

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 DECEMBER 12-18

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on December 12

Sun rises, 7h. 59m.; souths, 11h. 53m. 58'os.; sets, 15h. 49m.; decl. on meridian, 23° 6' S.: Sidereal Time at Sunset, 21h. 14m.

Moon (one day past Full) rises, 16h. 34m.*; souths, oh. 29m.; sets, 8h. 27m.; decl. on meridian, 18° 57' N.

Planet	Rises	Souths	Sets	Decl. on meridian
	h. m.	h. m.	h. m.	
Mercury	6 15	10 43	15 11	18° 3' S.
Venus	8 12	12 4	15 56	23 30 S.
Mars	10 10	14 6	18 2	23 1 S.
Jupiter	3 14	8 26	13 38	10 7 S.
Saturn	18 6*	2 9	10 12	21 33 N.

* Indicates that the rising is that of the preceding evening.

Occultations of Stars by the Moon (visible at Greenwich)

Dec.	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
			h. m.	h. m.	
14	3 Cancr	6	1 42	2 46	100 237
14	B.A.C. 2731	6½	6 54	near approach	207 —
14	54 Cancr	6½	21 26	22 9	85 181
Dec.	h.				
13	6				Mercury stationary.
13	17				Saturn in conjunction with and 2° 59' north of the Moon.

Variable Stars

Star	R.A.	Decl.	h. m.
	h. m.		
U Cephei	0 52.2	81 16 N.	Dec. 13, 1 25 m
T Arietis	2 42.0	17 2 N.	18, 1 5 m
S Tauri	4 23.0	9 42 N.	16, m
R Leporis	4 54.4	14 59 S.	18, M
S Cancr	8 37.4	19 27 N.	12, M
W Virginis	13 20.2	2 47 S.	17, 2 24 m
δ Libræ	14 54.9	8 4 S.	15, 21 0 M
U Coronæ	15 13.6	32 4 N.	16, 4 50 m
β Lyræ	18 45.9	33 14 N.	13, 22 15 m
δ Cephei	22 24.9	57 50 N.	15, 2 30 m ₂
			16, 4 50 m
			17, 19 20 M

M signifies maximum; m minimum; m₂ secondary minimum.

Meteor-Showers

Moonlight interferes with meteor observation during the early part of the week, which is also less fruitful of meteors than are the first few days of the month. Amongst the radiants which have supplied meteors at this season are one in the constellation of the Lynx, R.A. 108°, Decl. 63° N., and one in Quadrans, R.A. 221°, Decl. + 53° N.

THE LAW OF STORMS IN THE EASTERN SEAS¹

I. IN the Eastern seas the earliest signs of a typhoon are clouds of the cirrus type—looking like fine hair, feathers or small pale white tufts of wool—travelling from the east or thereabout, their direction backing towards the north, a slight rise in the barometer, clear and dry but hot weather, and light winds. This fine weather lasts for days, and the existence of a typhoon at a great distance contributes therefore to the safety of ships at sea,—a fact that is not sufficiently appreciated by mariners.

The cirrus clouds, which frequently assume fantastic shapes, make their appearance within 1500 miles of the centre of a typhoon, the barometer is generally rising beyond from 600 to 1000 miles of the centre, and the mean of the twenty-four hours' temperature rises in Hong Kong above 81°.

A swell in the sea is noticed within from 300 to 500 miles of the centre, but this depends greatly upon the situation of the

¹ By Dr. W. Doberck, Hong Kong Government Astronomer. Reprinted from the Hong Kong Telegraph.

nearest land. Halos round the sun and the moon, phosphorescence of the water, and also glorious sunsets appear to be frequently noticed before typhoons.

Within about 800 miles of the centre the sky is generally half covered with cumulus clouds, above which cirro-cumulus are usually seen. South and south-west of the centre, thunderstorms and cumulo-stratus clouds are observed. On approaching nearer to the centre the cloudiness increases, the temperature falls in consequence, and the mercury begins to descend in the barometer. Then the air becomes oppressive from the increasing dampness, a slight haze is observed during the morning hours, and the sky presents a threatening and vaporous appearance. Within 300 miles of the centre the temperature falls quickly owing to the cumulus, roll-cumulus, or nimbus clouds, with which the sky is nearly completely overcast. And meantime the wind has risen and blows generally with the force of a strong breeze about 300 miles from the centre. But this depends also upon the bearing of the centre, the wind being usually strongest in the right hand semicircle. Within 150 miles of the centre the sky is densely overcast with nimbus clouds accompanied by heavy rain, and within 60 miles it generally pours down in torrents, while the wind blows so hard that no canvas can withstand it; but there is no thunder and lightning. The temperature at sea is frequently about 76°, and on shore about 78°.

Within from 2 to 15 miles of the centre the wind either calms down or blow only moderate breezes, and the sky clears, being now covered only by very light clouds. The sea is as a rule mountainous, but in some reports it is stated that the sea had calmed down to some extent when the wind fell. Quantities of sea-birds, and near land also butterflies and other insects, cover a ship situated in the bull's eye of a typhoon. It is possible that the central calm does not quite accurately coincide with the centre of the typhoon.

The angle between the direction of the wind and the direction of the radius (the straight line between the observer and the centre of the typhoon) is, on an average, between 10° and 25° latitude, 43° in front of the centre and 53° behind the centre; between 33° and 35° latitude, 65° in front and 85° behind; and between 10° and 35° it is about 49° in front and 62° behind the centre. The angle appears to be smaller near the shore for off-shore winds, and far out at sea the difference between the angle in front of and behind the centre appears to be small. The following rule for finding, on board ship in the China seas, the bearing of the centre of a typhoon is, therefore, approximately correct: Stand with your back to the wind, and you will have the centre on your left side, but 3 points in front of your left hand; i.e. the centre bears about 11 points from the wind. If your ship is in a very low latitude the centre may lie as much as 4 points in front of your left hand, i.e. bear 12 points from the wind, and if you are in a high latitude it may bear only 9 points from the wind. Once the wind has reached the force of a strong breeze, the average angle between the wind and the direction of the centre does not appear to change at all, but the wind, which blows in great gusts in a typhoon, may oscillate to both sides of the true value. There does not appear to be any foundation at all for the belief that the wind near the centre blows in circles round the centre. To act according to this rule might prove disastrous to a ship experiencing a typhoon.

Very low clouds in a typhoon move with the wind, but if the clouds are high they are frequently seen to move in a different manner, and the following rule may then occasionally be of use: If right in front of the centre, stand with your back towards the direction whence the clouds are coming, and you will have the centre from 1 to 2 points in front of your left hand; and if straight behind the centre you may have it a point or two to the left of the direction in which you are looking.

Once the bearing of the centre has been ascertained, the master of a vessel in a typhoon requires to know in which semicircle, looking in the direction towards which the typhoon is moving, he is situated: If in the right hand semicircle, the wind will veer, i.e. shift with the sun; and if in the left hand semicircle, it will back, i.e. shift in the opposite direction. But this rule is strictly applicable on board of a vessel only when heave-to, or at any rate proceeding at a slower rate than the typhoon. For a vessel moving at a faster rate than and in the same direction as a typhoon, the rule may be reversed. In case of doubt it may therefore become advisable to heave-to in order to be quite sure of the semicircle in which you are situated. But we have seen that the wind moves in spirals towards the centre, and