Goldberg, Leo, Mohler, Orren C. and Brown, Jacqueline D. A connection between the granulation and the structure of the low chromosphere.

Isophotometer tracings of a plate of the Fraunhofer spectrum in the region of $H\beta$ show an interesting connection between the structures of the $H\beta$ line and of the FeI line $\lambda 4859.747$ (Rowland intensity 4). The $H\beta$ line is resolved into structures as small as $3''$ or less, and the detail in the neighboring metallic lines is equally good. Over an interval of about $6'$ on the disc, 41 features in the $H\beta$ line were measured for radial velocity with respect to the underlying photospheric component of the line core. Similarly, velocity shifts were measured in the neighboring FeI line at points in the line corresponding to the positions of the 41 $H\beta$ structures.

The results obtained are as follows: 1) There is a remarkable association of the $H\beta$ structures with violet shifts in the FeI line. Of the 41 measured $H\beta$ structures, 30 are associated with violet shifts in the FeI line, 7 with red shifts, and 4 with zero shifts; 2) The $H\beta$ structures are themselves predominantly shifted to the violet. The statistics show 26 violet shifts, 11 red shifts, and 4 zero shifts; 3) The velocity spread in the $H\beta$ line is about three times as great as that in the FeI line, the rms values being 0.64 and 0.24 km/sec, respectively.

It is tentatively suggested that the violet-shifted structures observed in the hydrogen lines represent extensions of the granular columns into the low chromosphere. The inequality between the negative and positive shifts in the $H\beta$ line may be attributed to the fact that on the average the ascending columns are at a somewhat higher temperature than the descending columns. Since a difference of only a few hundred degrees in temperature causes an enormous difference in the population of the two-quantum level of hydrogen, the relative absence of structures with descending velocities could be due to vanishingly small optical depth in the cooler columns. Further clarification may be expected from studies now being carried on with lines covering a large range of optical depth and excitation characteristics, including $H\alpha$, the K line of Ca^+ , the D lines of sodium, and the Mg b lines.

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Goldberg, Leo and Muller, Edith A. The origin of the double reversal in the Fraunhofer H and K lines.

The discovery by O. C. Wilson of a correlation between the absolute magnitudes of the G, K and M stars and the widths of the emission reversals in their K-line cores emphasizes the importance of establishing the mechanism both for widening the H and K emission-line cores in the sun and for producing the central self-reversal. Evidence is presented that favors Doppler broadening on the one hand and abundance broadening on the other. It is shown that the apparently conflicting arguments for the two kinds of broadening can be resolved if the cores of the H and K lines are formed in an optically-thick chromosphere in which the excitation temperature decreases with height. Methods are developed for the derivation of the excitation temperature and Ca^+ density distributions from the observed profiles and it is shown that the resulting model accounts satisfactorily for the main features of the observed profiles both at the center of the disk and at the limb.

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Innes, M. J. S. A possible meteorite crater at Deep Bay, Saskatchewan.

The waters of Deep Bay, which form the southeastern part of Reindeer Lake in northern Saskatchewan, occupy a circular depression having an average diameter of about $8\frac{1}{2}$ miles. Topographical, geophysical and geological evidence strongly suggest this feature has been formed by an explosion, for which no other cause than the impact of a huge meteorite can be suggested.

Although deeply eroded by movement of glaciers, many structural features characteristic of explosion craters are preserved. Its depth, from the highest point on the rim of the depression to the bed of the lake, is about 1130 feet. Precambrian granitic rocks exposed in many places on the inner wall show evidence of intense shattering. There is no sign of volcanism or volcanic rocks. Although no meteoric material has been identified, boulders of shale believed to have been carried by ice movement from a lake deposit on the floor of the crater were discovered. The shale contains 1.5 per cent iron and traces of nickel and is being examined for evidence of