trometer for several reasons. Firstly, the gross energy distribution curve of the star is flattened, approaching a straight line upon which the spectrum is displayed. Secondly, the ratio is independent of intensity fluctuations arising from seeing or from guiding errors. Thirdly, it is insensitive to variable extinction caused by the terrestrial atmosphere and interstellar absorption.

The spectrometer has been used to explore the possibility of extending the techniques of spectral classification developed by Stromgren. A program for the observation of MK standard stars has been started at Kitt Peak using one of the 16-inch Cassegrain telescopes.

An examination of tracings for luminosity and age characteristics immediately discloses interesting features in the later type stars. The illustrations show the range of effects noted in G8 stars. The most variable feature is the 4140 CN band when compared to adjacent features, or to the 3880 CN band. These bands are well known classification features and this illustration is made to indicate that the ratio spectrometer may be a promising tool for spectral classification.

Since fixed wave lengths are not employed, large radial velocities will not affect the method; hence, it may prove useful in classifying composite objects such as globular clusters and galaxies. In fact, the method may also be useful in determining radial velocities for distant nebulae simply by noting the wavelength shift of the entire pattern with respect to the spectrometer calibration scale.

This instrument will be a part of the instrumentation available to visiting astronomers with both the 16-inch and 36-inch telescopes.

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Millman, Peter M. and Halliday, Ian. *The near-infrared spectrum of meteors.*

Photographic records of meteor spectra in the infrared were first secured in 1950 (Millman 1953) and by the end of 1958, seven Perseid meteors had been photographed at Canadian stations on fast Eastman infrared emulsions. Two infrared spectra photographed at the Springhill Meteor Observatory on August 12, 1958 confirm features previously identified in earlier spectra showing less detail.

The better of the two Springhill spectra is of

a Perseid with a visual magnitude -5 , and shows a detail of 47 atomic emission lines, 33 in the visible region and 14 in the wave length range 7000–9000Å. Using the multiplet table by Moore (1945) all the infrared lines have been satisfactorily identified with four nitrogen multiplets, $N\text{I}$ (1), (2), (3), (8), two oxygen multiplets $O\text{I}$ (1), (4), and a multiplet of ionized calcium CaII (2). The visible region of the spectrum shows lines of $H\text{I}$, NaI , MgI , MgII , SiI , SiII , CaI , CaII , FeI , FeII and corresponds to the normal spectrum for bright Perseid meteors.

The meteor was recorded on both high and low power radars working at 32 Mc/s, and produced an echo that lasted for over 200 seconds. The visual persistent train had a duration of 30 seconds.

Heights for this meteor were determined by combining the photographic position with the radar range data. The photographed trail extended from a height of 104 km to 79 km with a bright burst at 84 km. The first feature to appear in the spectrum at the beginning of the trail was the neutral oxygen multiplet at 7774Å. The lines of the ionized elements gained steadily in relative strength along the trail, reaching peak relative intensity at the burst, where CaII was the strongest feature.

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Morton, Donald C. *Evolutionary mass exchange in close binary systems.*

Crawford and Kopal have found many eclipsing systems with the primary or more massive component near the main sequence and the secondary filling its lobe of the Roche limit, while there is a conspicuous absence of systems in the inverse state. It has been suggested that the primary expands first, according to the usual picture of stellar evolution, but when it reaches the Roche limit, mass is transferred to the secondary until it becomes the primary, leaving the new secondary filling its lobe. This paper describes investigations to show that this exchange happens fast enough so that there is a high probability that it escapes observation.