(a) The spectrum of the night sky in Alaska when no aurora is visible exhibits the negative band system of ionized nitrogen in addition to the features normally observed at latitudes 30° – 35° .

(b) Wide bands in the spectrum of the night sky observed in California seem to be coincident with groups of faint lines present in the spectra of high altitude aurora.

(c) Spectra of the tips of auroral rays show an enhancement of several sharp lines, probably atomic oxygen and nitrogen, and of wide symmetrical lines at wave lengths coincident with $H\beta$ and $H\gamma$.

(d) The spectra of diffuse aurora are intermediate between that of high altitude aurora and of the night sky, some having a rather strong continuous spectrum.

(e) The intensities of the enhanced lines of sodium in the spectrum of twilight or dawn are directly related to the intensity of the sodium lines in the spectrum of the night sky.

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Naval Ordnance Test Station,
Inyokern, Calif.

Epstein, I. Pulsation periods of noise-zone models.

The pulsation equation is solved numerically for an example of a noise-zone model,¹ using a value $\gamma = 5/3$.

Model	$Q_0 = (\text{Period in days}) \times (\bar{\rho}/\bar{\rho}_{\odot})^{1/2}$
Noise-zone model	0.0314
Russell-mixture model	0.0320
Oxygen model	0.0292
Standard model	0.0381

Comparing the results for the models² tabulated above, one finds that the noise-zone model and the Russell-mixture model have similar pulsation periods. Since the central densities of the two models differ by a factor 3×10^5 , one infers that the envelope, rather than the core, plays the dominant role in the pulsations.

To carry this analysis further, the variational method³ of solving for the period is considered. A weight function, giving the relative contribution to the period of different regions of the star, is computed. This shows a maximum at $7/10$ the stellar radius, and practically no contribution from the convective core, the noise zone, or the atmospheric regions ($r/R > .95$) of the star. Ionization of hydrogen and the ionizations of helium are found to be of no importance in influencing the period, except if they should pro-

duce a convection zone reaching deep into the star. In the region of highest weight, the opacity is found to follow Kramers' law closely, and the ratio of radiation pressure to total pressure is of order of magnitude $1/6$, yielding⁴ an effective polytropic index of 3.4 and an effective γ of $3/2$.

The pulsation integration for the noise-zone model had been carried out with $\gamma = 5/3$, corresponding to negligible radiation pressure. Since the effective γ , taking account of radiation pressure, is substantially smaller, a corrected value of Q_0 must be derived. For this purpose, G. Keller's integrations² are used for estimating the dependence of Q_0 on γ , and a value of approximately 0.042 is found for Q_0 . The observed value of Q_0 is about 0.09 , if one employs for Cepheids masses determined by the mass-luminosity relation.⁵ This shows a discrepancy of about a factor 2 in the period, which might be explained by reduction of Cepheid masses by about a factor 4 , or possibly by a reduction of the effective temperature scale as applied to Cepheids by 25 per cent.

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Princeton University Observatory,
Princeton, N. J.

Gaposchkin, Cecilia Payne. Phase relations for intrinsic variables.

The intricate and numerous phase relations for intrinsic variables, classical Cepheids and RV Tauri stars, were shown as existing between light variation, period, radius at maximum and at minimum, temperature at maximum and at minimum, shape of curves and their breaks along the period's length.

Harvard College Observatory,
Cambridge, Mass.

Gaposchkin, Sergei. New variables in NGC 6522.

From 350 stars down to apparent magnitude 20.5 of the globular cluster NGC 6522, five are variables of cluster type with the periods 0.222336 , 0.481903 , 0.563826 , 0.635019 and $0.6?$ day and the ranges 17.4 – 18.3 , 18.1 – 19.6 , 17.3 – 18.9 and 18.5 – $19.6?$ mag. respectively.

Harvard College Observatory,
Cambridge, Mass.