'slow tail' for a given distance is higher at night than by day, whereas for the oscillatory portion, Fig. 3, not dealt with by Hepburn and Pierce, it is lower at night than by day.

This investigation is part of a long-term study on the spectrum of atmospherics and has been aided by grants from the Department of Scientific and Industrial Research. A detailed account of the present work is in course of preparation.

F. W. Chapman
W. D. Matthews

Wheatstone Physics Laboratory,
King's College,
London, W.C.2.
June 12.

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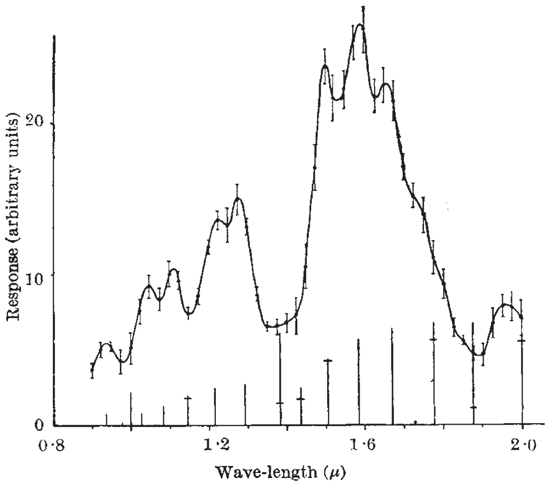
## Spectrum of the Night Sky in the Range 1·2–2 μ

We have recently obtained a series of spectra of the night sky in the wave-length region 1–2 μ. A lead sulphide cell was used as the detector in a grating spectrograph normally used for photographic spectroscopy[1]. The spectrum was scanned across the detector by rotating the grating, and spectra were obtained in the first order of the 15,000-lines/in. grating, using a 7–56 Corning filter to eliminate radiation of wave-length less than 0·9 μ.

The graph shows a plot of cell signal against wave-length, the average of five runs obtained at Saskatoon during the nights of June 14, 21 and 22, 1953. The spectrometer was directed towards a point in the sky about 15° above the northern horizon. Artificial lights were absent in this direction for a distance of at least twenty miles, and the atmosphere within the field of view of the spectrograph was not illuminated by the sun below 120 km. The spectral slit width used was 200 A., while the scanning-rate was 1 μ/hr. The standard deviation of the points obtained from individual runs is indicated by the length of the vertical lines through these points.

The most striking feature of the spectrum is the strong emission in the neighbourhood of 1·5 μ. It is possible to interpret this as being due to the $\Delta v = 2$ sequence of the OH rotation-vibration bands, the higher sequences of which were discovered in the night-glow spectrum by Meinel[2]. In the graph, below the spectrum, the positions and intensities of the OH bands as predicted by Heaps and Herzberg[3] have been indicated; the lengths of the vertical lines have been drawn in proportion to the predicted intensities. Since it is probable that the OH emission originates from a height of about 70 km.[4], it is to be expected that the band intensities will be strongly modified by atmospheric water-vapour absorption, and the horizontal strokes across the lines indicate the intensities as corrected for this absorption, the correction being, of course, rather uncertain[5].




Over the range 1·2–2 μ, the observed bands can be satisfactorily attributed to OH bands; at shorter wave-lengths the agreement is poor. We attribute this to the low signal-to-noise ratio in this region, since Kron[6] and Krasovsky[7], using detectors of greater sensitivity, have obtained general agreement with the OH bands up to 1·2 μ. Still, it is possibly worth noting that we have observed very intense radiation between 1·0 and 1·1 μ from the aurora, and it is therefore possible that low-level auroral activity, which is common in these latitudes, has distorted the night-sky spectrum in this spectral range.

Further investigations of the night sky and auroral spectra in this wave-length region are in progress.

The research reported here has been sponsored by the Geophysics Research Directorate of the Air Force Cambridge Research Center, Air Research and Development Command, under Contract *AF* 19(122)–152.

A. Vallance Jones
Herbert Gush

Physics Department,
University of Saskatchewan,
Saskatoon.

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## Difference of Temperature between Pole and Equator of the Sun

Both Emden's[1] old hydrodynamic solar theory and the more modern thermo-hydrodynamical solar theory due to Bjerknes[2] lead to a higher temperature at the poles than at the equator of the sun. Bjerknes's theory is, however, more definite as regards the order of temperature difference to be expected. Bjerknes regards the sun as a baroclinic cosmic vortex in which there is a stratified circulation directed from the poles to the equator in the upper photospheric layer and a reverse circulation in the layer immediately below. According to him, sunspots, which he considers also to be vortices, originate in the sub-photospheric stratum; and the depth of a sunspot vortex is connected with the actual difference of temperature between the pole and the equator of the sun. This difference of temperature thus acquires a special importance in solar physics, and therefore