stars listed here might thus be merely the result of differences in age. In view of this possibility, the stellar content of these groups is of interest. The limiting magnitude of the observations allows a consideration only of the most intrinsically luminous stars. In the above table the last two columns contain respectively the number of O-type stars (O9 and earlier) and B-type supergiants in each group. It is seen that the number of B-type supergiants relative to the number of O-type stars undergoes a marked increase with increasing linear size. If this indeed represents an evolutionary trend, a group of O-type multiple systems, similar to HD 5005 (Sharpless, 1954), may represent a still earlier stage.

Bidelman, W. P. 1943, *Ap. J.* **98**, 61.

Blaauw, A. and Morgan, W. W. 1953, *Ap. J.* **117**, 256.

Morgan, W. W., Whitford, A. E. and Code, A. D. 1953, *Ap. J.* **118**, 318.

Sharpless, S. 1952, *Ap. J.* **116**, 251.

—, 1954, *Ap. J.* **119**, 334.

Strömberg, B. 1948, *Ap. J.* **108**, 242.

*United States Naval Observatory,
Washington, D. C.*

Skumanich, Andrew. Thermo-convection in a polytropic atmosphere.

Thermally induced convection is investigated in an atmosphere with a strong density variation from top to bottom, such as is found in the hydrogen convection zone of the sun. The atmosphere is assumed to be initially stratified in horizontal planes and to follow the polytropic law, $P \propto \rho^r$. Viscosity and heat conduction are ignored, the perturbations are assumed to be adiabatic, and the perturbation equations are linearized. It is found that in a polytropic atmosphere—in contrast to the classical case of a homogeneous atmosphere—the speed of development of a perturbation increases persistently with decreasing horizontal wave length of the perturbations, even for wave lengths shorter than the thickness of the atmosphere. Thus in the solar hydrogen convection zone small element sizes are to be expected to predominate.

Las Vegas, Nev.

Smith, Elske v. P. Interstellar polarization in the southern Milky Way.

This study concerns the photoelectric observation of interstellar polarization of about two hundred stars in the southern Milky Way between longitudes 213° and 350° . The observations were made at the Boyden Station of the Harvard Observatory in South Africa.

From the data on galactic structure which Houck and Code of the Washburn South African Expedition and also Bok and Hoffleit kindly made available, we can relate these polarization observations with spiral arms in the southern Milky Way. Although there are localized departures from uniformity, there is a strong tendency along the whole Milky Way for the maximum of the electric vector to lie parallel to the galactic equator. In those regions where the Harvard and the Washburn data suggest that we are looking along spiral arms, as in Vela and in Carina, the dispersion in position angle tends to be high, whereas the amount of polarization is low. Between Crux and Scorpius, on the other hand, the polarization is far more uniform; apparently here the next inner spiral arm lies normal to the line of sight. Local features affect the large-scale picture to some extent. One such feature is the Coal Sack dark nebula in Crux, which lies near the sun and is responsible for most of the obscuration and polarization. The Scorpius field, $l = 310^\circ$ to 320° , poses somewhat of a problem. The ratio of polarization to absorption is low, and the position angles are random, despite the fact that the spiral arm still appears to lie across the line of sight in this direction. In summary, preliminary analysis indicates that the polarization data can be related to spiral structure, but local effects cannot be ignored.

*Harvard College Observatory,
Cambridge 38, Mass.*

Smith, Harlan J. Low-luminosity intrinsic variables with periods less than 0.2 day.

New photoelectric and spectrographic observations, coupled with other data, provide evidence which indicates that most of the galactic so-called RR Lyrae (or cluster-type) variables with periods less than 0.2 day are not true RR Lyrae stars.

On a period-spectrum diagram these variables lie parallel to, but displaced far from, the line corresponding to RR Lyrae types a and c. In addition, while the period-color relation for true galactic RR Lyrae stars is found to match very closely that long known for M3, the short-period variables form a relatively slender band of much smaller slope and again one which is quite displaced. Furthermore, amplitudes appear to diminish with increasing period, from 1.0 mag. at .05 day to 0.3 mag. at .20 day.

In this group there are 11 stars for which any