

OUR ASTRONOMICAL COLUMN.

BROOKS' COMET.—Dr. F. Bidschof has computed the following elements and ephemeris for the comet discovered by Mr. W. K. Brooks, on October 16 :—

$$\begin{aligned} T &= 1893 \text{ September } 19 \cdot 6929 \text{ Berlin mean time.} \\ \Omega &= 175^{\circ} 1' 0'' \text{ Mean} \\ \omega &= 348^{\circ} 30' 7'' \text{ eq.} \\ i &= 129^{\circ} 54' 6'' \text{ 1893} \cdot 0 \\ \log q &= 9 \cdot 91335 \end{aligned}$$

Ephemeris for Berlin Midnight.

1893.	R.A. app. h. m. s.	Decl. app. ° ' "	log r	log Δ	Brightness
November 2	12 45 59	+24 35 9	0·0600	0·1913	0·88
6	12 53 13	27 51 8	0·0782	0·1788	0·85
10	13 1 12	31 21 1	0·0961	0·1662	0·83
14	13 10 2	+35 4 6	0·1137	0·1539	0·81

The brightness of the comet on October 18 has been taken as unity.

THE PLANET JUPITER.—At the present time Jupiter is a fine object for observation, his declination being between 18° and 19° north of the equator. Coming into opposition on November 18, telescopes of moderate power can be used effectively for observing the belts, small spots, and other fine details. Large instruments—that is, those having an aperture of 15 or 16 inches or more—may be used also for observations of the 5th satellite. Assuming the period of this satellite to be 11h. 57m. 21·88s. with a probable error of about a second of time according to Mr. Marth, the following are the approximate times of elongation :—

Greenwich T.me.

Nov.	East. h. m.	West. h. m.
2	9 9 p.m.	3 8 a.m.
6	8 47	2 46
10	8 24	2 23
14	8 2	2 1
18	7 40	1 39
22	7 18	1 17
26	6 56	12 55
30	6 34	12 33

THE WAVE LENGTHS OF THE NEBULAR LINES.—Last week we referred to Prof. Keeler's paper, read at the congress of Astronomy and Astro-Physics at Chicago, and we may add here a few words with regard to the results it included, as they are of importance. This paper, on "The Wave-lengths of the two Brightest Lines in the Spectrum of the Nebulæ" is the outcome of a series of measurements made with the 36-inch refractor and the large spectroscope of the Lick Observatory, the dispersion employed being equivalent to twenty-four 60° flint prism. The "normal position" of a nebular line is defined as the position of the line in the spectrum of a nebula at rest relatively to the observer. The results with respect to the two chief nebular lines are—

Normal position of the chief nebular line on Rowland's scale	... λ 5007·05 ± '03
Normal position of the second nebular line on Rowland's scale	... λ 4959·02 ± '04

Prof. Keeler considers the greater part of this probable error to be due to comparisons with the third line, which could not be observed so accurately. From all the observations he finds that the motion of the Orion nebula referred to the sun is + 11'0 ± 0·8 miles per second, and the wave-length of the chief line in this nebula, corrected for the earth's orbital motion, is 5007·34 ± '013.

GEOGRAPHICAL NOTES.

YET another plan for polar exploration is announced with no definite purpose of pushing on to the pole, although that may incidentally be reached. Mr. Robert Stein, of the U.S. Geological Survey, proposes establishing a station at the south end of Ellesmere Land, which will be kept in touch with the outer world by the whalers hunting in Baffin Bay. Here a number of observers will live gaining experience in Arctic travel, and from this base "a fan of secondary stations" will be pushed out a hundred miles or so further north, where com-

fortable houses will be built and frequent communication kept up with headquarters. From each secondary station the staff of five hardy observers will travel northwards, combining science with sport, and even when tracking the musk-ox or white bear each explorer will carry his "four-pound aluminium theodolite" and "make game of the heights and bearings of the mountain peaks." We fear that if this expedition, or rather system of exploration, is really set on foot, its difficulties will become much more real than they now appear. In any case it would be wise to postpone work on so large a scale until the two well-equipped expeditions already in the field have added their contribution to our knowledge of Arctic conditions.

M. E. DE PONCINS, who is travelling in Central Asia, has written some interesting letters to the Paris Geographical Society. In the latest, dated from Chajan, in the Pamirs, on July 9, he mentions the curious fact that while in Europe he has repeatedly suffered from mountain sickness on Mont Blanc and Monte Rosa, he eats and sleeps at 4500 metres in the Pamirs just the same as at sea-level. In crossing snow-passes at 5750 metres his horses caused some trouble, but with this exception he found the Pamirs a pleasant region where it was easy to get about in summer.

THE Russian Government has organised a new province in Siberia under the name of Anadyr. It occupies the extreme north-east of Asia, and is very thinly peopled, mainly by natives, Koriaks, Kamchadales, Chuchis, &c., the last named being the most numerous and the least uncivilised.

DR. E. V. DRYGALSKI, who has spent eighteen months in North-West Greenland studying the phenomena of Arctic glaciers, has returned to Europe, and his report of the work done by his expedition will be expected with much interest.

A NOVELTY in political boundary lines is reported in *La Géographie*, which states that the frontier between Turkey and Servia is to be marked throughout its length by a wire fence.

THE November number of the *Geographical Journal* is rich in new contributions to geography and exploration. The Earl of Dunmore's paper on the Pamirs and Central Asia occupies the first place.—The Rev. J. A. Wylie gives an account of a journey through Central Manchuria, with many interesting notes on places and people, and a detailed itinerary which must prove valuable to subsequent travellers.—Lieut. B. L. Sclater writes a detailed report on routes and districts in Southern Nysaland, illustrated by a new map of the district east of the Shire as far as the Milanji Mountains, largely compiled from his own prismatic compass surveys.—Mr. Theodore Bent communicates a letter from Mr. Swan, who is now in Mashonaland, giving an account of fresh ruins recently visited on the Lotsani and Lundi Rivers, the "orientation" of which to the setting solstitial sun he believes he has established.—Mr. W. S. Bruce and Dr. C. W. Donald publish a preliminary report of their observations during a voyage toward the Antarctic Sea, and Dr. Schlichter gives his paper on the determination of geographical latitudes by photography.

INSTITUTION OF MECHANICAL ENGINEERS

ON Wednesday and Thursday of last week, October 25 and 26, a general meeting of the Institution of Mechanical Engineers was held in the theatre of the Institution of Civil Engineers, in Great George-street, Westminster; the President, Dr. William Anderson, occupying the chair. Dr. Anderson retires in rotation this year, and Prof. Alexander B. W. Kennedy, F.R.S., is proposed as his successor. There were two papers down for reading, as follows :—"On the Artificial Lighting of Workshops," by Mr. Benjamin A. Dobson, of Bolton; and "On the Working of Steam Pumps on the Russian South-Western Railways," by Mr. Alexander Borodin, Engineer-Director.

Mr. Dobson's contribution was an interesting and valuable paper, in which he described the results of inquiries he had made with a view to obtaining the best mode of artificial illumination for the large workshops of his engineering establishment at Bolton. Mr. Dobson's works are engaged in producing textile machinery, more especially that for cotton-spinning. Many parts of such machinery require to be finished