

one far less marked than that shown by the spots. The following numbers derived from notes by the Rev. S. J. Perry in the *Observatory* for February 1886, and March 1887, shows that the mean extent of the prominence arc has greatly diminished, though the mean height of the prominences has suffered little change. This diminution in extent was especially marked during the last three months of the year.

	Mean height of chromosphere, excluding prominences	Mean height of prominences	Mean extent of prominence arc
1885	8'00 ...	28'67 ...	28 25
1886	8'05 ...	24'78 ...	13 36
Mean 1880 to 1885 ...	8'07 ...	25'71 ...	32 45

The "mean extent" for October is 9° 54', for November 7° 25', and for December 9° 31'.

COMET 1887*d* (BARNARD, FEBRUARY 15).—Prof. Boss has furnished other elements of this comet than those he gave in his first circular, the first set of elements being thus superseded. They are as follows:—

$$T = 1887 \text{ March } 28.47$$

$$\left. \begin{aligned} \omega &= 36 \quad 37 \\ \Omega &= 135 \quad 28 \\ i &= 139 \quad 45 \end{aligned} \right\} \text{Mean Eq. } 1887.0$$

$$\log q = 1.0059$$

Prof. Krueger (*Astr. Nach.*, No. 2774) has computed the following ephemeris for Greenwich midnight from these elements:—

1887	R.A.	Decl.	log r	log Δ
March 13 ...	54 13	57 49 N.	0.0162	9.9430
15 ...	52 53	57 11	0.0129	9.9730
17 ...	51 44	56 39	0.0100	0.0008
19 ...	50 41	56 11	0.0076	0.0265
21 ...	49 46	55 46	0.0056	0.0400

THE WARNER OBSERVATORY.—Mr. Lewis Swift, director of the private observatory of Mr. Warner, of Rochester, N. Y., has recently published a pamphlet giving a description of the dome and 16-inch refractor and other accessories of the observatory. The great telescope has been used by Mr. Swift, since July 1883, in a systematic search for new nebulae, of which 540 have been discovered up to January 1, 1887. The places and descriptions of over 400 of them are given. Mr. Swift is also engaged in searching for comets. The pamphlet, in addition, contains a list of the recipients of the Warner Prizes for cometary and other astronomical discoveries, as well as a reprint of the essays on comets and on the "sky-glow" of 1883 and 1884, to which prizes have been adjudged.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 MARCH 13-19

(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 March 13

Sun rises, 6h. 21m.; souths, 12h. 9m. 39'3s.; sets, 17h. 58m.; decl. on meridian, 2° 56' S.; Sidereal Time at Sunset, 5h. 22m.

Moon (at Last Quarter March 16) rises, 21h. 43m.*; souths, 3h. 8m.; sets, 8h. 23m.; decl. on meridian, 9° 34' S.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	6 22 ...	12 54 ...	19 26 ...	5 33 N.
Venus ...	7 6 ...	13 39 ...	20 12 ...	5 52 N.
Mars ...	6 41 ...	12 46 ...	18 51 ...	0 15 N.
Jupiter...*	21 49* ...	2 52 ...	7 55 ...	11 53 S.
Saturn...*	11 34 ...	19 43 ...	3 52* ...	22 29 N.

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

Occultation of Star by the Moon (visible at Greenwich)

March	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
14 ...	γ Libræ ...	4½ ...	3 56 ...	5 10 ...	82 252
March 17 ...	14 ...	Saturn stationary.			

Variable Stars

Star	R.A.	Decl.	h. m.
η Geminorum ...	6 8.1 ...	22 32 N. ...	Mar. 15, 0 0 <i>M</i>
R Lyncis ...	6 51.9 ...	55 29 N. ...	,, 18, <i>M</i>
R Crateris ...	10 55.0 ...	17 43 S. ...	,, 19, <i>M</i>
δ Libræ ...	14 54.9 ...	8 4 S. ...	,, 16, 23 13 <i>m</i>
U Coronæ ...	15 13.6 ...	32 4 N. ...	,, 17, 3 18 <i>m</i>
U Ophiuchi... ..	17 10.8 ...	1 20 N. ...	,, 13, 2 40 <i>m</i>
and at intervals of 20 8			
W Sagittarii ...	17 57.8 ...	29 35 S. ...	Mar. 13, 22 0 <i>M</i>
U Sagittarii... ..	18 25.2 ...	19 12 S. ...	,, 15, 21 0 <i>m</i>
R Sagittæ ...	20 8.9 ...	16 23 N. ...	,, 19, <i>m</i>
U Capricorni ...	20 41.9 ...	15 12 S. ...	,, 16, <i>M</i>
R Vulpeculæ ...	20 59.4 ...	23 22 N. ...	,, 19, <i>M</i>
δ Cephei ...	22 25.0 ...	57 50 N. ...	,, 18, 11 0 <i>M</i>

M signifies maximum; *m* minimum.

Meteor-Showers

	R.A.	Decl.	
Near α Persei ...	50 ...	48 N.	
β Virginis... ..	175 ...	10 N.	Slow bright meteors.
δ Ursæ Majoris..	185 ...	58 N.	March 17.
β Draconis ...	263 ...	50 N.	
η Serpentis ...	276 ...	6 N.	Very swift meteors.
κ Cephei ...	300 ...	80 N.	Slow bright meteors.

GEOGRAPHICAL NOTES

ON Tuesday last, the 8th inst., the Expedition under Mr. H. M. Stanley for the relief of Emin Pasha, arrived at Simons-town from Zanzibar. They were to resume their voyage on Wednesday, after taking supplies on board. Mr. Stanley is accompanied by Tippoo Tip, through whose agency, it is expected, Stanley Falls will be restored to the Congo State. Messengers have been sent across the continent to the Congo, and Mr. Stanley expects that a large addition to his caravan will be awaiting him when he arrives on the Upper Congo.

LIEUT. BAERT, of the Congo Free State, has recently made a journey up the Mongalla, a northern tributary of the Congo, considerably to the east of the Mobangi. The river had previously been navigated to some extent by Mr. Grenfell, but Lieut. Baert has succeeded in getting much beyond Grenfell's furthest. In fact, he attained the limit of navigation, at over 200 miles from the mouth of the river, where its course is broken by falls. The river flows in a general southward direction, through a well-wooded country, and its rapids are situated in about 3° 30' N. lat., and 22° E. long. The Mongalla is very sinuous; its rapids are situated in a mountainous district inhabited by a people named Sebi, who do good work in iron.

A FRENCH traveller, M. Chaffanjon, is exploring the Orinoco. He has already surveyed the Bolivar and the San Fernando, and discovered numerous errors in existing maps. He has made large collections in ethnology, archaeology, and philology. He hoped to solve the puzzling problem of the Casiquiare, and reach the sources of the Orinoco last December.

IN the first number for 1887 of the *Mitteilungen* of the Vienna Geographical Society, is a German translation of the interesting paper by D. Isabelo de los Reyes, on the Tinguians of the Philippine Island, Luzon. The author is himself an Ilocan, a tribe which marches with the Tinguians, and has had exceptional opportunities of investigating the origin, and customs, and beliefs of his fellow-countrymen, and, being educated, can tell what he knows. A good map accompanies the paper, and to this Dr. Blumentritt contributes explanatory text. To the same number Herr Edward Glaser contributes a sketch of his journeys in South Arabia, which, while mainly for archaeological purposes, have yet been the means of adding much to our knowledge of the little-known South Arabian mountain-land.

THE *Bollettino* of the Italian Geographical Society for January publishes a detailed account of the recently acquired Italian possessions on the Red Sea coast, extracted from an official memoir presented to the Chamber of Deputies by S. E. di Robilant. These possessions are grouped under three separate divisions: (1) territory garrisoned and administered by Italy, including Massowa, Emberemi, the Abdel-Kader peninsula, Gherar, Taulud Island, and the neighbouring Dahlak Archipelago; (2) protected territory, comprising the