

precious stones, and references as to where the precious stones of his time came from; "Rings," Dr. G. F. Kunz, illustrated; "The Art of Anæsthesia," Dr. P. J. Flagg, illustrated; and (in "Lippincott's Farm Manuals") "Productive Sheep Husbandry," Prof. W. C. Coffey, illustrated; "Productive Marketing of Farm Products," A. E. Cance, illustrated; "Productive Feeding of Farm Animals," Prof. F. W. Woll, new edition, illustrated; "Productive Soil Maintenance," C. E. Thorne, illustrated; "Animal Husbandry," Prof. C. W. Gay, illustrated; "Productive Grape Growing," Prof. B. S. Pickett, illustrated.

OUR ASTRONOMICAL COLUMN.

FIREBALL OF OCTOBER 3.—Probably what was the most brilliant meteor that has appeared in the present year was seen on Tuesday, October 3, at 8.5 p.m. It passed over Devonshire, and, though the night was cloudy, it gave a very vivid illumination of the sky and landscape, and its apparition was witnessed by great numbers of persons in the S.W. counties of England.

The observations are, however, not very accurate or consistent one with another in consequence of there being very few, if any, stars visible at the time from which its path might be taken. The flight was vertical as observed at Bristol, and was similarly described at various stations in Devon and Cornwall, so that a radiant at or near the zenith is inferred. At Launceston, however, the course is stated to have been from E. to W., and the fireball burst when near the zenith. Mr. W. F. Denning has determined the real path from the data at hand, and places the probable radiant in the head of Cepheus. The height of the meteor was about 67 to 30 miles above a point of the earth's surface some 15 miles E.N.E. of Exeter. A few further observations from Dorset or Devon would be very valuable as, affording a test of the accuracy of this result; any such observations should be sent to Mr. Denning, 44 Egerton Road, Bristol.

MERCURY VISIBLE BEFORE SUNRISE.—Mercury will be a morning star during the latter half of this month, and at its greatest western elongation at midnight following October 20. The planet will rise from a point a little S. of due E. at the following times:—

	Mercury rises a.m.	Sun rises a.m.	Mercury precedes Sun h. m.
Oct. 15	... 4 51	... 6 26	... 1 35
17	... 4 48	... 6 29	... 1 41
19	... 4 46	... 6 32	... 1 46
21	... 4 46	... 6 36	... 1 50
23	... 4 50	... 6 39	... 1 49
25	... 4 58	... 6 42	... 1 44
27	... 5 8	... 6 46	... 1 38
29	... 5 17	... 6 49	... 1 32
31	... 5 27	... 6 53	... 1 26

The waning crescent of the moon will be in the same region of Mercury on the morning of October 25.

THE DISTRIBUTION OF B STARS.—An important memoir on the distances and distribution of the B (helium) stars has been published by Prof. Charlier (Nova Acta Reg. Soc. Sci., Upsala, series iv., vol. iv., No. 7). It contains all the details which led to the general conclusions previously announced (NATURE, vol. xcvii., p. 369). In a group of stars having the same luminosity, the distance (r) of each individual star can be deduced from the apparent magnitude (m) by the relation $r=R.10^{0.2m}$, where the parameter R is the distance for apparent magnitude 0.0. A first determination of R was based upon the proper motions and radial velocities of 156 stars brighter than 5th magnitude, for which the requisite data were available; its value is 4.76 siriometers (1 siriometer=a million

times earth's distance from sun). The corresponding absolute magnitude, or apparent magnitude at a distance of one siriometer, is given by $M=-5 \log R$, and is equal to -3.39 . It was next discovered that the fainter stars gave a somewhat smaller value of R , and the brighter stars a higher value. This anomaly was found to be due to the varying luminosities of the different sub-classes. Separate investigation of these showed, in the main, that types B_1 and B_2 have the greatest luminosity, R being 7.4 sir., whereas types B_0 , B_3 , B_5 have a value of $R=3.3$ sir. For each sub-class the value of R appears to be independent of apparent magnitude. Having the value of R for each sub-class, the position in space of each star at once follows, and it results that the B stars form a well-defined cluster, gradually thinning out from the centre to a distance of 200 siriometers. The centre of the cluster, which Prof. Charlier supposes to be coincident with the centre of the stellar universe, is in R.A. 7.7h., declination -55.6° ; it lies in a rich region in Carina, at a distance of 18.2 sir. from the sun. The cluster has an extension nearly three times as great in the plane of the Milky Way as in the direction at right angles, and the sun lies eccentrically with respect to it, at a distance of 4 sir. above the fundamental plane of the Milky Way. The mean density amounts to 0.0026 stars per cubic siriometer. A catalogue of the 804 known B stars is given, showing all the data relating to type, magnitude, distance, galactic co-ordinates, and so on. The distribution of the stars is further shown diagrammatically, and stereoscopic charts are in course of preparation. It is of interest to note further that the nearest B star is α Eridani, with a distance of only 4 sir. ($\pi=0.0516''$), while the three stars in the belt of Orion come next, with a distance of 8 sir. So far as they go, direct determinations of parallaxes support the values of R used in the investigation.

THE SPECTROSCOPIC BINARY χ AURIGÆ.—An orbit for the spectroscopic binary χ Aurigæ (type B_1) has been calculated by R. K. Young from eighty-eight single-prism spectrograms taken at Ottawa in the years 1913-16 (Journ. R.A.S. Canada, vol. x., p. 358). The period has the exceptional value, for an early type star, of 655.16 ± 5.26 days; the eccentricity is 0.171, and the orbital velocity 20.53 km./sec. The residuals from the simple elliptic orbit were examined for indications of the presence of a third body, but no secondary period was found; further investigation of this point, with high dispersion, is considered desirable. The calcium lines (H and K) have an amplitude of about half that shown by other lines of the spectrum. A useful summary is given of the different cases of anomalous behaviour of the calcium lines at present known, and Mr. Young considers that the phenomena are best explained on the supposition that there is a calcium cloud surrounding the binary, the absorption of this substance taking place at a much higher level than that of the other elements.

A NEW ASTRONOMICAL JOURNAL.—We have pleasure in directing attention to the publication in France of a new monthly periodical devoted to astronomy and meteorology. It bears the title *La Revue Verte*, and is edited by the Abbé Th. Moreux. The journal is intended especially for amateurs, and will include articles giving practical instruction in methods of observation, in addition to general astronomical news, and notes on celestial phenomena during each month. In the first number there is an article on sun-spots and meteorology by the editor, and the first of a series of articles on variable stars by Prof. Moye. There is also a brief biography, with portrait, of M. Baillaud, director of the Paris Observatory. All communications are to be addressed to M. l'Abbé Th. Moreux, Observatoire de Bourges (Cher), France. The annual subscription is 6 francs in France, and 7 francs for other countries.