## ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 JANUARY 6-12.

(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 January 6*

Sun rises, 8h. 7m.; souths, 12h. 6m. 17·2s.; sets, 16h. 6m.: right asc. on meridian, 19h. 11·3m.; decl. 22° 26′ S. Sidereal Time at Sunset, 23h. 12m.

Moon (at First Quarter January 9, 1h.) rises, 11h. 2m.; souths 16h. 22m.; sets, 21h. 53m.: right asc. on meridian, 23h. 27·9m.; decl. 8° 22′ S.

| Planet. | Rises. | Souths. | Sets. | Right asc. and declination on meridian. |
|---|---|---|---|---|
| | h. m. | h. m. | h. m. | h. m. ° ′ |
| Mercury.. | 8 39 ... | 12 30 ... | 16 21 ... | 19 35·5 ... 23 46 S. |
| Venus..... | 10 7 ... | 15 2 ... | 19 57 ... | 22 7·2 ... 13 15 S. |
| Mars ..... | 10 0 ... | 14 55 ... | 19 50 ... | 22 1·0 ... 13 16 S. |
| Jupiter.... | 6 32 ... | 10 28 ... | 14 24 ... | 17 32·8 ... 22 56 S. |
| Saturn.... | 18 55*... | 2 24 ... | 9 53 ... | 9 27·8 ... 16 6 N. |
| Uranus ... | 0 54 ... | 6 17 ... | 11 40 ... | 13 21·6 ... 7 55 S. |
| Neptune.. | 13 2 ... | 20 45 ... | 4 28*... | 3 52·0 ... 18 27 N. |

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

Saturn, January 6.—Outer major axis of outer ring = 45″·1: outer minor axis of outer ring = 11″·0: southern surface visible.

### *Variable Stars.*

| Star. | R.A. (1889·0) h. m. | Decl. (1889·0) ° ′ | | h. m. | |
|---|---|---|---|---|---|
| U Cephei ... ... | 0 52·5 | 81 17 N. | Jan. | 8, 21 53 | *m* |
| R Tauri ... ... | 4 22·3 | 9 55 N. | ,, | 9, | *M* |
| ζ Geminorum ... | 6 57·5 | 20 44 N. | ,, | 7, 19 0 | *m* |
| | | | ,, | 12, 19 0 | *M* |
| R Canis Majoris ... | 7 14·5 | 16 11 S. | ,, | 11, 18 10 | *m* |
| | | | ,, | 12, 21 26 | *m* |
| U Geminorum ... | 7 48·5 | 22 18 N. | ,, | 10, | *M* |
| X Boötis ... ... | 14 18·9 | 16 50 N. | ,, | 7, | *m* |
| U Boötis ... ... | 14 49·2 | 18 9 N. | ,, | 9, | *m* |
| δ Libræ ... ... | 14 55·1 | 8 5 S. | ,, | 12, 22 53 | *m* |
| R Herculis ... ... | 16 1·2 | 18 40 N. | ,, | 10, | *M* |
| U Ophiuchi... ... | 17 10·9 | 1 20 N. | ,, | 11, 4 58 | *m* |
| ϑ Lyræ... ... | 18 46·0 | 33 14 N. | ,, | 12, 6 0 | *M* |
| R Aquilæ ... ... | 19 0·0 | 8 4 N. | ,, | 6, | *M* |
| T Vulpeculæ ... | 20 46·8 | 27 50 N. | ,, | 8, 20 0 | *M* |
| | | | ,, | 12, 4 0 | *m* |
| V Cygni ... ... | 20 47·6 | 34 14 N. | ,, | 6, 5 40 | *m* |
| | | and at intervals of | | 36 0 | |
| δ Cephei ... ... | 22 25·0 | 57 51 N. | Jan. | 7, 2 0 | *M* |
| | | | ,, | 10, 20 0 | *m* |
| S Aquarii ... ... | 22 51·3 | 20 56 S. | ,, | 7, | *M* |

*M* signifies maximum; *m* minimum.

### *Meteor-Showers.*

| | R.A. | Decl. | |
|---|---|---|---|
| Near ξ Virginis ... ... | 173° | 9° N. | ... Swift; streaks. January 11. |
| ,, ζ Boötis ... ... | 218 | 14 N. | ... Very swift; streaks. |
| ,, β Boötis ... ... | 222 | 42 N. | ... ,, ,, |

## NOTES ON METEORITES.[1]

### VII.

#### Possible Connection between the Jets and Envelopes seen in Cometary Swarms.

THE jets observed in comets when near the sun are very various in form. The concentric envelopes seen at times are much more regular; an idea of their appearance will be gathered from the accompanying illustration of Donati's comet.

It has not yet been clearly ascertained whether the jets and envelopes are connected phenomena—that is, whether the jets are true whirls of the meteorites themselves—or whether they represent volatilization of the vapours of the nucleus in a particular direction, which vapours subsequently assume a concentric form. In Halley's comet, at all events, this was not

FIG. 21.—Concentric envelopes as illustrated by Donati's comet.

observed. Sir John Herschel writes concerning this: "The bright smoke of the jets, however, never seems to be able to get far out towards the sun, but always to be driven back and forced into the tail, as if by the action of a violent wind rolling against them—always from the sun—so as to make it clear that this tail is neither more nor less than the accumulation of this

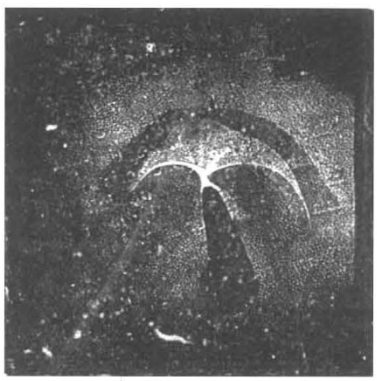

FIG. 22.—Combination of jets and envelopes (comet of 1861).

sort of luminous vapour, darted off in the first instance towards the sun, as if something raised it up, as if it were exploded by the sun's heat, out of the kernel, and then immediately and forcibly turned back and repelled from the sun."

#### The Concentric and Excentric Envelopes.

While in Donati's comet we get perhaps the finest exhibition of concentric envelopes successively thrown off from the nucleus towards the sun, in Coggia's comet, on the other hand, we had the most striking instance which has been yet observed in which the envelopes put on an appearance as if they belonged to two different systems of concentric envelopes cutting each other.

It is important here to enter into some details. In Coggia's comet (as observed with Mr. Newall's 25-inch refractor, with a low power), next to the nucleus the most brilliant feature was an object resembling a fan opened out some 160°. The nucleus, marvellously small and definite, was situated a little to the left of the pin of the fan—not exactly, that is, at the point held in the hand. If this comet, outside the circular outline of the fan, offered indications of other similar concentric circular outlines, astronomers would have recognized in it a

[1] Continued from p. 142.