Bok, Bart J., B. D. Boutelle and M. Olmsted.
Space reddening and density gradients for the anti-center.

A study has been made of the color indices and the space distribution of the stars with known Henry Draper Extension spectra for galactic longitudes 160° to 175° , latitudes -4° to $+7^\circ$. Regions obviously affected by strong local obscuration have been avoided.

The space reddening appears to be variable. At $l = 170^\circ$, $b = 0^\circ$ the absorption for photographic light amounts to 0.5 mag. per kiloparsec, whereas at $l = 165^\circ$, $b = 0^\circ$ the average absorption amounts to 1.2 mag. per kiloparsec. At $b = +7^\circ$ the absorption is only 0.5 mag. per kiloparsec to a limiting distance of 2500 parsecs. Heavy local obscuration is found south of the galactic circle, extension of the dark nebulae in Orion and Taurus.

For the B8-A0 stars negative density gradients are found, with the star densities at 1000 parsecs being only 0.4 those near the sun. The A1-A7 and F0-F8 stars have steep negative density gradients within 500 parsecs, whereas the G-M stars have roughly constant space densities to 500 parsecs from the sun.

The absence of distant objects of high intrinsic luminosity is noteworthy. Early B and O stars are scarce and c stars few in number. Many of these stars congregate in the region immediately surrounding NGC 2244-2237, but none appear to be more than 2500 parsecs away. Trumpler lists three galactic clusters beyond 3500 parsecs, but one of these is in a highly obscured region, whereas the other two derived large distances reflect only the smallness of the angular diameters of the objects; Cuffey has already shown that distances based on angular diameters of small clusters are apt to prove too large. There are five known Cepheids with distances that may be in excess of 3500 parsecs, but all of these fall in or close to obscured fields.

For the present we do not possess any evidence, for the section of the Milky Way between galactic longitudes 160° and 175° , that there exist galactic objects at distances greater than 3500 parsecs from the sun. It is significant to note that the section $l = 160^\circ$ to 175° is perhaps the least obscured part of the anti-center region. The importance of future studies of distant galactic clusters and faint Cepheid variables in the anti-center section is stressed.

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Buscombe, William. The Alberta twilight meteor of 1946 October 21.

From 50 independent visual observations collected by mail a path was computed for this -7th magnitude object which fell in central Alberta, and was seen over a wide area including parts of western Saskatchewan. As the graphical determination of beginning and end points of the visible path indicated a high inclination to the horizon with consequent uncertainty in the direction of the radiant in space, a least-squares method was devised to determine from the observed elevations and azimuths from various directions the most probable elements of the path.

Time of apparition, 1946 October 21, 5:32 p.m.

M.S.T. = Oct. 22.022 U.T.

Appeared at height 94 ± 5 km over $112^\circ 25' \pm 3'W$, $53^\circ 34' \pm 1'N$.

Disappeared at height 37 ± 1.4 km over $112^\circ 48' \pm 7'W$, $53^\circ 25' \pm 1'N$.

Earth point, $113^\circ 3' \pm 10'W$, $53^\circ 19' \pm 2'N$; sidereal time, 284.8.

Length of path (true), 64 ± 9 km; (projected), 30 ± 8 km.

Duration of flash, 3.3 ± 0.4 ; apparent velocity, 21 ± 5 km/sec.

Slope of path, 62° ; from azimuth N57°E.

Unperturbed radiant, $\alpha = 340^\circ$, $\delta = 59^\circ$.

Geocentric velocity, 17 km/sec; heliocentric, 42 km/sec.

Parabolic orbit, $i = 37^\circ$, $\Omega = 208^\circ$, $\pi = 348^\circ$, $q = 0.881$ astr. units.

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Eggen, Olin J. Sudden changes in the β Cephei variables.

The short period variables, β Cephei and HD 199140 = BW Vul, have been observed with the photomultiplier photometer of the Washburn Observatory. This photometer, designed and constructed by Dr. A. E. Whitford, is used in connection with an Esterline-Angus recording milliammeter which permits continuous recording of the light variations. The amplitude of the light curve of HD 199140, 0.28 mag., was found to remain constant over a period of two months while that of β Cephei, observed on but one night, appeared to decrease in successive cycles. The period of both stars is 0.19 days. The light curves resemble those of the Cepheid variables with the exception that on one night, September