

DR. GEORGE H. PETHYBRIDGE, until recently head of the Seeds and Plant Disease Division of the Department of Agriculture and Technical Instruction for Ireland, has been appointed mycologist to the Ministry of Agriculture and Fisheries for England.

DR. C. E. K. MEES has described, in the *Journal of the Franklin Institute* for August, the way in which the Eastman Kodak Company has sought to overcome the chief difficulties that prevent "motion photography" from being available for general purposes, reducing the cost and facilitating the development, etc., of the film. The "Cine Kodak" weighs about 8 pounds and takes 100 feet of film, which is equivalent, with its smaller pictures, to 250 feet of film of the standard size. The projector is driven by a motor so that it is automatic, and has a capacity for 400 feet of film, which requires 16 minutes to show on the screen. A large saving is effected in the cost of the film by its smaller size, and a further economy is gained in the majority of cases where only one film of the subject is required, by treating the exposed film by a reversing process, instead of making the

positive by printing it on a second film. But "this is quite a complicated process and requires very special and complicated equipment" to avoid the appearance of graininess on the screen, so the Company undertakes this work itself. By these means the fifteen cents per second of picture as shown on the screen, which is about the cost of a standard film, is reduced to two and a half cents per second; and as 7 or 8 seconds is a sufficient duration of exposure for a single scene (such as a waterfall or a game), the cost for one subject is about 20 cents, and this compares favourably with the cost of making a negative and one print in the ordinary way. The film base is made from cellulose acetate, so that the risk from fire that the ordinary film of cellulose nitrate suffers from is practically done away with.

A NEW edition of his work on "The Endocrine Organs" is being prepared by Sir E. Sharpey Schafer for publication by Messrs. Longmans and Co. Part 1, dealing with the thyroid, parathyroids and suprarenals, will appear this autumn, and Part 2, embracing the rest of the subject and completing the work, next year.

Our Astronomical Column.

THE TOTAL SOLAR ECLIPSE OF SEPTEMBER 10.—This eclipse is total in south-west California and the adjacent islands; also in Mexico. There is no official expedition from the British Isles, but many of the great American Observatories are sending parties to observe it. *Popular Astronomy* for June-July contains an outline of their programmes. The Yerkes, Washburn, and Goodsell Observatories are occupying Catalina Island. The Washburn party will measure the brightness of the corona by the photo-electric cell; the Goodsell party will photograph the corona and star-field with an 8-inch lens, and the flash spectrum with a grating.

Mt. Wilson and Leander McCormick Observatories will occupy two stations; at Point Loma the corona and star-field will be photographed, also the spectra of corona and chromosphere; the interferometer will be used to determine the wave-length of the green coronal line and the rotation period of the corona. Their other station is at Lakeside, near the northern limit of totality, where the flash spectrum will be photographed with concave gratings.

The Lick Observatory, and the Students' Observatory of the University of California, will work together at Ensenada. The polarisation of the coronal light will be measured, and many other researches made.

The Sproul Observatory is occupying Cuernavaca, Mexico, and will photograph the corona both on a large and a small scale; also the flash spectrum. The interferometer will be used to study the rotation of the corona.

The University of Toronto will study the spectrum and polarisation of the corona.

The Steward Observatory (University of Arizona) and the Mexican National Observatory will also occupy stations in Mexico.

The Lick Observatory will not repeat the Einstein investigation, believing that the question was sufficiently settled at the eclipses of 1919 and 1922. The Goodsell, Mt. Wilson, and Sproul Observatories will take star photographs for this purpose, though the

star-field is a poor one—less suitable than those of 1919, 1922. Signor Emanuelli, of the Vatican Observatory, gives a list and diagram of the stars in the region in *Astr. Nach.* There are three stars (magnitudes 8.8, 8.5, 8.0) with Einstein displacement exceeding 1"; they are likely to be hidden in the corona: six stars with displacements between 1.0" and 0.6" (magnitudes 8 to 9); thirteen stars between 0.6" and 0.4"; fifty-eight stars between 0.4" and 0.2". Some of these last are fairly bright, one being σ Leonis.

INTERNAL MOTION IN THE SPIRAL NEBULA MESSIER 33.—Mr. A. van Maanen contributes another of his important papers on internal motion in the spiral nebulae to the *Astrophys. Journ.* for June.† The measures were made on pairs of plates taken with the 60-inch reflector, the time interval being 12 years; 24 comparison stars and 400 points presumably belonging to the nebula were measured. One of the latter shows an annual displacement of 0.136", so that its connexion with the nebula is disproved. The remaining points when plotted show consistent motions outwards along the arms of the spiral. The mean annual motion of the nebula as a whole, relatively to the comparison stars, is +0.003" in R.A., -0.004" in decl. The motions of the nebular points, in addition to their outward movements, indicate rotation in periods varying from 60,000 years for the inner portions to 240,000 years for the outer ones. The mean component of velocity along the nebular stream is +0.020"; it increases slightly as the distance from the centre increases.

Mr. van Maanen gives in full the reasoning which leads to the conclusion that these displacements are real. Taken in conjunction with the radial velocities measured, they indicate a parallax of the nebula of the order of 0.0005", or a distance of 6000 light-years. The diameters of the spirals are many light-years (in some cases hundreds of light-years), but they are much smaller objects than the Galaxy.