OUR ASTRONOMICAL COLUMN.

THE VARIABLE NEBULA IN CORONA AUSTRALIS.—A somewhat extended investigation of this remarkable object—N.G.C. 6729—has been made at Helwân with the Reynolds 30 in. reflector, and a brief account of the observations, with illustrations, has been given by J. H. Reynolds (*Monthly Notices*, R.A.S., vol. lxxvi., p. 645). The thirty-seven photographs taken during 1914 and 1915 clearly demonstrate that the nebula is variable in form as well as in brightness, and it seems probable that its variability is closely related to that of the variable star R Coronæ Australis, to which it appears to be attached. The appearance is such as might be expected if the nebulous matter was discharged from the star when at its maximum brightness and illuminated by it.

Further particulars are given by Mr. Knox Shaw, who took the photographs. The forms of the nebula can be classified into seven types, ranging from the first, in which the nebula is very bright and attached to the star, to the seventh, where the nebula is very faint and entirely detached. There is, however, no simple relation between the form of the nebula and the magnitude of the star; the nebula is brightest when the star is brightest, but is not always of the same form for a given magnitude of the star. It seems quite possible that the apparently imperfect correspondence between the variations of the nebula and those of the star may be caused by the presence of absorbing matter lying between them and the earth. If this absorbing matter were of varying thickness and in motion, it would naturally complicate the phenomena, but it is not suggested that this is the main cause of the variability.

PROPER MOTIONS BY THE BLINK-MICROSCOPE.—A further report on the use of the blink-microscope (see NATURE, vol. xcvi., pp. 237 and 438) in the detection and measurement of proper motions has been issued by Mr. Innes (Union Observatory Circular, No. 35). The greater part of the report refers to the comparison of eight astrographic plates taken at Greenwich, at intervals approximating to twenty years, and forty-three proper motions of stars ranging in magnitude from 7·1 to 13·5 are tabulated. As an indication of the rapidity of work by this method, Mr. Innes states that the investigation of the eight regions, including the identifications and reductions, occupied only twenty-four hours, although there was no attempt to make a record. Every pair of plates confirmed the impression that the vast majority of stars, bright and faint, are relatively fixed, and the measures were made on this assumption, the numerical work then being very slight. If plates are taken with a view to their ultimate examination by the blink-microscope, Mr. Innes considers that long exposures should be given, as crowded regions are a great advantage. Triple images are unnecessary, and double images are also superfluous if a third plate be available.

THE PERIOD OF U CEPHEI.—A discussion of Wendell's observations of this well-known eclipsing variable has been undertaken by Martha B. Shapley (*Astrophysical Journal*, vol. xliv., p. 51). The observations were made at Harvard during the years 1895–1912 with a polarising photometer, the total number of comparisons being 17,296; they have a special value because the instrument, method of observing, and comparison star were the same throughout this long period. As the light at minimum is constant for about two hours, Wendell observed mainly the steepest part of the ascending or descending branch, and in most cases the time at which the star was at a specified magnitude—say, 8.40—can be determined from the observations with an uncertainty of less than a minute. Variations in the mean phases of both steep branches are apparent, and there is evidence that the variation is not in the duration of minimum, nor due to variability of the comparison star, but a definite change in the light period. When all the observations since the time of discovery in 1880 are considered, it is evident that they are not satisfied either by Chandler's elements (1903) or by those of Wendell (1909). The latter serve best as a working formula at the present time, but would probably predict the minima too early. The variations are apparently very complex, and no attempt has yet been made to obtain an analytical expression for them. Wendell's formula is

$$\text{Min.} = \text{J.D. } 2407890{\cdot}3007 + 2{\cdot}4928840d.E$$

with zero phase at the midpoint of minimum light. The mean magnitude at minimum is 9·14, and at maximum 6·81.

MR. JOHN ANGELL.

ON September 9 there passed away in the person of Mr. John Angell a figure notable in the educational world of Manchester. He was born in London in 1824, and in his early educational career was chemical assistant to Prof. Thos. Graham, F.R.S., professor of chemistry in University College, London, and was hon. secretary to the Birkbeck School Committee, whose school was the first established in Great Britain with the object of demonstrating both the desirability and the possibility of teaching soundly and rationally the elements of science as leading everyday subjects in the ordinary day school. In 1852 he accepted an appointment at the Salford Mechanics' Institute as head of the Boys' School established therein, and five years later became the organiser of the day and evening classes of the Manchester Mechanics' Institution, then established in a new and commodious building in that city, where he remained for twelve years, resigning his position in 1869 to accept the senior science mastership in the Manchester Grammar School, then under the vigorous direction of Mr. F. W. Walker, afterwards master of St. Paul's School, London. Mr. Angell remained at this post for eighteen years, during which period he greatly raised the reputation of the school by his energetic and intelligent teaching of science, especially in the subject of physics. He was an enthusiastic disciple of George Combe, whose teaching, as exhibited in his work, "The Constitution of Man," as he said, "completely revolutionised the course of my life." He was an ardent and enlightened exponent of the "Socratic" method of instruction, which he applied with much success in the courses he gave in chemistry, physics, and physiology to day and evening pupils during his career at the Manchester Mechanics' Institution. In 1868 the Institution was visited by a French Imperial Commission appointed to visit and report upon secondary education in England and Scotland. In its report it has nothing but praise for the methods of teaching in use. "If he selects a reagent, it is because some pupil suggested it; if he obtains a gas in his analysis, he has already caused his students to predict its nature. . . . 'My object,' as this excellent teacher told us, 'is to train the intellect through the study of science.'" His work as a teacher received the approval of such men as Drs. Joule and Angus Smith, and Profs. Clifton, Williamson, and Roscoe. He ceased his duties as a teacher in 1887, but continued his keen interest in scientific subjects in association with many of the literary and scientific societies of Manchester of which he was an active member almost to the day of his death at the ripe age of ninety-two. He was the author of many once widely used science text-books.