

magnesium) will be most obvious when the hydrogen lines are not seen. A comparison of the two spectra with the same instruments under similar conditions will therefore be valuable.

(3) This comparatively bright star of Group II. has not yet been observed in sufficient detail, Dunér simply stating that the bands 2-8 are wide and dark. For purposes of classification it is also necessary to know whether the bands in the blue or those in the red are most intense.

(4 and 5) These are stars of the solar type and of Group IV. respectively (Konkoly). The usual observations are required in each case.

(6) Dunér describes the spectrum of this star as one of Group VI., consisting of three zones, of which the blue is also pretty bright. The principal bands are very dark, and the secondary bands 4 and 5 ( $\lambda$  589 and 576) were also occasionally seen. The brightness of the blue zone varies very considerably in stars of this group, and, moreover, does not depend upon the magnitude of the star. It probably therefore depends upon temperature. The associated phenomena are well worth investigation.

(4) This interesting variable will reach a maximum about September 6. The observations of the magnitude at maximum are a little discordant, but there can be no doubt that it changes considerably, the extremes being 6.8 and 9.5, whilst the minimum is a prolonged one of about magnitude 13. The spectrum is one of Group VI., showing very little blue light. Continuous spectroscopic observations will be very valuable in connection with Mr. Lockyer's theory of the cause of variability in stars of this group.

A. FOWLER.

**VARIABLE STARS NEAR THE CLUSTER 5 M.**—At the June meeting of the Royal Astronomical Society, Mr. A. A. Common, F.R.S., exhibited some photographs of the cluster 5 Messier, taken with his 5-foot telescope at Ealing. Four photographs had been taken on April 22, May 9, May 15, and June 9, with exposures of 25, 45, 66, and 45 minutes respectively. The plate taken on May 15—that is, the one with the longest exposure—contains five stars not shown on those taken before and after that date. The presence of these five stars was not due to longer exposures because they were all brighter than the 10th magnitude, whereas stars of at least the 12th magnitude were seen on all the plates. A great difference was also observed in the apparent magnitudes of many of the stars near the cluster.

Prof. E. C. Pickering notes (*Astronomische Nachrichten*, No. 2986) that an examination of the photographs of this region taken at Harvard College Observatory proves beyond doubt that the star about  $9^{\circ}$  or  $10^{\circ}$  south preceding the cluster varies between 9.76 and 11.6 magnitude, and that the south component of the wide pair just following the cluster varies between 9.3 and 12.2 magnitude.

**NEW ASTEROIDS.**—A new minor planet (295), of the 13th magnitude, was discovered by Dr. Palisa, at Vienna, on August 17; and another, (296), by Mr. Charlois, at Nice, on August 19. The latter was found near the position of Hera, (103), but because of the difference in magnitude it is thought to be new.

## SOCIETIES AND ACADEMIES.

### PARIS.

**Academy of Sciences, August 25.**—On a jawbone of a Greenland seal, found by M. Michel Hardy in the grotto of Raymond. —Observations of the Denning (July 23, 1890) Comet, made at the Paris Observatory, by M. G. Bigourdan. —Observations of the new planet Palisa (Vienna, August 17, 1890), made at the Paris Observatory, by Mdlle. D. Klumpke. —Elements and ephemerides of the planet (294), discovered at the Nice Observatory, July 15, 1890, by M. Charlois. —On two forms of electrical gyroscopes, one serving to show the movement of the earth, and the other for the rectification of the marine compass, by M. G. Trouvé. The two instruments are similarly constructed, but the latter is heavier, and so hung as to be free from the various causes of disturbance always present on board. It is able to correct the compass with certainty, since its axis of rotation remains fixed in space, however long it is necessary to prolong the observa-

tion.—On the respiration of the grasshopper, by M. Ch. Contejean. The abdomen is chiefly concerned with the respiratory movements. Stimulation of the nervous system by applying induced electric currents causes an obvious acceleration in the breathing.—New researches on the production of light by animals and vegetables, by M. Raphael Dubois. The author concludes that the production of light in animal organisms is due to the transformation of the colloidal protoplasmic granulations into crystalloidal granulations, under the influence of a respiratory phenomenon.—On the presence of the carboniferous formation in Brittany, by M. P. Lebesconte. This paper contains a list of the fossils obtained from some newly-discovered fossil-bearing strata in the carboniferous limestones at L'Ille-et-Vilaine in Quenon.—On the storm of August 18, 1890, at Dreux, by M. Léon T. de Bort. In its local and destructive character this storm showed many analogies with the tornadoes of the United States.—Notes were also submitted by M. Chapel, on the coincidence of atmospheric disturbances with the meeting with the Perseids; by M. van Heyden, on the height of the atmosphere; and by M. E. Mathieu-Plessy, on a new base obtained by heating ammonium nitrate, possibly nitramide,  $\text{NO}_2 \cdot \text{NH}_2$ .

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

*Principia*; or, the Three Octaves of Creation: Rev. A. Kennion (E. Stock).—Transactions and Proceedings of the New Zealand Institute, 1889, vol. xxii.; Sir J. Hector (Trübner).—Paul Nugent, Materialist, 2 vols., 3rd edition: H. F. Hetherington and Rev. H. D. Burton (Griffith and Farran).—Annual Report of the Department of Mines, New South Wales, for the year 1889 (Sydney).—Inorganic Chemistry: Wm. Jago (Longmans).—Wild Flowers of North Wales Coast: R. Darlington (Roper and Drowley).—Wild Flowers of Vale of Llangollen, &c.: R. Darlington (Roper and Drowley).—The Ethical Problem: Dr. P. Carus (Chicago, Open Court Publishing Company).—Report of the French Commission on the Use of Explosives in the Presence of Fire-Damp in Mines (Newcastle-upon-Tyne).—Zur Geschichte der Ältesten Haustiere: Dr. Otto (Breslau).—Untersuchungen über die Physiologischen Wirkungen der Lupetidine und verwandter Körper und deren Beziehungen zu ihrer chemischen Constitution: A. Gürber (Zürich).—Tiemehri, No. xvii. (Stanford).—Journal of the Chemical Society, August (Gurney and Jackson).

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