

tinuation of the lists which appeared in the *Scottish Naturalist* for 1886 and 1887. Mr. Bennett says that the results during the year 1887 were probably richer than in any former year, not only in the large number of comital records, but in the new species added to the Scottish flora.

WE have received several numbers of the *Annales de la Faculté des Sciences de Toulouse* (Paris: Gauthiers-Villars). This new publication (which is well printed on good paper, with wide margins) consists chiefly of memoirs relating to physics, chemistry, and mathematics pure and applied. It contains also articles on questions of general scientific interest. To papers of the latter class the authors append lists of books on the questions discussed.

ACCORDING to a paper in the *Board of Trade Journal* for April, the production of attar of roses constitutes one of the most important branches of native industry in Bulgaria. The valley of Kezanlyk, known as the Vale of Roses, is the centre of this production, which extends as far as Carlovo, and the villages which lie sheltered from the north wind by the vast chain of the Great Balkans. In 1885, and no later statistics have been published, the manufacture of attar of roses in the district indicated amounted to a value of 1,100,000 francs. The prosperous condition of the valley of Kezanlyk has led other districts of Bulgaria to develop the same industry, and particularly the inhabitants of Strema, and of Toundja, at the foot of Mount Rhodope. It is not yet certain that the attar from these new countries will equal in quality the famous product of Kezanlyk. The Government, however, is anxious to encourage this movement, and the Department of the Interior has lately authorized the purchase of a certain quantity of attar prepared at Strema and at Toundja. Specimens of each are to be sent for examination at the laboratory of the University of Moscow, and the result is to be published.

FROM an official report just published it appears that in 1886 there were killed in Norway 114 bears, 37 wolves, 5618 foxes, 950 eagles, 5100 hawks, and 108 other animals of prey. The number of bears was slightly below that of 1885, but above the numbers of previous years, whilst the number of wolves was twice that of 1885. The number of foxes, on the other hand, was only half that of the previous year, whilst those of eagles and hawks were about the same.

IN last week's NATURE (p. 581), near the middle of the second column, for "Ekholm of Hagström," read "Ekholm and Hagström."

THE additions to the Zoological Society's Gardens during the past week include a Common Marmoset (*Hapale jacchus*) from South-East Brazil, presented by Mrs. Leighton; a Striped Hyæna (*Hyæna striata*) from Morocco, presented by Mr. Herbert E. White; an Indian Wolf (*Canis pallipes* ♂), two — Foxes (*Canis* —), a — Hawk Eagle (*Spizaetus* —) from India, presented by Colonel Alex. A. A. Kinloch, C.M.Z.S.; two Rock-hopper Penguins (*Eudyptes chrysocome*) from Auckland, New Zealand, presented by Captain Sutcliffe, R.M.S.S. *Aorangi*; a Gannet (*Sula bassana*), British, presented by Miss Serrell; three Common Swans (*Cygnus olor*), British, purchased; a Chinchilla (*Chinchilla lanigera*), a Barbary Wild Sheep (*Ovis tragelaphus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

PHOTOGRAPHY IN THE DETERMINATION OF THE MOTIONS OF STARS IN THE LINE OF SIGHT.—Of the many developments of spectroscopy, one of the most interesting is that first made a practical branch of observation by the skill and patience of Dr.

Huggins, viz. the determination of the motions of stars in the direction of the visual ray by measures of the displacement of the more prominent lines in their spectra. The research has, however, always been beset with many practical difficulties, one of the most serious being the manner in which the stellar lines seem to elude the sight when the air is disturbed. This hindrance has been especially felt at Greenwich, where this kind of work has been adopted as part of the ordinary routine, and where, in consequence, it has not been possible, as would be the case in a private observatory, to confine observation to nights of faultless definition. Many of the observations have, therefore, been exceedingly rough, or even discordant. Prof. H. C. Vogel, who had made some successful measures of the displacements of lines in three or four of our brightest stars soon after Huggins's first observations, has recently turned his attention to photography as a means of overcoming this difficulty, and his first results, given in a paper read before the Royal Prussian Academy on March 15, are very promising. Prof. Vogel finds that the atmospheric tremors, so wearisome to the eye, exercise no influence upon the photograph, which possesses the additional advantage of being free from all bias or predisposition. Dr. Scheiner, who has been carrying out these experiments, has examined seven spectra, viz. those of Sirius, Procyon, Castor, Arcturus, Aldebaran, Pollux, and Rigel. Of these, Sirius showed a slight displacement to the red, Procyon a decided displacement, and Rigel very large in the same direction, whilst Arcturus showed a considerable displacement towards the violet. The observations were made on the third line of hydrogen, H γ , a train of two prisms of high dispersion being used.

THE TOTAL LUNAR ECLIPSE OF JANUARY 28.—Dr. E. Lindemann sends the following list of the number of occultations observed at different Observatories during this eclipse, in addition to the lists given already: Albany (U.S.), 7; Christiania, 28; Milan, 23; Bonn, 7; Durban (Natal), 17; Oxford (Radclyffe), 9; Bruxelles, 14; Liège, 5; Palermo, 8; Cape of Good Hope, 21; Madras, 10. The weather was cloudy at Warsaw.

NEW MINOR PLANETS.—Herr Palisa discovered a new minor planet, No. 274, on April 3, and another, No. 275, on April 13. The latter is his sixty-third discovery. No. 269 has received the name of Justitia.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 APRIL 29—MAY 5.

(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 29

Sun rises, 4h. 36m.; souths, 11h. 57m. 10'3s.; sets, 19h. 18m.; right asc. on meridian, 2h. 28'7m.; decl. 14° 41' N. Sidereal Time at Sunset, 9h. 51m.

Moon (at Last Quarter May 3, oh.) rises, 22h. 21m.*; souths, 2h. 46m.; sets, 7h. 6m.; right asc. on meridian, 17h. 15'7m.; decl. 19° 30' S.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury..	4	23	11	11	17	59	1	42'0
Venus.....	4	8	10	44	17	20	1	15'8
Mars.....	16	45	22	25	4	5*	12	58'3
Jupiter....	21	25*	1	40	5	55	16	9'9
Saturn....	9	40	17	38	1	36*	8	10'8
Uranus....	16	42	22	20	3	58*	12	53'2
Neptune..	5	35	13	17	20	59	3	48'6

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

Occultations of Stars by the Moon (visible at Greenwich).

May.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.	
					h. m.	h. m.
1	50 Sagittarii	6	3 19	3 33	359	339
3	31 Capricorni	6½	2 50	3 43	112	214
May.	h.					
5	18					

Mars in conjunction with and 0° 35' north of Uranus.