

worded definitions to separate the sub-kingdoms, classes, and sub-classes of the vegetable kingdom. Modern research is now all destructive, nor seems it to have a thought as yet of proceeding on the lines of scientific construction.
E. PERCEVAL WRIGHT

OUR ASTRONOMICAL COLUMN

OLBERS' COMET OF 1815.—The Royal Society of Sciences of Haarlem have offered a prize for a new determination of the elements of this comet, founded upon the whole series of observations which remain in a form admitting of more accurate reduction than they have yet received, by the use of improved positions of the comparison stars and a calculation of the effect of perturbations, while the comet was visible, with the more precise values of the planetary masses which we now possess. Bessel, in his final memoir upon this comet, not only investigated the elements of the orbit from the *ensemble* of the observations in the form in which they were known to him in 1815, but essayed to determine the effect of planetary attraction upon the epoch of next return to perihelion, which he fixed to February 9, 1887, but he found that the period of revolution resulting from the observations in 1815, was liable to a probable error of ± 101 days. Unless the semi-axis major admits of determination within narrower limits, a recomputation of the perturbations would lose much of its value and interest, and accordingly the Haarlem Society, in stating the terms of the prize, limit the investigation now demanded to a definitive calculation of the orbit of the comet in 1815, at least we so understand the notification in *Astronomische Nachrichten*, No. 2,264. Allusion is made to NATURE, vol. xix. pp. 268, 366, where we gave references to publications in which the observations of this comet that admit of a new reduction are to be found. The Society at the same time offer a prize for a critical examination of Serpieri's theory of the zodiacal light, "especially if it is to be sought within or without the earth's atmosphere," and it does not clearly appear from the article in the *Astronomische Nachrichten*, whether one prize is intended to apply to the two subjects; we can hardly suppose that this is the case, as it seems unlikely that any one person would engage upon problems of so widely different a character.

THE NEW COMET.—The elements of the comet discovered by Mr. Lewis Swift do not bear resemblance to those of any comet previously computed, and it does not appear that the body is one of any special interest. The perihelion passage took place towards the end of April, and the comet is now slowly receding from the earth. From the direction of its path, so far as position is concerned, it might remain visible for a considerable time, but its brightness is stated to be sensibly diminishing.

THE COMET 1759 (III).—The following orbit of this comet by Mr. Hind rests upon a new reduction of some of the observations made at Paris, and upon Cassini de Thury's last observation as given by Pingré.

Perihelion passage, 1759, Dec. 16^h 84^m 10^s G.M.T.

Longitude of perihelion	138° 28' 35"	} Mean equinox 1760 ^o .
" ascending node	79° 50' 4"	
Inclination	4° 52' 31"	
Log. perihelion distance	9.9848692	
Motion—retrograde.			

This is the comet which became suddenly visible in Western Europe on January 8, 1760, when its distance from the earth was within 0.075 of the earth's mean distance from the sun.

VARIABLE STARS.—The following are Greenwich times of geocentric minima of Algol according to Prof. Schön-

feld's elements, from the middle of July to the middle of October:—

h. m.		h. m.		h. m.	
July 15	... 12 29.2	Aug. 27	... 12 37.4	Sept. 22	... 7 54.4
18	... 9 17.8	30	... 9 25.9	Oct. 6	... 15 57.6
Aug. 4	... 14 9.1	Sept. 16	... 14 17.2	9	... 12 46.2
7	... 10 57.7	19	... 11 5.8	12	... 9 34.9
24	... 15 48.9				

The rise in brightness of *Mira Ceti* to its maximum on September 11 may be well observed this summer. S Cancri will be at a minimum on September 18 at 10h. 4m. On the variations of the latter star Schönfeld's memoir published at Mannheim in 1872 may be advantageously consulted.

GEOGRAPHICAL NOTES

THE new number of the Geographical Society's periodical contains Mr. Keith Johnston's notes on "Native Routes in East Africa, from Dar-es-Salaam towards Lake Nyassa," accompanied by a very interesting map, in which are embodied the particulars gleaned by Mr. Johnston from native travellers. This paper is followed by Prof. Geikie's lecture on geographical evolution, of which an abstract appeared in NATURE, vol. xix. p. 490, and several pages are next devoted to a not very happy attempt to present the salient geographical features of Mr. Ryall's account of his explorations in Western Tibet, which forms one of the appendices of the *General Report* of the operations of the Survey of India for 1877-8. Among the geographical notes we find intimations that the science lectures are to be discontinued, and that the Council have arranged to provide means of instruction and training for intending travellers. There is also a note of Mr. M. C. Doughty's visit to El-Hejjer, a reported Troglodyte city in North-west Arabia, which disposes of singular fables that have been accepted by some learned Orientalists.

THE question of the availability of elephants in African exploration, lately so much discussed, is now about to be put to the crucial test of experiment. The four elephants presented by the Indian Government to the King of the Belgians for the use of his expedition have arrived safely at Zanzibar, and have been landed near Dar-es-Salaam, not, however, without some difficulty, as the following extract from a letter written by a lady who witnessed the scene will show:—"We never thought the first elephant could get alive to shore. It swam more than a mile in distance, and was in the water for more than an hour. Long after it was half way it would keep turning round and trying to come back to the ship. I cannot describe to you the excitement there was on board. I fairly cried once with anxiety and excitement, it would have been too horrible to see it drowned! It tried to climb up the ship's side once. It was pouring with rain, which made things seem more dismal; we were all wet through, but nobody cared. We had to get our experience as we went on, as no one knew anything about elephants on landing. We managed the other three much better, and made the Captain take the ship nearer in shore. Capt. Carter has stayed over there to take the elephants to Dar-es-Salaam, a distance of four miles, and will stay to see them comfortably settled."

THE *Novoye Vremya* gives some further news as to the progress of the Russian traveller, Col. Prjevalsky. The distance from the Saisan port to the River Buguluk, in the southern Altai mountains, was accomplished by the Colonel towards the end of April. All this tract is a barren desert, having neither flora nor fauna, though the banks of the River Urungu were found to bear some slight vestiges of vegetation. As for the climate, Col. Prjevalsky describes it as characterised by frost at night-time, with heat and storms during the day. Eight degrees of frost in the morning were often followed by 20 deg. of

heat at noon. Nevertheless, the scientific labours of the expedition had great success, the country being explored in all directions, and the gallant Colonel only hopes to attain as fruitful results in Thibet. He intended advancing to Barkul and Chami, as the shortest way through the southern Altai range.

FROM the Annual Report upon the Survey of the Northern and North-Western Lakes and the Mississippi River, in charge of Major C. B. Comstock and Capt. H. M. Adams, we learn that on Lake Erie the triangulation has been carried from Cleveland, Ohio, to the west end of the lake. The topography and hydrography have been extended to include all of the American shore, and the Canadian shore from Detroit River to Point Pelée. A base-line has been measured near Chicago and the connecting triangulation east has been completed to White Pigeon, Mich. The latitude and longitude of Memphis, Tenn., have been determined, and in connection with Capt. W. S. Stanton, United States Engineers, the longitudes of Fort Laramie, Wyo., Camp Robinson, Neb., and Deadwood, Dak., have been determined. The survey of the Mississippi River has been carried from Mound City, above Memphis, to Scanlon's Landing, Ark., and a line of precise levels has been completed from Memphis, Tenn., to Austin, Miss. A chart of Lake Ontario, coast charts Nos. 1 and 2 Lake Ontario, coast charts Nos. 7, 8, and 9 Lake Michigan, and detail charts Nos. 1, 2, 3, 4, 5, 6, and 7 Mississippi River have been completed.

IN his last report from Saigon, Mr. Consul Tremlett states that the water communication between Saigon, Cholon, and the western provinces of French Cochinchina being very circuitous and inadequate to the traffic, the Canal of Cho-goo has been cut from Cho-goo to Soug-tra, being six miles in length and 110 feet broad. This canal is of immense importance to the country between the River Donnai and the Mei-Kong. Another short canal is to be cut near the junction of the Viaco and Soir-ap, two arms of the Donnai. Mr. Tremlett also mentions that a canal which did not attract much attention was opened in 1876, connecting the lower and upper branches of the Mei-Kong; it is $3\frac{1}{2}$ miles long, and opens a more direct course from the south-western parts of the colony to Cholon, the great centre of traffic.

ERNEST MARNO, the well-known Austrian traveller in Africa, who originally formed one of the staff of the Belgian expedition under the late Capt. Crespel, has recently been appointed deputy governor of the province of Galabat in the Soudan. M. Statin, another Austrian traveller, has gone to the region of the Upper Nile, the special object of his journey being meteorological investigations.

MESSRS. S. T. LEIGH AND CO., of Sydney, have issued a map which will be very useful to persons visiting Australia during the approaching exhibition. It shows the Great Western Railway of New South Wales crossing the Blue Mountains, from the Nepean River to Bowenfels, also the localities and natural features of greatest general interest. The map has been compiled on the scale of one geographical mile to an inch by Mr. E. Du Faur, and is intended to accompany some fine photographs of the same region which Mr. Du Faur published about two years back. The more remarkable gorges and cliffs among the mountains are illustrated by dark shading.

NO. 1 of the new volume (36) of *Globus* has the first of a series of articles on the Island of Chios, by Dr. Ad. Testevuide, of that island. There are two papers of considerable ethnological interest: one by M. Andrée on the ethnological boundaries in France, and the other by Dr. Jung, mentioned in next note, on Australian types and sketches. Among the news are some details concerning Severtzov's second journey in the Pamir.

"AUSTRALIEN UND NEUSEELAND" is the title of an historical, geographical, and statistical sketch by Dr. Carl E. Jung, which has just been published at Leipzig (O. Mutze), with ten illustrations.

LAST YEAR'S SOLAR ECLIPSE¹

WE have received an interesting account of the observations made during the late eclipse in Texas, under the direction of Mr. Waldo. The first part of the Report is chiefly taken up with an account of the determination of the geographical position of Fort Worth. The second part contains the reports of the various observers. Mr. Waldo gives a description of the photographs obtained. Unfortunately the camera had no proper clockwork. An ingenious, though most likely shaky, arrangement was used to correct the sun's motion in altitude, while his motion in azimuth was left to take care of itself. Each point more luminous than the remainder of the sun's corona is therefore drawn out into a line; but this outline of the moon's edge at the beginning and end of totality is sufficient to determine the position of these brighter points. An attempt was made to obtain photographic evidence of the polarisation of the corona, by inserting a double image prism between the lenses of the camera. The result was doubtful. The photographs were examined by Prof. Pickering, who found inequalities in them, which, as far as they go, tend to indicate a tangential polarisation; but in the opinion of Dr. Hastings, the evidence is not conclusive.

Mr. R. W. Willson observed the corona through a 3-inch telescope. By an oversight a red shade was not removed before totality. Through this shade the corona seemed to have a pretty well-defined limit about four or five minutes from the moon's limb. After the shade had been removed, other portions of the corona could be seen, the light of which was nearly as intense as that near the sun's limb; while the ring, which alone was visible through the shade, was not distinguished from the other parts of the corona. These observations would indicate that there is more red light in the corona near the body of the sun than away from it; and this observation is confirmed by Prof. S. H. Lockett, who, in a letter to Mr. Waldo, calls the outer corona "more bluish-white" than the inner corona.

Prof. J. H. Rees made some spectroscopic observations with a two-prism spectroscope. No bright lines were seen; but on widening the slit dark lines were noticed, amongst them especially C and D.

Mr. W. H. Pulsifer made also some spectroscopic observations. He noticed the reversal of the Fraunhofer lines with a tangential slit, and from the length of these lines he determined approximately the thickness of the reversing layer to be about 524 miles. No observations could be made during totality, as the image of the corona on the slit was lost, and could not be found again. The mischief was caused originally by one of the lamps, which went out just before totality. Moral: Don't trust to any lamps during eclipse observations. There is always a gust of wind at the beginning of totality, which is pretty sure to extinguish lamps.

Mr. Seagrave could see the inner corona about thirty seconds before totality.

Several gentlemen have sent in sketches of the corona, which are given on the last of the four plates accompanying the report. The remaining plates are taken up by an enlarged copy of the best photograph obtained, by a sketch illustrating Mr. Willson's report, and by a sketch of the corona made by Prof. Lockett.

ARTHUR SCHUSTER

¹ Report of the Observations of the Total Solar Eclipse, July 29, 1878, made at Fort Worth, Texas. Edited by L. Waldo. (Cambridge: J. Wilson and Son, 1879.)