

photometric observations extend the observations of Z Draconis over nearly 7000 periods and of RT Persei over nearly 11,000 periods. Visual and photographic light-curves were compared.

R. J. McDiarmid: "The Variable Stars TV, TW, and TX Cassiopeiae."

A brief discussion of the light-curves of the variable stars TV, TW, TX Cassiopeiae and T Leonis Minoris was given, pointing out interesting features in connection with each system. In the system TV Cass. we have two stars of nearly the same size but of different surface brightness, the ratio being 5.5 to 1.0. In this system other points of interest are brought out, such as the reflection and ellipticity effects. The system TW Cass. represents two stars of almost equal brightness and of nearly the same size, moving in an eccentric orbit. In the third system TX Cass. the two stars are very unequal in size with a ratio of surface brightness of 1.0 to 1.5. The stars are ellipsoidal in shape, giving rise to an ellipticity effect shown by the light-curve. The system is of special interest, as there seems to be little doubt of its being similar to the sun, bright at the centre, decreasing in brightness towards the limb. T Leonis Minoris is an eclipsing variable. The ratio of the surface of the two stars in the eclipsing system T. Leonis Minoris is 1 to 25.

Dr. Edwin B. Frost: "Radial Velocities in the Orion Nebula."

The investigations of the nebula in Orion by Messrs. Bourget, Fabry, and Buisson, of Marseilles, published in the *Astrophysical Journal* for October, 1914, show that the photographic interferometer method can be applied successfully to the study of the radial velocities of the nebula, both as a whole and in its separate parts. Their conclusion that there are appreciable motions in closely adjacent portions of the nebula have been confirmed by observations made recently with the Bruce spectrograph. Differences of more than 10 km. per second in the velocity in the line of sight have been found, and the general effect of rotation of the nebula inferred by the French observers is confirmed by the spectrograph.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—The council has decided that in the existing circumstances of national stress the ordinary annual degree congregation with its attendant ceremonial and festivity would be inappropriate. All degrees this year will therefore be granted *in absentia*.

Dr. T. Sydney Short has been appointed Ingleby lecturer for 1916, and Dr. Douglas Stanley has been appointed honorary examiner for the Russell Memorial Prize for the current year.

THE Board of Trinity College, Dublin, has appointed Miss E. M. Maxwell, of the Royal Victoria Eye and Ear Hospital, Dublin, to the Montgomery lectureship in ophthalmology, the establishment of which was announced in NATURE of February 25 last.

WE have received from Washington a copy of the report of the librarian of Congress and of the superintendent of the library building and grounds for the financial year ending June 30, 1914. It is interesting to note that in 1897 the library comprised about 850,000 printed volumes and pamphlets and about 500,000 other articles—manuscripts, maps, and prints; and a staff of forty-two persons. The grants for the purchase of books was 6000l. a year, and for printing and binding 5000l. At the date of the report the

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grant for the purchase of books had increased to 20,000l., the staff in the library proper was 385, and the number of books had reached two millions, and the other articles another million. In other words, the collection is now in size third among those of the world. We have also received from the Library of Congress a catalogue of the publications issued by the library since 1897.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 3.—Sir William Crookes, president, in the chair.—Prof. C. H. Lees: The shapes of the equipotential surfaces in the air near long buildings or walls, and their effect on the measurement of atmospheric potential gradients. The shapes of the equipotential surfaces are determined, and the equipotential lines drawn to scale in the following cases:—(1) A thin vertical wall; (2) a retaining wall separating a lower from a higher horizontal plane; (3) a series of equidistant parallel vertical walls. In each case the normal vertical potential gradient may be calculated from observations of the potential at any point. A point on each wall is indicated at which the horizontal potential gradient is identical with the normal vertical gradient.—Prof. O. W. Richardson: The influence of gases on the emission of electrons and ions from hot metals. As is well known, the thermionic saturation current i is expressed accurately and quite generally over wide ranges of temperature by the equation $i = AT^{\frac{3}{2}}e^{-b/T}$. In the case of metals, in particular, the equation is satisfied when the metals are contaminated by the presence of a gaseous atmosphere, as well as when the surfaces of the pure metals are tested. In general, however, the effect of the contaminating gas is to cause large changes in the values of the constants A and b . The changes which are thus brought about in these constants are considered in the present paper. So far as it may be considered trustworthy, the available evidence shows that A and b for a given metal always change together in such a way that the change in $\log A$ is proportional to the change in b . This linear relation is very closely satisfied by the results of all Langmuir's observations with tungsten, for which substance different gases change A by as large a factor as 10^{12} . A similar relation, with an almost equal coefficient of proportionality, is required by the best observations on the negative emission from platinum. In the case of tungsten, contaminants cause an increase in A and b , whereas with platinum a diminution occurs. All the known data point to the existence of a similar law governing the steady emission of positive ions from platinum. By applying thermodynamic considerations to the emission of electrons from contaminated surfaces, it is shown to follow from the linear relation between $\log A$ and b , that the contact potential difference between the pure and the contaminated metal is of the form $a_0(1 - aT)$, where the constant a_0 has opposite signs for tungsten and platinum, and a has approximately the same value for both metals. T is the absolute temperature.—Prof. J. W. Nicholson: The band spectrum associated with helium. Fowler has concluded recently that the heads of the bands in the new spectrum associated with, and perhaps due to, helium follow laws of the type hitherto peculiar to line-series. A further examination of some points which were in doubt has been made with the following results:—(1) The paper supports the conclusion that the heads of the bands in the spectrum of Goldstein and Curtis follow ordinary series laws by showing that the doublet separations actually tend to zero at the limits of the series; (2) both the doublet