the second author for $m = 1.414-1.414$ i , a value representative for metallic particles.

Comparison of the ratios of the extinction produced by the two alternative directions of the incident electric vector with the maximum observed values, indicate that the margin is even smaller for partially absorbing particles than for pure dielectric cylinders. It had been hoped that the opposite would be true, since the particles are presumably not perfectly aligned and may not be as long as we have assumed, and therefore would not show the maximum polarization as predicted by theory.

I. van de Hulst, *Ap. J.* **112** 1, 1949.

*Harvard College Observatory,
Cambridge, Mass.,
and Leiden Observatory,
Leiden, Netherlands.*

Strand, K Aa. and A. D. Code. A multiple exposure camera with automatic timing and plate transport.

In order to fully utilize the superior accuracy of the photographic measure of binaries with distinctly separated images on the plates as compared with the more conventional visual observations with a micrometer, it is necessary to have between 40 and 50 measurable images on the same plate. The present equipment was developed for this purpose although it may also be utilized for other astrometric programs requiring several timed exposures on the same plate.

The camera attachment with a movable plate carriage fits into the position of the plate holder of the ordinary double slide camera, thus allowing guiding during the exposure.

The sequence of exposures starts with an exposure of the chosen length which can be varied from $\frac{1}{2}$ second to 2 minutes. Upon completion of the exposure the shutter is released and the plate holder is moved automatically $1/10$ inch to the next position by means of a turning screw. When reaching this position the plate holder stops and the next exposure starts immediately. This procedure is continued until a row of thirty images has been obtained and then the circuit is instantly cut off by means of a microswitch.

Upon completion of a row of exposures a trail of the star is usually exposed on the plate for orientation. For this purpose the camera shutter is mounted on a manually operated slide which can be removed from the field of the plate.

The timing circuit providing the necessary signals for operation of the plate holder, the

camera shutter, and the timing of the exposures in the proper sequence of operation, is a modification of the simple cathode coupled one-kick multivibrator. This circuit provides considerable flexibility and accuracy.

The camera shutter used in the equipment is of the usual commercially available kind; accordingly, by resetting the shutter from bulb, exposures of the marked shutter speeds can be made. Moreover, since all exposures are made near the optical axis of the instrument, the equipment can easily be adapted to the use of a Barlow lens for either double star or planetary work.

*Dearborn Observatory,
Evanston, Ill.,
and Washburn Observatory,
Madison, Wis.*

Strömgren, Bengt. Spectral classification through photoelectric photometry with interference filters.

The possibilities of spectral classification through photoelectric photometry with interference filters have been studied empirically through measures of 110 standard stars, using a set of 26 filters covering the wave-length region 3550-5500 Å. The intensity measures were made by Mr. K. Gyldenkarne with the 32-inch reflector of the Observatoire de Haute Provence, using a photometer constructed at the Copenhagen Observatory. The measures were obtained in October 1950 and January 1951.

The half-widths of the interference filters used (made by Bausch and Lomb) ranged from 80 to 120 Å, the maximum transmissions from 35 to 45 per cent. One color filter was used (Schott UG2) for the region around 3550.

For the 110 standard stars spectral classes and luminosity classes by W. W. Morgan were available. From an analysis of the material of intensity ratios the following results were obtained:

1. For late-type stars, F8-K6, accurate two-dimensional classification giving spectral class as well as luminosity class, is possible with the aid of the intensity ratios 4320/4240 and 4240/4170. These intensity ratios correspond to ratios used by Lindblad and his associates in their photographic-spectrophotometric classification work, g-band discontinuity and cyanogen criterion.

2. For stars of classes F8-K0 the ratio 3910/4030, which is a measure of the K-line intensity, yields accurate spectral classes.