most interesting pictures shown by Dr. Cornish at the Royal Geographical Society and elsewhere, and the descriptive notes which have been prepared for the slides direct attention to the chief points of interest.

We have received from New York the first number of the *Mining Magazine*, an international monthly review of progress in mining and metallurgy. Though new in name, the magazine is really a development of the *Pacific Coast Miner*, a weekly journal of repute. It is edited by specialists, and the illustrations and typography reach the high standard that characterises American magazines. The contents are of varied interest. Mr. J. A. Church gives a sketch of mining, past and future. The geographical distribution of ores within the United States is discussed by Mr. F. L. Ransome. Mr. Carl Henrich gives an admirably illustrated account of the Guanajuato mining district of Mexico; and Mr. Henry S. Fleming discusses the commercial divisions of the competitive coal markets. Lastly, a useful index of current literature is provided.

OUR ASTRONOMICAL COLUMN.

Visibility of the Martian Canals.—In *Bulletin* No. 12 of the Lowell Observatory Mr. Lowell extends and sums up the results recently outlined by him in a communication to the American Academy of Sciences under the title "The Cartouches of the Canals of Mars." During the last opposition he made 372 drawings of the planet's visible surface on 143 nights, and by carefully examining these and eliminating all known extrinsic variations he secured sufficient data to enable him to plot a visibility curve for each canal, between January 19 and July 26, which he believes exhibits only the actual, intrinsic variability of the marking in question. This curve he calls the "cartouche" of that canal.

Analysing the 109 curves thus obtained he finds, except in three cases, a well marked seasonal variation. These curves are not exactly similar, but on arranging them in a steadily progressive order it was seen that the order was one of latitude, the increase of visibility taking place in the north polar canals first and in the equatorial canals last. The reason assigned for the earlier quickening of the polar canals is that all these markings are due to vegetable growth, which requires both warm sunshine and water for its increase, and, as the general surface of Mars is devoid of water, this growth has to await the arrival of the liberated fluid from the polar caps before it can assume its vernal appearance. Naturally, the sun having already passed the summer solstice, those portions of the planet's surface nearer to the water supply will be the first to grow the new vegetation.

Further considerations, dealt with *in extenso* in the *Bulletin*, lead Mr. Lowell to the conclusion that both the anomalies and the generalities he has discovered argue for the artificial origin of the Martian canals.

Total Solar Eclipse of 1905.—An article in the August number of the *Bulletin de la Société astronomique de France* gives a number of details concerning the eclipse of 1905, and maps showing the entire path and the sections of it which traverse Spain and Tunis. A set of diagrams showing the appearance, at various places, of the greatest phase of the eclipse, indicates that for Paris the eclipse commences at 12h. 3·1m. (Paris Civil M.T.), has its greatest phase (0·818) at 13h. 19·1m., and finishes at 14h. 31·7m.

Solar Prominences during 1903.—In No. 6, vol. xxxiii., of the *Memorie della Società degli Spettroscopisti Italiani*, Prof. Mascari summarises the results of the observations of prominences made at Catania during 1903.

Very few prominences were seen during the first months of the year, but they were notably augmented later. In January and February the phenomena presented themselves with equal intensity in each hemisphere, but in the second and third trimestres they prevailed in the northern hemisphere, whilst in the fourth they were more numerous in southern latitudes.

The number of days without prominences during 1903 was 38 per cent. of the total number of days of observation, instead of 67 per cent. as in 1902. The mean latitude of the prominences in 1903 was 42°·1, as compared with 48°·4 in the previous year. The undecennial minimum of prominence activity apparently occurred in October, 1902.

The Lowell Spectrograph.—In No. 1, vol. xx., of the *Astrophysical Journal*, Mr. V. M. Slipher gives a detailed description of the complete spectrographic equipment obtained for the Lowell Observatory from Mr. J. A. Brashear in 1901.

The chief instrument differs but little from the Mills spectrograph (Lick), and its linear and angular dispersion at Hγ, as compared with the other large instruments of its class, may be seen from the following table:—

Spectrograph	Focal length of camera		Dispersion: Linear, tenth-metres per mm.		Dispersion: Angular, for one-tenth metre
	mm.				″
Lowell	Short	386	...	14·5	... 36·8
,, ...	Long	471	...	11·4	... 36·8
Mills (Lick) ...		406	...	12·6	... 40·5
Potsdam III....	1	560	...	10·2	... 36·5
,, ...	2	410	...	13·8	... 36·5
Bruce (Yerkes)	A	449	...	10·7	... 42·8
,,	B	607	...	7·9	... 42·8

Mr. Slipher's communication gives all the details of the instrument's construction and mounting, and is illustrated by several photographs and colour-curves.

A New Band Spectrum of Nitrogen.—Whilst photographing the spectrum of the afterglow from metallic spark discharges in an atmosphere of nitrogen, Mr. Percival Lewis, of the University of California, has discovered what is presumably a new band spectrum of nitrogen. He found that the afterglow occurred only in chemically prepared, dried and purified nitrogen, and then only when a strong condenser discharge was employed.

The spectrum is discontinuous, consisting of lines and bands, some of the latter belonging to Deslandre's third group, whilst others were of unknown origin. No afterglow occurred in the metallic vapours unless there was an afterglow in the gas. New bands occur in most of the spectra obtained at λλ 2750, 2890, 3035, and 3200, whilst others, at approximate wave-lengths 3380, 3575, 3805, 4130, and 4540, only occur in some of the photographs. Of the latter bands several may be due to NO, but none of them are found in the spectrum of NO_2 (*Astrophysical Journal*, No. 1, vol. xx.).

THE PERSEID METEORIC SHOWER OF 1904.

This shower has not furnished a rich display this year; in fact, the number of meteors visible appears to have been decidedly below the average. Yet there was no moonlight to offer any impediment, and the nights were very clear just at the important time.

On August 9 there were a few Perseids, but the meteors recorded from all sources little exceeded the average number observable on an ordinary night in August, and I wrote down in my notebook that I had never seen so few meteors on August 9 in any previous year.

On August 10 there was an increase in the number visible but I made no lengthy observations.

On August 11, between 10h. 30m. and 13h. 30m., Perseids were falling at the rate of about 25 per hour for one observer, and the radiant was at 46°+58° from 37 paths. This horary rate is for an observer who registered a few of the tracks, and whose attention, therefore, was not given continuously to the sky. Mr. McHarg at Lisburn, Ireland, says that from 10h. to 11h. local time the Perseids averaged 30 to the hour. Mr. J. Webb, of Bristol, counted 21 between 9h. 50m. and 10h. 50m.; Mr. W. E. Besley, of London, saw 66 meteors in 3 hours between 10h. 30m. and 13h. 30m., and others must have been missed while records were being made. He saw meteors as bright as Jupiter or Venus at 10h. 30m., 11h. 14m., 11h. 20m., and 13h. 7m. Mr. McHarg noted a brilliant green fireball > ♀ at 10h. 20m. G.M.T. falling in Libra a little west of α and directed from ε Boötis, so it was probably a Perseid.