

ASTRONOMICAL PHOTOGRAPHY.—The *New Princeton Review* for May 1887 contains an interesting article, by Prof. C. A. Young, with the above title. The article is, of course, of quite a popular character, but none the less is it deserving of perusal by astronomers—professional as well as amateur. In a rapid survey of the history of astronomical photography, Prof. Young refers briefly to the labours of J. W. Draper, Bond, Rutherford, Gould, Henry Draper, and Pickering, in America; of De la Rue, Common, and Roberts, in England; of the Brothers Henry, in France; of Vogel, in Germany; and of Gill, in South Africa. He then goes on to discuss the relative advantages and disadvantages attending the employment of the reflector and of the refractor respectively in this particular department of astronomical science; pointing out, in the case of the refractor, the two directions in which, at the present time, efforts are being made to overcome the difficulties arising from the want of perfect achromatism of the object-glass, viz. Prof. Abbe's researches on the production of glass which shall be perfectly achromatic, and Herr Vogel's investigations on a new sensitizing medium which may be as sensitive to the yellow and green rays as the salts of silver are to the violet rays. In the remaining portion of the article Prof. Young distinguishes two classes of astronomical photographs: those in which the end is to produce a picture of the object; and those which are made for purposes of measurement, and the determination of precise numerical data. He gives various examples of each class, with a brief account of the progress which has been made in solar, lunar, planetary, stellar, and nebular photography, as thus classified, concluding with an account of the very remarkable results which have recently been obtained by Prof. Pickering in the photography of stellar spectra.

COMET 1887 e (BARNARD, MAY 12).—Dr. H. Oppenheim (*Astron. Nachr.* No. 278) has computed the following elements and ephemeris of this comet from an observation made at Cambridge, U.S., on May 12, and from two others made at Rome on the 15th and 17th:—

T = 1887 June 24^h 55^m 59^s Berlin M. T.

$$\begin{aligned} \pi - \varrho &= 24 \quad 21 \quad 30 \\ \varrho &= 244 \quad 54 \quad 52 \\ \iota &= 17 \quad 9 \quad 21 \end{aligned} \left. \vphantom{\begin{aligned} \pi - \varrho \\ \varrho \\ \iota \end{aligned}} \right\} \text{Mean Eq. 1887} \cdot 0. \\ \log q &= 0 \cdot 11510$$

Ephemeris for Berlin Midnight.

1887.	R.A.	Decl.	Log Δ .	Log r .	Bright-ness.
	h. m. s.				
June 1	15 49 55	16° 12' 3" S.	9.5323	0.1299	2.0
5	16 0 2	12 19.1	9.5185	0.1253	2.2
9	16 10 46	8 17.1	9.5097	0.1216	2.3
13	16 22 1	4 13.9	9.5062	0.1186	2.4

The brightness on May 12 is taken as unity.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 JUNE 5-11.

(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 June 5.

Sun rises, 3h. 48m.; souths, 11h. 58m. 10.2s.; sets, 20h. 8m.; decl. on meridian, 22° 33' N.; Sidereal Time at Sunset, 13h. 4m.

Moon (Full on June 5) rises, 19h. 31m.; souths, 0h. 4m.*; sets, 4h. 32m.*; decl. on meridian, 18° 7' S.

Planet.	Rises.		Souths.		Sets.		Decl. on meridian.
	h. m.	s.	h. m.	s.	h. m.	s.	
Mercury	4	15	12	44	21	13	25° 6' N.
Venus	6	47	15	1	23	15	23° 8' N.
Mars	3	14	11	15	19	16	21° 13' N.
Jupiter	15	26	20	44	2	2*	8° 56' S.
Saturn	6	29	14	35	22	41	21° 56' N.

* Indicates that the southing and setting are those of the following morning.

Variable Stars.

Star.	R.A.		Decl.		h. m.
	h. m.	s.	h. m.	s.	
U Cephei	0	52.3	81	16 N.	June 8, 1 16 m
δ Libræ	14	54.9	8	4 S.	" 11, 1 52 m
U Coronæ	15	13.6	32	4 N.	" 7, 23 48 m
W Scorpil	16	5.2	19	51 S.	" 7, m
U Ophiuchi	17	10.8	1	20 N.	" 10, 0 14 m

M signifies maximum; m minimum.

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

June.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.
			h. m.	h. m.	
5 ...	29 Ophiuchi	6 ...	20 52	21 59	60 224
6 ...	B.A.C. 6081	6 ...	20 40	21 39	20 258
10 ...	45 Capricorni	6 ...	23 49	0 53†	42 275
10 ...	44 Capricorni	6 ...	23 58	near approach	156 —

† Occurs on the following morning.

Saturn, June 5.—Outer major axis of outer ring = 38".1; outer minor axis of outer ring = 15".2; southern surface visible.

Meteor-Showers.

	R.A.	Decl.
Near Antares	249	20 S.
β Ophiuchi	261	5 N. Rather slow.

GEOGRAPHICAL NOTES.

THE Expedition which went out to explore the New Siberian Islands, has returned to St. Petersburg with interesting results. The Expedition was organized by the Academy of Science, St. Petersburg, 26,000 roubles being contributed by the Emperor Alexander. Operations commenced in 1885, and considerable preparations had to be made. A winter retreat was chosen in the district of Kasachje (under 71° N. lat.), 30 kilometres south of Ustjansk at the mouth of the Jana. About 270 kilometres distant from Kasachje, were discovered the remains of a mammoth. At the end of March 1886, Dr. Bunge left for the Swatoinoss Mountains, where the real march with 240 dogs was to begin; 19 sledges drawn by 12 dogs, led the expedition over the frozen sea. In the latter half of April, the Jakutes returned with the sledges, and reported that the journey had been successfully accomplished. Dr. Bunge devoted his attention in particular to the Liachow Island, while Baron Toll attempted not only Kotelni Island, but also the Island of New Siberia. In May both explorers were at the Medweshi foothills, to the south of Kotelni Island. Liachow Island has a very uniform but rough appearance; it is 300 kilometres in circumference, the surface being uneven and hilly. The prevailing winds are east and west. The latter is extraordinarily violent, and works great mischief; it brings first rain, and then frost. Winter retires about the beginning of June, although the summer is never quite free from snow, mist, storms, &c. Enormous masses of perpetual ice inclose the island; only once could Dr. Bunge make a sea passage free from ice. In clear weather, looking northwards from Kotelni Island land is visible, which appears to be only 150 kilometres distant. The possibility of reaching this land is increased by the fact that a warm current flowing in a fixed direction prevents the sea from freezing over. The highest observed temperature in Liachow Island was only 8° (Réaumur). The snow melted in the beginning of June, and about the middle of the same month the first flower was found. Wild reindeer, wolves, Arctic foxes, and mice are found on these islands, as also sea-gulls, snipe, and other birds. With the exception of the mouse, all animals on the island are merely guests; they all winter on the land.

THE Canadian Government sent out at the beginning of May an Expedition for the exploration of the region watered by the great river Yukon in the north-west of the Dominion. The geology and natural history of the Expedition will be under the care of Dr. Dawson of the Canadian Survey; while a careful topographical survey will be made by Mr. W. Ogilvy.

In the new number (128) of the *Zeitschrift* of the Berlin Geographical Society, Prof. Blumentritt has some critical remarks on the Spanish data with reference to the distribution of the native languages in the Philippines. Colonel Schelling contributes a useful abstract of the Russian Survey work up to 1885, and Dr. Emil Deckert a paper on the country and people of the Southern United States.

THE German Government has appointed Lieut. Kund, who has done such good work in the Congo region, chief of the scientific station which has been established at the Cameroons; for when the Germans undertake the development of any region they at once recognize the necessity for scientific observations in order to accomplish their object. A surgeon and botanist will