

diminished that the Kirghizes already ford the strait which connects it with the lake. None of the rivers given on our maps as flowing into the Ala-kul Gulf and Lake Balkhash from the south-west were found by M. Krasnoff. They have all dried up.

THE additions to the Zoological Society's Gardens during the past week include an Alexandrine Parrakeet (*Palaeornis alexandri*) from India, presented by Miss Ada Marshall; two Chinese Geese (*Anser cygnoides*) from China, presented by Miss Hoare; four Midwife Toads (*Alytes obstetricans*), South European, purchased; a Blue-cheeked Parrakeet (*Platyercus cyanogenys*) from North Australia; a Pied Crow Shrike (*Strepera graculina*) from Australia; a Sun Bittern (*Eurypyga helias*) from South America, received in exchange; a Blood-breasted Pigeon (*Phlogoenas cruentata*); two Dwarf Chameleons (*Chamaeleo pumilus*) bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

MICROMETRIC MEASURES OF JUPITER AND SATURN.—In the recently-published "Observations," made at the Hong Kong Observatory during 1886, Dr. Doberck gives some measures of Jupiter and Saturn made with the 6-inch Lee equatorial now at Hong Kong. The measures of Jupiter, extending from August 29, 1879, to April 7, 1886, include the position-angle of the polar axis, the apparent equatorial and polar diameters, the breadth of the equatorial belts and of the red spot, and the length of the latter when on the central meridian. Dr. Doberck concludes that the equatorial and polar diameters at the mean distance of Jupiter are 38".207 and 35".942 respectively, and that the equatorial semi-diameter at the mean distance of the earth from the sun is 99".39. The measures of Saturn extend from January 3, 1879, to April 5, 1886, and include the position-angle of the polar axis, the external diameter of the ring, the diameter of Cassini's division, the internal diameter of the ring, and the equatorial and polar diameters of the planet. The deduced dimensions at the mean distance of Saturn are:—External diameter of ring 40".28, diameter of Cassini's division 34".42, internal diameter 26".82, equatorial diameter of Saturn 17".22, and polar diameter 16".53. The equatorial semi-diameter at the mean distance of the earth from the sun is 82".11.

PRESENT APPEARANCE OF SATURN'S RING.—M. Stuyvaert, Assistant-Astronomer at the Royal Observatory, Brussels, has recently presented a couple of drawings of Saturn to the Royal Belgian Academy. These were made on February 8 and 15 in the present year, and show the Cassinian division as encroaching on the outer ring, A, in a remarkable series of shaded indentations. Ring B is nearly broken up into a series of bright white spots by a number of dusky indentations on its inner border of a similar shape, and the dusky ring, C, likewise shows two dark notches on the inner side of the following ansa. Struve's division between B and C was also seen, and appeared on February 8 to be formed by a succession of dark gray spots. These observations are largely supported by those of Dr. Terby and Mr. Elger, published in the *Observatory* for March and April. Mr. Elger observed three or four "large re-entering angles like the teeth of a saw" on the inner margin of the dusky ring. This was on the preceding ansa, and not the following, as in M. Stuyvaert's observations, but the rotation of the ring would account for the change. Mr. Elger also noticed on February 25 that the preceding ansa of the dusky ring was unequally black, certain parts of its surface appearing quite black. These black spots were also noticed and drawn by Dr. Terby, who likewise remarked the unusual distinctness and breadth of Struve's division. It would appear, therefore, from these and other recent observations that the matter composing the ring system is at present much less symmetrically and evenly distributed than usual. Irregularities in the inner borders of the various rings, such as the above observers describe, have indeed been observed before, Trouvelot, for example, having remarked notches in Ring A, and Jacob similar indentations in the dusky ring, but they are not ordinarily seen.

THE RED SPOT UPON JUPITER.—From some recent observations of this object published by Mr. Stanley Williams in the May number of the *Observatory*, it appears that the ephemeris given

by Mr. Marth in the *Monthly Notices* for November 1886, is about a quarter of an hour too late. The red spot may therefore be expected to be on the central meridian at about the following times:—

	h. m.		h. m.		h. m.
May 24...	21 33	June 7...	23 6	June 19...	23 0
,, 26...	23 11	,, 10...	20 35	,, 22...	20 30
,, 29...	0 49	,, 12...	22 14	,, 24...	22 8
,, 31...	22 19	,, 14...	23 53	,, 26...	23 46
June 2...	23 57	,, 15...	19 43	,, 27...	19 38
,, 5...	21 27	,, 17...	21 22	,, 29...	21 16

The above times are expressed in Greenwich civil time, and are reckoned from midnight to midnight.

DISCOVERY OF A NEW COMET.—A new comet was discovered on May 12, by Mr. E. E. Barnard, Nashville, Tennessee, U.S.A. Place, May 12, 16h. 57m., R.A. 15h. 10m. 58s., Decl. 31° 25' S. The comet was only faint.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 MAY 22-28.

(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 May 22.

Sun rises, 4h. 1m.; souths, 11h. 56m. 24'.6s.; sets, 19h. 52m.; decl. on meridian, 20° 23' N.; Sidereal Time at Sunset, 11h. 52m.
Moon (New on May 22) rises, 4h. 18m.; souths, 11h. 38m.; sets, 19h. 9m.; decl. on meridian, 14° 17' N.

Planet.	Rises.		Souths.		Sets.		Decl. on meridian.
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	
Mercury ...	3 47	11 31	19 15	18 38	N.		
Venus ...	6 17	14 47	23 17	25 14	N.		
Mars ...	3 43	11 29	19 15	18 56	N.		
Jupiter...	16 26	21 43	3 0*	9 14	S.		
Saturn...	7 16	15 23	23 30	22 8	N.		

* Indicates that the setting is that of the following morning.

May 26 ... 8 ... Venus in conjunction with and 5° 18' north of the Moon.
26 ... 17 ... Saturn in conjunction with and 2° 45' north of the Moon.
27 ... 14 ... Mercury in superior conjunction with the Sun.

Variable Stars.

Star.	R.A.		Decl.	h. m.
	h. m.	h. m.		
U Cephei ...	0 52.3	81 16 N.	May 24,	2 18 m
U Canis Minoris...	7 35.2	8 39 N.	,, 22,	m
δ Librae ...	14 54.9	8 4 S.	,, 28,	2 44 m
U Ophiuchi...	17 10.8	1 20 N.	,, 25,	1 48 m
			and at intervals of 20 8	
W Sagittarii ...	17 57.8	29 35 S.	May 28,	21 0 M
η Aquilæ ...	19 46.7	0 43 N.	,, 27,	3 0 m
R Sagittæ ...	20 8.9	16 23 N.	,, 28,	m
R Vulpeculæ ...	20 59.4	23 22 N.	,, 22,	m
δ Cephei ...	22 25.0	57 50 N.	,, 26,	3 0 m

M signifies maximum; m minimum.

Meteor-Showers.

	R.A.	Decl.
Near α Draconis ...	280	54° N.
γ Cygni ...	301	37 N.
From Lacerta ...	329	48 N.

GEOGRAPHICAL NOTES.

THE new *Ergänzungsheft* (No. 86) of *Petermann's Mitteilungen* contains a monograph of great importance in scientific geography by Dr. Rudolf Credner, Professor of Geography at Greifswald, on "Die Reliktenseen," which he defines broadly so as to include all lakes of marine origin, whether they do or do not now contain remains of marine fauna. The author considers such lakes of so great importance in connexion with the evolution of the earth, that he thinks it the duty of physical geography to critically examine all data concerning lakes which may have a claim to be regarded as of marine origin, and

decide whether such claim is justifiable. He discusses the evidences on which lakes may be regarded as of marine origin—historical, morphological, biological, and with regard to existing names. He then devotes considerable space to the discussion of the claims of lakes in all parts of the world to be regarded as of such origin; to the relations between salt- and fresh-water fauna; and to a critical examination of the faunistic argument for the marine origin of existing inland lakes. He concludes that none of the arguments derived from the considerations referred to have a convincing importance in deciding as to the marine origin of lakes. Dr. Credner is of opinion that the question can only be satisfactorily solved on the geological evidence furnished by the various lake regions; and this argument he means to develop in a second part of this very valuable monograph.

DETAILS are to hand of the recent exploration of the Mobangi tributary of the Congo, by Capt. van Gèle, which add something to the results obtained by Mr. Grenfell. Capt. van Gèle's journey was made at the end of 1886, at the time when the river is in flood, and when the current of the rapids is most powerful. At no part was the water less than 1'80 metre in depth, and the deepest did not exceed 11 metres. Not far from the embouchure of the Mobangi, on the left bank, 8° 30' S. lat., 17° 35' E. long., there is a French station. Above this part the Mobangi measures 2500 metres in breadth, 11 metres in depth in the centre, with a current at the rate of 1 metre per second. At the 4th degree N., just below the rapids, there is a breadth of 1200 metres, a depth of 7'50 metre, and a current of 1'50 metre per second. Between these two points the breadth of the Mobangi constantly varies, never exceeding 4000 metres. Its waters are of a clear brown colour, and its general aspect much the same as that of the Congo, its channel studded with islands, and its banks wooded. The right bank is often marshy, while the left bank is frequently steep, and the neighbourhood hilly. The left bank is much more densely peopled than the right, which never has but a scanty population. On the left bank, especially above the 2nd degree of latitude, there is a rapid succession of villages, belonging to the Baati, the Monyembo, and the Montumbi. The people are well made and tall (mean height of men 1'80 metre), they are industrious, but at the same time inveterate cannibals. In all the course of the river which has been observed, Capt. van Gèle did not notice any affluent of importance; the only three worth mentioning are the Nghiri on the left bank, and the Ibenya and the Lobay on the right. The Nghiri winds through a very marshy country, which probably occupies the place of the conjectural lake of that name. About 4° N. lat., a mountain mass is met with, running in a north-east and south-west direction, through which the Mobangi must penetrate in making its way to the Congo, and here it is, as might be expected, that rapids are found. The river here is narrowed into a gorge, impassable at high water, but, Mr. Grenfell assures us, quite passable at low water for a suitable steamer.

The Argentines have been very active recently in the exploration both of Patagonia and of their section (the eastern) of Tierra del Fuego. In a communication which appears in *Petermann's Mitteilungen*, Ramon Lista gives some details of a journey which he made through the centre of the large eastern island from Sebastian Bay to the Strait of Le Maire. He states that our notions of the surface and climate of this island have hitherto been entirely erroneous: it has been regarded as inhospitable, barren, and uninhabitable; its rocky mountains covered with everlasting snow. This may be so with the west part of the land, but M. Lista gives a different account of the region traversed by him. From Cape Espiritu Santo to Cape Peñas he found valleys of varying breadth, covered with luxuriant fodder plants, and abounding in rivers, some of which are navigable, and which come from a snow-covered region in the interior. South of this is found the region of Antarctic forests. Though not so rich in grass and water as the northern region, M. Lista states that it made a favourable impression on him. He saw a good deal of the native population, and collected considerable data as to their anthropology. Many other scientific observations were made by him on the geology, fauna, and flora of the country.

THE Carniola section of the German and Austrian Alpine Club has resolved to put up on the Old Posthouse at Wurzen, the favourite head-quarters of Sir Humphry Davy, a tablet to commemorate his services in making known the South-Eastern Alps of Austria, and in attracting visitors thither.

THE ROYAL SOCIETY CONVERSAZIONE.

LAST week we referred to the *conversazione* of the Royal Society, held on Wednesday, the 11th inst. It was the best which has been given for many years. A large number of remarkable objects were exhibited, and an account of some of the most important of them may be of interest to our readers.

Prof. A. W. Rücker exhibited lecture apparatus to illustrate the measurement of coefficients of expansion by means of Newton's rings. The rings are formed between a glass plate and the convex end of a glass cylinder. These are pressed together by a metal frame, the front and back of which are connected by tubes through which a current of water is passed. The rings are projected on a screen and expand or contract when the temperature of the water is altered. The apparatus was shown in operation.

Maps to illustrate the present state of the magnetic survey of the British Isles now in progress, with a set of instruments of the Kew pattern, which have been used in the survey, were exhibited by Profs. Thorpe and Rücker. (1) Large map showing the stations at which observations have been made, and the values of three magnetic elements, viz. the inclination, declination, and total force at all places for which the reduction of the observations has been completed. The epoch of the survey is to be January 1, 1886, but the values given are not as yet corrected for secular change, except in the case of stations in Scotland. (2) Three maps of Scotland showing the lines of equal dip and equal total force for 1837, 1858, and 1886, and the lines of equal declination for 1858 and 1886. Mr. C. V. Boys exhibited a radio-micrometer and spinning-pile, which is probably the most sensitive instrument for measuring radiant heat yet made. It consists of a movable circuit of copper, antimony, and bismuth hung by a quartz fibre in a strong magnetic field. One-hundred-millionth of a degree is not beyond the possible limit of such an instrument. Prof. D'Arsonval made an instrument essentially the same in principle last year. This radio-micrometer was devised by the exhibitor without knowledge of M. D'Arsonval's, from which, however, it differs in important details. The one exhibited is an experimental instrument only; but it is about one hundred times as sensitive as a thermopile. The spinning-pile is peculiar in that it will start itself and turn either way indifferently when a spark is held on one side, and will at once stop when the spark is held on the other. Mr. Boys also showed an apparatus for shooting threads of glass, emerald, quartz, &c. A thin rod of the material is fastened to the tail of an arrow and heated at the end by an oxy-hydrogen flame. The trigger of a cross-bow is immediately pulled, and the arrow shot, when a thread of extreme fineness is drawn out. These threads are far finer than spun glass, and many are finer than spider-lines. Threads of quartz are practically free from elastic fatigue, and are most suitable for the torsion threads of instruments of precision. Quartz can be drawn so fine that the thinnest parts are beyond the power of any possible microscope to define them. Experiments were made, showing the discharge by flame of electrically-spun threads.

Sir John Fowler and Mr. B. Baker exhibited a series of most marvellous photographs of the 1700-foot span cantilever bridge now in course of construction across the Firth of Forth. Some of these photographs will be exhibited to-morrow at the Royal Institution. Specimens of wire and other articles made from "platinoid," manufactured by Mr. F. W. Martino, were exhibited by the London Electric Wire Company. Platinoid is untarnishable under atmospheric influences, and is specially suited to be a substitute for platinum-silver, German silver, &c., for electrical purposes, as by experiments it has proved itself unchanged under variation of temperature (see Proceedings of the Royal Society, No. 237, 1885). Major H. S. Watkin exhibited a Watkin patent aneroid invented by himself, and manufactured by Mr. J. J. Hicks. It is well known that aneroids have been made of all sizes, from 3 feet to half an inch in diameter; the length of the divisions on the scale representing inches on the mercurial barometer have also been varied to suit different purposes; but inasmuch as there was only one circle of figures, either the number of inches, and therefore the extreme height at which the instrument was available, had to be restricted, or the dimensions of the scale contracted in order to obtain a longer range. Major Watkin's patent index gets over this difficulty, and an open scale can now be obtained, combined with great length of range. Thus, in the 4-inch patent aneroid 1 inch on the mercurial barometer can be made to represent from 4 to 10 inches, and yet be available for great heights.