

# The Cambridge MS 32 Star Catalog

## Abstract

This paper explores the star catalog contained in the copy of Ptolemy's *Almagest* in the collection at Cambridge's Queens' College, identified as MS 32. This manuscript appears to be virtually unstudied. I find the star catalog contains an interesting variant in that the values in longitude have been adjusted for precession of the equinoxes. This, along with several rare variants on entries, allow for the first time, the manuscript to be placed within the historical lineage.

## Introduction

Within the history of astronomy, Ptolemy's *Almagest* stands as the single most important work within the medieval period. Written in the 2nd century CE, this work lays out his vision of the geocentric cosmos. It is largely based on the work of the earlier Greek astronomer Hipparchus (2nd century BCE). In it, Ptolemy walks through the calculations necessary to create, calibrate, and use the model, checking figures as necessary and adding a few updates<sup>1</sup>.

The text is broken up into a collection of 13 books. For the purpose of this paper, we will be concentrating on books VII and VIII. In these books, Ptolemy discusses the fixed stars. He first discusses a phenomenon known as precession of the equinoxes.

This phenomenon is caused by a precession of the Earth's axis over a ~26,000 year period. It causes the intersection of the ecliptic and celestial equator to slowly drift along the ecliptic, in reverse order of the zodiac signs. Since astronomical coordinate systems are based on this intersection, this has the effect of causing coordinate systems to drift.

Ptolemy's preferred coordinate system is the ecliptic coordinate system. This is a logical choice since the ecliptic is the plane of the solar system and Ptolemy's primary focus is the objects in the solar system. Within this system, precession only causes a drifting of the coordinate system in the ecliptic longitude (measured along the ecliptic) but not the ecliptic latitude (measured up/down from the ecliptic).

Next, he produces a table of 1,025 stars<sup>2</sup>, listing the bright stars in the figure of each of the Greek constellations and the nearby stars and giving their coordinates and brightnesses. Because of Ptolemy's choice of the ecliptic coordinates, this allows readers in the distant future to be easily able to account for precession by simply adjusting the ecliptic longitude. The amount it would need to be adjusted is easily calculable by counting the number of years since the time since the *Almagest* was calibrated and multiplying by the rate of precession. Ptolemy tells us that his star catalog was calibrated for "the beginning of the reign of Antoninus" which was 137 CE<sup>3</sup>. This date is known as an epoch date.

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<sup>1</sup> The most notable updates include a geometric proof that allows him to determine the relationship between a chord within a circle and its central angle, allowing him to more efficiently derive a table of chords (necessary for solving right triangles without trigonometry, which had not been developed yet) (*Almagest*, I.10). Ptolemy also recognized deficiencies in Hipparchus' lunar model in which the anomaly of the moon was understated at first and third quarter for which Ptolemy introduced a new component of the model to improve accuracy (*Almagest*, V.2-5).

<sup>2</sup> Some catalogs have up to 1,028 entries.. However, in them, up to three stars are repeated as they are used in the figures of multiple constellations. Thus, there are 1,025 *unique* entries. Not all catalogs list each of them multiple times.

<sup>3</sup> While Ptolemy makes this claim, it is highly disputed by modern scholars. Many suggest that Ptolemy's catalog was in fact, stolen from Hipparchus in the 2nd century BCE and that Ptolemy attempted to account for precession but, due to an

Discovery of this phenomenon is attributed to Hipparchus who, Ptolemy tells us, believed the upper limit to be  $1^\circ$  per century. Ptolemy settles on a rate of exactly  $1^\circ$  per century. Other astronomers, throughout period, would calculate rates which were progressively closer to the modern accepted value of  $1^\circ$  per 72 years ( $1.39^\circ$  per century). Al-Battani (9th-10th century) calculates a rate of  $1^\circ$  per 66 years ( $1.51^\circ$  per century) (Wikipedia - Al-Battani) and Ibn Yunus (10th-11th century) gives a rate of  $1^\circ$  per 70 years ( $1.43^\circ$  per century)<sup>4</sup>.

This would allow astronomers in any period to be able to update the stellar coordinates given by Ptolemy simply by applying the rate of their choice over the period of time from the epoch date for the star catalog. This is precisely what appears to have happened with the catalog in this manuscript.

When compared with the rest of the text, the star catalog is uniquely interesting, as it is susceptible to greater corruption than other portions of the text. While scribes copying a text could rely on their understanding of the subject and rules of grammar to prevent the text from being overly corrupted, the star catalog is simply a table of numerical data which holds little meaning and is difficult to check. As such, it is unsurprising that the star catalog is easily the most corrupted portion of the text.

Various historians of astronomy have attempted to reconstruct an authoritative version of the star catalog by comparing extant copies and comparing the various values with the positions of stars in ancient times as calculated with modern astronomical techniques (Peters & Knobel, Toomer, and Grasshoff to name a few). If they were a good fit positionally and fit reasonably with the description in the figure of the constellation, they would consider it a good match. However, there are still around a dozen stars over which experts disagree about the identification and many more cases in which experts have come to the same conclusion, but admit that the data is not a good fit, leaving the identification uncertain (Toomer).

Much of this work of comparing manuscripts was conducted as part of a joint effort by Dr. Christian Peters and Edward Knobel, beginning in the late 1800's. The project was initially started by Dr. Peters, but was continued and taken to publication by Knobel upon Dr. Peters' death in 1890. The effort compared the star catalogs of 55 surviving manuscripts and was the first serious attempt at constructing an authoritative historical edition (Peters & Knobel). The work also lists the variations between manuscripts<sup>5</sup> allowing readers to begin to get a sense of the scale of corruption. Indeed, even a quick perusal of this section of their work shows that it is very rare that some variation is not found for a given star.

While the work of Peters & Knobel is still considered an important step in the history of the star catalog, cited by many historians to this day, it is certainly incomplete as there are several manuscripts known to exist today which were either not known to Peters & Knobel, or not available to them. One of these manuscripts is currently housed in the library at the Queen's College and is identified as MS 32 and is the subject of this study.

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incorrect constant of precession, did so incorrectly, thus not correctly representing the values for the date to which he attempted to adjust them. However, this was not suspected by astronomers until the late 1500's and those before then would have applied their correction using Ptolemy's (incorrect) dates.

<sup>4</sup> This rate clearly appears in some Islamic *zij* (books of astronomical figures used for calculations), but, in my opinion, it is not clear that Ibn Yunus is the source for it. Although many sources (Ex: Powell) make this claim regarding Ibn Yunus' value of precession, I have never found any able to point to primary sources. As such, this value should be treated with suspicion.

<sup>5</sup> I have reviewed several of the manuscripts Peters & Knobel include and find the values they list occasionally incorrect.

# History of the Manuscript

Aside from the Cambridge library listing for this manuscript, there appears to be no other information on it, indicating that it is virtually unstudied. The author of the library entry (Elia) states that it is a composite work, written by two unknown scribes, both writing in Greek. The work is incomplete, ending abruptly in the middle of a sentence in Book X, Chapter 4 although this does not affect the star catalog, which is complete.

The manuscript is believed to have been constructed in the early 16th century, although it is not clear whether the scribes worked together or not.

The book was known to have been owned by Henry Hastings, the Earl of Huntingdon in 1585 and was later given to Thomas Church, the Earl's tutor before being donated to Queens' College (a constituent of Cambridge University) in 1606.

## Interpreting the Star Catalog

As with the rest of the manuscript, the star catalog is written in Greek<sup>6</sup>. It is broken up by constellation, first listing the primary stars in the figure of the constellation, followed by stars near the constellation, but not part of the figure itself.

In the first column, a description of the star's position is given (Ex: "The star on the end of the snout [of Ursa Major]"). While this would ostensibly require being able to read the Greek to determine which star is being described, scribes across the generations have done an excellent job of keeping the stars in the same order. Thus, this column can generally be ignored and the star catalog interpreted sequentially. Only in very rare instances have I encountered a transposition of entries (obvious from the coordinates) and such instances have not happened in this text.

Next, the star's ecliptic longitude is given. While ecliptic longitude runs from  $0^\circ$  -  $360^\circ$  (measured along the ecliptic beginning at the vernal equinox), astronomers in this period did not record the values in this manner. Instead, the ecliptic was broken into twelve  $30^\circ$  segments, progressing in the order of the zodiac signs. Thus,  $0^\circ$  -  $30^\circ$  was Aries,  $30^\circ$  -  $60^\circ$  was Taurus, etc.... As such, the star catalog first lists the sign followed by the distance into the sign. (Ex:  $45^\circ$  ecliptic longitude would be written as Taurus  $15^\circ$ ).

As noted above, the catalog is written in Greek, and does not use the modern constellation names. While some catalogs make use of the astrological symbols, most use abbreviations for the Greek constellation names. The Cambridge manuscript begins with symbols but quickly switches to abbreviations. The constellations are as follows:

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<sup>6</sup> There are also some notes in the margins and blank pages that are in Latin. This includes one on the page prior to the beginning of the star catalog. I have been unable to read it sufficiently well to determine if it makes mention of the adjustment to ecliptic longitude which will be discussed shortly.

English	Greek	Cambridge MS 32
Aries	Krios	Κριο
Taurus	Tavros	Ταυρ
Gemini	Didimoi	Διδυ
Cancer	Karkinos	Κρκιν
Leo	Leon	Λεον
Virgo	Parthenos	Παρθ
Libra	Zygos	Ζυγού
Scorpio	Skorprios	Σκορ
Sagittarius	Tokostis	Τοζο'
Capricorn	Aigokeros	Αιγο
Aquarius	Ydrohoos	Υδρο
Pisces	Ihteis	Ίχθυ

The third column in the star catalog lists the ecliptic latitude. It notes whether the angle is north (“Boreas”, abbreviated “Bor”) or south (“Notos” abbreviated “Not”) of the ecliptic and then gives the angle.

Lastly, a column is given for the brightness (known as magnitude) of the star. In some instances, an additional note is added indicating whether the star is brighter or fainter than the listed magnitude. Some stars are given no magnitude and simply listed as “faint.”

In all of the numerical columns, values are presented in Greek numerals which make use of the same characters as the Greek alphabet. A table giving examples of each of the characters is below:

Number	Cambridge MS 32
0	Ϡ
1	Α
2	Β
3	Γ
4	Δ
5	Ε
6	Ϛ
7	ζ
8	Η
9	Θ
10	Ι
20	Κ
30	Λ
40	Μ
50	Ρ
60	Ξ
70	Ο
80	Π

The numbering system works largely the same as ours does today. However, since the values for the tens place are given a unique character, it is not necessary to include a value in the ones place if there isn't one. (Ex: 30 is simply written as λ and does not require an ο (0) in the ones place.)

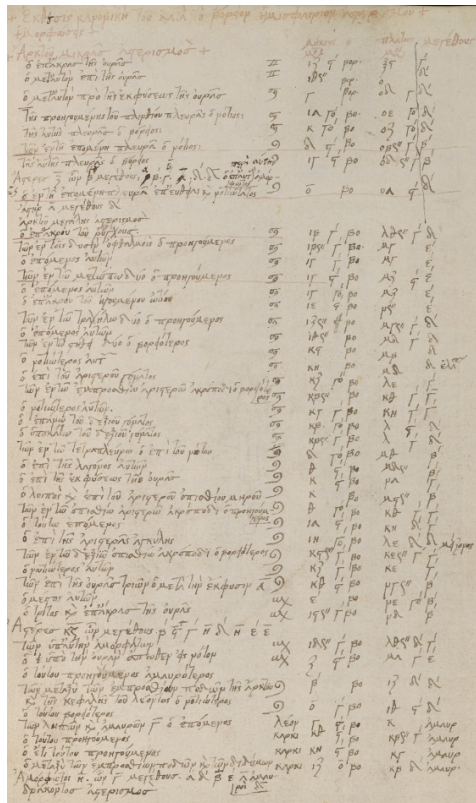
When the values are not whole numbers, fractions are used. However, Greek astronomers evidently did not make use of fractions in the manner we think of them today, with a numerator and denominator. Instead, they only made use of inverses of whole numbers by adding a tick mark after the number. (Ex: 1/2 would be expressed as 2'). In essence, the numerator is always 1.

This meant that, to represent more complicated fractions, other inverses would need to be added together. For example, we see 5/6 written as β' + Γ' (1/2 + 1/3). The exception to this is the fraction for 2/3 in which the symbol Γ' (1/3) is used, but with a circle added within it to indicate that it should be read as 2/3.

The use of this tick mark system is easily the most significant reason for corruption of the values over the generations. An accidental stray mark or the fading of a light tick mark would change the interpretation of the number. (Ex: If a number was written as λΓ, this could be interpreted as 33 if no tick mark was intended, or as 30 1/3 if it was).

The second largest reason for corruption is simply poor handwriting. As you can see in the table on the previous page, this scribe drew the character for α such that the loop is almost entirely squished making it look more like a ^. A poorly drawn λ could easily be mistaken for this. Similarly, a poorly drawn horizontal line on a θ may result in the character being mistaken for an ο (0) or Ο (70).

Fortunately, many of the manuscripts place a space between the whole number portion of a number and the fractional portion, allowing for some indication of the scribe's intent, at least with regards to whether or not a character was meant to be a fraction or not. The Cambridge MS 32 manuscript is quite excellent at following this formatting.



# Analysis

## Adjusted Longitudes

When reviewing the star catalog, it becomes immediately obvious that the ecliptic longitudes do not resemble the expected values. Frequently the zodiacal sign is different and the longitudinal value within the sign is always different. However, the ecliptic latitudes and magnitudes are extremely faithful.

This deviation is characteristic of an attempt to correct the ecliptic longitudes for the effects of axial precession as the ecliptic longitudes are adjusted, but not the latitudes. By comparing the values to other manuscripts, it becomes quickly apparent that each value has been increased by  $17^\circ$ . This adjustment is *not* reported on the website for the manuscript, indicating that this discovery is being reported for the first time.

For the purpose of comparing this manuscript to others, it is necessary to remove the  $17^\circ$  adjustment. As such, all values discussed herein have all been reduced to the Ptolemaic epoch by subtracting  $17^\circ$  from the ecliptic longitude.

## Lineage

At present, I have been unable to find any research exploring the lineage of this manuscript. However, the star catalog gives an excellent opportunity for exploring such lineages as errors made in one would likely be passed down to later generations<sup>7</sup>. Thus, studying the pattern of errors gives a powerful tool to determine relationships between manuscripts.

In comparing most entries in MS 32 to others, the variants for most entries are already widespread which makes such entries a weak test for potential relationships. However, I have identified 16 instances in which a variant found in Cambridge MS 32 is only found in a small number of other manuscripts (3 or less). Such rare variants provide a much stronger argument for a relationship between the manuscripts.

Below, I have compiled a list of such instances and how many unique variants are found in each of the other sources<sup>8</sup>. For the values listed, ones beginning with an astrological sign are longitudes, ones beginning with a +/- are latitudes, and ones with a single number are magnitudes (brightnesses).

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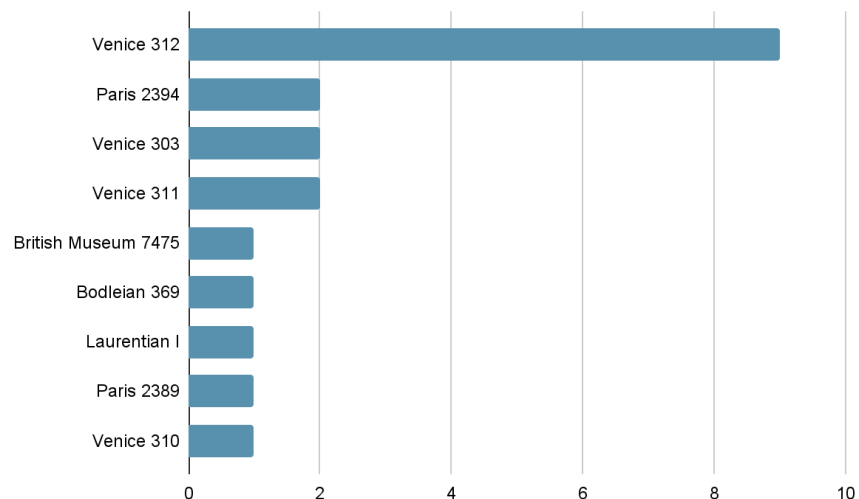
<sup>7</sup> The exception would be when a scribe compared multiple manuscripts and was uncertain of which value was more authoritative, or was uncertain at the reading of a character. In these cases, scribes would occasionally list two values for a single entry. This is found in this manuscript for the following stars:

- Star 410 (23 Tau) which gives values of  $2 \frac{1}{2}$  and  $2 \frac{1}{3}$  for the longitude
- Star 584 (55 Sgr) which gives values of  $25 \frac{1}{3}$  and  $25 \frac{2}{3}$  for the longitude
- Star 690 (v Psc) which gives values of  $28 \frac{1}{3}$  and  $28 \frac{2}{3}$  for the longitude
- Star 705 (u Psc) which gives values of  $2 \frac{1}{2}$  and  $2 \frac{1}{6}$  for the longitude
- Star 708 (27 Psc) which gives values of  $1 \frac{1}{3}$  and  $1 \frac{1}{6}$  for the longitude
- Star 718 ( $\xi^1$  Cet) which gives values of  $7 \frac{1}{3}$  and  $7 \frac{2}{3}$  for the longitude

<sup>8</sup> For each of the Paris manuscripts, I have examined each of these and can confirm that the values in these manuscripts match the ones in the Cambridge manuscripts. For all other manuscripts, I rely on Peters & Knobel.

Star #	Value	Modern Identification	Sources Found in
155	♄ 24;00	β Lyr	Venice 303, Venice 312
229	♃ 19;20	ι Tau	Venice 310
247	+2;15	36 Oph	Paris 2394, Venice 303, Venice 312
248	+1;30	θ Oph	Paris 2394, Venice 312
273	3	μ Ser	British Museum 7475
301	+29;00	ε Del	Bodleian 369
501	+0;30	β Vir	Venice 311
570	♄ 5;30	γ Sgr	Venice 312
576	-5;30	φ Sgr	Venice 312
584	♄ 25;40	55 Sgr	Paris 2389
594	♄ 16;40	η Sgr	Venice 312
626	♆ 27;40	μ Cap	Venice 312
661	-10;15	104 Aqr	Laurentian I
669	-16;00	88 Aqr	Venice 312
799	-54;45	υ <sup>2</sup> Eri	Venice 311
980	-30;10	κ Lup	Venice 312

Taking a count of the number of instances in which one of these rare variants appears in each of the sources, we can quickly see that the Venice Codex 312 is the strong favorite, suggesting that it is either the progenitor of, or copied from the same source as Cambridge MS 32.



However, there is an even more significant connection between the two:



**Venice Codex 312 also contains the 17° adjustment present in this manuscript.** It is presently the only other known manuscript with this adjustment.

The Venice Codex 312 is dated to the 12th to 13th century (Peters & Knobel). This later date would potentially make the Venice Codex 312 contemporary to the Alfonsine tables which were commissioned by Alfonso X of Castile and calculated between 1263 and 1272. This set of tables recalculated many of the tables necessary for astronomical calculations for the latitude of Castile, Spain. It also included a star catalog that was based on Ptolemy's<sup>9</sup> but incremented similarly by 17;08° - a value strikingly similar to that used in the Venice Codex 312 and Cambridge MS 32 (Samsó).

It is an interesting historical note that the astronomers compiling the Alfonsine tables clearly attempted to include more recent sources of astronomical thinking than just that of Ptolemy. Indeed, the Alfonsine tables are known to have made use of an alternative theory of precession, known as trepidation, in which the rate of precession was not constant, and in which the position of the equinox varied back and forth about a mean position.

The oldest reference to this theory comes from the astronomer Theon of Alexandria in the 4th century in which he states:

According to certain opinions, ancient astrologers believe that from a certain epoch the solstitial signs have a motion of 8° in the order of the signs, after which they go back the same amount (Dreyer).

This theory is incorrect, but produced a surprisingly accurate mean amount of precession for the 13th century - one better than any of the fixed precession rates cited above.

## Copy Orientation

One of the exciting parts of engaging with period manuscripts is finding hints of the methods and mindset of the scribe. In this manuscript, we see compelling evidence that the scribe copying this text did so by copying vertically (in columns) as opposed to in rows.

The first evidence we find for this comes in the constellation of Aquila. The figure of this constellation is described as having nine stars. While there are nine longitudes, latitudes, and magnitudes listed, there is an extra zodiacal sign. Had the scribe been copying by row, it would have been obvious that a 10th row was not needed. A similar error happens in the constellation of Gemini in which an extra sign is added between stars 429 and 430, but it does not correspond to any description, longitude, latitude, or magnitude.

Another error also highlights the copying orientation. In the constellation of Taurus, the scribe misses the longitude for star 383 (o Tau) resulting in the remaining values for the longitude on this page to be shifted up by one row. Had the scribe copied by row, it would have been obvious that the longitudes were no longer matching with the latitudes and magnitudes.

Perhaps the most compelling evidence comes from the beginning of the constellation of Leo. Typically, after each constellation, a space is left in which a header for the name of the next constellation would be present. However, in this case, the scribe evidently continued writing without leaving a gap as four more lines were present but were unsuccessfully rubbed out and are still readable. These lines only include the zodiacal sign and longitude but clearly do not include the latitude or magnitude.

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<sup>9</sup> Here, I draw a distinction between the star catalog derived from Ptolemy's and ones like Venice Codex 312 and Cambridge MS 32 which are contained within copies of the *Almagest* and purport to be Ptolemy's catalog.

# Works Cited

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# Star Catalog of Cambridge MS 32

Catalog Number	Number in Constellation	Description	Ecliptic Longitude (Sign)	Ecliptic Latitude (Sexagesimal)	Magnitude
<b>I: Constellation of Ursa Minor</b>					
1	1	The star on the end of the tail	♊ 0;10	+66;00	3
2	2	The one next to it on the tail	♊ 2;30	+70;00	4
3	3	The one next to that, before the place where the tail joins [the body]	♊ 16;00	+74;20	4
4	4	The southernmost of the stars in the advance side of the rectangle	♊ 29;40	+75;40	4
5	5	The northernmost of [those in] the same side	♋ 3;40	+77;40	4
6	6	The southern star in the rear side	♋ 17;10	+72;50	2
7	7	The northern one in the same side	♋ 26;10	+74;50	2
7 stars, 2 of the second magnitude, 1 of the third, 4 of the fourth					
<i>Nearby star outside the constellation</i>					
8	8	The star lying on a straight line with the stars in the rear side [of the rectangle] and south of them	♋ 13;00	+71;10	4
1 star of the fourth magnitude					
<b>II: Constellation of Ursa Major</b>					
9	1	The star on the end of the snout	♊ 25;20	+39;50	4
10	2	The one advanced of the stars in the two eyes	♊ 25;50	+43;00	5
11	3	The one to the rear	♊ 26;20	+43;00	5
12	4	The more advanced of the two stars in the forehead	♊ 26;10	+47;10	5
13	5	The one to the rear	♊ 26;40	+47;00	5
14	6	The star on the tip of the advance ear	♊ 28;10	+50;30	5
15	7	The more advanced of the two stars in the neck	♋ 0;30	+43;50	4
16	8	The one to the rear	♋ 2;30	+44;20	4
17	9	The northernmost of the two stars in the chest	♋ 9;00	+42;00	4
18	10	The southernmost of them	♋ 11;00	+44;00	4-5
19	11	The star on the left knee	♋ 10;40	+35;00	3
20	12	The northernmost of the [two] in the front left paw	♋ 5;30	+29;20	3
21	13	The southernmost of them	♋ 6;20	+28;20	3
22	14	The star above the right knee	♋ 5;40	+30;10	4
23	15	The star below the right knee	♋ 5;50	+30;20	4
24	16	The star on the back [of the quadrilateral]	♋ 17;40	+49;00	2
25	17	The star on the flank [of the quadrilateral]	♋ 22;10	+44;30	2
26	18	The star on the place where joins [the body, in the quadrilateral]	♌ 3;10	+51;00	3

27	19	The remaining star [in the quadrilateral]	♌ 3;00	+46;30	2
28	20	The more advanced of the [two stars] in the left hind paw	♌ 22;40	+29;20	3
29	21	The one to the rear of it	♌ 24;10	+28;15	3
30	22	The star on the left knee-bend	♌ 1;40	+35;15	4-3
31	23	The northernmost of the [two stars] in the right hind paw	♌ 9;50	+25;50	3
32	24	The southernmost of them	♌ 10;20	+25;00	3
33	25	The first of the three stars on the tail next to the place where it joins [the body]	♌ 12;10	+53;30	2
34	26	The middle one	♌ 18;00	+55;40	2
35	27	The third, on the end of the tail	♌ 29;50	+54;00	2

27 stars, 6 of the second magnitude, 8 of the third, 8 of the fourth, 5 of the fifth

*Stars under [Ursa Major] outside the constellation*

36	28	The star under the tail, at some distance towards the south	♌ 27;50	+39;45	3
37	29	The rather faint star in advance of it	♌ 20;10	+41;20	5
38	30	The southernmost of the [two] stars between the front legs of Ursa [Major] and the head of Leo	♌ 15;00	+17;15	4
39	31	The one north of it	♌ 13;20	+19;10	4
40	32	The rearmost of the remaining three faint stars	♌ 16;10	+20;00	f
41	33	The one in advance of this	♌ 12;10	+22;50	f
42	34	The one in advance again of the latter	♌ 11;10	+23;00	f
43	35	The star between the front legs [of Ursa Major] and Gemini	♌ 0;00	+22;15	f

8 stars outside the constellation, 1 of third magnitude, 2 of the fourth, 1 of the fifth, and 4 faint












**III: Constellation of Draco**

44	1	The star on the tongue	♌ 26;40	+76;30	4
45	2	The star in the mouth	♌ 11;50	+78;30	4-3
46	3	The star above the eye	♌ 13;10	+75;40	3
47	4	The star on the jaw	♌ 27;20	+80;20	4
48	5	The star above the head	♌ 29;40	+75;30	3
49	6	The northernmost of the 3 stars in a straight line in the first bend of the neck	♌ 24;40	+82;20	4
50	7	The southernmost of these	♌ 2;20	+88;15	4
51	8	The middle one	♌ 28;50	+80;20	4
52	9	The star to the rear and due east of the latter	♌ 19;30	+81;10	4
53	10	The southern star of the [two] forming the advance side of the quadrilateral in the next bend	♌ 8;00	+81;32	4
54	11	The more northerly star of the advance side	♌ 20;30	+83;00	4

55	12	The northern star of the rear side [of the quadrilateral]	 7;40	+78;50	4
56	13	The southern star of the rear side	 22;50	+77;50	4
57	14	The southern star of [those forming] the triangle in the next bend	 10;40	+80;30	5
58	15	The more advanced of the other two stars of the triangle	 21;40	+81;20	5
59	16	The one to the rear	 29;10	+80;15	5
60	17	The most advanced of the three stars in the next triangle, which is in advance [of the last]	 13;20	+84;30	4
61	18	The southernmost of the other two forming the triangle	 20;20	+83;30	4
62	19	The northernmost of the other two	 11;50	+84;50	4
63	20	The rearmost of the two small stars to the west of the triangle	 28;40	+87;30	6
64	21	The one in advance	 21;40	+86;50	6
65	22	The southernmost of the next 3 stars in a straight line	 9;00	+81;15	5
66	23	The middle one of the three	 9;20	+80;20	5
67	24	The northernmost of them	 8;20	+84;50	3
68	25	The northernmost of the next 2 to the west	 10;00	+78;00	3
69	26	The southernmost of these	 10;20	+74;40	4-3
70	27	The star to the west of these, in the bend by the tail	 12;40	+70;00	3
71	28	The advance star of the 2 quite some distance from the latter	 7;20	+64;40	4
72	29	The rear star of these [two]	 11;10	+65;30	3
73	30	The star close by these, by the tail	 19;10	+61;15	3
74	31	The remaining star, on the tip of the tail	 13;10	+56;15	3

31 stars, 8 of third magnitude, 16 of the fourth, 5 of the fifth, 2 of the sixth

#### IV: Constellation of Cepheus

75	1	The star on the right leg	 9;00	+75;40	4
76	2	The one on the left leg	 3;00	+64;15	4
77	3	The star under the belt on the right side	 7;20	+71;10	4
78	4	The star over the right shoulder, which touches it	 16;40	+69;00	3
79	5	The star over the right elbow, which touches it	 9;20	+72;00	4
80	6	The one under that elbow, which also touches it	 10;00	+74;00	4
81	7	The star in the chest	 28;30	+65;30	5
82	8	The star on the left arm	 7;30	+62;30	4-3
83	9	The southernmost of the 3 stars on the tiara	 16;20	+60;15	5
84	10	The middle one of the three	 17;20	+61;15	4
85	11	The northernmost of the three	 19;00	+61;20	5

11 stars, 1 of the third magnitude, 7 of the fourth, 3 of the fifth

*Stars around Cepheus outside the constellation*

86	12	The one in advance of the tiara	♃ 13;40	+64;00	5
87	13	The one to the rear of the tiara	♃ 21;20	+59;30	4

2 stars outside the constellation, 1 of the fourth magnitude, 1 of the fifth

**V: Constellation of Bootes**

88	1	The most advanced of the three in the left arm	♃ 2;20	+58;40	5
89	2	The middle and southernmost of the three	♃ 4;10	+58;20	5
90	3	The rearmost of the three	♃ 9;40	+60;10	5
91	4	The star on the left elbow	♃ 9;40	+54;40	5
92	5	The star on the left shoulder	♃ 19;40	+49;00	3
93	6	The star on the head	♃ 26;40	+53;50	4-3
94	7	The star on the right shoulder	♃ 5;40	+48;40	4-3
95	8	The one to the north of these, on the staff	♃ 5;40	+53;15	4
96	9	The one farther to the north again of this, on the tip of the staff	♃ 5;00	+47;30	4
97	10	The northernmost of the two stars below the shoulder, in the club	♃ 7;40	+46;30	4-3
98	11	The southernmost of them	♃ 8;30	+45;30	5
99	12	The star on the end of the right arm	♃ 8;10	+41;40	5
100	13	The more advanced of the two stars on the wrist	♃ 6;40	+41;40	5
101	14	The rearmost of them	♃ 7;00	+42;30	5
102	15	The star on the end of the handle of the staff	♃ 7;40	+43;00	5
103	16	The star in the right thigh, in the apron	♃ 0;00	+44;00	3
104	17	The rearmost of the two stars in the belt	♃ 25;40	+41;40	4
105	18	The more advanced of them	♃ 25;00	+42;10	4-3
106	19	The star on the right heel	♃ 5;20	+28;10	3
107	20	The northernmost of the 3 stars in the lower left leg	♃ 21;20	+28;00	3
108	21	The middle one of the three	♃ 20;30	+26;30	4
109	22	The southernmost of them	♃ 21;20	+25;00	4

22 stars, 4 of the third magnitude, 9 of the fourth, 9 of the fifth

*Star under [Bootes] outside the constellation*

110	23	The star between the thighs, called "Arcturus", reddish	♃ 27;00	+31;30	1
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1 star of the first magnitude

**VI: Constellation of Corona Borealis**

111	1	The bright star in the crown	♃ 14;40	+44;30	2-1
112	2	The star most in advance of all	♃ 11;40	+46;30	4-3
113	3	The one to the rear and to the north of this	♃ 11;50	+48;00	5

114	4	The one to the rear and north again of this	♌ 13;40	+50;30	6
115	5	The one to the rear of the bright star from the south	♌ 17;10	+44;45	4
116	6	The one to the rear again of the latter, close by	♌ 19;10	+44;50	4
117	7	The one to the rear again of these	♌ 21;20	+46;10	4
118	8	The star to the rear of all [the others] in the crown	♌ 21;40	+49;20	4


8 stars, 1 of the second magnitude, 5 of the fourth, 1 of the fifth, 1 of the sixth

### VII: Constellation of Hercules











119	1	The star on the head	♌ 17;40	+37;30	3
120	2	The star on the right shoulder by the armpit	♌ 3;40	+43;00	3
121	3	The star on the right upper arm	♌ 1;40	+40;10	3
122	4	The star on the right elbow	♌ 28;00	+37;10	4
123	5	The star on the left shoulder	♌ 16;40	+48;00	3
124	6	The star on the left upper arm	♌ 22;00	+49;30	4-3
125	7	The star on the left elbow	♌ 27;40	+52;00	4-3
126	8	The rearmost of the 3 stars in the left wrist	♌ 5;30	+52;50	4-3
127	9	The northernmost of the other 2	♌ 1;40	+54;00	4-3
128	10	The southernmost of them	♌ 1;30	+53;00	4
129	11	The star in the right side	♌ 6;40	+50;40	4
130	12	The star in the left side	♌ 16;00	+53;30	5
131	13	The one north of the latter, on the left buttock	♌ 10;00	+56;30	5
132	14	The one on the place where the thigh joins the same [buttock]	♌ 11;10	+58;30	3
133	15	The most advanced of the 3 in the left thigh	♌ 14;00	+59;50	4
134	16	The one to the rear of this	♌ 15;20	+63;00	4
135	17	The one yet further to the rear of this	♌ 16;20	+61;15	4-3
136	18	The star on the left knee	♌ 0;50	+61;00	4
137	19	The star on the left shin	♌ 22;10	+69;20	4
138	20	The most advanced of the 3 stars in the left foot	♌ 15;20	+70;15	6
139	21	The middle one of the three	♌ 16;50	+71;15	6
140	22	The rearmost of them	♌ 19;40	+72;15	6
141	23	The star on the place where the right thigh joins [the buttock]	♌ 0;40	+64;00	4-3
142	24	The star north of it in the same thigh	♌ 25;20	+63;00	4
143	25	The star on the right knee	♌ 15;40	+65;30	4-3
144	26	The southernmost of the 2 stars under the right knee	♌ 13;40	+63;40	4
145	27	The northernmost of them	♌ 10;10	+64;00	4
146	28	The star in the right lower leg	♌ 11;10	+60;00	4
147		The star on the end of the right leg is the same as the one on the tip of the staff [Bootes 9]			

Not counting the latter, 28 stars, 6 of third magnitude, 17 of the fourth, 2 of the fifth, 3 of the sixth

*Star outside this constellation*

















148	29	The star south of the one in the right upper arm	 2;40	+38;10	5
1 star of fifth magnitude					

**VIII: Constellation of Lyra**

149	1	The star on the shell, called Lyra	 17;20	+62;00	1
150	2	The northernmost of the 2 stars lying near the latter, close together	 20;20	+62;40	4-3
151	3	The southernmost of them	 20;20	+61;00	4-3
152	4	The one to the rear of these, in between the points where the horns [of the lyre] are attached	 23;40	+60;00	4
153	5	The northernmost of the 2 stars close together in the region of the east of the shell	 2;00	+61;20	4
154	6	The southernmost of them	 1;40	+63;00	4
155	7	The northernmost of the two advance stars in the bridge	 24;00	+56;10	3
156	8	The southernmost of them	 20;50	+55;00	4-5
157	9	The northernmost of the two rear stars in the bridge	 24;10	+55;20	3
158	10	The southernmost of them	 21;00	+54;45	4-5

10 stars, 1 of the first magnitude, 2 of the third, 7 of the fourth

**IX: Constellation of Cygnus**

159	1	The star on the beak	 4;30	+49;00	3
160	2	The one to the rear of this, on the head	 9;00	+50;30	5
161	3	The star in the middle of the neck	 16;20	+54;30	4-3
162	4	The star in the breast	 28;30	+57;00	3
163	5	The bright star in the tail	 9;10	+60;00	2
164	6	The star in the bend of the right wing	 19;20	+64;40	3
165	7	The southernmost of the 3 in the right wing-feathers	 22;30	+69;40	4
166	8	The middle one of the three	 21;10	+71;30	4-3
167	9	The northernmost of them, on the tip of the wing-feathers	 12;30	+74;00	4-3
168	10	The star on the bend of the left wing	 0;50	+49;30	3
169	11	The star north of this, in the middle of the same wing	 3;50	+52;10	4-3
170	12	The star in the tip of the feathers of the left wing	 6;40	+44;00	3
171	13	The star on the left leg	 10;00	+55;10	4-3
172	14	The star on the left knee	 14;30	+57;00	4-3
173	15	The more advanced of the 2 stars in the right leg	 1;10	+64;00	4
174	16	The one to the rear	 2;40	+64;30	4



175	17	The nebulous star on the right knee	♆ 12;10	+63;45	5
17 stars, 1 of the second magnitude, 5 of the third, 9 of the fourth, 2 of the fifth					
<i>Stars around [Cygnus] outside the constellation</i>					
176	18	The southernmost of the 2 stars under the left wing	♆ 10;40	+49;40	4-3
177	19	The northernmost of them	♆ 13;50	+51;40	4-3
2 stars of the fourth magnitude					
<b>X: Constellation of Cassiopeia</b>					
178	1	The star on the head	♈ 7;50	+45;20	4-3
179	2	The star in the breast	♈ 13;20	+46;45	3
180	3	The one north of that, on the belt	♈ 13;00	+47;50	4
181	4	The star over the throne, just over the thighs	♈ 16;40	+49;00	3-2
182	5	The star between the knees	♈ 20;40	+45;30	3
183	6	The star on the lower leg	♈ 27;00	+47;45	4
184	7	The star on the end of the leg	♉ 1;40	+47;20	4
185	8	The star on the left upper arm	♈ 14;40	+44;20	4
186	9	The star below the left elbow	♈ 17;40	+45;00	5
187	10	The star on the right fore-arm	♈ 2;20	+50;00	6
188	11	The star above the foot of the throne	♈ 15;00	+52;40	4-5
189	12	The star on the middle of the back of the throne	♈ 7;50	+51;40	3
190	13	The star on the top of the throne-back	♈ 3;20	+51;40	6
17 stars, 1 of the second magnitude, 5 of the third, 9 of the fourth, 2 of the fifth					
<b>XI: Constellation of Perseus</b>					
191	1	The nebulous mass on the right hand	♈ 26;40	+40;30	neb
192	2	The star on the right elbow	♉ 1;10	+37;30	4
193	3	The star on the right shoulder	♉ 2;40	+34;30	3-4
194	4	The star on the left shoulder	♈ 27;30	+32;20	4
195	5	The star on the head	♉ 0;40	+34;30	4
196	6	The star on the place between the shoulders	♉ 1;30	+31;10	4
197	7	The star in the right side	♉ 4;50	+30;00	2
198	8	The most advanced of the 3 stars next to the one in the side	♉ 5;20	+27;50	4
199	9	The middle one of the three	♉ 7;00	+27;40	4
200	10	The rearmost of them	♉ 7;40	+27;20	3
201	11	The star on the left elbow	♉ 0;30	+27;00	4
202	12	The bright star [in the gorgon head]	♈ 29;40	+23;00	2
203	13	The one to the rear of this	♈ 29;10	+21;00	4
204	14	The one in advance of the bright star [in the gorgon head]	♈ 27;40	+21;00	4

205	15	The remaining one [in the gorgon head], yeat again in advance of this	♈ 26;50	+22;15	4
206	16	The star in the right knee	♈ 14;50	+28;00	4
207	17	The one in advance of this, over the knee	♈ 10;20	+28;10	4
208	18	The more advanced of the 2 sars above the bend in the knee	♈ 12;20	+30;00	4
209	19	The rearmost of them, just over the bend in the knee	♈ 14;00	+26;15	4
210	20	The star on the right calf	♈ 14;10	+24;30	5
211	21	The star on the right ankle	♈ 16;20	+18;45	5
212	22	The star in the left thigh	♈ 6;50	+24;50	4-3
213	23	The star on the left knee	♈ 8;40	+19;15	3
214	24	The star on the left lower leg	♈ 8;20	+14;45	4
215	25	The star on the left heel	♈ 4;10	+12;00	3-4
216	26	The one to the rear of this, on the left foot	♈ 6;20	+11;00	3-2

26 stars, 2 of the second magnitude, 5 of the third, 16 of the fourth, 2 of the fifth, [1] nebulous































*Stars around Perseus outside the constellation*

217	27	The star to the east of the one on the left knee [no. 23]	♈ 11;50	+18;00	5
218	28	The star to the north of this one in the right knee [no. 16]	♈ 15;00	+31;00	5
219	29	The star in advance of those in the Gorgon-head [nos. 12-15]	♈ 24;40	+20;40	1-0

3 stars, 2 of fifth magnitude, 1 faint

**XII: Constellation of Auriga**

220	1	The southernmost of the two on the head	♊ 2;30	+30;00	4
221	2	The northernmost [of these], over the head	♊ 2;20	+31;50	4
222	3	The star on the left shoulder, called Capella	♈ 25;00	+22;30	1
223	4	The star on the right shoulder	♊ 2;50	+20;00	2
224	5	The star on the right elbow	♊ 1;10	+15;15	4
225	6	The star on the right wrist	♊ 2;50	+13;20	4-3
226	7	The star on the left elbow	♈ 22;00	+20;40	4-3
227	8	The rearmost of the two star on the left wrist, which are called Haedi	♈ 22;10	+18;00	4-3
228	9	The more advanced of these	♈ 22;00	+18;00	4
229	10	The star on the left ankle	♈ 19;20	+10;10	3-4
230	11	The star on the right ankle, which is common to the horn [of Taurus]	♊ 2;40	+5;00	3-2
231	12	The one to the north of the latter, in the lower hem [of the garment]	♈ 26;00	+50;30	5
232	13	The one north again of this, on the buttock	♈ 26;20	+12;00	5

233	14	The small star over the left foot	 20;40	+16;00	6
14 stars, 1 of the first magnitude, 1 of the second, 2 of the third, 7 of the fourth, 2 of the fifth, 1 of the sixth					
<b>XIII: Constellation of Ophiuchus</b>					
234	1	The star on the head	 24;50	+36;00	3-2
235	2	The more advanced of the 2 stars on the right shoulder	 28;00	+27;15	4-3
236	3	The rearmost of them	 29;00	+26;30	4
237	4	The more advanced of the 2 stars on the left shoulder	 13;20	+33;00	4
238	5	The rearmost of them	 14;40	+31;50	4
239	6	The star on the left elbow	 8;20	+33;50	4
240	7	The more advanced of the 2 stars in the left hand	 5;00	+17;00	3
241	8	The rearmost of them	 6;00	+16;30	3
242	9	The star on the right elbow	 26;40	+15;00	4
243	10	The more advanced of the 2 stars in the right hand	 2;20	+13;40	4-5
244	11	The rearmost of them	 3;20	+14;20	4
245	12	The star on the right knee	 21;10	+7;30	3
246	13	The star on the right lower leg	 23;40	+2;15	4-3
247	14	The most advanced of the 4 stars on the right foot	 23;00	+2;15	4
248	15	The one to the rear of this	 24;20	+1;30	4-3
249	16	The one to the rear again of that	 25;00	+0;20	4
250	17	The last and rearmost of the 4	 25;50	+0;15	5
251	18	The star to the rear of these, which touches the heel	 27;10	+1;00	5
252	19	The star in the left knee	 12;10	+11;50	3
253	20	The northernmost of the 3 stars in a straight line in the left lower leg	 11;40	+5;20	5-4
254	21	The middle one of these	 12;40	+3;10	5
255	22	The southernmost of the three	 9;20	+1;20	5-4
256	23	The star on the left heel	 12;20	+0;40	5
257	24	The star touching the hollow of the left foot	 10;40	+0;45	4
24 stars, 5 of the third magnitude, 13 of the fourth, 6 of the fifth					
<i>Stars around Ophiuchus outside the constellation</i>					
258	25	The northernmost of the 3 to the east of the right shoulder	 2;00	+28;10	4
259	26	The middle one of the three	 2;40	+26;20	4
260	27	The southernmost of them	 3;00	+25;00	4
261	28	The star to the rear of these 3, approximately over the middle one	 3;40	+27;00	4
262	29	The lone star north of [these] 4 [nos. 25-28]	 4;40	+33;00	4

## 5 stars of the fourth magnitude

**XIV: Constellation of Serpens**

263	1	The star on the end of the jaw [of the quadrilateral in the heads]	♌ 18;50	+38;00	4
264	2	The star touching the nostrils [of the quadrilateral in the heads]	♌ 21;40	+40;00	4
265	3	The star in the temple [of the quadrilateral in the heads]	♌ 21;20	+36;00	3
266	4	The star where the neck joins [the head of the quadrilateral in the heads]	♌ 22;00	+31;15	3
267	5	The one in the middle of the quadrilateral, in the mouth [of the quadrilateral in the heads]	♌ 21;20	+37;15	4
268	6	The star outside the head, to the north of it	♌ 26;10	+42;30	4
269	7	The one after the first bend in the neck	♌ 21;40	+29;15	3
270	8	The northernmost of the 3 following this	♌ 24;45	+26;30	4
271	9	The middle one of the three	♌ 24;20	+25;20	3
272	10	The southernmost of them	♌ 26;20	+24;00	3
273	11	The star after the next bend which is in advance of the left hand of Ophiuchus	♌ 28;50	+16;30	3
274	12	The star to the rear of those in the hand [of Ophiuchus (Ophiuchus 7-8)]	♍ 8;10	+16;15	5
275	13	The one after the back of the right thigh of Ophiuchus	♍ 23;40	+10;30	4
276	14	The southernmost of the 2 to the rear of the latter	♍ 27;00	+8;30	4-3
277	15	The northernmost of them	♍ 27;50	+10;50	4
278	16	The one after the right hand [of Ophiuchus], on the bend in the tail	♎ 3;40	+20;00	4
279	17	The one to the rear of this, likewise on the tail	♎ 8;40	+21;10	4-3
280	18	The star on the tip of the tail	♎ 18;20	+27;00	4

18 stars, 5 of the third magnitude, 12 of the fourth, 1 of the fifth

**XV: Constellation of Sagitta**

281	1	The lone star on the arrow-head	♎ 16;00	+39;20	4
282	2	The rearmost of the three stars in the shaft	♎ 6;40	+39;10	6
283	3	The middle one	♎ 5;50	+39;50	5
284	4	The most advanced of the three	♎ 4;40	+39;00	5
285	5	The star on the end of the notch	♎ 3;20	+37;40	5

5 stars, 1 of the fourth magnitude, 3 of the fifth, 1 of the sixth

**XVI: Constellation of Aquila**

286	1	The star in the middle of the head	♏ 7;10	+26;50	4
287	2	The one in advance of this, on the neck	♏ 4;50	+27;10	3

288	3	The bright star on the place between the shoulders, called Aquila	♈ 3;50	+29;10	2-1
289	4	The one close to this towards the north	♈ 4;40	+30;00	3-4
290	5	The more advanced of the 2 in the left shoulder	♈ 3;10	+31;30	3
291	6	The rearmost of them	♈ 6;00	+31;30	5
292	7	The more advanced of the two in the right shoulder	♈ 29;40	+28;40	5
293	8	The rearmost of them	♈ 1;10	+26;40	5-4
294	9	The star some distance under the tail of Aquila, touching the Milky Way	♈ 22;10	+36;20	3

9 stars, 1 of the second magnitude, 4 of the third, 1 of the fourth, 3 of the fifth

*The stars around Aquila, to which the name 'Antinous' is given*

295	10	The more advanced of the 2 stars south of the head of Aquila	♈ 3;40	+21;40	3
296	11	The rearmost of them	♈ 8;50	+19;10	3
297	12	The star to the south and west of the right shoulder of Aquila	♈ 26;00	+25;00	4-3
298	13	The one star to the south of this	♈ 28;10	+20;00	3
299	14	The one to the south again of the latter	♈ 29;40	+15;30	5
300	15	The star most in advance of all	♈ 21;10	+18;10	3

6 stars, 4 of the third magnitude, 1 of the fourth, 1 of the fifth




### **XVII: Constellation of Delphinus**

301	1	The most advanced of the 3 stars in the tail	♈ 17;40	+29;00	3-4
302	2	The northernmost of the other 2	♈ 18;40	+29;00	4-5
303	3	The southernmost of them	♈ 18;40	+27;45	4
304	4	The southernmost one in the advance side [of the rhomboid quadrilateral]	♈ 18;30	+32;00	3-4
305	5	The northernmost of the one on the advance side [of the rhomboid quadrilateral]	♈ 20;10	+33;50	3-4
306	6	The southernmost of the one on the rear side of the rhombus	♈ 21;20	+32;00	3-4
307	7	The northernmost one on the rear side [of the rhomboid quadrilateral]	♈ 23;10	+33;00	3-4
308	8	The southern of the 3 stars between the tail and the rhombus	♈ 17;30	+30;15	6
309	9	The more advanced of the other 2 to the north	♈ 17;20	+31;50	6
310	10	The remaining, rearmost one	♈ 19;00	+31;30	6

10 stars, 5 of the third magnitude, 2 of the fourth, 3 of the sixth

### **XVIII: Constellation of Equuleus**

311	1	The more advanced of the 2 stars in the head	♈ 26;20	+20;30	f
312	2	The rearmost of them	♈ 28;00	+20;40	f
313	3	The more advanced of the two stars in the mouth	♈ 26;20	+25;30	f

314	4	The rearmost of them	 27;40	+25;00	f
4 stars, [all] faint					
<b>XIX: Constellation of Pegasus</b>					
315	1	The star on the navel, which is in common to the head of Andromeda	 17;50	+26;00	2-3
316	2	The star on the rump and the wing-tip	 12;10	+12;30	2-3
317	3	The star on the right shoulder and the place where the leg joins [it]	 2;10	+31;00	2-3
318	4	The star on the place between the shoulders and the shoulder-part of the wing	 26;40	+19;40	2-3
319	5	The northernmost of the two stars in the body under the wing	 4;30	+25;30	4
320	6	The southernmost of them	 5;00	+25;00	4
321	7	The northernmost of the two stars in the right knee	 29;00	+35;00	3
322	8	The southernmost of them	 28;30	+34;30	5
323	9	The more advanced of the two stars close together in the chest	 26;10	+29;00	4
324	10	The rearmost of them	 27;00	+29;30	4
325	11	The more advanced of the 2 stars close together on the neck	 18;50	+18;00	3
326	12	The rearmost of them	 20;30	+19;00	4
327	13	The southernmost of the two stars on the mane	 21;20	+15;00	5
328	14	The northernmost of them	 20;30	+16;00	5
329	15	The northernmost of the two stars close together on the head	 9;10	+16;50	3
330	16	The southernmost of them	 8;00	+16;00	4
331	17	The star in the muzzle	 5;20	+22;30	3-2
332	18	The star in the right hock	 23;40	+41;10	4-3
333	19	The star on the left knee	 17;40	+34;15	4-3
334	20	The star in the left hock	 12;20	+36;50	4-3
20 stars, 4 of the second magnitude, 9 of the fourth, 3 of the fifth					
<b>XX: Constellation of Andromeda</b>					
335	1	The star in the place between the shoulders	 25;20	+24;30	3
336	2	The star in the right shoulder	 26;20	+27;00	4
337	3	The star in the left shoulder	 24;20	+23;00	4
338	4	The southernmost of the 3 stars on the right upper arm	 23;40	+32;00	4
339	5	The northernmost of them	 24;40	+33;30	4
340	6	The middle one of the three	 25;00	+32;20	5
341	7	The southernmost of the 3 stars on the right hand	 19;40	+41;00	4
342	8	The middle one of these	 20;40	+42;00	4

343	9	The northernmost of the three	♋ 22;10	+44;00	4
344	10	The star on the left upper arm	♋ 24;10	+17;30	4
345	11	The star on the left elbow	♋ 25;40	+15;50	4
346	12	The southernmost of the 3 stars over the girdle	♋ 3;50	+25;20	3
347	13	The middle one of these	♋ 1;50	+30;00	4
348	14	The northernmost of the three	♋ 2;00	+32;30	4
349	15	The star over the left foot	♋ 16;50	+28;00	3
350	16	The star in the right foot	♋ 17;10	+37;20	4
351	17	The one south of the latter	♋ 15;10	+35;40	4-3
352	18	The northernmost of the 2 stars on the left knee-bend	♋ 12;20	+29;00	4
353	19	The southernmost of them	♋ 12;00	+28;00	4
354	20	The star on the right knee	♋ 10;10	+35;30	5
355	21	The northernmost of the two stars in the lower hem [of the garment]	♋ 12;40	+34;30	5
356	22	The southernmost of them	♋ 14;10	+32;30	5
357	23	The star in advance of the three in the right hand, outside [of it]	♋ 11;40	+44;00	3

23 stars, 4 of the third magnitude, 15 of the fourth, 4 of the fifth

#### XXI: Constellation of Triangulum

358	1	The star in the apex of the triangle	♋ 11;00	+16;30	3
359	2	The most advanced of the 3 on the base	♋ 16;00	+20;40	3
360	3	The middle one of these	♋ 16;20	+19;40	4
361	4	The rearmost of the three	♋ 16;50	+19;00	3

4 stars, 3 of the third magnitude, 1 of the fourth

**Total for the northern segment: 360 stars, 3 of the first magnitude, 18 of the second, 81 of the third, 177 of the fourth, 58 of the fifth, 13 of the sixth, 9 faint, 1 nebulous**

#### Constellations in the Zodiac

#### XXII: Constellation of Aries

362	1	The more advanced of the 2 stars on the horn	♈ 6;40	+7;20	3-4
363	2	The rearmost of them	♈ 7;40	+8;20	3
364	3	The northernmost of the 2 stars on the muzzle	♈ 11;00	+7;40	5
365	4	The southernmost of them	♈ 11;30	+6;00	5
366	5	The star on the neck	♈ 6;30	+5;30	5
367	6	The star on the rump	♈ 17;20	+6;00	6
368	7	The star on the place where the tail joins [the body]	♈ 21;20	+4;50	5
369	8	The most advanced on the 3 stars in the tail	♈ 23;50	+1;40	4
370	9	The middle one of the three	♈ 25;20	+2;30	4

371	10	The rearmost of them	♈ 27;00	+1;50	4
372	11	The star in the back of the thigh	♈ 19;40	+1;30	5
373	12	The star under the knee bend	♈ 18;00	-1;30	5
374	13	The star on the hind hoof	♈ 15;00	-5;15	4-3
13 stars, 2 of the third magnitude, 4 of the fourth, 6 of the fifth, 1 of the sixth					
<i>Stars around Aries outside the constellation</i>					
375	14	The star over the head, which Hipparchus [calls] 'the one on the muzzle'	♈ 10;40	+10;30	3-4
376	15	The rearmost [star over the rump], which is brighter [than the others]	♈ 21;40	+12;40	4
377	16	The northernmost of the other 3 fainter [stars over the rump]	♈ 21;20	+11;10	5
378	17	The middle one of these three [stars over the rump]	♈ 19;40	+11;10	5
379	18	The southernmost of them	♈ 19;10	+12;40	5
5 stars, 1 of the third magnitude, 1 of the fourth, 3 of the fifth					
<b>XXIII: Constellation of Taurus</b>					
380	1	The northernmost of the 4 stars in the cut-off	♈ 26;20	-6;00	4
381	2	The one close by this	♈ 26;00	-7;15	4
382	3	The one close again to the latter	♈ 24;20	-8;30	4
383	4	The southernmost of the 4	♈ 29;20	-9;15	4
384	5	The one to the rear of these, on the right shoulder-blade	♉ 3;40	-9;30	5
385	6	The star in the chest	♉ 6;40	-8;00	5
386	7	The star on the right knee	♉ 3;00	-12;40	4
387	8	The star on the right hock	♉ 12;10	-14;50	4
388	9	The star on the left knee	♉ 13;00	-10;00	4
389	10	The star on the left lower leg		-13;00	4
390	11	The [star in the Hyades] on the nostrils	♉ 9;00	-5;45	3-4
391	12	The [star in the Hyades] between this and the northern eye	♉ 10;20	-4;15	3-4
392	13	The [star in the Hyades] between it [no. 11] and the southern eye	♉ 10;20	-5;50	3-4
393	14	The bright star of the Hyades, the reddish one on the southern eye	♉ 12;40	-5;10	1
394	15	The remaining [star in the Hyades], on the northern eye	♉ 11;50	-3;00	3-4
395	16	The star on the place where the southern horn and the ear join [the head]	♉ 17;30	-4;00	4
396	17	The southernmost of the 2 stars on the southern horn	♉ 20;20	-5;00	5
397	18	The northernmost of these	♉ 20;00	-3;30	5



398	19	The star on the tip of the southern horn	♋ 27;40	-2;30	3
399	20	The star on the place where the northern horn joins [the head]	♋ 15;40	-4;00	4
400	21	The star on the tip of the northern horn, which is the same as the one on the right foot of Auriga (Auriga 11)	♋ 25;40	+5;00	3
401	22	The northernmost of the 2 stars close together in the northern ear	♋ 12;00	+0;30	5
402	23	The southernmost of them	♋ 11;40	+4;00	5
403	24	The more advanced of the 2 small stars in the neck	♋ 7;00	+0;40	5
404	25	The rearmost of them	♋ 9;00	+1;00	6
405	26	The southernmost star on the advance side [of the quadrilateral in the neck]	♋ 8;00	+5;00	5
406	27	The northernmost star on the advance side [of the quadrilateral in the neck]	♋ 8;30	+7;20	5
407	28	The southernmost star on the rear side [of the quadrilateral in the neck]	♋ 12;00	+3;00	5
408	29	The northernmost one on the rear side [of the quadrilateral in the neck]	♋ 11;40	+5;00	5
409	30	The northern end of the advance side [of the Pleiades]	♋ 2;10	+4;30	5
410	31	The southern end of the advance side [of the Pleiades]	♋ 2;20	+3;40	5
411	32	The rearmost and narrowest end of the Pleiades	♋ 3;40	+3;20	5
412	33	The small star outside the Pleiades, towards the north	♋ 3;40	+5;00	4
32 stars [21 not counted since it was previously counted as part of Auriga], 1 of the first magnitude, 6 of the third, 11 of the fourth, 13 of the fifth, 1 of the sixth					
<i>Stars around Taurus outside the constellation.</i>					
413	34	The star under the right foot and the shoulder blade	♌ 25;00	-17;30	4
414	35	The most advanced of the three stars over the southern horn	♋ 20;00	-2;00	5
415	36	The middle of the three	♋ 24;00	-1;45	5
416	37	The rearmost of them	♋ 26;00	-2;00	5
417	38	The northernmost of the 2 stars under the tip of the southern horn	♋ 29;00	-6;20	5
418	39	The southernmost of them	♋ 29;00	-7;40	5
419	40	The most advanced [of the stars under and to the rear of the northern horn]	♋ 27;00	+0;40	5
420	41	The one to the rear of this	♋ 29;00	+1;00	5
421	42	The one to the rear again of the latter [of the stars under and to the rear of the northern horn]	♌ 1;00	+1;20	5

422	43	The northernmost of the remaining, rearmost 2 [of the stars under and to the rear of the northern horn]	♊ 2;20	+3;20	5
423	44	The southernmost of these two [of the stars under and to the rear of the northern horn]	♊ 3;20	+1;15	5

11 stars, 1 of the fourth magnitude, 10 of the fifth

#### XXIV: Constellation of Gemini

424	1	The star on the head of the advance twin	♊ 23;20	+9;30	2
425	2	The reddish star on the head of the rear twin	♊ 26;40	+6;15	2
426	3	The star in the left forearm of the advance twin	♊ 16;40	+10;00	4
427	4	The star in the same [left] upper arm	♊ 18;40	+7;20	4
428	5	The one to the rear of that, just over the place between the shoulders	♊ 22;00	+5;30	4
429	6	The one to the rear of this, on the right shoulder of the same [advance] twin	♊ 24;00	+4;50	4
430	7	The star on the rear shoulder of the rear twin	♊ 26;40	+2;40	4
431	8	The star on the right side of the advance twin	♊ 21;40	+2;40	5
432	9	The star on the left side of the rear twin	♊ 26;10	+3;00	5
433	10	The star on the left knee of the advance twin	♊ 13;00	+1;30	3
434	11	The star under the left knee of the rear twin	♊ 18;15	-2;30	3
435	12	The star in the left groin of the rear twin	♊ 21;40	-0;30	3
436	13	The star over the bend in the right knee of the same [rear] twin	♊ 21;40	-0;40	3
437	14	The star on the forward foot of the advance twin	♊ 6;30	-1;30	4-3
438	15	The one to the rear of this on the same foot	♊ 8;30	-1;15	4-3
439	16	The star on the right foot of the advance twin	♊ 16;00	-3;30	4-3
440	17	The star on the left foot of the rear twin	♊ 12;00	-7;30	3
441	18	The star on the right foot of the rear twin	♊ 14;40	-10;30	4

18 stars, 2 of the second magnitude, 5 of the third, 9 of the fourth, 2 of the fifth

#### *Stars around Gemini outside the constellation*

442	19	The star in advance of the forward foot of the advance twin	♊ 4;10	-0;40	4
443	20	The bright star in advance of the advance knee	♊ 6;30	+5;50	4-3
444	21	The star in advance of the left knee of the rear twin	♊ 15;30	-2;15	5
445	22	The northernmost of the three stars in a straight line to the rear of the right arm of the rear twin	♊ 28;20	-1;20	5
446	23	The middle one of the three	♊ 26;20	-3;20	5
447	24	The southernmost of them, near the forearm of the [right] arm	♊ 26;40	-4;30	5
448	25	The bright star to the rear of the above-mentioned 3	♋ 0;40	-2;40	4

7 stars, 3 of the fourth magnitude, 4 of the fifth

<b>XXV: Constellation of Cancer</b>					
449	1	The middle of the nebulous mass in the chest, called Praesepe	♋ 10;20	+0;20	neb
450	2	The northernmost of the two stars in advance [in the quadrilateral containing the nebula]	♋ 7;40	+1;15	4-5
451	3	The southernmost of the two stars in advance [in the quadrilateral containing the nebula]	♋ 8;00	-1;10	4-5
452	4	The northernmost of the rear 2 stars in the quadrilateral, which are called 'Aselli' [the Asses]	♋ 10;20	+2;40	4
453	5	The southernmost of these two [stars in the quadrilateral containing the nebula]	♋ 11;20	-0;10	4-3
454	6	The star on the southern claw	♋ 16;30	-5;30	4
455	7	The star on the northern claw	♋ 13;20	+11;50	4
456	8	The star on the northern back leg	♋ 2;40	+1;00	5
457	9	The star on the southern back leg	♋ 7;10	-7;30	4-3
9 stars, 7 of the fourth magnitude, 1 of the fifth, 1 nebulous					
<i>Stars around Cancer outside the constellation</i>					
458	10	The star over the joint in the southern claw	♋ 19;40	-2;20	4
459	11	The star to the rear of the tip of the southern claw	♋ 21;10	-5;40	4-5
460	12	The more advanced of the two stars over the nebula and to the rear of it	♋ 14;00	+4;50	5
461	13	The rearmost of these [two]	♋ 17;00	+7;15	5
4 stars, 2 of the fourth magnitude, 2 of the fifth					
<b>XXVI: Constellation of Leo</b>					
462	1	The star on the tip of the nostrils	♌ 18;20	+10;00	4
463	2	The star in the gaping jaws	♌ 21;10	+7;30	4
464	3	The northernmost of the two stars in the head	♌ 24;20	+12;00	3
465	4	The southernmost of these	♌ 24;10	+9;30	3-2
466	5	The northernmost of the 3 stars in the neck	♌ 0;10	+11;00	3
467	6	The one close to this, the middle of the three	♌ 2;10	+8;30	2
468	7	The southernmost of them	♌ 0;40	+4;30	3
469	8	The star on the heart, called 'Regulus'	♌ 2;30	+0;10	1
470	9	The one south of this, about on the chest	♌ 3;30	-1;50	4
471	10	The star a little in advance of the star on the heart [no. 8]	♌ 0;00	-0;15	5
472	11	The star on the right knee	♌ 27;20	-0;00	5
473	12	The star on the right from claw-clutch	♌ 24;10	-3;40	6
474	13	The star on the left front claw-clutch	♌ 27;20	-4;10	4
475	14	The star on the left [front] knee	♌ 2;30	-4;15	4
476	15	The star on the left armpit	♌ 9;10	-6;00	4

477	16	The most advanced of the three stars in the belly	♌ 7;00	+4;00	6
478	17	The northernmost of the other, rearmost 2	♌ 10;20	+5;20	6
479	18	The southernmost of these [two]	♌ 12;10	+2;20	6
480	19	The more advanced of the two stars on the rump	♌ 11;20	+12;15	6
481	20	The rearmost of them	♌ 14;10	+13;40	2-3
482	21	The northernmost of the 2 stars in the buttocks	♌ 14;20	+11;10	5
483	22	The southernmost of them	♌ 16;20	+9;40	3
484	23	The star in the high thighs	♌ 20;20	+5;50	3
485	24	The star in the hind leg-bends	♌ 21;40	+1;15	4
486	25	The one south of this, about in the lower legs	♌ 21;40	-0;50	4
487	26	The star on the hind claw-clutches	♌ 27;30	-3;12	5
488	27	The star on the end of the tail	♌ 24;30	+11;50	1-2

27 stars, 2 of the first magnitude, 2 of the second, 6 of the third, 8 of the fourth, 5 of the fifth, 4 of the sixth.

*Stars around Leo outside the constellation*

489	28	The more advanced of the 2 over the back	♌ 6;00	+13;20	5
490	29	The rearmost of them	♌ 8;10	+15;30	5
491	30	The northernmost of the 3 under the flank	♌ 17;30	+1;10	4-5
492	31	The middle one of these	♌ 17;10	-0;30	5
493	32	The southernmost of them	♌ 18;00	-2;40	5
494	33	The northernmost part of the nebulous mass between the edges of Leo and Ursa [Major], called Coma [Berenices]	♌ 24;50	+30;00	f
495	34	The most advanced of the southern outrunners of Coma	♌ 24;20	+25;00	f
496	35	The rearmost of them, shaped like an ivy leaf	♌ 28;30	+25;30	f

5 stars, 1 of the fourth magnitude, 4 of the fifth, plus Coma [Berenices]

**XXVII: Constellation of Virgo**

497	1	The southernmost of the 2 stars in the top of the skull	♌ 25;20	+4;15	5
498	2	The northernmost of them	♌ 27;00	+5;40	5
499	3	The southernmost of the 2 stars to the rear of these, in the face	♍ 0;40	+8;00	5
500	4	The southernmost of them	♍ 0;10	+5;30	5
501	5	The star on the tip of the souther, left wing	♌ 29;00	+0;30	3
502	6	The most advanced of the 4 stars in the left wing	♍ 8;15	+1;10	3
503	7	The one to the rear of this	♍ 13;10	+2;50	3
504	8	The one to the rear again of this	♍ 17;10	+2;50	5
505	9	The last and rearmost of the 4	♍ 21;00	+1;40	4
506	10	The star in the right side under the girdle	♍ 14;20	+8;30	3

507	11	The most advanced of the 3 stars in the right, northern wing	♃ 8;10	+13;50	5
508	12	The southernmost of the other 2	♃ 16;00	+11;40	6
509	13	The northernmost of these, called 'Vindemiatrix'	♃ 12;10	+20;10	5-4
510	14	The star on the left hand, called 'Spica'	♃ 26;40	-2;00	1
511	15	The star under the apron, just about over the right buttock	♃ 24;50	+8;40	3
512	16	The northern star on the advance side [of the quadrilateral in the left thigh]	♃ 26;20	+3;20	5
513	17	The southern star on the advance side [of the quadrilateral in the left thigh]	♃ 27;15	+0;10	6
514	18	The northernmost of the 2 stars on the rear side [of the quadrilateral in the left thigh]	♃ 0;00	+1;30	4-5
515	19	The southernmost star on the rear side [of the quadrilateral in the left thigh]	♃ 28;00	-3;00	5
516	20	The star on the left knee	♃ 1;40	-1;30	5
517	21	The star in the back of the right thigh	♃ 28;00	+8;30	5
518	22	The middle star of the 3 in the garment-hem round the feet	♃ 6;20	+7;30	4
519	23	The southernmost of them	♃ 7;20	+2;40	4
520	24	The northernmost of the three	♃ 8;20	+11;40	4
521	25	The star on the left, southern foot	♃ 10;00	+0;30	4
522	26	The star on the right, northern foot	♃ 12;40	+0;50	3

26 stars, 1 of the first magnitude, 6 of the third, 7 of the fourth, 10 of the fifth, 2 of the sixth

*Stars around Virgo outside the constellation*

523	27	The most advanced of the three in a straight line under the left forearm	♃ 14;40	-3;30	5
524	28	The middle one of these	♃ 19;00	-3;30	5
525	29	The rearmost of the 3	♃ 22;15	-3;20	5
526	30	The most advanced of the 3 stars almost on a straight line under Spica	♃ 27;10	-7;10	6
527	31	The middle one of these, which is a double star	♃ 28;10	-8;20	5
528	32	The rearmost of the three	♃ 5;00	-7;50	6

6 stars, 4 of the fifth magnitude, 2 of the sixth

**XXVIII: Constellation of Libra**

529	1	The bright [star on the tip of the southern claw]	♃ 18;10	+0;40	2
530	2	The star to the north of this and fainter than it [on the tip of the southern claw]	♃ 17;00	+2;30	5
531	3	The bright [star on the tip of the northern claw]	♃ 22;10	+8;50	2
532	4	The fainter star in advance of this [on the tip of the southern claw]	♃ 17;40	+8;30	5
533	5	The star in the middle of the southern claw			

534	6	The one in advance of this on the same claw			
535	7	The star in the middle of the northern claw			
536	8	The one to the rear of this on the same claw	♌ 3;00	+3;30	4-5
8 stars, 2 of the second magnitude, 4 of the fourth, 2 of the fifth					
<i>Stars around Libra outside the constellation</i>					
537	9	The most advanced of the 3 stars north of the northern claw	♌ 26;10	+9;00	5
538	10	The southernmost of the rearmost 2 [of these]	♌ 3;40	+6;40	4-5
539	11	The northernmost of them	♌ 4;20	+9;15	4-5
540	12	The rearmost of the 3 stars between the claws	♌ 3;30	+0;30	6
541	13	The northernmost of the other 2 in advance [of the latter]	♌ 0;20	+0;20	5
542	14	The southernmost of them	♌ 1;10	-1;30	4
543	15	The most advanced of the 3 stars south of the southern claw	♌ 23;00	-7;30	3
544	16	The northernmost of the other , rear 2	♌ 1;10	-8;30	4
545	17	The southernmost of them	♌ 2;00	-9;40	4

9 stars, 1 of the third magnitude, 5 of the fourth, 2 of the fifth, 1 of the sixth

### XXIX: Constellation of Scorpius

546	1	The northernmost of the 3 bright stars in the forehead	♌ 6;20	+1;20	3
547	2	The middle one of these	♌ 5;40	-1;40	3
548	3	The southernmost of the three	♌ 5;40	-5;00	3
549	4	The star south again of this, on one of the legs	♌ 6;00	-7;50	3
550	5	The northernmost of the 2 stars adjacent to the northernmost of the [3] bright ones [no. 1]	♌ 7;00	+1;40	4
551	6	The southernmost of these	♌ 6;20	+0;30	4
552	7	The most advanced of the 3 bright stars in the body	♌ 10;40	-3;45	3
553	8	The middle one of these, which is reddish and called Antares	♌ 12;40	-4;00	2
554	9	The rearmost of the 3	♌ 14;30	-5;30	3
555	10	The advance star of the 2 under these, approximately on the last leg	♌ 9;20	-6;30	5
556	11	The rearmost of these	♌ 10;40	-6;40	5
557	12	The star in the first [tail] joint from the body	♌ 18;30	-11;00	3
558	13	The one after this, in the 2nd joint	♌ 18;50	-15;00	3
559	14	The southern star of the double star	♌ 20;00	-18;40	4
560	15	The northern star of the double-star in the 3rd joint	♌ 20;10	-18;00	4
561	16	The one following, in the 4th joint	♌ 23;10	-19;30	3
562	17	The one after that, in the 5th joint	♌ 28;10	-18;50	3

563	18	The next one again, in the 6th joint	♈ 0;30	-16;40	3
564	19	The star in the 7th joint, the joint next to the sting	♍ 29;00	-15;10	3
565	20	The rearmost of the 2 stars in the sting	♍ 27;30	-13;20	3
566	21	The more advanced of these	♍ 27;00	-13;30	4
21 stars, 1 of the second magnitude, 13 of the third, 5 of the fourth, 2 of the fifth					
<i>Stars around Scorpius outside the constellation</i>					
567	22	The nebulous star to the rear of the sting	♈ 1;10	-13;15	neb
568	23	The most advanced of the 2 stars to the north of the sting	♍ 25;30	-6;10	5-4
569	24	The rearmost of them	♍ 25;30	-1;10	5
3 stars, 2 of the fifth magnitude, 1 nebulous					
<b>XXX: Constellation of Sagittarius</b>					
570	1	The star on the point of the arrow	♈ 5;30	-6;20	3
571	2	The star in the [bow] grip held by the left hand	♈ 7;40	-6;30	3
572	3	The star in the southern portion of the bow	♈ 8;00	-10;50	3
573	4	The southernmost of the [2] stars in the northern portion of the bow	♈ 9;00	-0;30	3
574	5	The northernmost of these, on the tip of the bow	♈ 6;40	+2;50	4
575	6	The star on the left shoulder	♈ 15;20	-3;10	3
576	7	The one in advance of this, just over the arrow	♈ 13;00	-5;30	4
577	8	The star on the eye, which is nebulous and double	♈ 15;10	+0;45	neb
578	9	The most advanced of the 3 stars in the head	♈ 15;40	+2;10	4
579	10	The middle one of these	♈ 17;40	+1;30	4
580	11	The rearmost of the three	♈ 19;10	+2;00	4
581	12	The southernmost of the 3 stars in the northern cloak-attachment	♈ 21;20	+2;50	5
582	13	The middle one of these	♈ 22;20	+4;30	4
583	14	The northernmost of the three	♈ 25;20	+6;30	4
584	15	The faint star to the rear of these three	♈ 25;40	+5;30	6
585	16	The northernmost of the 2 stars on the southern cloak-attachment	♈ 29;30	+5;50	5
586	17	The southernmost of them	♈ 27;40	+2;00	6
587	18	The star on the right shoulder	♈ 22;40	-1;50	5
588	19	The star on the right elbow	♈ 24;50	-2;50	4
589	20	The one just above the place between the shoulders [of the three stars in the back]	♈ 20;00	-2;30	5
590	21	The middle one, just above the shoulder-blade [of the three stars in the back]	♈ 17;40	-4;30	4-3
591	22	The other one, under the armpit [of the three stars in the back]	♈ 16;20	-6;45	3



592	23	The star on the front left hock	♄ 17;40	-23;00	2
593	24	The one on the knee of the same leg	♄ 17;00	-18;00	2-3
594	25	The star on the front right hock	♄ 16;40	-13;00	3
595	26	The star on the left thigh	♄ 17;20	-13;30	3
596	27	The star on the right hind lower leg	♄ 23;50	-26;00	3
597	28	The advance star on the northern side [of the four stars forming a quadrilateral in the place where the tail joins the body]	♄ 27;20	-4;50	5
598	29	The rear star on the northern side [of the four stars forming a quadrilateral in the place where the tail joins the body]	♄ 28;50	-4;50	5
599	30	The advance star on the southern side [of the four stars forming a quadrilateral in the place where the tail joins the body]	♄ 28;50	-5;50	5
600	31	The rear star on the southern side [of the four stars forming a quadrilateral in the place where the tail joins the body]	♄ 29;40	-6;30	5

31 stars, 2 of the second magnitude, 9 of the third, 9 of the fourth, 8 of the fifth, 2 of the sixth, 1 nebulous

### XXXI: Constellation of Capricornus

601	1	The northernmost of the 3 stars in the rear horn	♄ 7;20	+7;20	3
602	2	The middle one of these	♄ 7;40	+6;40	6
603	3	The southernmost of the three	♄ 7;20	+5;00	3
604	4	The star on the tip of the advance horn	♄ 9;00	+8;00	6
605	5	The southernmost of the 3 stars in the muzzle	♄ 9;00	+0;45	6
606	6	The more advanced of the other two	♄ 8;40	+1;45	6
607	7	The rearmost of these	♄ 8;50	+1;30	6
608	8	The star in advance of the [above] 3, under the right eye	♄ 6;10	+0;40	5
609	9	The northernmost of the 2 stars in the neck	♄ 11;40	+3;50	6
610	10	The southernmost of them	♄ 11;50	+0;50	5
611	11	The star under the right knee	♄ 11;40	-8;40	4
612	12	The star on the left, doubled-up knee	♄ 10;20	-6;30	4
613	13	The star on the left shoulder	♄ 16;40	-7;40	4
614	14	The more advanced of the 2 stars close together under the belly	♄ 26;00	-6;50	4
615	15	The rearmost of these	♄ 23;20	-6;00	5
616	16	The rearmost of the 3 stars in the middle of the body	♄ 18;40	-4;15	5
617	17	The southernmost of the other, advance 2	♄ 16;40	-4;00	5
618	18	The northernmost of them	♄ 16;40	-2;50	5
619	19	The more advanced of the 2 stars in the back	♄ 16;40	-0;00	4
620	20	The rearmost of them	♄ 21;00	-0;50	4



















621	21	The more advanced of the 2 stars in the southern spine	♋ 23;20	-4;45	4
622	22	The rearmost of them	♋ 25;00	-4;30	4
623	23	The more advanced of the 2 stars in the section [of the body] next to the tail	♋ 21;50	-2;10	3
624	24	The rearmost of them	♋ 26;20	-2;00	3
625	25	The most advanced of the 4 stars on the northern portion of the tail	♋ 26;50	+3;00	4
626	26	The southernmost of the other 3	♋ 27;40	0;00	5
627	27	The middle one of these	♋ 27;40	+2;50	5
628	28	The northernmost of them, on the end of the tail-fin	♋ 28;40	+4;20	5

28 stars, 4 of the third magnitude, 9 of the fourth, 9 of the fifth, 6 of the sixth

### XXXII: Constellation of Aquarius

629	1	The star on the head of Aquarius	♋ 0;20	+15;45	5
630	2	The brighter of the 2 stars in the right shoulder	♋ 6;20	+11;00	3
631	3	The fainter one, under it	♋ 5;10	+9;40	5
632	4	The star in the left shoulder	♋ 26;30	+8;50	3
633	5	The one under that, in the back, approximately under the armpit	♋ 27;20	+6;15	5
634	6	The rearmost of the three stars in the left arm, on the coat	♋ 17;40	+5;30	3
635	7	The middle one of these	♋ 16;10	+8;00	4
636	8	The most advanced of the three	♋ 14;40	+8;40	3
637	9	The star in the right forearm	♋ 9;30	+8;45	3
638	10	The northernmost of the 3 stars on the right hand	♋ 11;40	+10;45	3
639	11	The more advanced of the other 2 to the south	♋ 12;00	+9;00	3
640	12	The rearmost of them	♋ 13;20	+8;30	3
641	13	The more advanced of the 2 stars close together in the hollow of the right [hip]	♋ 6;10	+3;00	4
642	14	The rearmost of them	♋ 7;00	+3;10	5
643	15	The star on the right buttock	♋ 8;40	-0;50	4
644	16	The southernmost of the 2 stars in the left buttock	♋ 1;40	-1;40	4
645	17	The northernmost of them	♋ 3;10	+4;00	6
646	18	The southernmost of the 2 stars in the right lower leg	♋ 11;40	-7;30	3
647	19	The northernmost of them, under the knee-bend	♋ 11;20	-5;00	4
648	20	The star in the back of the left thigh	♋ 4;40	-5;20	5
649	21	The southernmost of the 2 stars in the left lower leg	♋ 8;20	-10;00	5
650	22	The northernmost of these, under the knee	♋ 7;50	-9;00	5
651	23	The most advanced [in the flow of water] beginning at the hand	♋ 15;00	+2;00	4

652	24	The one next to the latter, towards the south [in the flow of water]	 14;50	+0;10	4
653	25	The one next to this, after [the beginning of the] bend [in the flow of water]	 17;40	-1;10	4
654	26	The one to the rear again of this [in the flow of water]	 20;00	-0;30	4
655	27	The one in the bend to the south of this [in the flow of water]	 20;30	-1;40	4
656	28	The northernmost of the 2 stars to the south of this [in the flow of water]	 19;00	-3;30	4
657	29	The southernmost of the two [in the flow of water]	 19;50	-4;10	4
658	30	The lone star at some distance from these [two] towards the south [in the flow of water]	 20;50	-8;15	5
659	31	The more advanced of the 2 stars close together after the latter [in the flow of water]	 22;20	-11;00	5
660	32	The rearmost of them [in the flow of water]	 23;10	-10;50	5
661	33	The northernmost of the 3 stars in the next group [in the flow of water]	 21;40	-10;15	5
662	34	The middle one of the three [in the flow of water]	 22;10	-14;45	5
663	35	The rearmost of them [in the flow of water]	 23;10	-15;40	5
664	36	The northernmost of the next 3 [arranged] likewise [in the flow of water]	 17;00	-14;10	4
665	37	The middle one of the three [of the above, in the flow of water]	 17;30	-15;00	4
666	38	The southernmost of the three [in the flow of water]	 18;20	-15;45	4
667	39	The most advanced of the 3 stars in the remaining group [in the flow of water]	 11;50	-14;45	4
668	40	The southernmost of the other 2 [in this group, in the flow of water]	 12;20	-15;20	4
669	41	The northernmost of them [in this group, in the flow of water]	 13;10	-16;00	4
670	42	The star at the end of the [flow of] water and on the mouth of Piscis Austrinus	 7;00	-20;20	4
42 stars, 1 of the first magnitude, 9 of the third, 18 of the fourth, 13 of the fifth, 1 of the sixth					
<i>Stars around Aquarius outside the constellation</i>					
671	43	The most advanced of the 3 stars to the rear of the bend in the water	 26;40	-15;30	4-3
672	44	Northernmost of the other 2	 29;40	-14;40	4-3
673	45	The southernmost of them	 29;00	-18;15	4-3
3 stars of magnitude greater than the fourth					
<b>XXXIII: Constellation of Pisces</b>					
674	1	The star in the mouth of the advance fish	 21;40	+9;15	4-3

675	2	The southernmost of the 2 stars in the top of its head	♁ 24;10	+7;30	4
676	3	The northernmost of them	♁ 26;00	+9;20	4
677	4	The more advanced of the 2 stars in the back	♁ 28;10	+9;30	4
678	5	The rearmost of them	♁ 0;40	+7;30	4
679	6	The more advanced of the 2 strs in the belly	♁ 26;00	+4;30	4
680	7	The rearmost of them	♁ 29;40	+3;30	4
681	8	The star in the tail of those on the same [advanced] fish	♁ 6;00	+6;20	4
682	9	The first after the tail [in the stars forming the fishing line]	♁ 11;00	+5;45	6
683	10	The first one to the rear [in the stars forming the fishing line]	♁ 13;00	+3;45	6
684	11	The most advanced of the 3 following bright stars [of those forming the fishing line]	♁ 17;10	+2;15	4
685	12	The middle one of these [in the stars forming the fishing line]	♁ 20;10	+1;10	4
686	13	The rearmost of the [above] three [in the stars forming the fishing line]	♁ 23;30	-6;00	4
687	14	The northernmost of the 2 small stars under these, in the bend [of the stars forming the fishing line]	♁ 22;20	-2;00	6
688	15	The southernmost of them [in the stars forming the fishing line]	♁ 23;20	-5;00	6
689	16	The most advanced of the 3 stars after the bend [in the stars forming the fishing line]	♁ 26;30	-2;20	4
690	17	The middle one of [the above, in the stars forming the fishing line]	♁ 28;40	-4;40	4
691	18	The rearmost of the [these three, in the stars forming the fishing line]	♁ 0;40	-7;45	4
692	19	The star on the knot joining the 2 fishing lines	♁ 2;30	-8;30	3
693	20	The first in the section beginning at the knot [in the northern fishing line]	♁ 0;30	-4;40	4
694	21	The southernmost of the 3 stars following after that [in the northern fishing line]	♁ 0;10	+1;50	5
695	22	The middle one of [the above, in the northern fishing line]	♁ 0;40	+5;20	3
696	23	The northernmost of the 3, which is also on the end of the tail [in the northern fishing line]	♁ 0;30	+9;00	4
697	24	The northernmost of the 2 stars in the mouth of the rear fish	♁ 2;00	+21;45	5
698	25	The southernmost of them	♁ 1;40	+21;40	5
699	26	The rearmost of the 3 small stars in the head	♁ 28;40	+20;00	6
700	27	The middle one of those	♁ 27;40	+19;50	6

701	28	The most advanced of the three	♋ 27;00	+23;00	6
702	29	The most advanced of the 3 stars on the spine in the back, following [i.e. to the rear of] the star on the elbow of Andromeda (Andromeda no. 11)	♋ 25;40	+14;20	4
703	30	The middle one of the three	♋ 26;40	+13;15	4
704	31	The rearmost of the three	♋ 27;40	+12;00	4
705	32	The northernmost of the 2 stars in the belly	♋ 2;10	+17;00	4
706	33	The southernmost of them	♋ 29;20	+15;20	4
707	34	The star in the rear spine, near the tail	♋ 0;00	+11;45	4

34 Stars, 2 of the third magnitude, 22 of the fourth, 3 of the fifth, 7 of the sixth

*Stars around Pisces outside the constellation*

708	35	The more advanced of the 2 northern stars [in the quadrilateral under the advance fish]	♋ 1;20	-2;40	4
709	36	The rearmost of [the stars in the quadrilateral under the advance fish]	♋ 2;15	-2;30	4
710	37	The more advanced star on the southern side [of the quadrilateral under the advance fish]	♋ 0;40	-5;30	4
711	38	The rearmost one on the southern side [of the quadrilateral under the advance fish]	♋ 2;20	-5;30	4

4 stars of the fourth magnitude

**Total for the zodiac: 346 stars, 5 of the first magnitude, 9 of the second, 64 of the third, 133 of the fourth, 105 of the fifth, 27 of the sixth, 3 nebulous, and Coma [Berenices]**

**XXXIV: Constellation of Cetus**

712	1	The star on the tip of the nostrils	♋ 17;40	-7;45	4
713	2	The rearmost [of the three stars in the snout], on the end of the jaw	♋ 17;40	-12;20	3
714	3	The middle [of the three stars in the snout], in the middle of the mouth	♋ 12;40	-11;30	3
715	4	The most advanced of the 3 [stars in the snout], on the cheek	♋ 10;30	-10;15	3
716	5	The star on the eyebrow and the eye	♋ 16;00	-8;10	4
717	6	The one to the north of this, about on the hair	♋ 12;40	-6;20	4
718	7	The one in advance of this, about on the mane	♋ 7;40	-4;10	4
719	8	The northernmost star on the advance side [of the quadrilateral in the chest]	♋ 3;00	-24;30	4
720	9	The southernmost one on the advance side [of the quadrilateral in the chest]	♋ 3;20	-28;00	4
721	10	The northernmost one on the rear side [of the quadrilateral in the chest]	♋ 6;40	-25;10	4
722	11	The southernmost of the one on the rear side [of the quadrilateral in the chest]	♋ 7;00	-27;30	3
723	12	The midmost of the 3 stars in the body	♋ 22;00	-25;20	3

724	13	The southernmost of them	♃ 23;00	-26;20	4
725	14	The northernmost of the three	♃ 25;00	-26;00	3
726	15	The rearmost of the 2 stars by the section next to the tail	♃ 19;40	-15;40	3
727	16	The more advanced of them	♃ 15;00	-15;40	3
728	17	The northernmost star on the rear side [of the quadrilateral in the section next to the tail]	♃ 11;00	-13;40	5
729	18	The southernmost one on the rear side [of the quadrilateral in the section next to the tail]	♃ 10;40	-14;40	5
730	19	The northernmost one on the advance side [of the quadrilateral in the section next to the tail]	♃ 9;20	-13;00	5-4
731	20	The southernmost one on the advance side [of the quadrilateral in the section next to the tail]	♃ 9;00	-14;00	5-4
732	21	The star on the northern [tail-fin]	♃ 4;40	-9;40	3-4
733	22	The star on the end of the southern tail-fin	♃ 5;40	-23;00	3

22 stars, 10 of third magnitude, 8 of the fourth, 4 of the fifth

### XXXV: Constellation of Orion

734	1	The nebulous star in the head of Orion	♃ 27;00	-13;30	neb
735	2	The bright, reddish star on the right shoulder	♃ 2;00	-17;00	1-2
736	3	The star on the left shoulder	♃ 24;00	-17;30	2
737	4	The one under this to the rear	♃ 25;00	-18;00	4-5
738	5	The star on the right elbow	♃ 4;20	-14;30	4
739	6	The star on the right forearm	♃ 6;20	-11;50	6
740	7	The rear, double star on the southern side [of the quadrilateral in the right hand]	♃ 6;30	-10;00	4
741	8	The advance star on the southern side [of the quadrilateral in the right hand]	♃ 6;00	-9;45	4
742	9	The rear one on the northern side [of the quadrilateral in the right hand]	♃ 7;40	-8;15	6
743	10	The advance one on the northern side [of the quadrilateral in the right hand]	♃ 6;40	-8;15	6
744	11	The more advanced of the 2 stars in the staff	♃ 1;40	-3;45	5
745	12	The rearmost of them	♃ 4;40	-4;15	5
746	13	The rearmost of the 4 stars almost on a straight line just over the back	♃ 27;50	-19;40	4
747	14	The one in advance of this	♃ 26;20	-20;00	6
748	15	The one in advance again of this	♃ 25;20	-20;20	6
749	16	The last and most advanced of the 4	♃ 21;10	-20;40	5
750	17	The northernmost [star on the pelt on the left arm]	♃ 20;30	-8;00	4
751	18	The 2nd from the northernmost [star on the pelt on the left arm]	♃ 19;20	-8;10	4

752	19	The 3rd from the northernmost [star on the pelt on the left arm]	♋ 18;00	-10;15	4
753	20	The 4th from the northernmost [star on the pelt on the left arm]	♋ 16;20	-12;50	4
754	21	The 5th from the northernmost [star on the pelt on the left arm]	♋ 15;10	-14;15	4
755	22	The 6th from the northernmost [star on the pelt on the left arm]	♋ 16;50	-15;50	3
756	23	The 7th from the northernmost [star on the pelt on the left arm]	♋ 14;50	-17;10	3
757	24	The 8th from the northernmost [star on the pelt on the left arm]	♋ 15;20	-20;20	3
758	25	The last and southernmost of those in the pelt	♋ 16;20	-21;30	3
759	26	The most advanced of the 3 stars on the belt	♋ 25;20	-24;10	2
760	27	The middle one [of the 3 stars on the belt]	♋ 27;20	-24;50	2
761	28	The rearmost of the three [stars on the belt]	♋ 28;10	-25;40	2
762	29	The star near the handle of the dagger	♋ 23;50	-25;50	3
763	30	The northernmost of the 3 stars joined together at the tip of the dagger	♋ 26;30	-28;20	4
764	31	The middle one	♋ 26;40	-29;10	3
765	32	The southernmost of the three	♋ 27;00	-29;50	3-4
766	33	The rearmost of the 2 stars under the tip of the dagger	♋ 27;40	-30;40	4
767	34	The more advanced of them	♋ 26;30	-30;50	4
768	35	The bright star in the left foot, which is in common to the water [of Eridanus]	♋ 19;50	-31;30	1
769	36	The star to the north of it in the lower leg, over the ankle-joint	♋ 21;00	-30;15	4-3
770	37	The star under the left heel, outside	♋ 22;20	-31;10	4
771	38	The star under the right, rear heel	♌ 0;10	-33;30	3-2

38 stars, 2 of the first magnitude, 4 of the second, 8 of the third, 15 of the fourth, 3 of the fifth, 6 of the sixth, [1] nebulous

### XXXVI: Constellation of Eridanus

772	1	The star after the one in the foot of Orion [Orion no. 35], at the beginning of the river	♋ 18;20	-31;50	4-3
773	2	The one north of this, in the curve near the shin of Orion	♋ 18;50	-28;15	4
774	3	The rearmost of the 2 stars next in order after this	♋ 18;00	-29;50	4
775	4	The more advanced of them	♋ 14;40	-28;15	4
776	5	The rearmost of the next 2 in order again	♋ 13;10	-25;50	4
777	6	The more advanced of them	♋ 10;10	-25;20	4
778	7	The rearmost of the 3 stars after this	♋ 6;20	-26;00	5
779	8	The middle one of these	♋ 5;30	-27;00	4

780	9	The most advanced of the three	♋ 2;50	-27;50	4
781	10	The rearmost of the four stars in the next interval	♋ 27;00	-32;50	3
782	11	The one in advance of this	♋ 24;20	-31;00	4
783	12	The one in advance again of this	♋ 21;10	-28;50	3
784	13	The most advanced of the 4	♋ 22;00	-28;00	3
785	14	The rearmost of the 4 stars in the next interval again	♋ 17;10	-25;30	3
786	15	The one in advance of this	♋ 11;50	-23;50	4
787	16	The one in advance again of this	♋ 12;10	-23;30	3
788	17	The most advanced of the 4	♋ 10;30	-23;15	4
789	18	The first star in the bend of the river, which touches the chest of Cetus	♋ 5;10	-32;10	4
790	19	The one to the rear of this	♋ 5;50	-34;50	4
791	20	The most advanced of the next [group of] three	♋ 8;50	-38;30	4
792	21	The middle one of these	♋ 13;50	-38;10	4
793	22	The rearmost of the three	♋ 17;30	-39;00	4
794	23	The northern one on the advance side [of the next four stars, that nearly form a trapezium]	♋ 21;20	-41;20	4
795	24	The southernmost on the advance side [of the next four stars, that nearly form a trapezium]	♋ 21;30	-42;30	5
796	25	The more advanced one on the rear side [of the next four stars, that nearly form a trapezium]	♋ 22;10	-43;15	4
797	26	The last of the 4, the rear one on that size [of the next four stars, that nearly form a trapezium]	♋ 24;40	-43;20	4
798	27	The northernmost of the 2 stars close together at some distance to the east	♋ 4;10	-53;20	4
799	28	The southernmost of them	♋ 5;00	-54;45	4
800	29	The rearmost of the next 2 stars after the bend	♋ 28;10	-53;50	4
801	30	The more advanced of them	♋ 25;30	-53;10	4
802	31	The rearmost of the 3 stars in the next interval	♋ 17;50	-53;00	4
803	32	The middle one	♋ 14;50	-53;30	4
804	33	The most advanced of the three	♋ 11;50	-52;00	4
805	34	The last star of the river, the bright one	♋ 0;10	-53;30	1

34 stars, 1 of the first magnitude, 5 of the third, 26 of the fourth, 2 of the fifth

### XXXVII: Constellation of Lepus

806	1	The northern star on the advance side [of the quadrilateral just over the ears]	♋ 19;40	-35;00	5
807	2	The southern star on the advance side [of the quadrilateral just over the ears]	♋ 19;50	-36;30	5
808	3	The northern star on the rear side [of the quadrilateral just over the ears]	♋ 21;20	-35;40	5



809	4	The southern star on the rear side [of the quadrilateral just over the ears]	♃ 21;20	-36;40	5
810	5	The star in the cheek	♃ 19;10	-39;15	4-3
811	6	The star on the left front foot	♃ 16;10	-45;15	4-3
812	7	The star in the middle of the body	♃ 25;50	-41;30	3
813	8	The star under the belly	♃ 24;50	-44;20	3
814	9	The northernmost of the 2 stars in the hind legs	♃ 1;00	-44;00	4
815	10	The southernmost of them	♃ 29;00	-45;50	4
816	11	The star on the rump	♃ 0;00	-38;20	4
817	12	The star on the tip of the tail	♃ 2;40	-38;10	4

12 stars, 2 of the third magnitude, 6 of the fourth, 4 of the fifth

### XXXVIII: Constellation of Canis Major

818	1	The star in the mouth, the brightest, which is called "the Dog" and is reddish	♃ 17;40	-39;10	1
819	2	The star on the ears	♃ 19;40	-35;00	4
820	3	The star on the head	♃ 21;20	-36;30	5
821	4	The northernmost of the 2 stars in the neck	♃ 23;20	-37;45	4
822	5	The southernmost of them	♃ 25;20	-40;00	4
823	6	The star on the chest	♃ 20;30	-42;40	5
824	7	The northernmost of the 2 stars on the right knee	♃ 16;10	-41;15	6
825	8	The southernmost of them	♃ 16;00	-42;30	5
826	9	The star on the end of the front leg	♃ 11;00	-41;20	3
827	10	The more advanced of the 2 stars in the left knee	♃ 14;40	-46;30	5
828	11	The rearmost of them	♃ 16;10	-45;50	5
829	12	The rearmost of the 2 stars in the left shoulder	♃ 24;40	-46;10	4
830	13	The more advanced of them	♃ 21;40	-47;00	5
831	14	The star in the place where the left thigh joins [the body]	♃ 26;40	-48;45	3-4
832	15	The star below the belly, in the middle of the thighs	♃ 23;40	-51;30	3
833	16	The star on the joint of the right leg	♃ 23;00	-55;10	4
834	17	The star on the end of the right leg	♃ 9;40	-53;45	3
835	18	The star on the tail	♃ 2;10	-50;40	3-4

18 stars, 1 of the first magnitude, 5 of the third, 5 of the fourth, 7 of the fifth

#### *Stars around Canis Major outside the constellation*

836	19	The star to the north of the top of Canis	♃ 19;30	-25;15	4
837	20	The southernmost of the 4 stars almost on a straight line under the hind legs	♃ 10;00	-61;30	4
838	21	The one north of this	♃ 11;20	-58;45	4
839	22	The one north again of this	♃ 13;00	-57;00	4
840	23	The last and northernmost of the 4	♃ 14;10	-56;00	4



841	24	The most advanced of the 3 stars almost on a straight line west of the [above] four	♁ 28;00	-55;30	4
842	25	The middle one	♁ 0;20	-57;40	4
843	26	The rearmost of the three	♁ 2;20	-59;50	4
844	27	The rearmost of the 2 bright stars under these	♁ 29;00	-59;40	2
845	28	The more advanced of them	♁ 26;00	-57;40	2
846	29	The last star, to the south of the above	♁ 22;10	-59;30	4

11 stars, 2 of the second magnitude, 9 of the fourth

### XXXIX: Constellation of Canis Minor

847	1	The star in the neck	♁ 25;00	-14;00	4
848	2	The bright star just over the hindquarters, called 'Procyon'	♁ 29;30	-16;10	1

2 stars, 1 of the first magnitude, 1 of the fourth

### XL: Constellation of Argo

849	1	The more advanced of the 2 stars in the stern-ornament	♁ 10;20	-42;30	5
850	2	The rearmost of them	♁ 14;20	-43;20	3
851	3	The northernmost of the 2 stars close together over the little shield in the poop	♁ 8;50	-45;00	4
852	4	The southernmost of them	♁ 8;40	-46;00	4
853	5	The star in advance of these	♁ 5;20	-45;30	4
854	6	The bright star in the middle of the little shield	♁ 6;20	-47;15	3
855	7	The most advanced of the 3 stars under the little shield	♁ 5;20	-49;45	4
856	8	The rearmost of them	♁ 9;20	-49;50	4
857	9	The middle one of the three	♁ 8;30	-49;15	4
858	10	The star on the goose[-neck]	♁ 14;00	-49;50	4
859	11	The northernmost of the 2 stars in the stern-keel	♁ 4;00	-53;00	4
860	12	The southernmost of them	♁ 4;00	-58;40	3
861	13	The northernmost [star in the poop-deck]	♁ 10;10	-55;30	5
862	14	The most advanced of the next 3 [stars in the poop-deck]	♁ 12;10	-58;40	5
863	15	The middle one [of the stars in the poop-deck]	♁ 13;40	-57;15	4
864	16	The rearmost of the three [of the stars in the poop-deck]	♁ 16;30	-57;45	4
865	17	The bright star on the deck to the rear of these	♁ 21;10	-58;40	2
866	18	The more advanced of the 2 faint stars under the bright one	♁ 18;10	-60;00	5
867	19	The rearmost of them	♁ 21;00	-59;20	5
868	20	The more advanced of the 2 stars over the above-mentioned bright one	♁ 23;10	-56;20	5

869	21	The rearmost of them	♁ 24;20	-57;40	5
870	22	The northernmost of the 3 stars on the little shields, about on the mast holder	♁ 5;40	-51;30	4-3
871	23	The middle one	♁ 6;10	-55;40	4-3
872	24	The southernmost of the three	♁ 4;00	-57;10	4-3
873	25	The northernmost of the 2 stars close together under these	♁ 9;10	-60;00	4-3
874	26	The southernmost of them	♁ 9;00	-61;15	4-3
875	27	The southernmost of the 2 stars in the middle of the mast	♁ 0;10	-51;40	3
876	28	The northernmost of them	♁ 29;20	-49;00	3
877	29	The more advanced of the 2 stars by the tip of the mast	♁ 28;00	-43;20	4
878	30	The rearmost of them	♁ 29;00	-43;30	4
879	31	The star below the 3rd and rearmost little shield	♁ 14;10	-51;30	2
880	32	The star on the cut-off of the deck	♁ 17;30	-51;15	2-3
881	33	The star between the steering-oars, in the keel	♁ 11;10	-63;00	4
882	34	The faint star to the rear of this	♁ 19;00	-64;30	6
883	35	The bright star to the rear of this, under the deck	♁ 0;00	-63;50	2
884	36	The bright star to the south of this, on the lower [part of the] keel	♁ 8;30	-69;40	2
885	37	The most advanced of the 3 stars to the rear of this	♁ 15;10	-65;40	2
886	38	The middle one	♁ 21;20	-65;50	3
887	39	The rearmost of the three	♁ 26;00	-67;20	2
888	40	The more advanced of the 2 stars to the rear of these, near the cut-off	♁ 1;00	-62;50	3
889	41	The rearmost of them	♁ 8;00	-62;15	3
890	42	The more advanced of the 2 stars in the northern, advance steering-oar	♁ 4;00	-65;50	4-3
891	43	The rearmost of them	♁ 20;10	-65;40	3-2
892	44	The more advanced of the 2 stars in the other steering-oar, called 'Canopus'	♁ 17;10	-75;00	1
893	45	The other, rearmost star	♁ 29;00	-71;45	3-2

45 stars, 1 of the first magnitude, 6 of the second, 11 of the third, 19 of the fourth, 7 of the fifth, 1 of the sixth

### XLI: Constellation of Hydra

894	1	The southernmost of the 2 advance [stars in the head], which is on the nostrils	♁ 14;00	-15;00	4
895	2	The northernmost of these [2], which is above the eye	♁ 13;20	-13;40	4
896	3	The northernmost of the 2 to the rear of these [in the head], which is about on the skull	♁ 15;20	-11;30	4
897	4	The southernmost of them, on the gaping jaws	♁ 15;30	-14;15	4

898	5	The rearmost of all [of the stars in the head], about on the cheek	♁ 17;50	-12;15	4
899	6	The more advanced of the 2 stars in the place where the neck joins [the head]	♁ 23;00	-11;50	5
900	7	The rearmost of them	♁ 23;20	-13;40	4
901	8	The middle star of the following three in the bend of the neck	♁ 28;50	-15;20	4
902	9	The rearmost of the 3	♁ 0;40	-14;50	4
903	10	The southernmost of them, on the gaping jaws	♁ 28;30	-17;10	4
904	11	The faint, northernmost star of the 2 close together to the south	♁ 29;10	-19;45	6
905	12	The bright one of these two close stars	♁ 0;00	-20;30	2
906	13	The most advanced of the 3 stars to the rear, after the bend [in the neck]	♁ 6;00	-26;30	4
907	14	The middle one	♁ 8;40	-26;00	4
908	15	The rearmost of the three	♁ 11;10	-26;15	4
909	16	The most advanced of the next 3 stars, almost on a straight line	♁ 18;00	-24;40	3
910	17	The middle one	♁ 20;00	-23;00	4
911	18	The rearmost of the three	♁ 23;00	-22;10	3
912	19	The northernmost of the 2 stars after [i.e., to the rear of] the base of Crater	♁ 1;30	-25;45	4-3
913	20	The southernmost of them	♁ 4;20	-36;00	4
914	21	The most advanced of the 3 stars after these, as it were in a triangle	♁ 12;10	-31;20	4
915	22	The middle and southernmost of one	♁ 11;30	-36;10	4
916	23	The rearmost of the three	♁ 16;10	-31;20	3
917	24	The star after Corvus, in the section by the tail	♁ 0;00	-33;40	4-3
918	25	The star on the tip of the tail	♁ 3;30	-17;20	4-3

25 stars, 1 of the second magnitude, 3 of the third, 19 of the fourth, 1 of the fifth, 1 of the sixth

*Stars around Hydra outside the constellation*

919	26	The star to the south of the head	♁ 12;30	-23;15	3
920	27	The star some distance to the rear of those in the neck [Hydra nos. 6-15]	♁ 11;00	-16;00	3

2 stars of the third magnitude

**XLII: Constellation of Crater**

921	1	The star in the base of the bowl, which is in common to Hydra	♁ 26;20	-23;00	4
922	2	The southernmost of the 2 stars in the middle of the bowl	♁ 2;30	-19;30	4
923	3	The northernmost of them	♁ 0;00	-18;00	4
924	4	The star on the southern rim of the mouth	♁ 7;00	-18;30	4-3




925	5	The star on the northern rim	♁ 29;20	-13;40	4
926	6	The star on the southern handle	♁ 9;10	-16;10	4-5
927	7	The star on the northern handle	♁ 1;40	-11;50	4
7 stars of the fourth magnitude					
<b>XLIII: Constellation of Corvus</b>					
928	1	The star in the beak, which is common to Hydra	♁ 15;20	-21;40	3
929	2	The star in the neck, by the head	♁ 14;20	-19;40	3
930	3	The star in the breast	♁ 16;40	-18;10	5
931	4	The star in advance, right wing	♁ 13;30	-14;50	3
932	5	The more advanced of the 2 stars in the rear wing	♁ 16;40	-12;30	3
933	6	The rearmost of them	♁ 17;00	-11;45	4
934	7	The star on the end of the leg, which is in common to Hydra	♁ 20;30	-18;10	3
7 stars, 5 of the third magnitude, 1 of the fourth, 1 of the fifth					
<b>XLIV: Constellation of Centaurus</b>					
935	1	The southernmost of the 4 stars in the head	♁ 10;30	-21;40	5-4
936	2	The northernmost of them	♁ 10;00	-18;50	5-4
937	3	The more advanced of the other, middle 2	♁ 9;10	-20;30	4-3
938	4	The rearmost of these, last of the 4	♁ 10;00	-20;00	5-4
939	5	The star on the left, advance shoulder	♁ 6;10	-25;40	3
940	6	The star on the right shoulder	♁ 15;00	-20;30	3
941	7	The star on the left shoulder-blade	♁ 9;10	-27;30	4
942	8	The northernmost of the advance 2 [stars in the thyrsus]	♁ 18;10	-22;20	4
943	9	The southernmost of these [stars in the thyrsus]	♁ 19;10	-23;45	4
944	10	The one of the other two which is at the tip of the thyrsus	♁ 22;00	-18;15	4
945	11	The last one, south of the latter	♁ 22;30	-20;50	4
946	12	The most advanced of the 3 stars in the right side	♁ 13;20	-28;20	4-3
947	13	The middle one	♁ 14;00	-29;20	4-3
948	14	The rearmost of the three	♁ 15;10	-28;00	4-3
949	15	The star on the right upper arm	♁ 16;20	-26;10	4-3
950	16	The star on the right forearm	♁ 22;50	-25;00	3
951	17	The star in the right hand	♁ 27;30	-24;00	4
952	18	The bright star in the place where the human body joins [the horse's]	♁ 18;00	-33;30	3-2
953	19	The rearmost of the 2 faint stars to the north of this	♁ 17;40	-31;00	5
954	20	The more advanced of them	♁ 16;50	-33;00	5
955	21	The star on the place where the back joins [the horse's body]	♁ 12;10	-31;50	5

956	22	The star in advance of this, on the horse's back	♋ 9;00	-37;40	5
957	23	The rearmost of the stars on the rump	♋ 5;50	-40;00	3
958	24	The middle one	♋ 5;00	-43;00	4
959	25	The most advanced of the three	♋ 2;40	-41;00	5
960	26	The more advanced of the 2 stars close together on the right thigh	♋ 2;40	-46;10	3
961	27	The rearmost of them	♋ 3;30	-46;45	4
962	28	The star in the chest, under the horse's armpit	♋ 18;20	-42;45	4
963	29	The more advanced of the 2 stars under the belly	♋ 16;20	-43;00	2
964	30	The rearmost of them	♋ 17;40	-43;45	3
965	31	The star on the knee-bend of the right [hind] leg	♋ 10;00	-51;10	2
966	32	The star in the hock of the same leg	♋ 15;20	-51;40	2
967	33	The star under the right knee-bend of the left [hind] leg	♋ 6;20	-55;10	4
968	34	The star on the frog of the hoof on the same leg	♋ 11;10	-55;20	2
969	35	The star on the end of the right front leg	♌ 8;20	-44;10	1
970	36	The star on the knee of the left [front] leg	♋ 24;10	-45;20	2
971	37	The star outside, under the right hind leg	♋ 14;40	-49;10	4

37 stars, 1 of the first magnitude, 5 of the second, 7 of the third, 16 of the fourth, 8 of the fifth








#### XLV: Constellation of Lupus

972	1	The star at the end of the hind leg, by the [right] hand of Centaurus	♋ 28;00	-24;50	3
973	2	The southernmost of them	♋ 25;50	-29;10	3
974	3	The more advanced of the 2 stars just over the shoulder-blade	♌ 1;00	-21;15	4
975	4	The rearmost of them	♌ 4;10	-21;00	4
976	5	The star in the middle of the body of Lupus	♌ 3;00	-25;10	4
977	6	The star in the belly, under the flank	♌ 0;10	-27;00	5
978	7	The star on the thigh	♌ 0;40	-29;00	5
979	8	The northernmost of the 2 stars near the place there the thigh joins [the body]	♌ 4;40	-28;30	5
980	9	The southernmost of them	♌ 4;40	-30;10	5
981	10	The star on the end of the rump	♌ 5;40	-33;10	5
982	11	The southernmost of the 3 stars in the end of the tail	♋ 22;00	-31;20	5
983	12	The middle one of the three	♋ 21;50	-30;30	4
984	13	The northernmost of them	♋ 23;00	-29;20	4-3
985	14	The southernmost of the 2 stars in the neck	♌ 8;50	-17;00	4
986	15	The northernmost of them	♌ 9;20	-15;20	4-3
987	16	The more advanced of the 2 stars in the snout	♌ 5;40	-13;20	4

988	17	The rearmost of them	 6;40	-11;50	4
989	18	The southernmost of the 2 stars in the front leg	 21;10	-11;50	4-3
990	19	The northernmost of them	 26;30	-10;00	4-3














19 stars, 2 of the third magnitude, 11 of the fourth, 6 of the fifth

#### XLVI: Constellation of Ara

991	1	The northernmost of the 2 stars in the base	 27;40	-22;40	5
992	2	The southernmost of them	 3;00	-25;45	4
993	3	The star in the middle of the little star	 26;10	-26;30	4-3
994	4	The northernmost of the 3 stars in the brazier	 20;40	-30;20	5
995	5	The southernmost of the other 2 which are close together	 25;10	-34;10	4-3
996	6	The northernmost of these [2]	 25;00	-33;20	4
997	7	The star on the end of the burning-apparatus	 20;50	-34;15	4





7 stars, 5 of the fourth magnitude, 2 of the fifth









#### XLVII: Constellation of Corona Australis

998	1	The most advanced of the stars on the southern rim, outside [the crown]	 9;10	-24;30	4
999	2	The star to the rear of this, on the crown	 11;40	-21;00	5
1,000	3	The one to the rear of this	 13;10	-23;00	5
1,001	4	The one to the rear again of this	 14;50	-20;00	4
1,002	5	The one after this, before the knee of Sagittarius	 16;10	-18;30	5
1,003	6	The one after this, which is north of the bright star in the knee [of Sagittarius, (Sagittarius no. 24)]	 17;00	-17;10	4
1,004	7	The star to the north of this	 16;20	-16;00	4
1,005	8	The one to the north again of this	 16;30	-15;10	4
1,006	9	The rearmost of the 2 stars after this, in advance, in the northern rim	 15;10	-15;20	6
1,007	10	The more advanced of these 2 faint stars	 14;40	-14;50	6
1,008	11	The star quite some distance in advance of this	 11;50	-14;40	5
1,009	12	The one in advance again of this	 9;40	-15;50	5
1,010	13	The last one, which is south of the aforementioned star	 9;10	-18;30	5

13 stars, 5 of the fourth magnitude, 6 of the fifth, 2 of the sixth







#### XLVIII: Constellation of Piscis Austrinus

1,011	1	The star in the mouth, which is the same as the beginning of the water [in Aquarius no. 42]	 7;00	-23;00	1
1,012	2	The most advanced of the 3 stars on the southern rim of the head	 0;40	-20;20	4
1,013	3	The middle one	 4;10	-22;15	4
1,014	4	The rearmost of the three	 5;20	-22;30	4

1,015	5	The star by the gills	 4;20	-16;15	4-3
1,016	6	The star on the southernmost spine on the back	 25;10	-19;30	5
1,017	7	The rearmost of the 2 stars in the belly	 1;10	-15;10	5
1,018	8	The more advanced of them	 28;50	-14;40	4
1,019	9	The rearmost of the 3 stars on the northern spine	 25;10	-15;00	4
1,020	10	The middle one	 21;50	-16;30	4
1,021	11	The most advanced of the three	 21;00	-18;10	4
1,022	12	The star on the tip of the tail	 20;10	-22;15	4

11 stars, 9 of the fourth magnitude, 2 of the fifth [PsA no. 1 excluded from count as it was the same as Aq no. 42.]

*Stars around Piscis Austrinus outside the constellation*

1,023	13	The most advanced of the 3 bright stars in advances of Piscis [Austrinus]	 8;00	-22;20	3-4
1,024	14	The middle one	 11;10	-22;10	3-4
1,025	15	The rearmost of the three	 14;00	-21;10	3-4
1,026	16	The faint star in advance of this	 12;00	-20;50	5
1,027	17	The southernmost of the remaining 2 stars to the north	 13;50	-17;00	4
1,028	18	The northernmost of them	 13;50	-14;50	4

6 stars, 3 of the third magnitude, 2 of the fourth, 1 of the fifth

**Total for the southern region: 316 stars, 7 of the first magnitude, 18 of the second, 63 of the third, 164 of the fourth, 54 of the fifth, 9 of the sixth, 1 nebulous**

**Total for all stars: 1022, 15 of the first magnitude, 45 of the second, 208 of the third, 474 of the fourth, 217 of the fifth, 49 of the sixth, 9 faint, 5 nebulous, plus Coma [Berenices]**