conglomerate comet model (Whipple 1950, 1951), if we assume that the meteors originated in the outer layers of the parent comet's nucleus, under relatively weak pressure. This would imply that comet Giacobini-Zinner became a producer of meteors only in recent times, possibly after the great Jupiter perturbation of 1897, immediately preceding the comet's discovery. An analysis of other showers shows that the Taurid meteors display a low degree of fragmentability. This is consistent with the above explanation, since their parent comet, Halley's, is large and old, so that present-day Taurids probably came from layers which originally were deep inside the nuclear ices.

A survey of beginning heights, decelerations and fragmentation indices for some of the major showers, α -Capricornids, Taurids, ι -Aquarids, Geminids, δ -Aquarids, Lyrids, Perseids, Orionids, based exclusively on Super-Schmidt material, shows that each shower has its own distinct peculiarities, revealed by systematic deviations from the mean, as given by nonshower, sporadic meteors. These deviations are in both directions, plus and minus, with no special preference; in particular they do not indicate a systematically greater height of appearance for shower meteors. In view of the many factors which may combine to cause each single deviation, any attempt at a detailed explanation seems to be premature at this stage.

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Kerr, F. J., Hindman, J. V. and Carpenter, Martha S. Observations of the southern Milky Way at 21 centimeters.

Observations of 21-cm line radiation from the southern Milky Way are being carried out with the four-channel fixed-frequency receiver described by Kerr, Hindman and Robinson (1954). A tentative picture of the spiral structure in the southern portion of the conventional galactic plane was obtained from observations made during 1954. The current program covers an extended range of galactic latitude, 8° wide, with the object of obtaining the three-dimensional distribution of neutral hydrogen.

Observations are made along selected paths which cross the galactic circle at a number of different longitudes. For each longitude a dia-

gram showing constant-intensity contour lines with respect to galactic latitude and radial velocity is being derived. Since the velocity scale is related to a distance scale, a series of such diagrams leads to the space distribution, providing the ambiguities inside a circle through the sun can be resolved.

Diagrams of this type in the longitude range 260° to 275° indicate that the outer spiral arms are trailing in this region, confirming the results obtained in the galactic plane. They show in addition an increasing southward shift in galactic latitude with increasing distance.

Edmondson (1955) has recently suggested that the mean motions in the galaxy may depart from circular motion by about 4° . This hypothesis can be tested by comparing radial velocities in the inner part of the galaxy, along lines of sight which are symmetrically placed relative to the galactic center. Comparisons which have been made so far between the Sydney and Leiden results at corresponding longitudes near the center do not appear to show the large velocity differences predicted by Edmondson's theory. Complications are produced, however, by local structural differences and by the different antenna beam widths used in the two sets of observations, and a firm conclusion must await a systematic comparison over a wide range of longitudes.

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Linnell, Albert P. Light-loss tables for atmospheric eclipses.

The theory of atmospheric eclipses described in this paper considers the eclipse of a star following the cosine law of darkening by a larger star with a thick atmosphere. Simplifying assumptions are: (1) spherical stars, (2) negligible emission in the thick atmosphere produced by the presence of the secondary, (3) a negligible amount of light scattered into a given pencil from other oblique pencils, (4) the thick atmosphere may be characterized by the opacity law $\kappa\rho = c/\zeta n$ where ζ represents the distance from the star's center, c is a proportionality constant whose value depends on the way in which the boundary of the star is defined, and n is an adjustable parameter.