A new design for such an instrument is described which will take tracings of any length up to 30 feet and which has magnifications between tracing and intensity record in the dispersion co-ordinate, of 1 : 1, 1 : 2, and 1 : 4. The intensity record is drawn by a pen on a strip of paper 12 inches wide of any selected length. The scale of intensities can be varied at will up to a maximum of 10 inches. The instrument is shown to combine accuracy with speed and to reduce the time required for deriving line profiles from microphotometer tracings from one-fifth to one-tenth that required by older methods.

It is hoped shortly to incorporate in the instrument a device for rectifying line profiles by automatically reducing the intensity of the continuous spectrum to unity throughout its length. The principles of the method, which requires two operators, and its obvious advantages in the case of stars with large numbers of lines are discussed in some detail.

1. *C. R. (Doklady) Acad. Sci. U.S.S.R.* **15**, 25, 1937.
2. *Rev. Sci. Instruments* **9**, 178, 1938.
3. *B. A. N.* **9**, 155, 158, 1940.

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Bobrovnikoff, N. T. The light curve of comet 1942g.

Comet 1942g (Whipple) showed more remarkable fluctuations in brightness than any comet heretofore studied. The light curve is based on 146 observations reduced to the author's "system f" which is the total brightness of the comet observed by him with a 2½-inch finder. The author's observations are based on 708 estimates and are discussed in *Contributions from the Perkins Observatory* No. 19, 1943. Other observations used for the light curve are: Ashbrook;¹ Martinoff, Bakharev, Lange;² Miss Farnsworth and Miss Pillans (unpublished); and Van Biesbroeck (unpublished).

The light curve from January 5 to July 3, 1943 shows a periodic variation in light with a period of about 30 days and the semi-amplitude diminishing from 0.6 mag. in January to 0.2 mag. in June. Such a diminution of the amplitude was previously observed in Comets 1902 III and 1912 II.³

However, in the present case there was a rather sudden increase in brightness on about February 21. The comet then began decreasing in brightness but faster than before. The result is that it is impossible to represent the brightness

of the comet by any one formula. Before February 10 and after April 15 the brightness can be expressed as follows:

$$H = 6.60 + 5 \log \Delta + 5 \log r + \text{periodic term.}$$

Between these dates, however, the following formula represents the observed brightness:

$$H = 4.00 + 5 \log \Delta + 15 \log r + \text{periodic term.}$$

In spite of the change in brightness by 1.40 mag. and the accelerated decrease in brightness, the length of the period of intrinsic variation and even the phase did not change at all.

Sudden changes in the light curve have been found previously for Comets 1858 VI, 1862 III, and 1884 I. Comet 1942f is unique in the combination of a sudden change with a distinctly periodic variation preserved throughout its period of observation of half a year. It is also remarkable in the closeness of the times of the nearest approach to the earth, January 28, and perihelion passage, February 6, which places the theoretical maximum of brightness between these two dates, about a month before the actually observed maximum. There is also evidence of minor fluctuations in brightness of a semi-periodic character.

1. *Pop. Astr.* **51**, 362, 1943.
2. *Astr. Circ. Acad. Sci. U.S.S.R.* Nos. 12 and 13, 1943.
3. *Contr. Perkins Obs.* No. 16, 1942.

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Burns, Keivin. Atmospheric oxygen bands.

This note is concerned with the relative accuracy of lines of the atmospheric oxygen bands in the solar spectrum. The precision is shown by the exactness with which empirical formulas can be fitted to the four branches of each band and by similar formulas which connect the lines of the various bands. The lines of the P₁ branch of the stronger isotope band which have been measured by means of the interferometer fit the following formula with full eight-place accuracy; that is, one part in ten million.

$$\nu = 13123.648 - 2.718023J - .0435188J^2 \\ (J = 0.5, 1.5, 2.5, \dots)$$

The formulas for the P₁ and R₁ branches have the same value for the zero line (not a real line) when half-integral values of *J* are used. In order to have the same value for zero in the case of the P₂ and R₂ it is necessary to use *J*-values differing somewhat from the half-integral, as shown in the formulas for the B band which follow.