

of the nomenclature, and a popular history and description of all the known species, brought down to the latest date. It will be published in parts, each containing not less than ten coloured plates. The size will be large quarto.

MESSRS. ASHER AND CO. announce as just ready "The Chittagong Hill Tribes," results of a journey made in the year 1882 by Dr. Emil Riebeck, Ph.D., F.R.G.S., translated by Prof. A. H. Keane.

THE Oyster Fishery in the United States employs 53,805 persons, and yields 22,195,370 bushels of oysters, worth 30,438,852 dollars. In France 32,431 persons are engaged in the industry, which produces 43,307L, and in Great Britain 3,000,000L. The oyster industry is rapidly passing from the hands of the fishermen into those of oyster culturists, and in the United States is carried on in so reckless a manner that the Government are being urged to interfere in the matter.

WE have received a copy of "Ellis's Irish Education Directory." The part of the book relating to "National Education" has been remodelled so as to make it a complete guide to the National System. The "Irish Educational Guide and Scholastic Directory" has now been incorporated with "Ellis's Irish Education Directory."

AT the last meeting of the Seismological Society of Japan (as reported in the *Japan Weekly Mail*) Prof. Koto read a paper on the "Movement of the Earth's Crust," as these have been observed in Japan. It appears that the south and east coasts are gradually rising, while the north and west coasts are subsiding. This phenomenon is directly connected with the intensity of seismic activity along the eastern seaboard, almost every earthquake felt in the capital coming from a region extending from north-east to south-east or nearly south, while hardly any originate in the west. Mr. Sekiya described in detail the great earthquake of October 15 last year. It was attended by unusual barometric variations. The thermometer, which averaged 16° C. during the month, rose to 27° immediately before the shock, while the wind blew with a force of 43 kilometres per hour. The shock occurred at 4' 21" 54 after midnight, and lasted for 5' 20", during which time no less than 200 complete vibrations were recorded. During the first second the motion of the earth measured only 2.5 mm., but rose to 13 mm. in the third, and reached its maximum intensity of fully 42 mm. in the fourth second. The shock was then travelling with a velocity of 200-280 mm. in the second. Over a hundred reports were received by the Meteorological Bureau from various parts of the country, from which it appeared that the area affected by the shock was 24,728 square miles. Eighty-six per cent. of the pendulum clocks in Tokio were stopped, and much damage of the kind usual in these shocks was done. Mr. Sekiya states that this earthquake was the severest since February 22, 1880, to which it was remarkably similar in many ways. Both originated somewhere on the east side of the Bay of Yedo, and both affected the same area. In both instances the origin of the shock was in all probability due to the formation of a subterranean fissure.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Miss Pyne Hamilton; a Blaubok (*Cephalophus pygmaeus*) from South Africa, presented by Mr. A. Best; a Russ's Weaver-bird (*Quelea russi*) from West Africa, presented by Mr. J. Abrahams; a Long-eared Owl (*Asio otus*), a Common Buzzard (*Buteo vulgaris*), a Common Kestrel (*Tinnunculus alaudarius*), European, presented by Mr. Scott B. Wilson; two Ravens (*Corvus corax*), British, presented respectively by Mr. J. Bradley, jun., and Mr. Gerard Sloper; a Common Lizard (*Lacerta vivipara*), British, presented by Mr.

Stanley S. Flower; a Wattled Starling (*Dilophus carunculatus*) from South Africa, purchased; a Common Otter (*Lutra vulgaris*), British, received on approval.

OUR ASTRONOMICAL COLUMN

A STAR WITH LARGE PROPER MOTION.—Dr. Gould notifies the probable existence of very large proper motion in a star of a little below the eighth magnitude, which is No. 1584 of Hour xxiii. in the Cordoba Zone Catalogue; the position for 1875.0 is in R.A. 23h. 58m. 1.85s., Decl. -37° 58' 18.8", consequently in the constellation Sculptor. From observations between 1872 and 1884 Dr. Gould infers an annual proper motion of +0.4823s. in right ascension, and -2.4479" in declination, or 6.2057" in arc of a great circle in the direction 66° 46' east of south. This direction, he remarks, differs from that of Lacaille 9352 (which is 15° distant) by 34°. The large proper motion of Lacaille's star, one of 7.5m., was also detected by Dr. Gould; it amounts to 6.9565"; so that it had moved over 14½ minutes of arc between the year 1752 and the time of the Cordoba observations about the end of 1876.

The annual proper motion of the star, Groombridge 1830, the largest yet remarked in a star north of the equator, is 6.976", as determined by Argelander in 1843.

WOLF'S COMET.—This comet was observed for position with the 8-inch refractor at the Observatory of Kiel, on March 12, when its distance from the earth was 2.24, and that from the sun 1.94, so that the theoretical intensity of light was just one-tenth of the amount on the night of discovery, September 17. As there is a possibility that the comet may yet be observable with larger instruments during the next period of absence of moonlight, Dr. Lamp has continued his ephemeris from Prof. Krüger's second elements, and a few places are subjoined—

At Berlin Midnight.

	R.A.	Decl.	Log. Distance from Earth.	Distance from Sun.
	h. m. s.			
April 3 ... 4	19 44 ... +3	7.3 ...	0.4030 ...	0.3144
5 ...	24 6 ...	3 16.9 ...		
7 ...	28 28 ...	3 26.1 ...	0.4118 ...	0.3193
9 ...	32 49 ...	3 35.0 ...		
11 ...	37 9 ...	3 43.5 ...	0.4204 ...	0.3242
13 ...	41 28 ...	3 51.5 ...		
15 ... 4	45 47 ... +3	59.2 ...	0.4288 ...	0.3290

THE APRIL METEORS.—The earth will arrive at the descending node of the first comet of 1861, with which the Lyra-meteors of April have been supposed to be connected, on the morning of the 20th inst. In 1861 the comet at this node passed only 214,000 miles within the orbit of the earth, and the elements assign for the radiant R.A. 270.7°, Decl. +33.5°. If the present form of the comet's orbit is due to planetary action at some distant epoch, it is quite as likely that the planet Saturn was the disturbing body, as that it should have been the earth. With the elements of 1861 we find that at a true anomaly of 144.43°, the comet's distance from the orbit of Saturn is only 0.11, and this point would be reached 2.48 years after perihelion passage. The period of revolution, according to the definitive investigation of Prof. Oppölzer, is 415 years.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, APRIL 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 April 5

Sun rises, 5h. 28m.; souths, 12h. 2m. 38.2s.; sets, 18h. 38m.; decl. on meridian, 6° 15' N.; Sidereal Time at Sunset, 7h. 35m.
Moon (at Last Quarter on April 7) rises, 23h. 49m.*; souths, 4h. 19m.; sets, 8h. 48m.; decl. on meridian, 17° 56' S.

Planet	Rises	Souths	Sets	Decl. on meridian
	h. m.	h. m.	h. m.	
Mercury ...	5 46 ...	13 11 ...	20 36 ...	15 22 N.
Venus ...	5 23 ...	11 37 ...	17 51 ...	1 58 N.
Mars ...	5 13 ...	11 22 ...	17 31 ...	1 2 N.
Jupiter ...	13 41 ...	20 58 ...	4 15*	13 56 N.
Saturn ...	8 11 ...	16 17 ...	0 23*	21 55 N.

* Indicates that the rising is that of the preceding and the setting that of the following day.

On April 9 at 3h. 48m. there is a near approach of 14 Capricorn to the Moon at 339° from the vertex to right, for inverted image.

Phenomena of Jupiter's Satellites

April	h. m.		April	h. m.	
5	0 13	I. occ. disap.	7	22 45	III. occ. reap.
	3 26	I. ecl. reap.		23 13	III. ecl. disap.
	21 32	I. tr. ing.	8	2 40	III. ecl. reap.
	23 52	I. tr. egr.		21 34	II. occ. disap.
6	18 40	I. occ. disap.	9	2 29	II. ecl. reap.
	21 55	I. ecl. reap.	10	22 13	IV. ecl. disap.
7	2 28	II. tr. ing.	11	2 37	IV. ecl. reap.
	19 7	III. occ. disap.			

The Phenomena of Jupiter's Satellites are such as are visible at Greenwich.

Saturn, April 5.—Outer major axis of outer ring = $39''.8$; outer minor axis of outer ring = $18''.1$; southern surface visible.

April 8, 2h.—Mercury at greatest elongation from the Sun, 19° East.

GEOGRAPHICAL NOTES

A COMMITTEE of the Geographical Society of Vienna has been appointed to carry out the business arrangements of Prof. Lenz's proposed expedition to Central Africa. It is reckoned that 25,000fl. will be wanted for the expedition. At first it was thought that Herr Lenz might go out as the representative of the united Geographical Societies of Vienna, Berlin, and Munich, but the Society of Berlin has decided to send out an explorer of its own, Dr. Fischer, who will start next month. Dr. Fischer will go for the same purpose as Herr Lenz—that is, to explore the watershed of the Upper Congo, and to find traces of the four missing Europeans. But instead of starting from the west coast, as Dr. Lenz proposes to do, he will proceed from the east coast, going from Zanzibar to Uganda.

THE fifth German Geographical Congress (*Geographentag*) will be held in Hamburg on April 9 to 12. Among the points which will be brought before the Congress are the following: Antarctic investigations by Drs. Neumayer and Ratzel; the importance of the Panama Canal to the trade of the world, and deliberations on a new edition of Dr. Neumayer's "Guide to Scientific Observations on Travel." The afternoons will, as hitherto, be devoted to questions connected with school geography. The exhibition directed by Prof. Pagenstecher promises to be especially interesting and exhaustive. It is intended to exhibit new maps, especially in the domain of hydrography, and all the maps and descriptions of the free town of Hamburg and the adjoining districts. The instruments and apparatus used by travellers will be collected in a single group. Rich public and private collections of African and Central American ethnographical and archeological objects will be exhibited, and in part explained by their owners. An exhibit of the products and articles of trade of the various colonies has been rendered possible by the co-operation of large mercantile firms in Hamburg; and zoological, botanical, and geological collections will be so grouped that the character of single countries and continents will readily strike the eye. Some excursions will also be made, especially one to the marshes of the lower Elbe.

We have received a reprint of a paper recently read before the Philosophical Society of Glasgow by the Rev. Alexander Williamson, the well-known traveller in North China. In the compass of thirty octavo pages the writer describes rapidly the extent, physical conformation, means of intercommunication (especially the rivers, the enormous importance of which is pointed out with much force), the nature of the soil and its products, meteorology, textile fabrics, oil-producing plants, dyes, the geology, trade routes, the race, population, and finally discusses the future. The portions of the subject to which Dr. Williamson devotes especial attention are precisely those which are wholly passed over, or only hastily glanced at in popular works in China. The section dealing with the geology of China gives some remarkable results, based on the investigations of Pumpelly and Richthofen. These show that under every one of the eighteen provinces of China, each of which is about as large as Great Britain, there are large deposits of coal. In some provinces it underlies the whole country in all descriptions—bituminous, anthracite, cannel, and lignite. The extent of these coal-measures may be gathered from the following statement:—Their total area is about 400,000 square miles in China proper. The coal-field in Hunan alone is greater than the

aggregate of the coal-fields of the greatest coal-producing countries in Europe; the Shansi coal-field is one and a half times larger than this aggregate, while in other parts of North China we have coal-fields seven times greater than all the coal districts in Great Britain. And, side by side with all the coal-fields investigated, Mr. Pumpelly found iron ores and ironstone of all descriptions. As regards the important geographical and commercial questions involved in trade-routes with South-Western China, Dr. Williamson is in favour of the route from Moulmein through the Shan States, crossing the Chinese frontier into Yunnan at Ssu-mao (Esmok); but he does not despair of the road by the Irrawaddy to Bahmo, and so by Ja-li to the Yang-tse, more especially as the latter would create a trade for itself—viz. that with Sse-chian. Then there is the ancient route between Central Asia and China, which passes through Hinan, Shensi, and Kansu, the southern branch of which leads through Yarkand, Kashgar, and Khoten to India and Persia, and which was used by caravans prior to the Christian era, while the other branch goes in a north-westerly direction to Bar-Kul, Kuldja, and thence to Russian territory.

MR. STANFORD, of Charing Cross, has published a Catalogue of Maps, and other geographical publications, calculated to be of great service to all who may have occasion to inquire after such things. The catalogue covers seventy-two pages, is carefully classified, beginning with maps of the world; after the title of each map is an account of its special features, its size, number of sheets, scale in miles to an inch, and price, according to method of doing up. The Catalogue, we may say, contains the maps of all the leading publishers in Europe. As Mr. Stanford is now sole agent for the Ordnance Survey Maps, a special section of the Catalogue is devoted to this department, and contains a very useful index map.

MESSRS. W. AND A. K. JOHNSTON have also sent us a copy of their new catalogue of the many geographical and other works published by that well known firm. We have also from the same firm a very excellent wall-map of Egypt, embracing the country down to the south of Lake Victoria Nyanza; it is brought so well up to date as to contain the leading features of Masai Land discovered by Mr. Joseph Thomson's second expedition. Accompanying the map is a useful Handbook of the Geography of Egypt.

THE Arctic ship *Alert*, when returned by the Government of the United States to the Admiralty at Halifax, will be placed at the disposal of the Canadian Government, for the purpose of continuing the exploration in which they are now engaged of the Hudson Bay and Straits.

A COMMITTEE, consisting of members of the Italian Senate and Chamber of Deputies and other influential persons, has been formed at Turin for the purpose of furnishing Sig. Auguste Franzoi with the means of enabling him to carry out his proposal to explore the country between the Abyssinian province of Kaffa and the Lakes of Equatorial Africa.

THE most important paper read before the Paris Society of Commercial Geography at its meeting on the 17th ult. was one by M. Delouell, the explorer of the northern part of the Malay peninsula. He described his discovery of a large lake, during his survey of the isthmus of Krao, called Tabé-Sab, which is bordered by fertile plains, where elephants and buffaloes abound. The people inhabiting this region have hitherto been unknown; they appear to be mestizos, half Siamese, who call themselves Samsams.

AT the last meeting of the Geographical Society of Marseilles M. Brémond read a detailed account, with itineraries, of his travels in the kingdom of Choa.

THE first number for the current year (Band viii. Heft 1) of the *Geographische Blätter* of the Bremen Geographical Society contains papers on the forest districts of Bavaria, the abodes and wanderings of the Esquimaux of Baffin Land, by Dr. Boas, Schwatka's exploration on the Yukon, New Zealand past and present, the German journey of exploration through South America, and numerous smaller communications.

THE last number (Band xx. Heft 1) of the *Zeitschrift* of the Geographical Society of Berlin contains the following papers:—A description by Dr. von Langegg of Old Cairo, situated about four kilometres to the south-west of the Arab quarter of modern Cairo; an account of the mission station of Otyimbingue in Damaraland, by C. G. Büttner; the first part of a discussion