

matite veins in another paper, but he meanwhile points out that these veins are subsequent to the formation of the granite and gneiss, and that, like the quartz veins, they are of aqueous origin.

IN connection with the celebration of the centenary of ballooning, some foolhardy aeronauts have been attempting to cross the Channel through the fickle air. One, named L'Hoste, who started on Friday night from Boulogne, was missing till yesterday, when news reached Paris from Antwerp that he had been rescued in the North Sea by a French lugger bound for that town.

THE Swedish Academy of Agriculture has proposed to the Government that a sum of 50*l.* be granted to Dr. R. Lundberg for a visit to the International Fisheries Exhibition. The proposal will most likely be granted.

ON May 28, between 6 and 7.30 p.m., a magnificent mirage was seen at Finsbo, in Norra Ryrs parish, Sweden. During nearly two hours, with intervals of three to four minutes, a panoramic landscape was seen, with mountains, lakes, forests, and farms. To the eye the view appeared as if only three-quarters to one (English) mile distant.

LAST year several Swedish merchants contributed a sum of 100*l.* to enable the Swedish Doctor of Zoology, C. Bovallius, who has been travelling in Central America, to forward rare zoological specimens to the Upsala University. Herr Bovallius has from time to time sent some valuable collections of insects and birds to this institution.

THE additions to the Zoological Society's Gardens during the past week include an Orang-outang (*Simia satyrus* ♀) from Sumatra, presented by Mr. J. M. Vermont; two Duyker Boks (*Cephalophus mergens* ♂ ♀) from South Africa, presented by Mr. H. H. Trevor; a Philippine Paradoxure (*Paradoxurus prehensilis*) from the Philippine Islands, presented by Mr. A. Burgess; a King Parrakeet (*Aprosmictus scapulatus*) from Australia, presented by Mrs. Lewin; a Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea*) from Moluccas, presented by J. Snowdon Henry, F.Z.S.; two Viperine Snakes (*Tropidonotus viperinus*), a Dark Green Snake (*Zamenis atrovirens*) from North Africa, presented by Mr. J. C. J. Church; two Aye-ayes (*Chiromys madagascariensis*) from Madagascar, a Carpet Snake (*Morelia variegata*) from Australia, received on approval; a Hybrid Lühdorf's Deer (between *Cervus leuhdorfi* ♂ and *C. canadensis* ♀), ten Australian Wild Ducks (*Anas superciliosa*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

COMETARY REFRACTION.—M. W. Meyer, of the Observatory of Geneva, has published a discussion of three series of micrometrical observations, made during as many near approaches of the great comet of 1881 (1881 III.) to stars, when the latter were seen through the denser parts of the head of the comet, the immediate object of the micrometrical measures of distance between the nucleus and the star being the detection of any deflection or refraction of the light of the star in passing through the cometic nebulosity. This comet offered a great advantage in an investigation of the kind, inasmuch as its nucleus had perfectly the appearance of a fixed star. M. Gustave Cellérier had treated the question from a theoretical point of view in a memoir published in *Archives des Sciences Physiques et Naturelles*, of Geneva, of October 15, 1882; the conclusions are reproduced in abstract by M. Meyer, who has applied the resulting formulæ to the case in question. The first series of observations was made on June 29, 1881, when the comet passed close to the star 519 of *Durchmusterung* + 65°, which is No. 6594 in Oeltzen's Catalogue, of 7.8 mag. The

second series, on July 13, when the comet approached the star 1 Draconis (Hev.) within about 38", and the third series on August 1, when it passed about 24" from a star of 9.10 mag. For details of the method of treating the observations we must refer to M. Meyer's paper, which appears in *Mémoires de la Société de Physique et d'Histoire Naturelle de Genève*, t. xxviii.; he sums up his conclusions as follows:—"La substance dont la chevelure de la grande comète de 1881 a été composée s'est optiquement comportée comme un gaz, et sa puissance réfractive à une distance de 10,200 kil. du noyau a été pendant l'époque des observations de 0.000093. La pression de ce gaz diminuait dans les régions étudiées proportionnellement au carré de la distance au noyau." He does not venture to say, however, that this value exactly represents the refractive power of the comet, though he believes in a measurable force.

M. Meyer remarks that previous attempts to detect a deflection of light in traversing the substance of a comet had led only to negative results. Bessel availed himself of the conjunction of Halley's Comet with a star of the tenth magnitude on September 29, 1835, to discover by heliometric measures an effect of this kind, but without success. His measures have been subjected to a new reduction, in accordance with M. Cellérier's theory, by M. Meyer, though with similar negative result.

KEPLER'S NOVA OF 1604.—The position of this famous star is now favourably situated for observation. It is most readily found by reference to a star of 8.9 mag., which occurs in Argelander's southern zones, and which is No. 16872 of Oeltzen's Catalogue. The place of this star for 1883.0 is in right ascension 17h. 24m. 2.9s., declination - 21° 23' 34". By Prof. Schönfeld's reduction of the observations of Fabricius in 1604, Kepler's star would precede 25.3s. in R.A. 0.8 to the north. There is a star 11.12m. preceding 17.9s. and 1.6 south of Argelander's, and another 12m. preceding 33.2s. and 2.7 north; it is to the latter object, which was observed by Prof. Winnecke in 1875, though not previously glimpsed with a refractor of 7 inches aperture, that attention may be chiefly directed. It is to be remarked that the position of Kepler's star is liable to greater uncertainty than that of Tycho's star in 1572. It is very desirable that whatever may be the result of examination of the vicinity, it should be put upon record (of course with the corresponding date) from time to time. The Chinese annals have references to more than one of their stellar class *Ké-sing* or "extraordinary stars," in earlier times, which must have been situate in the neighbourhood of Kepler's *Nova*.

THE BINARY STAR, γ CORONÆ AUSTRALIS.—Several years since an orbit was calculated for this object by Prof. Schiaparelli, who made use of measures up to 1875, whence it appeared that the periastron passage would take place about the end of 1882. Mr. Downing, availing himself of measures to 1880, has applied small corrections to the elements found by the Milan astronomer, and fixes the periastron passage to 1883.203, the period of revolution being 54.985 years. The binary is therefore describing at present a critical portion of the orbit, and, it may be hoped, will not be neglected by those observers of double stars who can well command its position. The following are angles and distances calculated from the two orbits:—

	DOWNING		SCHIAPARELLI	
	Pos.	Dist.	Pos.	Dist.
1883.50 ...	134.2	0.27	93.3	0.38
83.75 ...	103.8	0.32	80.4	0.50
84.25 ...	74.6	0.55	59.5	0.73

THE SATURNIAN SATELLITE, MIMAS.—M. Meyer, observing with the 10 inch refractor presented to the Observatory of Geneva by the late director, Prof. Plantamour, succeeded in obtaining, near the opposition of Saturn in 1881, several sets of measures of the faint satellite, *Mimas*, about the time of greatest elongation. Considering the small number of measures of this object which have been obtained even with the largest instruments, M. Meyer's success is worthy of attention. On two nights he secured complete series of measures, and on other occasions partial ones. We find, on adjusting the circular elements adopted in this column for prediction of the positions of *Mimas* (which were founded upon Washington observations and required but small correction) by Prof. Frisby's observation of the conjunction of the satellite with the minor axis of the ring southwards, on November 8, 1882, that M. Meyer's measures are closely represented.