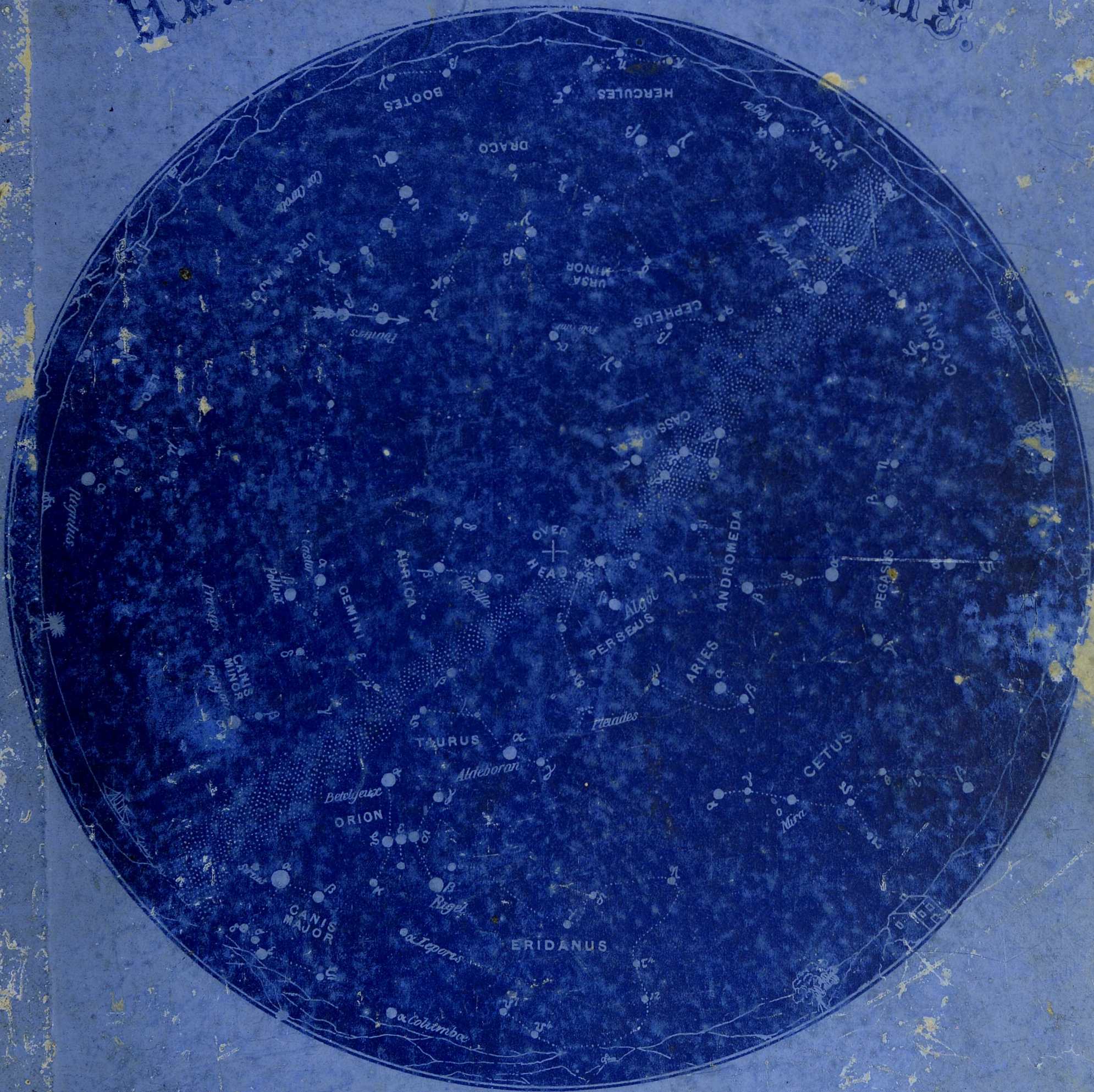
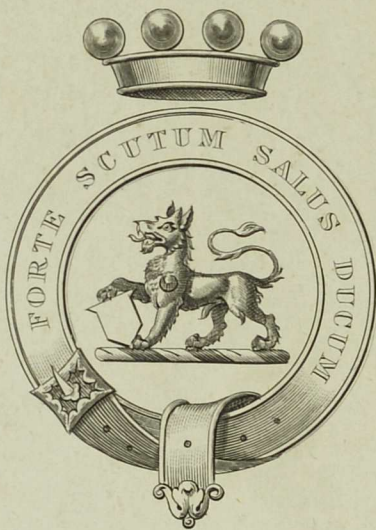


HALF HOURS WITH THE STARS.



By R. A. PROCTOR, B.A. F.R.A.S.

LONDON. ROBERT HARDWICKE, 192, PICCADILLY.



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A PLAIN AND EASY GUIDE

TO

THE KNOWLEDGE OF THE CONSTELLATIONS,

SHOWING, IN 12 MAPS, THE POSITION OF THE PRINCIPAL
STAR-GROUPS NIGHT AFTER NIGHT THROUGHOUT THE YEAR, WITH INTRODUCTION
AND A SEPARATE EXPLANATION OF EACH MAP.

TRUE FOR EVERY YEAR.

BY

RICHARD A. PROCTOR, B.A., F.R.A.S.

LATE SCHOLAR OF ST. JOHN'S COLLEGE, CAMBRIDGE, AND MATHEMATICAL SCHOLAR OF KING'S COLLEGE, LONDON:
AUTHOR OF 'SATURN AND ITS SYSTEM,' 'HALF-HOURS WITH THE TELESCOPE,' 'THE HANDBOOK OF THE STARS,'
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AND PARLIAMENT STREET

PREFACE.



THE OBJECT which I have proposed to myself in the preparation of this work has been to teach the beginner the stars in a manner which there can be no misunderstanding. I had the same object in view in preparing my Constellation-Seasons; but experience has shown me that to attain that object it is necessary to consult the beginner himself. I found on doing this that my Constellation-Seasons were not so well suited to the purpose I had in view as I had expected. Meridians and parallels, equator, ecliptic, and tropics, which had seemed to be absolutely necessary to the completeness of the maps, tended only to confuse the beginner. So also did the introduction of fourth-magnitude stars and the less important constellations. Other features of those maps, also, while increasing their utility (I think) to the more advanced student, rendered their meaning less *obvious* than is desirable for the beginner. In these maps I have discarded everything which could by any possibility be confusing. In place of letters indicating the points of the compass, the words *eastern horizon, north-eastern horizon, &c.* are written in full, and natural features round each map indicate the fact that the circumference of the map really corresponds to the horizon of the observer. The word 'overhead' is put on the centre of each map in place of 'zenith.' The hours to which each map corresponds for different days are written in according to the simplest mode of expressing them. And, lastly, the days proper for the use of each map will be found to run without interruption from the beginning of the year in Map I., to the end of the year in Map XII.; the interval between successive dates never exceeding four days.

I believe I am not claiming too much for these maps in saying that they are the first series ever published, *which the beginner could not possibly misinterpret, even if he paid no attention to the accompanying letterpress.*

R. A. P.

HALF-HOUR ON THE USE OF THE MAPS.



IT IS VERY EASY to gain a knowledge of the stars, if the learner sets to work in the proper manner. But he commouly meets with a difficulty at the outset of his task. He provides himself with a set of the ordinary star-maps, and then finds himself at a loss how to make use of them. Such maps tell him nothing of the position of the constellations *on the sky*. If he happen to recognise a constellation, then indeed his maps, if properly constructed, will tell him the names of the stars forming the constellation, and also he may be able to recognise a few of the neighbouring constellations. But when he has done this, he may meet with a new difficulty, even as respects this very constellation. For if he look for it again some months later, he will neither find it in its former place nor will it present the same aspect,—if indeed it happen to be above the horizon at all.

It is clear, then, that what the learner wants is a set of maps specially constructed to show him in what part of the sky the constellations are to be looked for. He ought on any night of the year to be able to turn at once to the proper map, and in that map he ought to see at once what to look for, towards what point of the compass each visible constellation lies, and how high it is above the horizon. And, if possible (as the present work shows is the case), *one* map ought to suffice to exhibit the aspect of the whole heavens, in order that the beginner may not be confused by turning from map to map, and trying to find out how each fits in with the others.

It is to fulfil these requirements that the present maps have been constructed. Each exhibits the aspect of the whole sky at a given day and hour. The circumference of the map represents the natural horizon, the middle of the map representing the part of the sky which lies immediately overhead. If the learner hold one of these maps over his head, so as to look vertically upwards at it, the different parts of the horizon marked in round the circumference being turned towards the proper compass points, he will see the same view of the heavens as he would if he were to lie on his back and look upwards at the sky, only that the map is a planisphere and the sky a hemisphere.

But although this illustration serves to indicate the nature of the maps, the actual mode of using them is more convenient.

Let it first be noted that properly speaking the maps have neither top, bottom, nor sides. Each map may be held with any part of the circumference downward, then the centre of the map is to be looked upon as the top for that part of the circumference. The portion of the map lying beneath the centre represents the portion of the sky lying between the point overhead and a certain portion of the horizon—the part in fact corresponding to the particular part of the circumference which is turned downwards. Thus if on any night we wish to learn what are the stars towards the north, we look for the map corresponding to that night. At the hour named the stars towards the north will be those shown between the centre of the map and the top; and, of course, we hold the map upside down so as to bring the centre above the northern part of the circumference.

But this matter will be more clearly understood by comparing the account of any of the accompanying maps with the map itself.

Again, it must be noted that although the maps are necessarily arranged in a certain order, there is in reality no first or last in the series. The map numbered I. follows the map numbered XII. in exactly the same manner as the latter follows the map numbered XI. The maps form a circular series, in fact.

The only reason for numbering the maps as at present, is that the map numbered I. happens to exhibit the aspect of the sky at a convenient hour on the night of January 1. It will be found that the dates follow on with intervals of three or four days right round the year, the end of the year falling in the left-hand column of map I., while the beginning of the year is in the middle column of the same map.*

It will be seen at once that a map can always be found corresponding to a convenient hour on any night of the year—except only in Midsummer, when on a few of the dates, night has not begun at the hour named. It was impossible without spoiling the regularity of the dating, or adopting an inconveniently late hour for *all* the maps, to avoid this difficulty. But as a matter of fact the difficulty disappears at once when the student is told that on any date named under a map, the aspect of the sky two hours later than that named is that represented in the following map. Thus at eight o'clock in the evening of June 21, the aspect of the stars is as shown in map VI., but the stars cannot be seen because it is still broad daylight: at ten o'clock, however, on the same night, the aspect of the sky is that shown in map VII., as indeed the first date under that map shows. Applying this rule to the few occasions on which the hour named is not available for observation (five or six in all out of ninety-six dates) the observer can manage as well for those occasions as for any others.

* It may be mentioned in passing, that the dates have not been thrown in so as to fall regularly round the year, but correspond with the variations due to the earth's variable motion round the sun.

Next as to finding the north point, or any point of the compass which will enable the observer to determine the rest. If he is only familiar with the aspect of those seven bright stars of the Great Bear which have been called Charles' Wain, the Butcher's Cleaver, and by other names, he can always determine the north point by means of the two stars called the pointers, since these seven stars never set. In the explanation of each map I have shown where the Great Bear is to be looked for on each night, the observer being assumed to have such a general knowledge of the direction of the compass-points as will suffice for the purpose of finding so marked a collection of stars. Thus the pole-star is found, and for the purpose of such observations as are here considered, this star may be looked upon as marking the exact direction of the north.

Perhaps nothing further is required, but if the observer prefer it he can determine the north point conveniently *at noon* by setting up a vertical stick in the sunlight and noting the direction in which the shadow lies. But this must be done at true noon; that is, when the sun is due south, and this does not agree with clock-time. However, if the observer notices that from December 25th to April 15th he must make the observation in the afternoon, thence to June 14th in the forenoon, thence to August 31st in the afternoon, and thence to December 25th in the forenoon; the time after or before noon being taken from the column in Hannay's Almanac, headed 'equation of time' (the fourth column after the calendar for each month), he can learn the north point on any day in the year with the utmost nicety. Once the observation has been made, he can note what objects (these should be distant) lie towards the different points of the compass, and from that time he can use the accompanying maps without any reference to the Great Bear and the pointers.

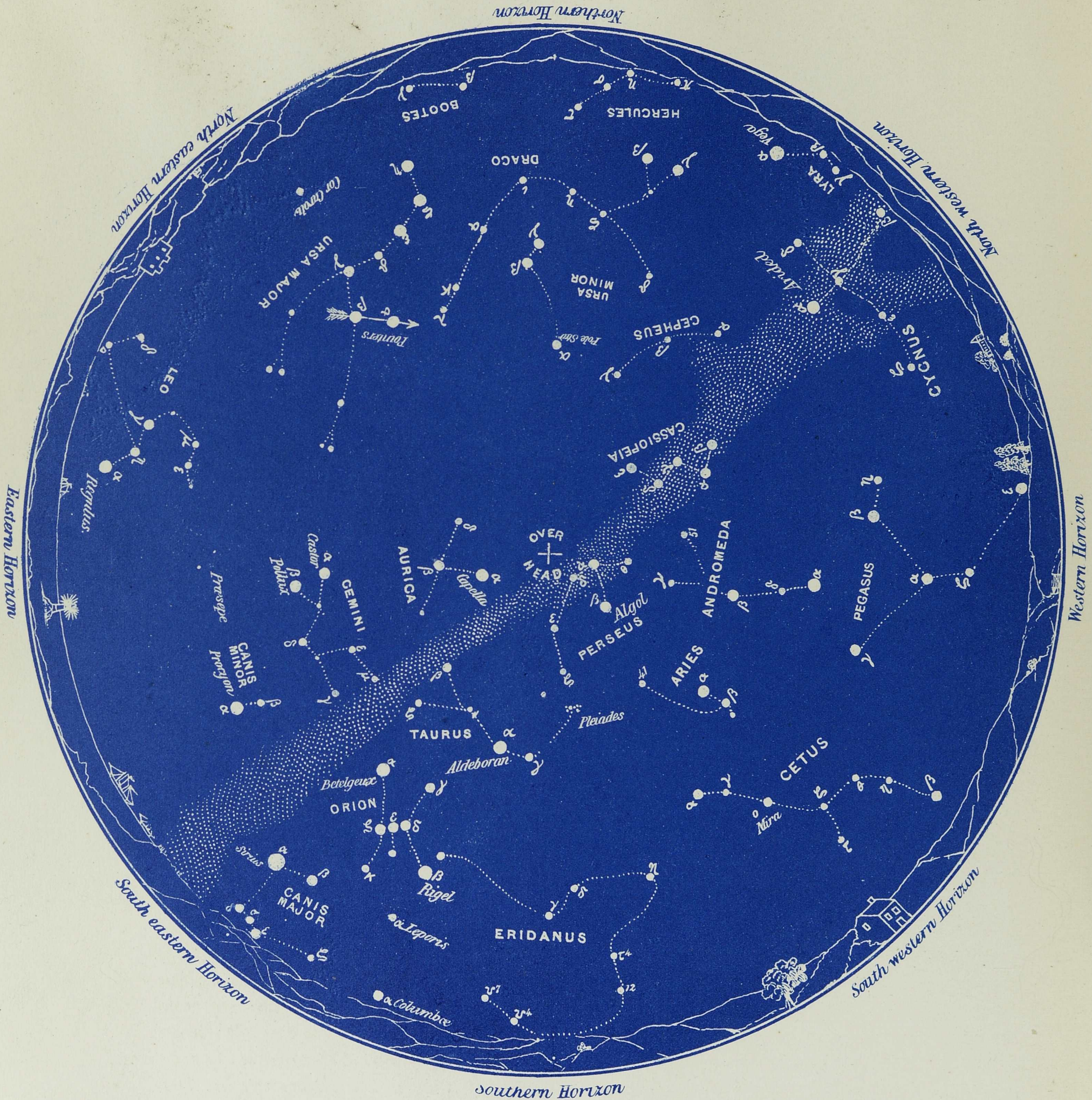
It is worth noticing that the stars called the Guardians of the Pole form no bad time-piece when used with the aid of such maps as the present. They revolve round the pole once in twenty-four hours (less about four minutes), in a direction contrary to that of a clock's hands. But stars near the equator, whose motions are much more rapid, afford a yet better measure of time, if the direction of the south point is well determined.

Of course, the observer who really wishes to become an astronomer, will not rest satisfied by learning only the principal stars shown in these maps. By means of regular star-maps he will be able to explore the depths of all the constellations, having once learned their position and general appearance from the accompanying maps. It will be well for the student to remember that the planets Venus, Mars, Jupiter, and Saturn, will at times appear among the constellations here shown. But besides that Venus and Jupiter can always be recognised by their superior light, and Mars and Saturn by the steadiness with which they shine, Hannay's Almanac will always show when those stars are above the horizon, their hours of rising, southing, and setting, and so on. As they never appear save among the zodiacal constellations, also, it becomes very easy to recognise them.

The following table exhibits the names of all the stars of the first three magnitudes to which astronomers have given names; at least, all those whose names are in common use:—

<i>a</i> Andromedæ, <i>Alpheratz</i>	<i>ζ</i> Ceti, <i>Baten Kaitos</i>	<i>a</i> Ophiuchi, <i>Ras Alhague</i>
<i>β</i> ———, <i>Mirach Mizar</i>	<i>ο</i> ———, <i>Mira</i>	<i>β</i> ———, <i>Cebalrai</i>
<i>γ</i> ———, <i>Almach</i>	<i>a</i> Columbæ, <i>Phact</i>	<i>a</i> Orionis, <i>Betelgeux</i>
<i>a</i> Aquarii, <i>Sadalmelik</i>	<i>a</i> Coronæ Bor., <i>Alphecca</i>	<i>β</i> ———, <i>Rigel</i>
<i>β</i> ———, <i>Sadalsund</i>	<i>a</i> Corvi, <i>Alchiba</i>	<i>γ</i> ———, <i>Bellatrix</i>
<i>δ</i> ———, <i>Skat</i>	<i>δ</i> ———, <i>Algores</i>	<i>δ</i> ———, <i>Mintaka</i>
<i>a</i> Aquilæ, <i>Altair</i>	<i>a</i> Cateris, <i>Alkes</i>	<i>ε</i> ———, <i>Abnilam</i>
<i>β</i> ———, <i>Alshain</i>	<i>a</i> Cygni, <i>Arided, Deneb Adige</i>	<i>a</i> Pegasi, <i>Markab</i>
<i>γ</i> ———, <i>Tarazed</i>	<i>β</i> ———, <i>Albireo</i>	<i>β</i> ———, <i>Scheat</i>
<i>a</i> Arietis, <i>Hamal</i>	<i>a</i> Draconis, <i>Thuban</i>	<i>γ</i> ———, <i>Algenib</i>
<i>β</i> ———, <i>Sheratan</i>	<i>β</i> ———, <i>Alwaid</i>	<i>ε</i> ———, <i>Enif</i>
<i>γ</i> ———, <i>Mesartim</i>	<i>γ</i> ———, <i>Etanin</i>	<i>ζ</i> ———, <i>Homan</i>
<i>a</i> Aurigæ, <i>Capella</i>	<i>β</i> Eridani, <i>Cursa</i>	<i>a</i> Persei, <i>Mirfak</i>
<i>β</i> ———, <i>Menkalinan</i>	<i>γ</i> ———, <i>Zaurac</i>	<i>β</i> ———, <i>Algol</i>
<i>a</i> Boötis, <i>Arcturus</i>	<i>a</i> Geminorum, <i>Castor</i>	<i>a</i> Piscis Aust., <i>Fomalhaut</i>
<i>β</i> ———, <i>Nekkar</i>	<i>β</i> ———, <i>Pollux</i>	<i>ε</i> Sagittarii, <i>Kaus Australis</i>
<i>ε</i> ———, <i>Izar, Mizar, Mirach</i>	<i>γ</i> ———, <i>Athena</i>	<i>a</i> Scorpionis, <i>Antares, Cor Scorpionis</i>
<i>η</i> ———, <i>Muphrid</i>	<i>δ</i> ———, <i>Wesat</i>	<i>a</i> Serpentis, <i>Unukalhai</i>
<i>a</i> Canum Ven., <i>Cor Caroli</i>	<i>ε</i> ———, <i>Mebstata</i>	<i>a</i> Tauri, <i>Aldeboran</i>
<i>a</i> Canis Majoris, <i>Sirius</i>	<i>a</i> Herculis, <i>Ras Algethi</i>	<i>β</i> ———, <i>Nath</i>
<i>β</i> ———, <i>Mirzam</i>	<i>β</i> ———, <i>Korneforos</i>	<i>η</i> ———, <i>Alcyone (Pleiad)</i>
<i>ε</i> ———, <i>Adara</i>	<i>a</i> Hydræ, <i>Alphard, Cor Hydræ</i>	<i>a</i> Ursæ Majoris, <i>Dubhe</i>
<i>a</i> Canis Minoris, <i>Procyon</i>	<i>a</i> Leonis, <i>Regulus, Cor Leonis</i>	<i>β</i> ———, <i>Merak</i>
<i>β</i> ———, <i>Gomeisa</i>	<i>β</i> ———, <i>Deneb Aleet, Denedola, Deneb</i>	<i>γ</i> ———, <i>Phecda</i>
<i>a</i> ² Capricorni, <i>Secunda Giedi</i>	<i>γ</i> ———, <i>Algeiba</i>	<i>ε</i> ———, <i>Alioth</i>
<i>δ</i> ———, <i>Deneb Algiedi</i>	<i>δ</i> ———, <i>Zosma</i>	<i>ζ</i> ———, <i>Mizar</i>
<i>a</i> Cassiopeiæ, <i>Schedar</i>	<i>a</i> Leporis, <i>Arneb</i>	<i>η</i> ———, <i>Alkaid, Benetnasch</i>
<i>β</i> ———, <i>Chaph</i>	<i>a</i> Libræ, <i>Zuben el Genubi</i>	<i>ι</i> ———, <i>Talitha</i>
<i>a</i> Cephei, <i>Alderamin</i>	<i>β</i> ———, <i>Zuben el Chamali</i>	<i>a</i> Ursæ Minoris, <i>Polaris</i>
<i>β</i> ———, <i>Alphirk</i>	<i>γ</i> ———, <i>Zuben Hakrabi</i>	<i>β</i> ———, <i>Kochab</i>
<i>γ</i> ———, <i>Errai</i>	<i>a</i> Lyræ, <i>Vega</i>	<i>a</i> Virginis, <i>Spica Aximech, Spica</i>
<i>a</i> Ceti, <i>Menkar</i>	<i>β</i> ———, <i>Sheliak</i>	<i>β</i> ———, <i>Zavijava</i>
<i>β</i> ———, <i>Diphda</i>	<i>γ</i> ———, <i>Sulaphat</i>	<i>ε</i> ———, <i>Vindemiatrix</i>

MAP I.



THE SKY.

on Dec: 21 at 10 o'clock;
 on Dec: 24 at 9½ o'clock;
 on Dec: 28 at 9½ o'clock;

on Jan: 7 at 9¼ o'clock;
 on Jan: 5 at 9 o'clock;
 on Jan: 8 at 8¾ o'clock;

on Jan: 12 at 8½ o'clock;
 on Jan: 16 at 8¼ o'clock;
 on Jan: 20 at 8 o'clock;

IN THE EVENING.

*** For the names of the stars, corresponding to the above lettering, refer to the list at p. 10

HALF-HOUR WITH THE STARS IN JANUARY.

MAP I.

THE GREAT BEAR lies towards the north-east. The pointers are uppermost, and the pole-star is towards the left.

The two stars known as The Guardians of the Pole (β and γ of the Little Bear) hang below the pole-star, slightly towards the right. The Dragon forms a loop of stars below the Little Bear. Observe the Dragon's Head,

With eyes oblique retorted, that aslant
Shot gleaming fire—

the eyes being the two stars β and γ towards the left, and not far raised above the north-north-west horizon.

The Lyre is low down on the left, its chief star, Vega, scintillating brilliantly. Still further on the left, almost due north-west, is the fine cross of Cygnus, standing upright. Following the direction indicated by the upright of the cross, raise the eyes towards the point overhead, and recognise the constellation Cassiopeia, by the five bright stars forming a figure resembling the letter W (now raised on end, the points of the W to the left).

Returning to the horizon, and looking further round to the left, we see due west the constellation Pegasus, or the Winged Horse. He is now inverted, his head being close to the horizon on the right. The square of Pegasus, formed by the bright stars, β , α , γ , and Alpherat will attract the observer's notice, and lead him to the constellation Andromeda, Alpherat being in Andromeda's head. The length of this constellation is now almost vertical; and between the feet of Andromeda and the point overhead lies the constellation Perseus. Notice Algol (the Demon Star, as the Arabs termed it,) lying due south-west, close up to the point overhead. Of the variations of this remarkable star a full account is given in 'Half-hours with the Telescope.' Usually the observer will see it of the second magnitude, however; as it only remains a fourth-magnitude star for about twenty minutes. Immediately below Perseus is Aries, recognisable by the three stars which form the Ram's head. Below that again is Cetus, the Whale.

Due south lies Eridanus, consisting chiefly of small stars, which cover a wide expanse of sky. Above is Taurus, recognisable at once by the Pleiades and Aldeboran. Still turning towards the left, we see Orion, nearly upright, but with his shoulders slightly thrown back. Immediately below Betelgeux (Ibt-al-Jauza, the Giant's Shoulder,) is Canis Major, on his hind feet, and throwing a fore-paw towards the Little Hare (a constellation of small stars directly below Orion). Observe the leading star of the Dove (α Columbæ), directly below α Leporis. Almost due west, and midway between the horizon and the point overhead, are the twin stars Castor and Pollux, Castor being uppermost. Still higher lies Auriga, the star Capella, always a very conspicuous object, shining very brilliantly at this elevation. Canis Minor lies below the feet of The Twins.

Observe the small cluster, Præsepe, or the Beehive (only visible on very clear nights): it lies now almost exactly midway between Castor and the horizon. Further to the left, and near the horizon, is the Lion. It is well to notice 'The Sickles' (the group of stars formed by Regulus, η , γ , μ , ϵ , and two small stars), as this is a well-marked object.

HALF-HOUR WITH THE STARS IN FEBRUARY.

MAP II.

THE GREAT BEAR is now midway between the horizon and the point overhead, and towards the north-east. The 'pointers' are uppermost, and the pole-star lies towards the left (as shown in the map).

The Guardians of the Pole are seen below, and towards the right. Immediately below the pole lies the Dragon's Head, the body and tail extending towards the right, to a point between the pointers and the Guardians of the Pole. Vega is seen just above the horizon, slightly to the left of the north point. Further to the left is the upper part of Cygnus, above which is the inconspicuous Cepheus. Due north-west, and high above the horizon, is Cassiopeia, the W being now in this position \approx . Further to the left, and close to the horizon, is the Flying Horse. The square of Pegasus stands on a corner (α Pegasi), just above the horizon. The upper corner (Alpherat) of the square belongs to Andromeda, still inverted; and above the feet of Andromeda we see Perseus. Algol is now due west.

Below Algol, but slightly to the left, is Aries; and still lower, and further to the left, Cetus appears, the figure presented by its principal stars reminding one of the Mantis insect. It is now setting. The star Mira may not be visible, as this is a variable, invisible at regular intervals for months together.

Notice Eridanus setting towards the south-west, and Taurus above; and then turn to Orion, almost due south, standing erect in all his glory, at the greatest elevation he ever attains in our latitude.

To the left, low down, we see the Greater Dog, Sirius now shining with his full splendour. The dog is still rampant; indeed he is never seen otherwise in our latitudes.

Looking upwards, and somewhat further to the left, almost due south-east we see the Twins, their feet resting on the borders of the Milky Way. Still higher is Auriga, now, in fact, overhead.

Below the Twins see the Little Dog. Below this constellation the stern of the ship Argo is rising into view. But as the part of this constellation which rises above our horizon contains no conspicuous stars, we need not pay much attention to it at this stage of our star-gazing.

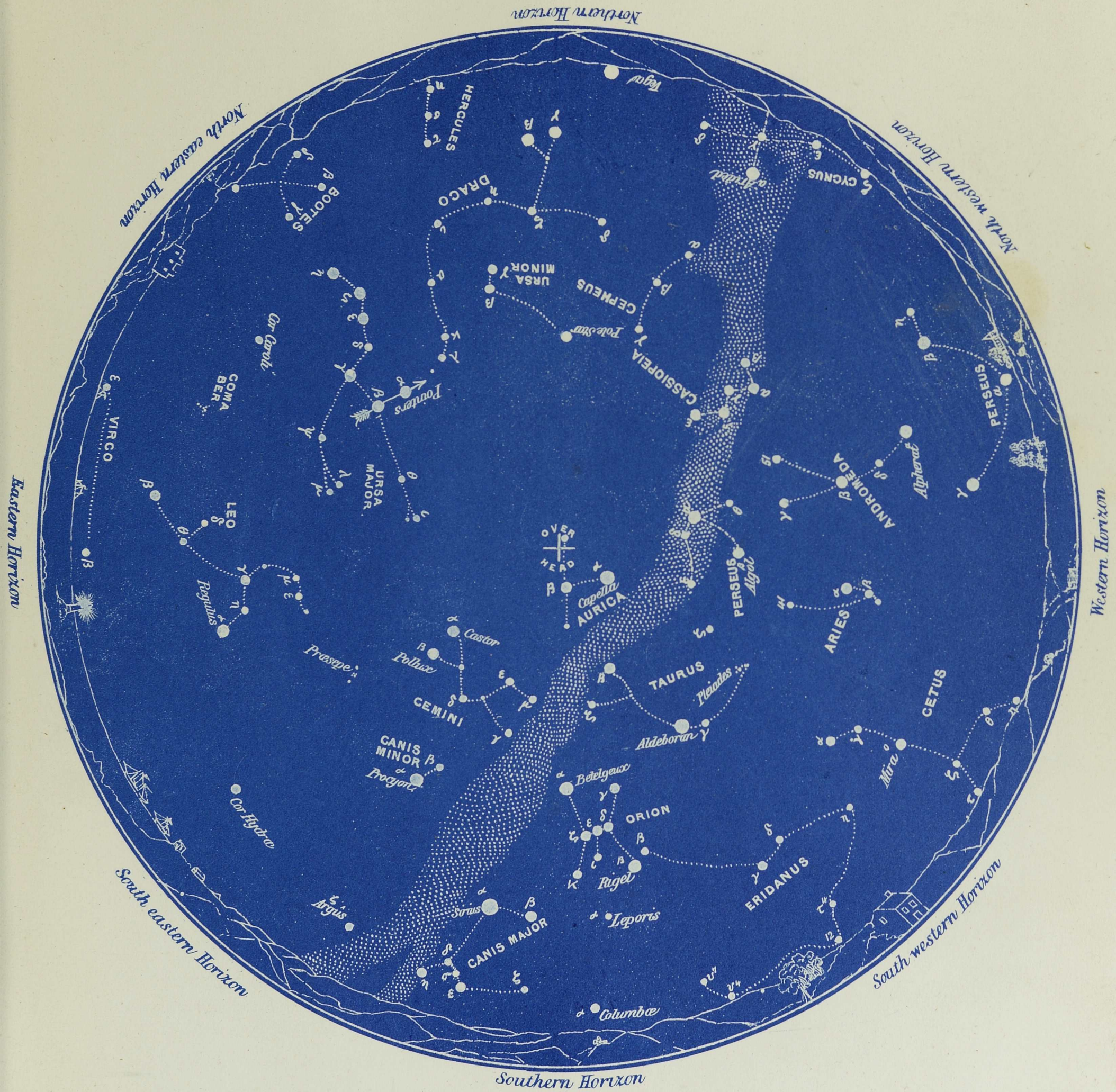
Somewhat to the east of south-east we see a single conspicuous star—though several small stars are seen in the neighbourhood. This is Cor Hydræ, the Heart of the Sea Serpent. The Arabian astronomers gave to this star the name of Alfard, or The Solitary One.

Leo lies towards the east, and between the Sickle in Leo and the Lesser Dog we recognise Præsepe, and the two small stars on either side, known to the ancients as the Aselli.

We have now come round again to the Great Bear. Observe how much larger an extent of sky this constellation covers, than is commonly assigned to it by beginners. In its present aspect, the constellation reminds the unpoetical observer of one of those figures of a monkey turning over a pole which used to amuse our childhood,—the pole being supposed to run vertically through the paws (at the stars λ and ι).

Below the Bear's tail the head and shoulders of Boötes are rising into view.

MAP 2.



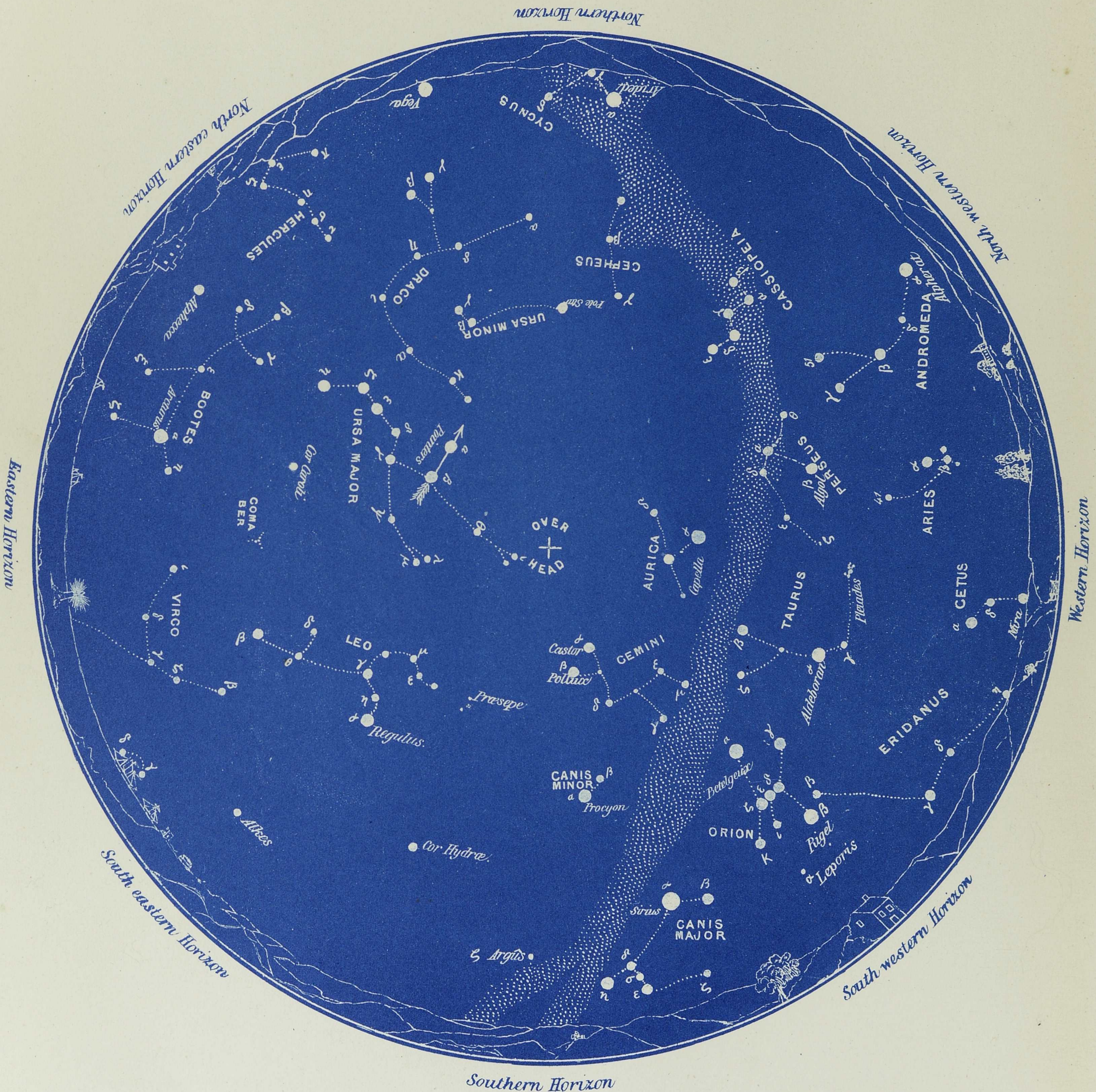
THE SKY.

on Jan: 20 at 10 o'clock;	on Jan: 31 at 9¼ o'clock;	on Feb 11 at 8½ o'clock,
on Jan: 23 at 9¾ o'clock;	on Feb: 4 at 9 o'clock;	on Feb 15 at 8¼ o'clock;
on Jan: 27 at 9½ o'clock;	on Feb: 7 at 8¾ o'clock;	on Feb 19 at 8 o'clock;

IN THE EVENING.

***For the names of the stars, corresponding to the above lettering, refer to the list at p.10.

MAP 3.



Southern Horizon
THE SKY.

on Feb: 19 at 10 o'clock;	on Mar: 2 at 9¼ o'clock;	on Mar: 13 at 8½ o'clock;
on Feb: 22 at 9¾ o'clock;	on Mar: 6 at 9 o'clock;	on Mar: 17 at 8¼ o'clock;
on Feb: 26 at 9½ o'clock;	on Mar: 9 at 8¾ o'clock;	on Mar: 21 at 8 o'clock;

IN THE EVENING.

***For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.

HALF-HOUR WITH THE STARS IN MARCH.

MAP III.

THE GREAT BEAR is now approaching the point overhead, but is easily recognised towards the north-east. The pointers, as shown, indicate the pole-star towards the left, and considerably below them.

The Guardians of the Pole now lie on the right of and somewhat below the pole-star. Vega shines just above the horizon, immediately below them. Between lies the Dragon's head; and we see the body and tail of the Dragon curving round between the head and the Guardians of the Pole.

The upper part of Cygnus is now all that can be seen of this constellation, almost due north on the horizon. Further to the left, and well raised above the horizon, we see Cassiopeia. Andromeda is now approaching the horizon, her head almost touching it towards the north-west. Next on the left is Aries, and above Aries is Perseus.

Above Perseus is Auriga, Capella being almost due west. Cetus has nearly set, only its head being visible above the horizon.

Above Eridanus (now nearly set) is Taurus, very favourably situated for observation. The Pleiades lie due west, and Aldeboran—the brilliant red star—to their left.

Orion is towards the south-west, bending forwards towards the west. Above him, but somewhat to the left, are the Twins, Castor still uppermost.

Below the Twins are the two dogs, Canis Major towards the south-south-west, and low down.

Alfard (The Solitary One), or Cor Hydræ, as he is called in the map, lies midway between the south and the south-east, and is well raised above the horizon. It is interesting to notice how blank this part of the heavens appears—so far, at least, as conspicuous stars are concerned.

Towards the south-east is Alkes, the chief star in the Cup; and we notice the Crow just rising into view towards the left.

Above, we recognise Leo, the Sickle being now a conspicuous object.

Virgo has risen partially into view above the eastern horizon. The cup-shaped group formed by the five stars shown in the map was called by the Arabian observers, for reasons not yet explained, 'The Retreat of the Howling Dog.'

Boötes has now risen entirely above the horizon, though as yet in a recumbent position: Arcturus is a conspicuous object on the right of this constellation.

Below the head and shoulders of Boötes notice the Crown, one star only of which (Alphecca) is shown in the map. Doubtless this group of stars originally formed the right arm of Boötes. The constellation recently attracted much notice as the region in which a new star (or rather, an irregular variable) made its appearance a year or two ago.

Hercules is gradually rising into view towards the north-east.

HALF-HOUR WITH THE STARS IN APRIL.

MAP IV.

THE GREAT BEAR is now easily found, being nearly overhead. The pole lies below the pointers.

The Guardians of the Pole are now somewhat higher than the pole towards the right. Below the pole-star is Cepheus, and due west of him is Cassiopeia, the W gradually approaching its natural position. Andromeda's feet are to be seen above the south-western horizon, and towards the left, Aries is setting.

Above Aries is Perseus, now well situated for observation. The brilliancy of the Milky Way in this neighbourhood is worth noticing.

Due west is the Bull, above which lies Auriga.

Orion is now approaching the horizon, and is prone towards his 'western grave;' above him hang 'the starry Gemini.'

Towards the left are the two Dogs. The Greater Dog is now setting.

Alfard (Cor Hydræ), is somewhat to the west of south. Above is the Sickle in Leo, due south, and with its handle vertical.

The length of Hydra is now nearly raised above the horizon. We may notice in passing that the Sea Serpent originally extended along the equator, and we believe that the epoch at which the ancient constellations were formed may be more correctly deduced from this correspondence than from any other, since few ideas of antiquity are more commonly recognised than that of the equatorial (and also oceanic) Serpent. It is strange, by the way, that sea monsters form so large a part of the mythology of the ancients, and a fanciful mind might incline to the notion that the ancients preserved in their celestial globes the records of sea-creatures once well known but now extinct. The reader if he have a taste for fanciful speculations may here refer to Gosse's chapter on the 'Great Unknown,' in which he argues that the Sea Serpent (despite Professor Owen's arguments to the contrary) is a true *Dolichodeiros*—that is, not a serpent but a paddling long-necked lizard. Certainly the Cetus and Hydra of ancient globes might not unreasonably be urged in support of this view; and the Dragon would figure as a respectable pterodactyl.

Virgo has now risen, and the brilliant Spica is a conspicuous object towards the south-east. Just above the horizon is the star β of the Scales.

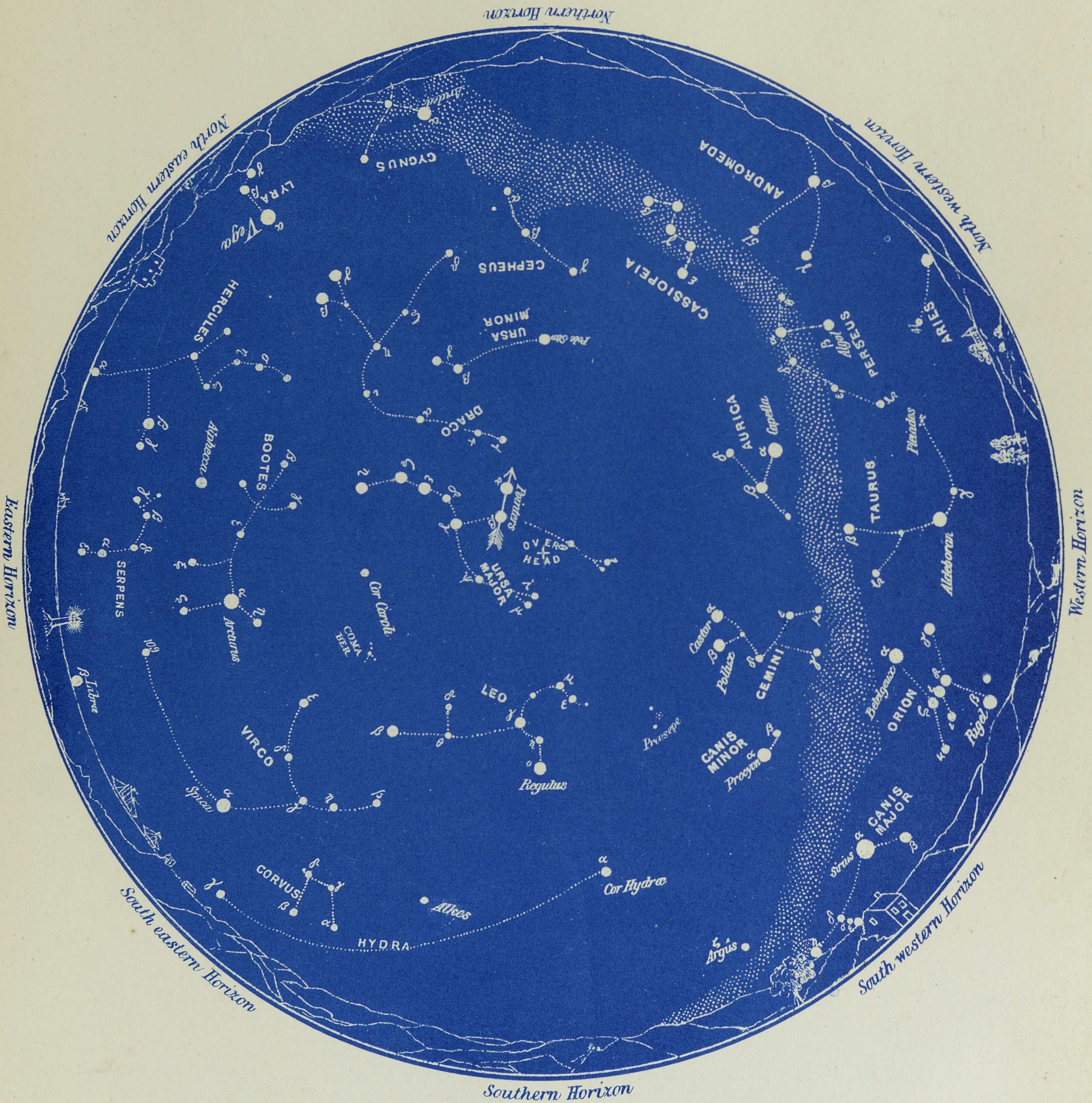
Due east is the Serpent just above the horizon. It must be noticed, however, that a part of this constellation lies on the further side of the as yet unrisen Ophiuchus. Serpens is the only constellation thus divided.

Above Serpens is Boötes, still nearly recumbent. Coma Berenices and Cor Caroli occupy the positions severally accorded to them in the map.

To the left of Serpens is Hercules, or Engonasin, the Kneeler, supposed by many to represent Adam kneeling on the head of the Serpent, Draco.

The Lyra has now nearly risen, in the north-east, immediately beneath the Dragon's head.

MAP 4.



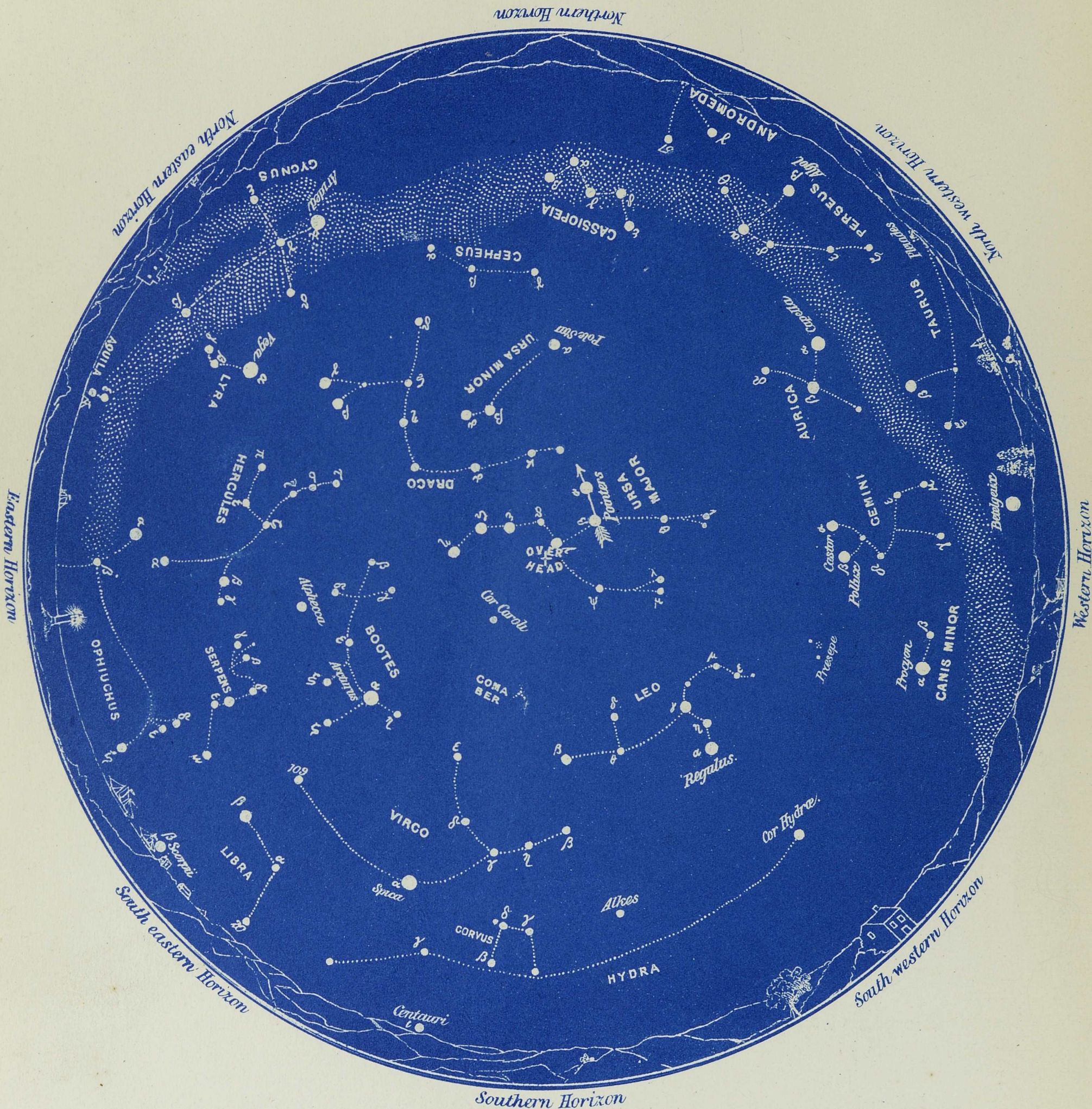
THE SKY.

on Mar. 21 at 10 o'clock;	on Apr. 1 at 9¼ o'clock;	on Apr. 12 at 8½ o'clock;
on Mar. 24 at 9¾ o'clock;	on Apr. 5 at 9 o'clock;	on Apr. 16 at 8¼ o'clock;
on Mar. 28 at 9½ o'clock;	on Apr. 8 at 8¾ o'clock;	on Apr. 20 at 8 o'clock;

IN THE EVENING.

*** For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.

MAP 5.



THE SKY

on April 20 at 10 o'clock;
 on April 23 at 9¾ o'clock;
 on April 27 at 9½ o'clock;

on May 7 at 9¼ o'clock;
 on May 5 at 9 o'clock;
 on May 9 at 8¾ o'clock;

on May 13 at 8½ o'clock;
 on May 17 at 8¼ o'clock;
 on May 21 at 8 o'clock;

IN THE EVENING.

*** For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.

HALF-HOUR WITH THE STARS IN MAY.

MAP V.

THE GREAT BEAR still overhead is found immediately, and the pointers, which have now crossed over to the west of the zenith, point downwards to the pole-star.

The Guardians of the Pole are now higher than the pole, towards the right.

Below the pole, Cepheus and Cassiopeia are seen, the former on the right. Andromeda has nearly disappeared; and Perseus has passed the north-west, and is approaching the horizon. The Pleiades are just setting, almost due north-west; and above is Auriga.

In the west we see Betelgeux, the sole star belonging to Orion now visible. Above, and due west, are the twin-stars Castor and Pollux. We have, in fact, the configuration described by Tennyson, speaking of the season we are considering:—

‘It fell on a time of year
When the shining daffodil dies, and the Charioteer
And starry Gemini hang like glorious crowns
Over Orion’s grave, low down in the west.’

May 2-76

Canis Major has set, but the Lesser Dog is still above the horizon, to the left of and below the Twins.

Cor Hydræ (The Solitary One) is almost exactly towards the south-west, and above is Leo.

Due south, the small quadrangle of Corvus is seen, above which is ‘The Retreat of the Howling Dog,’ Spica shining conspicuously on the left, towards the south-south-east.

Libra has risen into view, and somewhat to the east of south-east we see the first indications of the interesting southern constellation Scorpio.

The vertical row of conspicuous stars, formed by a part of Ophiuchus and the body of Serpens, is well worth noticing. Above it is Boötes: to the left of which, and lower down, we see Hercules, inverted. His head is marked by the upper alpha, the lower representing the head of Ophiuchus, the Serpent-holder—typical, some suppose, of the Messiah. The feet of the kneeling Hercules are on the head of Draco, whose body and tail extend upwards, between the Guardians of the Pole and the greater Bear. It is impossible not to recognise, from the configuration of this constellation as now seen, that the ancients looked on the stars which form the Lesser Bear as forming a wing of Draco.

Beneath the Dragon’s head we see the Lyre. The Swan has now risen above the horizon, and the cross belonging to this constellation is seen in an almost horizontal position. The brilliancy of the Milky Way at this part of its extent is well worth noticing. In the space between the stars α , β , and γ Cygni, there is a distinctly-marked black gap in the Milky Way, which has been termed the Northern Coalsack. The extension of the Milky Way towards Cepheus should also be noticed.

*Dustbrook
April 23. 76*

HALF-HOUR WITH THE STARS IN JUNE.

MAP VI.

THE LAST STAR of the Great Bear's tail is now just passing the point overhead. The pointers are lowermost, and the pole-star is below, towards the right.

The Guardians of the Pole are above the pole-star a little towards the right. Below them is Cassiopeia, the W being now almost in the proper position of the letter. To the left is Perseus, Algol being quite close to the horizon. Further round to the left we see Capella and the other stars of Auriga low down towards the horizon. Not much higher are the twin stars Castor and Pollux, Castor to the left, the feet of the twins resting on the horizon. It is interesting to compare the splendour of the sky near the horizon, from ^{Germani} Germani in the west-north-west, to Cassiopeia in the north, with the comparative blankness of the part of the sky immediately above these constellations.

Præsepe is almost due west, about as high as Castor. Leo has come round so far towards the west that the tip of the Sickle just reaches that point of the compass. Below Regulus is Alfard, now near sitting.

Virgo is now at her highest, Spica shining resplendently a little towards the west of south.

Below Virgo notice Corvus and Crater, two of the neatest small constellations in the heavens.

Due south, just above the horizon, is the head of the southern constellation the Centaur. Above Virgo, and almost due south, we see Boötes, now nearly upright, and presenting a fine figure, as with uplifted arm (the stars belonging to the Crown) he chases Ursa Major past the zenith.

Returning to the neighbourhood of the horizon observe the brilliant red star Antares, or Cor Scorpionis, lately risen above the south-eastern horizon. Due south-east we see a fine line of brilliant stars formed by ζ , ϵ , and δ Ophiuchi, and ϵ , α , and δ Serpentis. These stars, with η Ophiuchi, and the stars γ and β Serpentis, form a figure much resembling a sabre, the cross-handle being formed by two stars not shown in the map. Nearly the whole of the large constellation Ophiuchus (the reader will remember how Milton says of a comet, that it

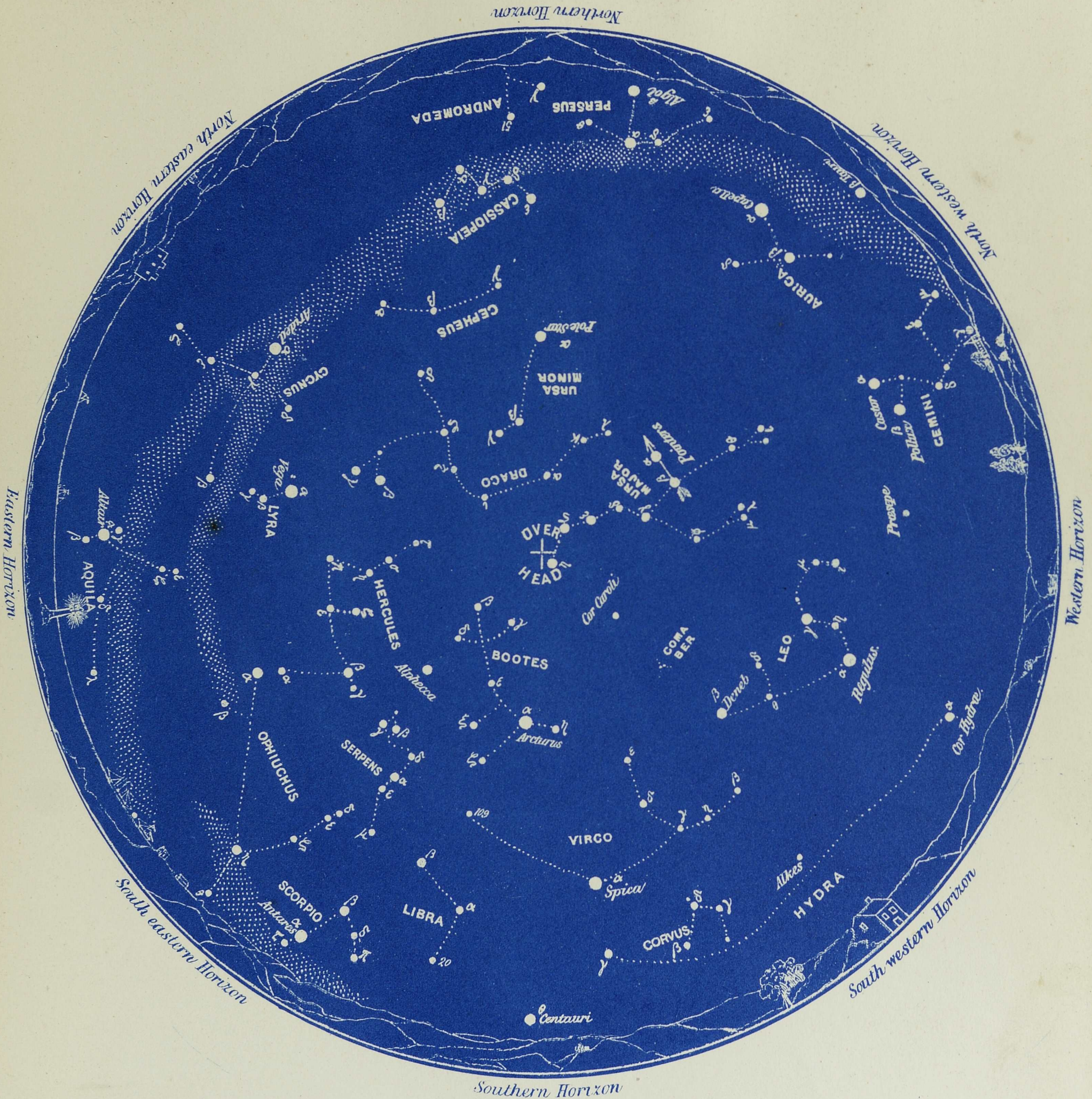
‘Fired the length of Ophiuchus large.’)

has now risen above the horizon. It requires some imagination to recognise in it the figure of a man holding a serpent; but this is not the only instance in which the stars of a constellation bear little resemblance to the figure from which the constellation is named.

Hercules is now nearly due east and high above the horizon. Towards the same quarter, but quite close to the horizon, Aquila is coming into view, the brilliant Altair scintillating finely. Lyra is above, Vega being almost exactly midway between the horizon and the point overhead.

The leading star of Cygnus is towards the north-east, the length of the cross being still nearly horizontal. Between Cygnus and the point overhead, is the head of the Dragon, the body and tail winding off towards the left and upwards, above the Guardians of the Pole.

On the dates named in the third column under this map the stars cannot be seen, as it is not yet dark. Therefore use Map VII. two hours later. For instance, on June 21, use Map VII. at ten o'clock, and similarly for other days at the end of June.



THE SKY.

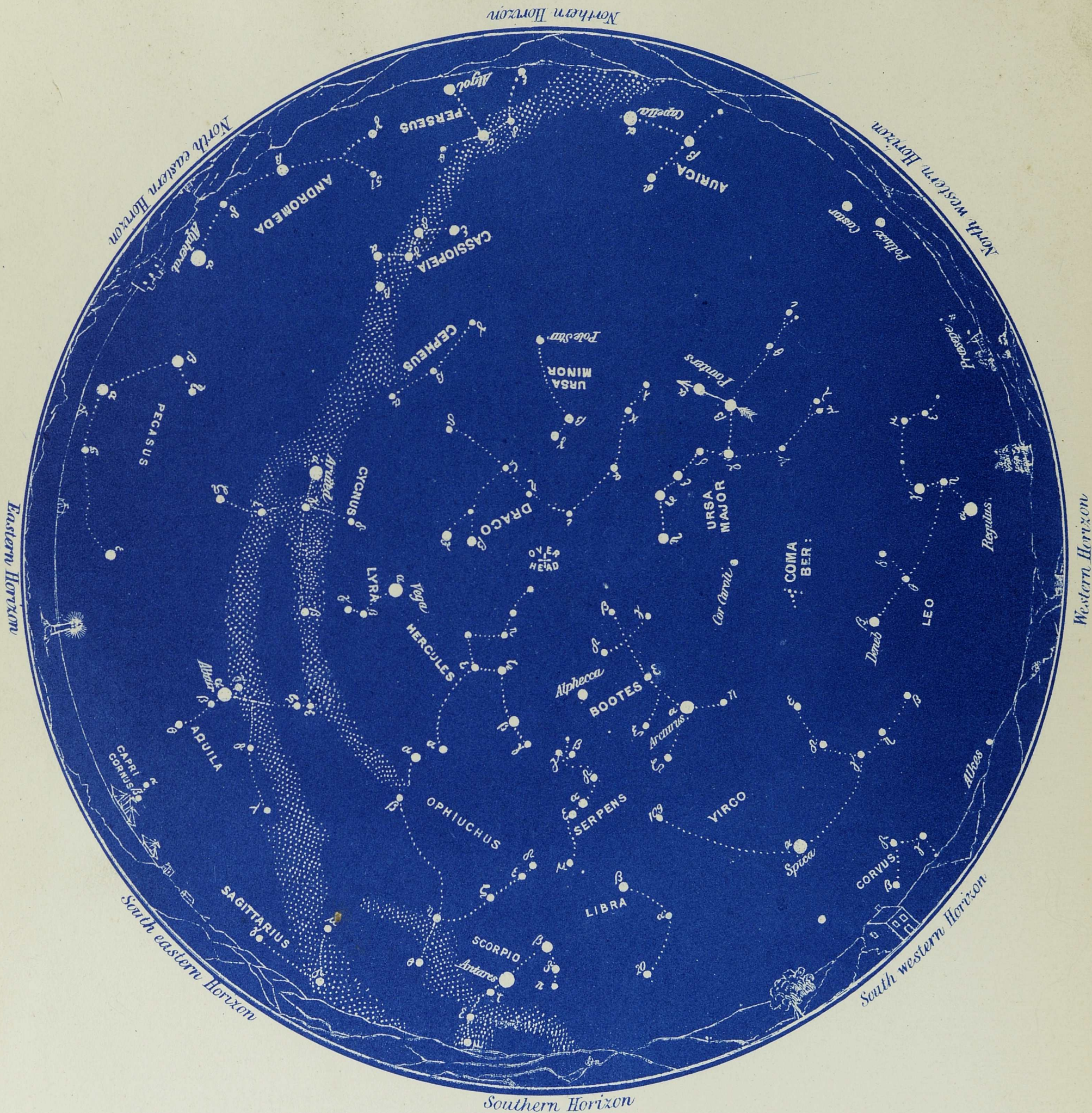
on May 21 at 10 o'clock;
 on May 25 at 9¾ o'clock;
 on May 28 at 9½ o'clock;

on June 7 at 9¼ o'clock;
 on June 5 at 9 o'clock;
 on June 9 at 8¾ o'clock;

on June 13 at 8½ o'clock;
 on June 17 at 8¼ o'clock;
 on June 27 at 8 o'clock;

IN THE EVENING.

*** For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.



THE SKY.

on June 21 at 10 o'clock;
 on June 25 at 9¾ o'clock;
 on June 29 at 9½ o'clock;

on July 3 at 9¼ o'clock;
 on July 7 at 9 o'clock;
 on July 10 at 8¾ o'clock;

on July 14 at 8½ o'clock;
 on July 18 at 8¼ o'clock;
 on July 22 at 8 o'clock;

IN THE EVENING.

***For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.

HALF-HOUR WITH THE STARS IN JULY.

MAP VII.

THE GREAT BEAR is now descending towards the north-west. The pointers lie nearly halfway between the point overhead and the horizon, towards the north-west. Thus the pole-star lies to the right of the pointers.

The Guardians of the Pole have passed above the pole towards the left. Below the pole, and close to the horizon, we see Perseus on the right, and Auriga on the left. Capella is scintillating brilliantly, as are Castor and Pollux, which are now sitting near the north-west, Pollux lowest, and on the left.

Præsepe is nearly set, and will probably not be visible in the thick air so low down.

Leo is approaching the horizon, the Sickle being inclined forwards. Above β Leonis notice the Hair of Berenice, halfway between the horizon and the point overhead, and forming an interesting object at this elevation.

Boötes stands now in the north-west, high up above the horizon. Below Arcturus is Spica, and lower still, towards the right, the Crow and Cup are setting.

The constellation Scorpio forms a magnificent object in the south. The stars which are assigned to this constellation in maps form but a portion of the original constellation, and it is not difficult to recognise in the arrangement of the stars now lying towards the south a resemblance to the figure of a Scorpion with extended claws.

Above Scorpio we see the group of stars compared to a sabre, now no longer vertical, but inclined forwards. 'Ophiuchus large' is fully raised, and reaches from the horizon more than halfway to the point overhead, and from the south to the south-east. Below his head (*a*) we see Sagittarius just rising above the horizon; and above Ophiuchus, Hercules extends right up to the point overhead.

The three bright stars in the body of Aquila are now midway between south-east and east; the uppermost is γ , the lowest β , and the middle star is Altair. Above, towards the left, is Lyra, Vega being now raised far towards the point overhead. Below Vega is the head of Cygnus, and the cross of Cygnus is now in a position *exactly* horizontal, and also exactly midway between the point overhead and the horizon; in other words, each of the stars *a*, γ , and β Cygni now has an elevation of forty-five degrees above the horizon.

Below Cygnus, Pegasus is rising into view, three stars of the square being visible, and the nose of the horse (ϵ) due east. Andromeda has just risen above the north-eastern horizon. Above her feet we see Cassiopeia, the W still in its natural position.

Draco forms a curve round and above the Guardians of the Pole, his head being to the east, and close to the point overhead.

On the dates mentioned in the last column under this map it will be better to use Map VIII., two hours later.

HALF-HOUR WITH THE STARS IN AUGUST.

MAP VIII.

THE GREAT BEAR is now in the north-west and midway between the point overhead and the horizon, the pole to the right of the pointers.

The Guardians of the Pole have swung round above the pole-star towards the north-north-west. Below the pole is the head of the Charioteer, Capella still low down towards the right of the north point. Above the Lesser Bear is the body of Draco. His head is almost exactly overhead.

Below the Great Bear, and somewhat towards the left, Leo is setting, only a part of the Sickle being visible. Coma Berenices lies immediately above the tip of the Lion's tail (β), and above Coma again is Cor Caroli and the poor constellation the Hunting Dogs, of which Cor Caroli is the leading brilliant.

Virgo is setting, 'The Retreat of the Howling Dog' having already lost one of its stars. To the left Spica is scintillating brilliantly, close to the horizon in the west-south-west.

Boötes is now midway between the horizon and the point overhead, and inclining forwards, his head and shoulders due west, his feet above Spica.

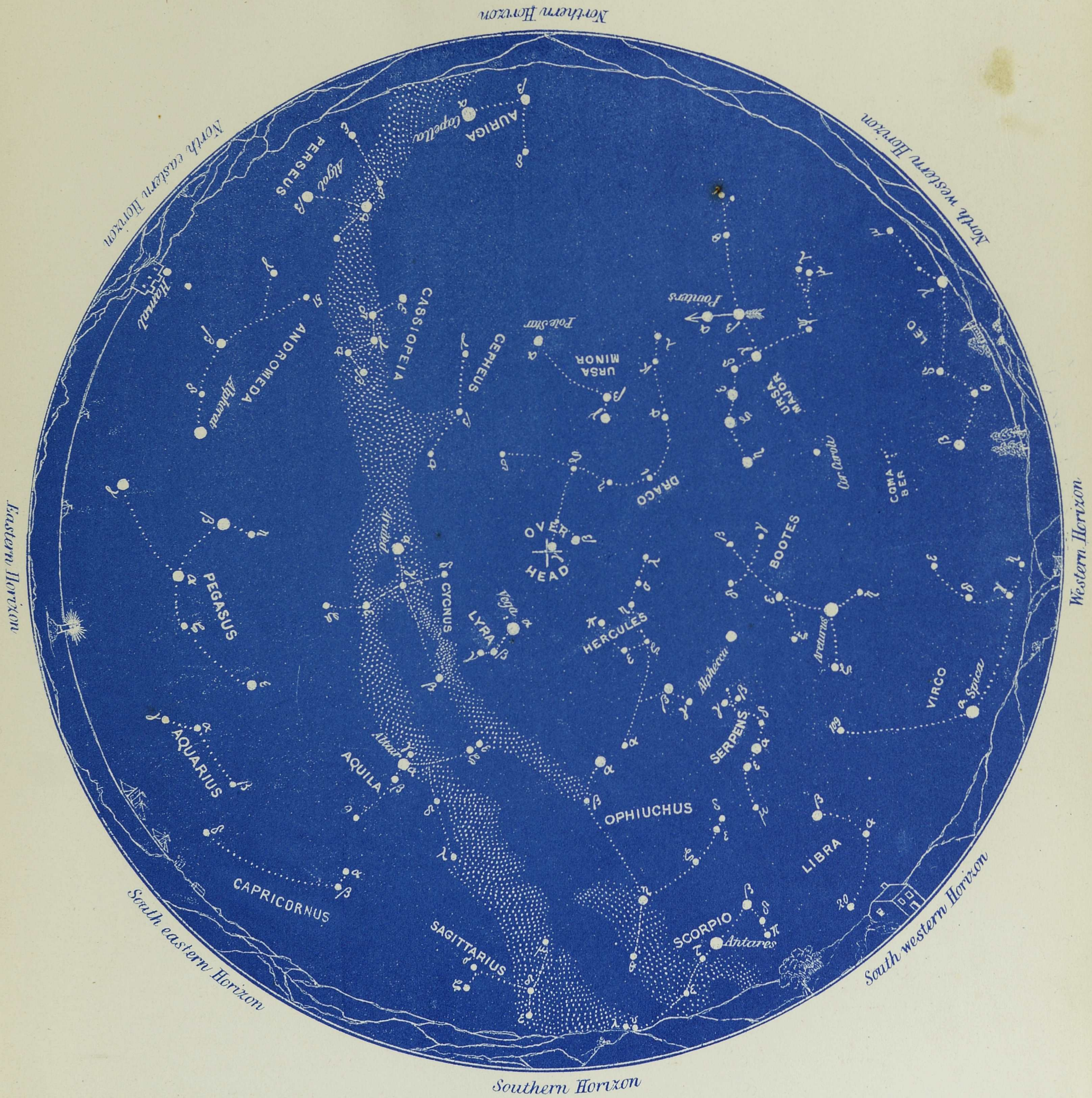
In the south-west is Libra, close to the horizon. Above is Serpens, reaching to a point midway between the horizon and the point overhead. Between the head of the serpent (γ , β) and the zenith we see Hercules, reaching round from the south to the west, and still inverted. In fact, Hercules is never seen upright in our latitudes. This kneeling figure must have been conceived by astronomers living in other latitudes and at a time when the pole was very differently situated.

Ophiuchus has now passed the south towards south-south-west; and Antares with the other stars of Scorpio lie towards the same quarter low down towards the horizon. It is interesting to notice the portion of the Milky Way now brought into view towards the south. We see here the commencement of that part of the Milky Way which by its superior brilliancy as seen in southern latitudes, indicates the greater proximity of the galaxy in that direction. It is also interesting to notice how singularly the two branches of the Milky Way vary in splendour along the southern half of the semicircle now above the horizon. For in Cygnus the upper branch is much the brightest, yet this branch vanishes altogether away in Ophiuchus. On the other hand the lower branch, faint in Cygnus, becomes very bright in Aquila and Sagittarius.

Lyra is high up towards the point overhead, the stars β and γ forming a pendent to the brilliant Vega. Below them, towards the south-east, and about half-way between the horizon and the point overhead, is Altair, γ and β Aquilæ lying almost in a vertical line, one above, the other below, Altair. Low down towards the horizon are the zodiacal constellations Sagittarius (extending from south to south-south-east), Capricornus (extending past the south-eastern quarter); and Aquarius, reaching nearly to the east. It is, indeed, noteworthy that from the north-west right round through south to the north-east, the horizon is occupied by zodiacal constellations, no less than eight of which are thus situated—though Pisces, having no conspicuous stars, is not marked-in in Map VIII.

Cygnus is high up towards the east, and below Arided is the square of Pegasus. The left-hand star of the square is Alpherat, and Andromeda lies in a nearly horizontal position, her feet being towards the north-east. Above these is Cassiopeia, the right-hand side of the W beginning to be the highest. Below, and close to the horizon, is Perseus.

MAP 8.



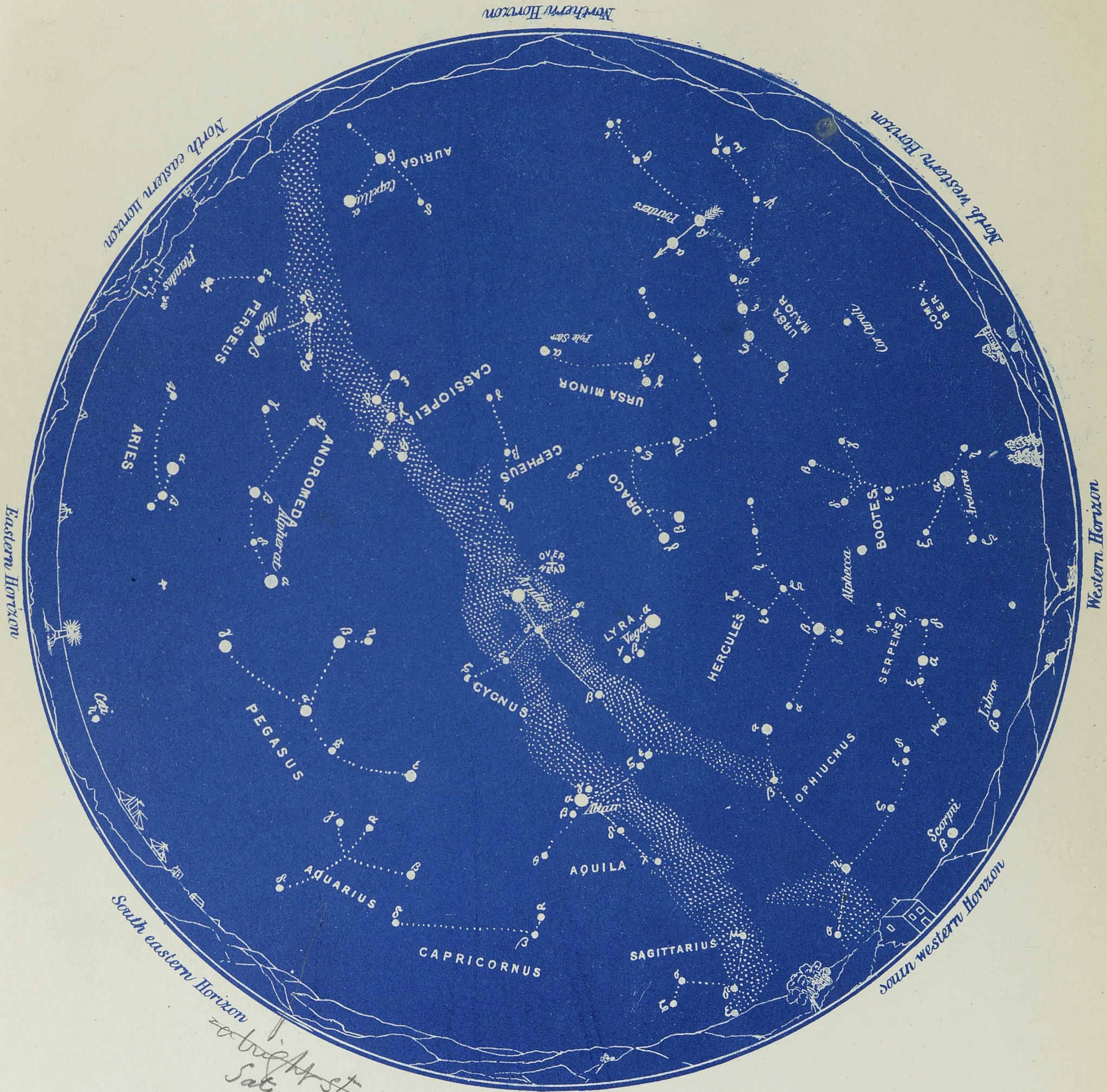
THE SKY

on July 22 at 10 o'clock;	on Aug: 3 at 9¼ o'clock;	on Aug: 15 at 8½ o'clock;
on July 26 at 9¾ o'clock;	on Aug: 7 at 9 o'clock;	on Aug: 19 at 8¼ o'clock;
on July 30 at 9½ o'clock;	on Aug: 11 at 8¾ o'clock;	on Aug: 23 at 8 o'clock;

IN THE EVENING.

** For the names of the stars, corresponding to the above lettering, refer to the list at p.10.

MAP 9.



THE SKY.

on Aug. 23 at 10 o'clock;
 on Aug. 27 at 9½ o'clock;
 on Aug. 31 at 9½ o'clock;

on Sep. 4 at 9¼ o'clock;
 on Sep. 8 at 9 o'clock;
 on Sep. 12 at 8¾ o'clock;

on Sep. 15 at 8½ o'clock;
 on Sep. 19 at 8¼ o'clock;
 on Sep. 23 at 8 o'clock;

IN THE EVENING.

*** For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.

HALF-HOUR WITH THE STARS IN SEPTEMBER.

MAP IX.

THE GREAT BEAR is now passing towards the north, and getting low down. The pointers are to the right of the seven stars, and the pole-star lies above them and towards the right.

The Guardians of the Pole are to the left of, and scarcely higher than, the pole-star. The Dragon passes between the two bears towards the west, his head being still high above the horizon. Coma Berenices is setting between north-west and west-north-west. Boötes has passed the west, and forms a fine figure above that part of the horizon. The Northern Crown, with the brilliant Alphecca, is due west, about midway between the horizon and the point overhead.

Above the Crown are the feet of Hercules. His head and shoulders are to the left of the Crown, and at about the same height above the horizon. The Serpent lies between the shoulders of Hercules and the horizon. On the left is 'Ophiuchus large' towards the south-west, and extending from the horizon halfway to the point overhead. The brilliant Vega lies towards the same quarter, but much higher up.

Aquila is due south, Altair being about midway between the horizon and the point overhead. Close to the horizon, and extending from south-south-west to south, is Sagittarius. Next to him on the left is Capricornus, and next to that again is Aquarius, now covering a wide range of sky between Capricornus and Pegasus. In the zenith is Cygnus, the upright and cross-rod of the cross being now about equally inclined to the horizon. The square of Pegasus has passed the east, the left-hand star being still Alpherat, and Andromeda still in a horizontal position. Cassiopeia is in the north-east, and raised somewhat more than halfway from the horizon towards the point overhead.

Below Andromeda, Aries has fully risen; and towards the north-east, low down, we see the Pleiades again. Between them and Cassiopeia lies Perseus. It is well to notice this constellation while in its present position, and also the richness of the background of milky light in this neighbourhood. The whole of this part of the heavens is full of beauty, and contrasts strangely with the barren region close by, between the north point of the horizon and Cassiopeia.

Auriga is rising above the north-north-east horizon, and Capella is beginning to scintillate less brilliantly as it rises above the denser strata of the atmosphere.

HALF-HOUR WITH THE STARS IN OCTOBER.

MAP X.

THE GREAT BEAR is low down towards the north-north-west; the pole-star lying above and very little to the right of the pointers.

The Guardians of the Pole are now below the pole-star on the left, and almost exactly midway between the horizon and the point overhead. The Dragon passes between the two Bears, and round to the left of the Guardians of the Pole. His head is towards the west-north-west, high up above the horizon.

Cor Caroli is approaching the horizon, and Boötes is already half set. So also is Serpens in the west. But Corona is still well raised above the north-north-west horizon. Hercules is in the west, but extends over a wide range from side to side. Vega is due west, and high above the horizon, the stars β and γ lying to the left at about the same height. Also at about the same height is the star β of the Swan, and the cross of Cygnus is now upright again, Arided lying near the point overhead.

Altair is in the south-west, raised somewhat less than halfway from the horizon towards the point overhead. Below Aquila is Sagittarius. Next, to the left and somewhat higher, is Capricornus; and, next, Aquarius in the south.

A noted star, Fomalhaut, the most southerly first-magnitude star ever seen in this country, is now visible towards the east of south, and very low down. It is the chief star of the Southern Fish, a constellation not to be confounded with the southernmost of the Fishes. ?

The square of Pegasus is towards the south-east, raised high above the horizon. Alpherat is still the most easterly star of the square, and Andromeda is still horizontal, though now well raised above the eastern horizon.

The sea-monster, Cetus, covers a wide range of the sky, low down towards the east-south-eastern horizon. The limits of the constellation, indeed, as defined by astronomers, extend from the east to the south-south-east.

Aries is in the east, about halfway between Andromeda and the horizon.

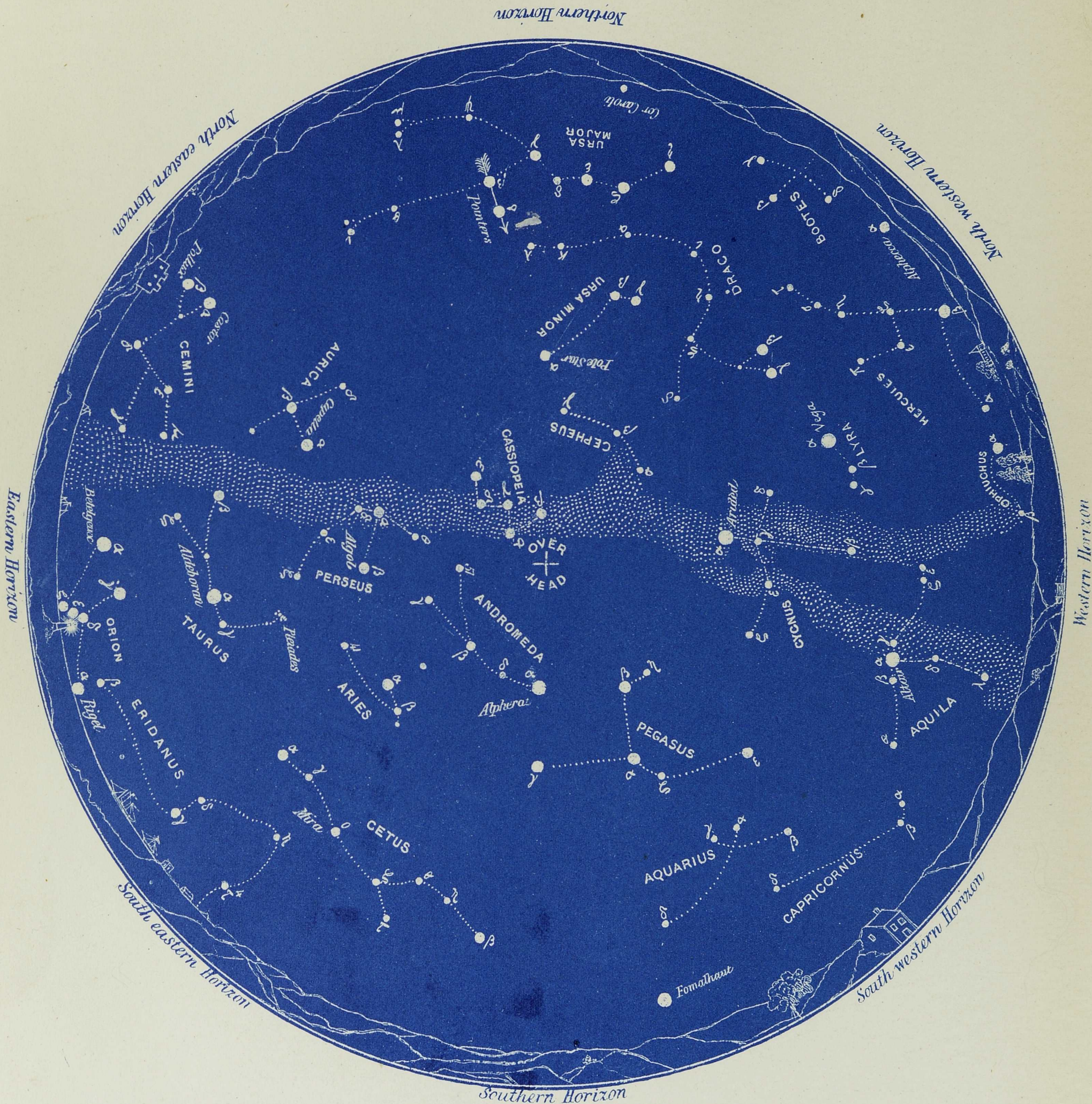
Taurus has now risen in the east-north-east, Aldeboran, the brightest red star in the heavens, scintillating brilliantly low down towards the horizon.

Above the head and horns of Taurus, is Perseus, and immediately above Perseus, raised three-quarters of the way from the horizon towards the point overhead, is Cassiopeia, the W now almost on end, and having the points towards the right.

Auriga has now risen in the north-east, Capella being almost exactly in that quarter, and raised somewhat more than one-fourth of the way towards the point overhead.

Castor is just rising between the north-east and north-north-east.

MAP II



THE SKY.

on Oct: 23 at 10 o'clock;	on Nov: 3 at 9¼ o'clock;	on Nov: 14 at 8½ o'clock;
on Oct: 26 at 9¾ o'clock;	on Nov: 7 at 9 o'clock;	on Nov: 18 at 8¼ o'clock;
on Oct: 30 at 9½ o'clock;	on Nov: 10 at 8¾ o'clock;	on Nov: 22 at 8 o'clock;

IN THE EVENING.

*** For the names of the stars, corresponding to the above lettering, refer to the list at p. 10.

HALF-HOUR WITH THE STARS IN NOVEMBER.

MAP XI.

THE GREAT BEAR is now due north, and at its lowest; the pole-star lying above, and somewhat to the left of, the pointers.

The Guardians of the Pole are below and to the left of the pole-star, and immediately above the last star of the Great Bear's tail.

The head of Draco has now come to the north-west, and is not nearly so high above the horizon as it was a month ago.

Due north-west, and almost on the horizon, is Alphecca, the other stars of the Crown being also very close to the horizon. Between Alphecca and the Great Bear the head and shoulders of Boötes are still to be seen above the horizon.

In the west-north-west, close to the horizon, are the heads of the two giant constellation-figures, Hercules and Ophiuchus. The left-hand and brighter *a* marks the place of the head of the Serpent-bearer, who is now passing below the horizon. The whole of Hercules, on the other hand, is still above the horizon, and, as usual, inverted. Above is Lyra; and Cygnus now occupies a conspicuous position in the west, midway between the horizon and the point overhead, the cross being still nearly vertical.

Aquila, the Eagle, is approaching the western horizon, Altair being in the west-south-west, and raised almost exactly one-fourth of the way towards the point overhead. Above Altair, and towards the left, is an interesting little constellation not marked in the map—Delphinus. It will be recognised at once, though consisting only of small stars, by the resemblance it presents to the figure of a dolphin leaping from the sea.

Capricornus is in the south-west, low down; and next to it is Aquarius, covering a wide range of the sky, and reaching almost to the south.

Below is Fomalhaut, nearing the south-south-west horizon.

The square of Pegasus is now at its highest, the left-hand side of the square vertical, the highest star on that side being Alpherat. Andromeda is still horizontal,—in fact, it is a peculiarity of this constellation that throughout its rise, from near the horizon to near the point overhead, the star Alpherat is always very nearly on the same level with a portion of the line joining the two stars γ and δ , which mark the feet of Andromeda. This is true from the epoch indicated in Map VII. to that indicated in Map XI., or through one-third part of the constellation's course round the pole.

Cetus is now well raised about the south-south-east horizon. The star *a* (Menkar) lies to the east of south-east. Immediately above this star is the head of Aries; below it is Eridanus, now rising in the south-east.

Orion also is rising, the three stars forming his belt almost upright towards the east. Above them is Aldeboran, and above that star are the Pleiades. Near the point overhead is Cassiopeia; below Cassiopeia, and somewhat to the right, is Perseus; below Perseus, and to the left, is Auriga, with the brilliant Capella; and below Auriga the twin-stars Castor and Pollux have risen, Castor vertically above Pollux.

HALF-HOUR WITH THE STARS IN DECEMBER.

MAP XII.

THE TIP of the Great Bear's tail lies almost due north, and low down. The pointers are towards the north-north-east, and the pole-star is above, and towards the left.

The Guardians of the Pole hang below the pole-star, slightly towards the left. Draco hangs below the Lesser Bear, extending around from right to left, where his body bends downwards again. The head of Draco lies between north-west and north-north-west, raised almost exactly one-fourth of the way from the horizon towards the point overhead. Towards the left, slightly lower, is Vega, the companion stars β and γ lying on the left.

Cygnus is in the west-north-west, the cross again upright, and Arided raised somewhat less than halfway from the horizon towards the point overhead. Above, very near the point overhead, is Cassiopeia.

Low down, and somewhat to the right of the western point of the horizon, is Altair, with his companion stars β and γ , the former on his left, the latter on his right.

The square of Pegasus is still high above the horizon, towards the west-south-west. The highest star of the square is Alpherat, and Andromeda now extends from this point to the point overhead, close to which are both her feet.

Aquarius is setting in the west-south-west. Cetus is due south, well raised above the horizon. The space below Cetus, quite bare of conspicuous stars, belongs to the southern constellations Sculptor and Fornax. Above Cetus is Aries, the star α due south, and raised nearly three-fourths of the way from the horizon towards the point overhead.

Above the south-south-east horizon is Eridanus, covering a large space of the sky. Orion has now risen well above the south-eastern horizon somewhat easterly. Above him is Taurus, the Pleiades now shining very conspicuously.

Near the point overhead is Perseus, the star α being towards the east, and Algol towards the south-east.

Below Perseus, somewhat to the left, is Auriga; and below the brilliant Capella are to be seen the twin-stars Castor and Pollux, the constellation Gemini being now in a horizontal position, the feet of the twins (μ and γ) resting on the Milky Way. Procyon has just risen above the eastern horizon.

Towards the north-east the sky is almost blank. But low down may be seen two stars belonging to the Sickle in Leo, now rising above the north-eastern horizon.

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