

of the great lines of faulting crossing Manchuria, indicated by Richthofen.

THE current number of the *Zeitschrift der Gesellschaft für Erdkunde* (vol. xxxiv, No. 2) is entirely devoted to the official reports of the members of the German deep-sea expedition in the *Valdivia*. Prof. Chun gives a narrative of the expedition and its progress; Dr. Gerhard Schott reports on the oceanographical work; and the navigating officer, Herr Walter Sachse, adds an account of the re-discovery of Bouvet Island. A summary of the contents of these reports has already appeared in these columns (p. 114).

A NUMBER of students from the Paris École Supérieure d'Électricité visited electrical works and manufactories in Switzerland at the end of last March, this being the second excursion arranged by the authorities of the School. A report upon some of the objects and installations examined was presented to the Société internationale des Électriciens in May, and has just been published as an excerpt from the *Bulletin* of the Society, by M. Gauthier-Villars, Paris.

THE additions to the Zoological Society's Gardens during the past week include a Vervet Monkey (*Cercopithecus imlandii*) from South Africa, presented by Mr. R. Hilliard; a Brown Capuchin (*Cebus fatuellus*, ♀) from Guiana, presented by Colonel Bouchier; a Common Kingfisher (*Alcedo ispida*), British, presented by Mr. John Porter; an Alexandrine Parakeet (*Palaeornis alexandri*, ♀) from India, presented by Miss J. M. Pott; a Common Boa (*Boa constrictor*) from South America, presented by Mr. C. W. Lilley; an Alligator (*Alligator mississippiensis*) from Southern North America, presented by Commander H. Woodcock; two Grevy's Zebras (*Equus grevyi*, ♂ ♀) from Southern Abyssinia, a Malayan Bear (*Ursus malayanus*) from Malacca, deposited; three Pink-headed Ducks (*Rhodonessa caryophyllacea*, ♂ ♀ ♀) from India, six Edible Frogs (*Rana esculenta*), European; twelve Paradise Fish (*Macropus viridi-auratus*) from China, purchased; a Japanese Deer (*Cervus sika*), a Puma (*Felis concolor*), a Burchell's Zebra (*Equus burchelli*, ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

HOLMES' COMET 1899 *d* (1892 III.).—

Ephemeris for 12h. Greenwich Mean Time.

1899.	R.A.	Decl.	Br.
	h. m. s.	° ' "	r^{-2} (r Δ) ⁻²
August 24	2 57 44.22	+38° 17' 15.7"	0.1888 0.04999
25	58 33.92	38 32 21.3	
26	2 59 22.11	38 47 22.9	
27	3 0 8.77	39 2 20.4	
28	0 53.85	39 17 13.7	0.1869 0.05109
29	1 37.31	39 32 2.7	
30	2 19.13	39 46 47.1	
31	3 2 59.26	+40 1 26.8	

During the ensuing week the comet is in a good position for observation by observers having sufficient optical power; it passes closely to the south of the second magnitude variable star β Persei (Algol).

THE PARIS OBSERVATORY.—The annual report of M. Loewy, the director of the Observatory, contains a detailed review of the work accomplished during the past year.

Special attention has been devoted to the improvement of meridian observations, chiefly in the attempt to eliminate instrumental errors by greater precision and stability of the mountings.

The small equatorial coude has been provided with several accessories, and the building covering it so altered that the whole is now adapted for astrophysical observations.

The volume of observations made during 1897 will shortly be published in four separate parts, by different authors, who

will each be responsible for all reductions, descriptions and discussions contained in the part under their names.

The fourth part of the Paris Observatory Catalogue (of which the first three parts already published contain all the meridian observations made from 1837-1881) has just been completed. The meridian circles have been in use for fundamental observations, for a revision of Lalande's Catalogue, and for work on the variation of latitude.

Coude Equatorial.—The large instrument has been chiefly used in obtaining further series of photographs of the moon (scale about 6.5 inches to the lunar diameter) for the large lunar atlas now in progress of publication. During the year 591 plates have been obtained for this purpose. The method of enlargement of the negatives has also been improved.

Accompanying the report is a heliogravure of the moon when 20d. 59h. old, reproduced the same size as the original plate.

For part of the year the photographic objective was replaced by the visual glass, and the instrument then used by M. Hamy for measuring the diameters of small celestial objects by an interference method. The satellites of Jupiter and the planet Vesta have been measured in this way, the diameter of the latter agreeing very closely with the value obtained by Prof. E. E. Barnard.

Astrographic Equatorial.—The actual photographic work is now almost completed, all that remains to be done being the replacement of a small number of defective plates. The reduction of the plates for the Catalogue is well in hand, and seven of the Chart plates have been engraved for heliographic reproduction.

"THE BULLETIN ASTRONOMIQUE."—The August number contains several interesting and suggestive articles.—M. Flammarion contributes an article on "The World of Jupiter," in which he discusses at length the question of the various rotation periods of the planet, and also an illustrated account of the observation made by M. Antoniadi at Juvisy during the opposition of June 1898.—"The Rotation of Venus" is treated mathematically by Abbé Th. Moreux, based on observations made at Juvisy by M. Antoniadi.—"Observations of Mars" (illustrated) are contributed by MM. V. Cerulli and J. Chludoff.—MM. L. Rudaux and Em. Touchet furnish an article on the "Systematic Observation of Meteors," giving a suggested form for recording observations systematically, and dealing with the determination of radiants, the physical characters of the swarms, heights of the meteors, and the photographing of them.

THE SUN'S HEAT.—Prof. T. J. J. See contributes a further article dealing with the extension of Helmholtz's theory of the heat of the sun, in *Astr. Nach.* (Bd. 150, No. 3586). The method he now pursues is the determination of the potential of a heterogeneous sphere as caused by itself. He finds that the energy developed by the condensation on this assumption is greater than that produced in the condensation of a homogeneous sphere in the ratio of 176,868 to 100,000.

IRON AND STEEL INSTITUTE.

THE autumn meeting of the Iron and Steel Institute was held this year at Manchester, on August 15 and 16, under the presidency of Sir William Roberts-Austen, K.C.B., and was attended by an unusually large number of members. The meetings were held in the Town Hall, the members being welcomed to Manchester in eloquent speeches by the Lord Mayor and by Mr. S. R. Platt, chairman of the Executive Reception Committee. In acknowledging the words of welcome, the President referred to the services rendered to metallurgy by Dalton and Joule, and by such great engineers as Fairbairn, Whitworth and Daniel Adamson, Manchester's distinguished sons. The programme was a long and varied one, no less than ten papers being on the list. The first read was by Prof. J. Wiborgh, of Stockholm, whose contribution, which was translated and read by Mr. H. Bauerman, dealt with the use of finely divided iron ore obtained by concentrating processes. By the introduction of such methods of separation, the power of enriching iron ores has been greatly increased; but the advantages are qualified by the circumstance that the product obtained is usually in the form of fine powder, which limits its utility to the smelter. The question of how such material can best be applied is one of importance, and the author shows how the material may be utilised by direct