

glowing-fire, or intense heat of the surface; and (7) the *Künstliche Feuer* of Gruithuisen.

There is one characteristic of the phenomenon abundantly verified by the numerous observers who have recorded it, which cannot be overlooked in our endeavours to arrive at its true cause, viz., its intermittent or only occasional visibility. This alone appears to render more than one of the explanations which have been advanced highly improbable if not wholly inadmissible. There are also isolated observations which seem rather to favour one or other of the hypotheses. Thus Schröter considered that the change in the colour of the faintly illuminated disc from reddish to ashy-grey remarked by Harding, indicated a connection with our aurora borealis, in exhibitions of which similar rapid changes or alternations of colour are observed, and a very curious observation by Mädler has been cited in the same direction. On April 7, 1833, at 8 P.M., in a sky of extraordinary clearness and tranquillity, Venus, then in crescent-phase, appeared to him accompanied by a beautiful radiating appearance; seven or eight straight rays, at times very bright and sharply defined, at others fainter and more diffused, occupied the north-west quadrant, and were gradually lost in the general ground of the sky. The longest ray extended about 15', the shortest was about half that length; neither turning round the eye-piece, nor viewing the planet in different parts of the field of the telescope, at all affected the phenomenon, which continued unchanged as long as Venus was observed that evening. A figure of this appearance is attached to Mädler's account of his observation.

Zöllner has expressed his conviction that under spectroscopic examination, the ash-coloured secondary light of Venus will be found to present bright lines, and it may be hoped that opportunities for such observations may occur during the present summer.

By closely watching the form of the crescent towards the extremities, further evidence of rotation in rather less time than is occupied by the earth in her diurnal revolution, may also be obtained. But with this object, observations must be made at very short intervals. In illustration of this may be quoted Mädler's experiences on June 6 and 10, 1836.

	h. m.		
June 6,	10 41	Sid. T.	Both horns equally pointed, and the curvature quite elliptical.
"	11 10	"	The same.
"	11 36	"	The northern horn appears to be the more pointed.
"	11 38	"	The northern horn certainly more pointed: also at 11h. 43m.
"	11 56	"	Again uncertain.
June 10,	11 14	"	Both horns alike.
"	11 26	"	The northern is more pointed.
"	11 38	"	Again doubtful.

Mädler referring to these and other observations of a similar character, in May and June 1836, expresses his opinion that they are quite irreconcilable with Bianchini's period of rotation, but may be compatible with the shorter one of Cassini and Schröter.

THE MINOR PLANETS.—The following summary is founded upon elements of 153 members of this group, which appear to be sufficiently well determined to afford reliable results. It exhibits the distribution of the perihelia, nodes, inclinations, and excentricities, and will be seen to offer several very decided characteristics.

1. Longitudes of the Perihelia.

Number of Orbits.		Number of Orbits.	
0-30	18	180-210	7
30-60	22	210-240	9
60-90	11	240-270	10
90-120	15	270-300	7
120-150	12	300-330	19
150-180	7	300-360	16

2. Longitudes of the Ascending Nodes.

Number of Orbits.		Number of Orbits.	
0-30	15	180-210	19
30-60	13	210-240	8
60-90	19	240-270	5
90-120	6	270-300	7
120-150	16	300-330	13
150-180	16	330-360	16

3. Inclinations to the Ecliptic.

0-5	52	20-25	6
5-10	58	25-30	2
10-15	26	30-35	1
15-20	8		

4. Excentricities.

0.00-0.05	7	0.20-0.25	31
0.05-0.10	23	0.25-0.30	6
0.10-0.15	41	0.30-0.35	6
0.15-0.20	38	0.35-0.40	1

A FREE SPANISH UNIVERSITY

OUR readers will easily understand what sort of a foster-mother a Government like that of Spain will prove to education generally, and to scientific education and inquiry in particular. Any educational institution connected with such a state must necessarily be hampered and hindered in many ways, and the only chance of obtaining perfect liberty in scientific education and instruction is in being rid of all state interference. This has been so strongly felt in Spain by some of the foremost Spanish men of science and letters that they have formed an association to found an institution for free education. A prospectus of the institution has been forwarded us, and the difficulties which beset a liberal education in Spain may be learned from the fact that it is signed by ten ex-professors of the highest standing, all of whom have been removed from their chairs by Government on account of their liberal opinions. Among these are the names of Augusto G. de Linares, ex-Professor of Natural History at the University of Santiago, and Laureano Calderon, ex-Professor of Organic Chemistry at the same University. The object of the Association, as stated in the prospectus, is to found at Madrid a free institution dedicated to the culture and propagation of science in its various branches, specially by means of education. A sort of joint-stock company will be constituted by shares of 250 francs, payable in four instalments between July next and April 1877. A preliminary meeting was to be held on the 1st inst. to constitute the Society, and we earnestly hope that a successful start has been made. The Association will be directed by a Council representing all parties interested. The Institution itself will, of course, be perfectly free from all religious, philosophical, or political restrictions, its only principles being the "inviolability of science" and the perfect liberty of teaching. There will be established, according to the circumstances and means of the Society (1) studies for general, secondary, and professional education with the academic advantages accorded by the laws of the State; (2) superior scientific studies; (3) lectures and brief courses, both scientific and popular; (4) competitions, prizes, publication of books and reviews, &c. The greatest precautions will be taken to obtain as professors men of undoubted probity and earnestness and of the highest competence.

We need say nothing to our readers in recommendation of the above scheme. All who sincerely desire the welfare of Spain and the spread of scientific knowledge must sympathise with its promoters, who, we have every reason to believe, are men of the highest character and competency. We hope that not a few of our readers will show their sympathy with the object of the Association by sending the moderate subscription which constitutes a shareholder to M. Laureano Figuerola, Calle de Alcalá, 72, Madrid.