the center of the optical object. The radio emission of the central component comes from two distinct sources, each much more compact than the equivalent elliptical source. Arguments leading to the conclusion that the two sources are volumes of relativistic electrons being fed out into the extended source will be presented.

Fifty Carbon Stars in a Region in Cygnus.

MARTIN F. MCCARTHY S.J., *Specola Vaticana, Castel Gandolfo (Rome) Italy*.—Observations made with the Burrell-Schmidt of the Warner and Swasey Observatory using the 2° and 4° objective prisms and infrared-sensitive plates exposed on an area in Cygnus at $\alpha=21^{\text{h}} 04^{\text{m}}$ and $\delta=+46^{\circ} 3'$ (1955) reveal 50 carbon stars in a circular area 27 square degrees in area. No attempt to classify the carbon stars into types N and R was made. Direct plates exposed on the same area allowed a determination of the apparent infrared magnitudes of these stars and an initial survey of the two known and seven suspected carbon star variables in the region.

A plot of the distribution in apparent infrared magnitude of the 50 stars shows the following features: (1) a large (72%) percentage of the carbon stars observed lies in the magnitude interval 11^m0 to 12^m8 and (2) the groupings at 7^m7 and 12^m0 indicate a possible discontinuity between 8^m0 and 9^m0. The reality of the grouping at faint magnitudes seems certain but the sampling of the brighter stars does not seem sufficient to justify any conclusion about interarm discontinuities or to allow any detailed spiral arm tracing.

A comparison of this region with others along the galactic plane where infrared surveys have been carried out to the same apparent magnitude shows that this region, which was chosen without special regard for freedom from absorption, contains more carbon stars per square degree except for the clear region LF2 investigated in the infrared by Westerlund.

An Attempt to Simulate Supernova Spectra.

DEAN B. McLAUGHLIN, *University of Michigan*.—The construction of synthetic supernova spectra by C. Payne-Gaposchkin and F. L. Whipple (*Proc. Natl. Acad. Sci. U. S.* **26**, 264, 1940) required assumed abundances and involved laborious computation. An alternative procedure is artificial blurring of existing emission spectra.

Spectrograms of the Wolf-Rayet stars HD 192103 (WC7) and 192163 (WN6) were photographically converted to supernovalike spectra. Positive enlargements were placed in an enlarger and focused sharply on the copying easel. A convex lens was inserted in the light beam a few inches above the easel. During exposure the lens scanned along the spectrum and introduced blurring equivalent to an

expansion velocity of 6000 km/sec. Doppler broadening in the prismatic spectrum was simulated by moving the lens on an inclined track to vary its distance from the plate. The resulting blurred negatives were traced with a microphotometer.

Both Wolf-Rayet stars gave results that incompletely matched certain supernova features, but class WC7 showed large discrepancies in the red to green region. A composite of the two spectra gave a little improvement. Class WN6 showed encouraging resemblance to the spectrum of the supernova in IC 4182 at 24 days after maximum (Minkowski, R., *Astrophys. J.* **89**, 156, 1939). Changes necessary to produce better agreement are definitely toward lower excitation than that of WN6. The match would be greatly improved by weakening of HeII and NIV, strengthening of HeI and NII, and introduction of FeII. Further experiments are contemplated.

Photographic work and tracing of the spectra were done by David F. Gray and Lloyd Wackerling, respectively.

Meteor Magnitude Distributions.

PETER M. MILLMAN, *National Research Council, Ottawa 2, Ontario*, and MIRIAM S. BURLAND, *Dominion Observatory, Ottawa 3, Ontario*.—The visual meteor observations of the International Geophysical Year program give a total of over 120 000 meteors. These records are being analyzed, using IBM punched-card procedures. Magnitude distributions are being studied by methods similar to those reported by Millman and Burland at the 96th Meeting of the A.A.S. in 1956 (*J. Roy. Astron. Soc. Canada* **51**, 113, 1957). In the previous paper it was found that the ratio of the numbers of meteors in adjacent whole magnitude classes was in the neighborhood of 3.5 for the Canadian visual observations, made in the period 1933–1956.

The IGY-IGC visual meteor program includes the records of over 10 000 different meteors observed at the Springhill Meteor Observatory, 1957–1960. A preliminary analysis of this material indicates that several factors have a marked influence on the magnitude ratio found. Most important among these are the total number of meteors included, the sky luminosity and weather factor, and the mean elevation of the meteors above the horizon. Individual values of the magnitude ratio determined from various groupings of the observations ranged from 2 to 4 with an over-all mean value of 2.7.

The best value for observations made near the zenith under perfect weather conditions with a dark sky is 3.0. This agrees with the general mean determined by Öpik (*Mem. Soc. Roy. Sci. Liège Ser. 4*, **15**, 125, 1955; *Contrib. Armagh Obs.* No. 26, 1958) from 20 000 meteors observed on the Arizona ex-