62. W. D. Rannie: *Tensor methods in the theory of turbulence.* Preliminary report.

Applications of tensor analysis to the statistical theory of isotropic turbulence as developed by T. von Kármán and L. Howarth, and later treated by H. P. Robertson, are reviewed. (Received November 18, 1940.)

63. Eric Reissner: *A new derivation of the equations for the deformation of elastic shells.*

The equations of the theory of small deformations of shells, first given by A. E. H. Love, are rederived in a simpler manner. The simplifications are accomplished by using (1) vector stress resultants and equilibrium conditions in vector form and (2) the three-dimensional system of orthogonal coordinates which goes with the lines of curvature on the middle surface of the shell and the strain components with respect to this system. The assumption that the normal to the undeformed middle surface is deformed into the normal to the deformed middle surface, satisfied by determining appropriate displacement components, is introduced into these strain components. (Received November 25, 1940.)

64. H. J. Stewart: *Steady state oscillations in an atmosphere on a rotation sphere.* Preliminary report.

If one plots the mean surface atmospheric pressure, averaged over a period of at least a week, one finds that in addition to the mean westerly flow of air, there exist large scale closed isobaric systems which change very slowly with time. Attempts to develop long range weather forecasting techniques have shown the positions of these systems to be of primary importance and a knowledge of the factors which control these systems is very useful as a guide in formulating forecasting methods. In the present paper certain steady state oscillations of the stratosphere are investigated and are shown to vary with the mean velocity in the same manner as the observed oscillations. (Received November 18, 1940.)

GEOMETRY

65. P. O. Bell: *On differential geometry intrinsically connected with a surface element of projective arc length.*

In this paper a surface element of projective arc length is interpreted geometrically and used to obtain a new geometric interpretation for each of the following: a generalization of Bompiani's projective curvature, a generalization of Fubini's asymptotic curvature, a projective torsion introduced in this paper, conjugate tangents, the tangents of Darboux, and the tangents of Segre. The associate conjugate net of an arbitrary net $N_{\lambda_1\lambda_2}$ of a surface S (introduced in this paper) is defined as the conjugate net whose tangents at a point P of S separate harmonically the tangents at P of the net $N_{\lambda_1\lambda_2}$. The following characteristic property of this net is a typical result: Let arcs PP_1, PP_2 of equal projective length s be measured, with respect to the form $ds=(2Rv')^{1/2}du$, from the point P along the curves C_{λ_1}, C_{λ_2}, respectively, of the net $N_{\lambda_1\lambda_2}$. The tangent plane to S at P intersects the line joining P_1P_2 in a point P_3 which tends to a limit point P_0, distinct from P, as s tends to zero. The tangent line joining PP_0 and its conjugate tangent envelop the conjugate associate of the net $N_{\lambda_1\lambda_2}$, as P varies over S. (Received November 20, 1940.)