾	wei vi }	tail
$18, \psi, \chi, 11$ (Sco) plus, $49$ (Lib)	笞	fa	punishment ( " )
$\xi$ (Sco), plus $50, 48, \theta, \eta$ (Lib)	西咸	xi xian	west harmony ( " )
$\nu$ (Sco)	键闭	jian bi	padlock; pin of a wheel ( " )
$\lambda$ (Lib)		keen pi	2 parts of a lock ( " )
$\omega_1, \omega_2$ (near $\beta$ ) (Sco)	钩铃	kow kin lou ling }	hook and latch bell on a hook with latch ( " )
$\Gamma$ (Sco)	傅说	Fu Shu	legendary wise minister, discoverer of trigram.
$M7$ (Sco)	鱼	yu	fish
$\zeta$ (Sco)	神宫	shen gong shing kung }	emperor's council hall; divine temple (like ming tang)

ARA (Ara), the altar

$\sigma, \alpha, \beta$ (Ara)	杵	chu	pestle, staff, club
$\delta, \zeta$ "		tsin yin	dark sky
$\epsilon, \gamma, \delta, \eta, \zeta$ (Ara)	龟	tsu kang	left watch

LUPUS (Lup), the wolf

$\alpha, \sigma, \pi, \mu$ (Lup)	骑阵将军	gi zhen jiang jun	cavalry general
$\beta, \gamma, \delta$ "	骑官	ke kwan gi guan }	cavalry captain
$\phi, 1$ "	砺石	dun wan	whetstone stone to whet weapons
$\chi, \psi_1$ "	从官	cong guan	attendant
$\theta, \eta, \sigma, \rho, \zeta$ "	积卒 车骑	ji zu	two soldiers



INDUS (Ind), the indian

α (Ind)	波斯	pe sze	the persian
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TELESCOPIUM (Tel), the telescope

α (Tel)		We	danger
γ "		Chuen Shwo	lengendary person

MICROSCOPIUM (Mic), the microscope

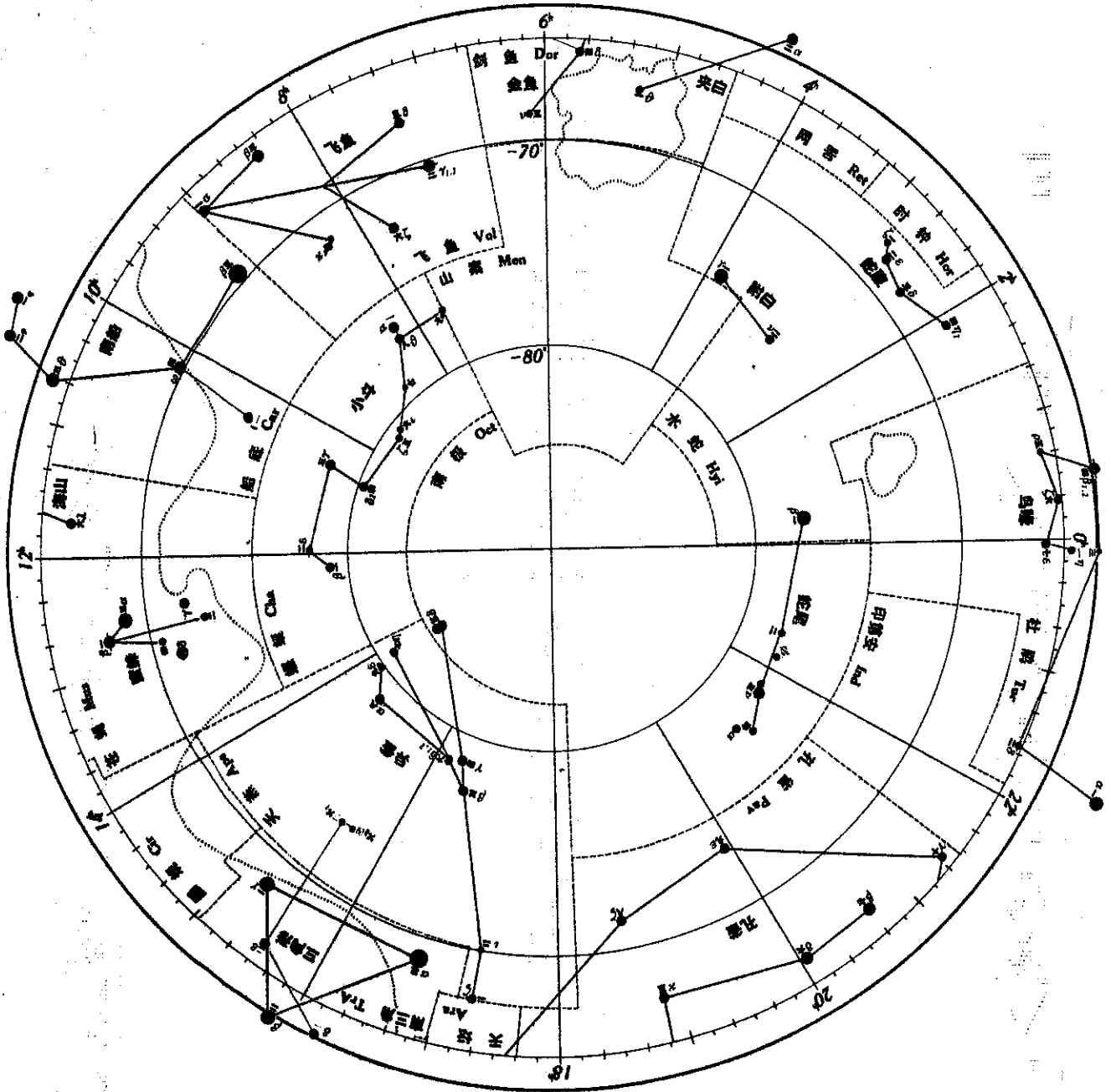
γ, ε (Mic)	高瑜	li yu	pieces of jade
4 stars at -40°	九坎	jiu kan	nine ridges

CORONA AUSTRALIS (CrA), the southern crown

α, β, γ, δ, ζ, η, θ, κ, λ (CrA) }	蟹	pee pi	tortoise, river turtle
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SAGITTARIUS (Sgr), the bowman

α, β (Sgr)	天淵	tian yuān	deep pool
δ, ε, η "		feng shi	general of the wind
γ, δ, ε, η "	箕	ki; ji	sieve with wind; winnow basket to clean the grains
γ, δ ε, η }			the mouth } of the basket the heel }
μ, λ, φ, σ, τ, ζ "	斗	nan tow nan dou }	ladle; measure; southern dipper; temple
ψ, χ, 52 "	狗	kow gou }	dog (map 14)
ω, 60, 59 "	狗國	kow kwo gou guo }	doghouse
near 6723, ε (CrA)	农丈人	nong zhang ren	farmer
ξ, ν, ο, π, ρ, υ	建	jian	building ( " )
55, 56 (Sgr)	天鸡	tian ji	chicken ( " )



THE SOUTHERN HEMISPHERE

$\alpha, \nu, \psi$ (Oct) plus $\beta$ (Hy1) }	蛇尾	she wei	tail of snake serpents tail
$\gamma, \nu$ (Hy1)	附白	fu pih foo bai }	?
$\zeta, \epsilon, \delta, \eta$ (Hy1)	蛇腹	shai fuh	serpents belly
$\alpha$ (Hy1), $\beta$ (Ret)	蛇首	shai shou	serpents head
$\alpha, \delta, \beta, \rho, \zeta, \epsilon, \eta$ (Tuc)	鸟喙	neaou chui	beak bird
$\alpha, \gamma, \epsilon, \zeta, \eta, \pi$ plus $\nu, \lambda, \kappa, \delta, \beta$ (Pav) }	孔雀	ju tsiu	peacock
$\alpha, \beta, \epsilon, \gamma$ (TrA)	三角形	san kio hung	southern triangle
$\epsilon, \alpha, \delta, \beta, \gamma, \iota, \zeta$ (Aps) plus $\delta$ (Oct) }	异雀	e cho	curious sparrow little wonder bird
$\alpha, \beta, \gamma, \delta$ (Mus)	蜜蜂	meih fung	the bee
$\alpha, \theta, \iota, \zeta, \delta, \gamma, \epsilon, \beta$ (Cha)	小斗	siau tau	small measure; a dipper
$\alpha, \beta, \gamma, \delta$ (Cru)	十字架	shih tsze kia	southern cross
$\alpha$ (Car) (Canopus)	老人	Laou Jin	legendary old wise man
$\epsilon, \iota, \nu$ (Car)	海石	hai shi hae shih }	stone in the sea
$\beta, \omega, \theta$ "	南船	nan chuan	southern ship
$\eta$ (Car), $\mu$ (Vel)	海山	hai shao	mountain in the sea
$\beta, \alpha, \kappa, \delta, \gamma, \zeta$ (Vol)	飞鱼	fe yu	sparrow
$\gamma, \alpha, \beta, \delta, \nu$ (Dor)	金鱼	kin yu	goldfish
$\theta$ (Dor), $\alpha$ (Ret)	夹白	kaou pin jiao bai }	?