

about 125 full-page plates and an analytical subject-index.

MESSRS. J. WHELDON AND CO., 38 Great Queen Street, W.C., have just published No. 76 of the new series of their catalogue. It deals with the journals and transactions of many scientific societies, and with English and foreign literary and scientific periodicals. There are also addenda giving particulars of remainders of books relating to natural history. The catalogue should be of interest and service to many students of science.

MR. F. EDWARDS, High Street, Marylebone, has recently circulated a very interesting illustrated catalogue of autograph letters, manuscripts, and historical documents. A section of the catalogue is composed of documents relating to the United States, Canada, and the West Indies.

THE two following volumes are in preparation, among others, for appearance in the "University of Chicago Science Series" (Cambridge University Press):—"A Factorial Theory of Evolution," by W. L. Tower, and "Chemical Signs of Life," by S. Tashiro.

OUR ASTRONOMICAL COLUMN.

THE RADIAL VELOCITY OF β URSÆ MAJORIS.—From observations of the radial velocity made at Potsdam some years ago it was concluded by Ludendorff that β Ursæ Majoris was a spectroscopic binary with a period of 27.16 days and total range of $15\frac{1}{2}$ km./sec. Subsequent observations made at the Lick Observatory, however, gave a range of velocity no greater than that to be expected in the determinations for a constant-velocity star of type A. Further interest in the question was aroused last year by Guthnick and Prager's observations of the star with a photo-electric photometer, from which a variation through 0.02 mag. in a period of 0.3122 day was deduced; the Potsdam radial velocity values were thought to be consistent with this period. A further investigation of the radial velocity, with special reference to short-period changes, has since been undertaken at Mt. Hamilton (Lick Observatory Bulletin No. 284). Thirty-six plates were taken on three nights during February, 1916, but, as in the case of the earlier photographs, these do not appear to indicate a variation through any appreciable or dependable range of velocities. Prof. Campbell hopes that someone with less observing opportunity and more opportunity for computation will make a further effort to discover a periodicity of very small amplitude. The plates are available for loan to any experienced measurer of spectrograms who may have a plan for remeasuring them.

RADIAL MOTION IN SUN-SPOTS.—Mr. Evershed has recently reported on some further investigations of the radial motion in sun-spots discovered by him in 1909 (Kodaikanal Observatory Bulletin 51). Improved results have been obtained by the use of instruments which reduced the times of exposure, and by working only under the best conditions as to definition of the spot image. It now appears that the radial motion displacement may be very unequal at equal distances from the umbra, and the two spots investigated showed larger displacements on the limb side than on the side towards the centre. There is usually an acceleration of velocity from the umbra to the outer limits of the penumbra, and then a sudden fall to zero, or to a lesser speed which diminishes to zero at some distance outside the spot. The radial movement may amount to as much as 4 km./sec. at one edge of the penumbra

for lines of intensity 0 and 1 in large spots. The diminution of the indicated velocity with increased intensity, which was found by St. John, and attributed by him to differences of effective level, is confirmed by the new measures. In opposition to St. John, however, no difference was found for enhanced lines of iron as compared with the arc lines of like intensity. Mr. Evershed further concludes that while movements at right angles to the radial motion may occur in the penumbra, rotational movement is not a constant feature.

WOLF-RAYET BANDS IN THE NUCLEI OF NEBULÆ.—In continuation of the work of Wright, the nuclei of three additional planetary nebulae have been found by G. F. Paddock to give the Wolf-Rayet type of spectrum (Lick Observatory Bulletin, No. 284). The nucleus of N.G.C. 6826 shows a fairly bright band at 4686, and a fainter band at 4657, which is not given in Campbell's list of Wolf-Rayet lines. In N.G.C. 418, the band 4686 is faintly seen in the nucleus, while that at 4650 is fairly bright. Four bright bands were found in the nucleus of N.G.C. 40, namely:—

Wave-length	Width	Intensity
4862.2	14 A.	Faint.
4788.3	13 A.	Faint.
4687.4	15 A.	Fairly strong.
4652.1	22 A.	Very strong.

The band at 4652 is strongest near its violet edge, and seems to shade off towards the red. That at 4862 corresponds to H_{β} .

BARNARD'S HIGH PROPER-MOTION STAR.—Some interesting details relating to the discovery of the star with the largest known proper motion have been given by Prof. Barnard (*Popular Astronomy*, vol. xlvii., p. 504). The star was shown on plates taken in 1894, 1904, 1907, and 1916, and the images were so far apart as to seem to represent different objects, which might be new or variable stars. It was found, however, that all the images were in a straight line, and that the different photographs could be reconciled by supposing the images to have been made by a star with an annual proper motion of about $10''$, in a direction almost exactly north. At the epoch 1916.423 the R.A. of the star was $17^{\text{h}}. 53^{\text{m}}. 43.60^{\text{s}}$, and the declination $+4^{\circ} 27' 48''$; it was 9.1s. following, and $51''$ north of B.D. $+4^{\circ} 35' 60''$. The star is situated in the northern part of Ophiuchus, and is of about the 10th visual magnitude. The movement may easily be detected in the course of a few months, and photographs and charts are given for the benefit of those desiring to observe the star.

Mr. Adams has found that the type of spectrum is Mb, and that the star is approaching the earth with a velocity of 91 km./sec. The relative intensities of certain spectral lines suggest a parallax of 0.2", and it would follow from this that the star's real velocity in space is 260 km./sec.

A CATALOGUE OF METEORITES.—An illustrated handbook and descriptive catalogue of the meteorite collections in the United States National Museum, prepared by Dr. G. P. Merrill, has recently been published by the Government Printing Office, Washington. Though the handbook is intended primarily for the general public, it is so arranged as to provide also for the needs of the student and investigator. At the beginning of the present year the collection included 329 falls and finds, and an equal number of thin sections for microscopic study. There is a brief introduction, giving an interesting account of the characteristics of meteorites, and of the system of classification, following in the main that proposed by Brezina. In a large number of cases the results of analyses are given.