

Brazilian expeditions to observe the transit of Venus of December 1882. The volume, which is a handsome quarto of some 750 pages, and is fully illustrated with photographs of the various stations and instruments, contains reports from three stations, the weather at the Imperial Observatory at Rio de Janeiro itself, which should have been a fourth station, having proved cloudy and wet. It had been at first intended to send an expedition to Cuba, but as the French astronomers were to occupy a position there, the little Island of St. Thomas, belonging to Denmark, was chosen instead. St. Thomas paired well with the southern station, Punta Arenas, in Patagonia, for the duration was much shortened at the former place and slightly lengthened at the latter, the sun being high at both stations, and ingress and egress at both taking place nearly symmetrically with regard to the meridian. The entire transit was also seen from the remaining station, Olinda, near Pernambuco, where ingress was somewhat retarded and egress much accelerated. The observations were all made by the method of projection, in order that the disturbing effects of irradiation might be got rid of as far as possible. The St. Thomas expedition which was under the command of Baron de Tefé, possessed three equatorials, and Dr. H. Draper had promised to supply a photo-heliograph, but his lamented death prevented the carrying out of his generous intention. The Olinda expedition, commanded by M. J. de Oliveira Lacaille, had two equatorials; whilst M. Cruls, the chief of the Punta Arenas party, had but one; the largest telescope in each case being 6½ inches in aperture. M. Cruls selected a site for his party within a mile of that occupied by Dr. Auwers with the German expedition; for the Brazilian Parliament having delayed the necessary credit for the expedition to the last moment, the expedition did not arrive at the place until late, and it seemed better to take advantage of the German choice of position rather than lose time by surveying for a fresh site at a distance. The observations at each of these three stations were successful, the second internal contact being observed at all, but the first internal contact was lost at St. Thomas. The method of chords could not, therefore, be employed, but the combination of the second contacts of the two northern stations with both contacts of the southern gave 8"·808 as the resulting parallax. A large part of the volume is devoted to a report of the voyage of the corvette *Parnahyba*, by Captain L. Saldanha de Gama, the captain who conveyed the southern observing party to their station, and to a description of the natural history of Tierra del Fuego.

THE TAIL OF COMET 1887 a (THOME).—Prof. Bredichin has discussed in the *Bulletin* of the Imperial Society of Naturalists of Moscow, 1888, Nos. 2 and 3, the observations of the direction of the tail of this comet. The comet was discovered by Mr. Thome, of Cordoba, on January 18, 1887, and it was remarkable for the smallness of its perihelion distance, the complete absence of any nuclear condensation in the head, and the length, straightness, and narrowness of the tail. Prof. Bredichin finds that the tail manifestly belongs to his third type, viz. those in which the repulsive force,  $1-\mu$ , does not exceed 0·1. He suggests, as the rate of outflow in comets of short perihelion distance is much more rapid at perihelion passage than later, and as the comet was not discovered until a week after perihelion, that the lighter materials may already have been driven off and reduced to such a degree of tenuity as to be invisible, leaving only substances of heavy atomic weight. As is well known, he associates his first type of tail, that in which the repulsive force is greatest, with hydrogen, the more ordinary second type with the hydrocarbons; and he suggests in the case of the present comet that elements with atomic weights like those of gold, mercury, and lead, would furnish a tail of the character observed. Some comets, however, which do not approach the sun closely, have tails only of the third type. If, then, Prof. Bredichin's explanation is to be received in its entirety, hydrogen and hydrocarbons are not always constituents of cometary tails.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 NOVEMBER 25—DECEMBER 1.

(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 November 25

Sun rises, 7h. 38m.; souths, 11h. 47m. 19'0s.; sets, 15h. 57m.: right asc. on meridian, 16h. 6'7m.; decl. 20° 54' S. Sidereal Time at Sunset, 20h. 17m.

Moon (at Last Quarter November 26, 17h.) rises, 21h. 1m. \*. souths 4h. 56m.; sets, 12h. 40m.: right asc. on meridian, 9h. 14'7m.; decl. 18° 7' N.

Planet.	R.ses.		Souths.		Sets.		Right asc. and declination on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury...	5	53	10	38	15	23	14	57'0
Venus....	10	37	14	18	17	59	18	37'4
Mars.....	11	30	15	29	19	28	19	49'1
Jupiter...	8	32	12	33	16	34	16	52'1
Saturn....	21	48*	5	14	12	40	9	32'2
Uranus...	3	31	8	57	14	23	13	16'0
Neptune..	15	50	23	35	7	20*	3	56'2

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

Occultations of Stars by the Moon (visible at Greenwich).

Nov.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.	
					h. m.	h. m.
26 ...	37 Leonis	6	...	7 25	near approach	178° 0'
28 ...	B.A.C. 3996	6	...	1 44	near approach	301 —
30 ...	B.A.C. 4572	6	...	5 59	near approach	124 —
Nov. h.	25 ...	13	...	Saturn in conjunction with and 1° 31' south of the Moon.		
Dec.	1 ...	11	...	Saturn stationary.		

Variable Stars.

Star.	R.A.		Decl.	h. m.
	h. m.	h. m.		
U Cephei ...	0 52'4	...	81° 16' N.	Nov. 25, 0 27 m
S Arietis ...	2 9'8	...	24 32 N.	Dec. 1, 30, 0 6 m
λ Tauri... ..	3 54'5	...	12 10 N.	Nov. 26, 20 44 m
ζ Geminorum ...	6 57'5	...	20 44 N.	" 30, 19 36 m
R Canis Majoris ...	7 14'5	...	16 12 N.	" 29, 2 0 m
U Monocerotis ...	7 25'5	...	9 33 S.	" 26, 3 57 m
U Hydræ ... ..	10 32'0	...	12 48 S.	" 27, m
S Leonis ... ..	11 5'1	...	6 4 N.	" 30, M
R Scuti ... ..	18 41'5	...	5 50 S.	" 29, M
η Aquilæ ... ..	19 46'8	...	0 43 N.	" 29, 18 0 m
T Aquarii ... ..	20 44'0	...	5 34 S.	" 27, m
T Vulpeculæ ...	20 46'7	...	27 50 N.	" 29, 21 0 M
Y Cygni ... ..	20 47'6	...	34 14 N.	" 25, 2 18 m
δ Cephei ... ..	22 25'0	...	57 51 N.	" 28, 2 12 m
				" 25, 4 0 M
				" 28, 21 0 m

M signifies maximum; m minimum.

Meteor-Showers.

The most interesting periodical shower of the week is that of the *Andromedes*, the stream connected with Biela's comet, but no remarkable display can be expected from it this year: max. Nov. 27; radiant about R.A. 25°, Decl. 44° N. Other showers of the week are as follow:—

	R.A.	Decl.
Near λ Persei ... ..	60°	50° N.
„ β Canum Venaticorum	190	42° N.

GEOGRAPHICAL NOTES.

Two letters relating to Dr. Nansen's expedition across Greenland have been published—one from Dr. Nansen himself to Mr. Augustin Gamel, Copenhagen, who is defraying the expenses of the expedition; the other from Mr. Sverdrup, one of Dr. Nansen's companions, to his father. The letters were sent forward from Godthaab by two *kajak*-men, who delivered them to the captain of the *Fox*, at Ivigtut. The following is a translation of Dr. Nansen's letter:—

GODTHAAB, October 4.

I have at last the great joy to report to you that Greenland has been successfully crossed from east to west. I regret that the very short time left to me before despatching my messengers will not permit any detailed account. I can just jot down a few words to be forwarded by the *kajak*-men. I am sending southwards in the hope of stopping the *Fox* at Ivigtut, and getting her to wait for us and take us home this autumn. But