35. J. J. Stoker: *Nonlinear theory of curved elastic sheets.*

The membrane theory of thin elastic shells, which is based on the assumption that bending stresses can be neglected, is relatively simple from the mathematical point of view since the stresses can be determined independently of the strains. However, it is not possible then, in general, to satisfy boundary conditions which refer to displacements—such as, for example, the condition of a fixed edge. The present paper presents a theory of thin shells which neglects bending stresses but which, nevertheless, makes it possible to satisfy various types of boundary conditions which are reasonable from a physical point of view, such as that of a fixed edge. This is accomplished by taking into account certain of the quadratic terms in the expressions for the strains as functions of the displacements, in a manner analogous to that employed in deriving the von Kármán equations for bending of thin plates. (Received October 4, 1944.)

Ergodic Theory

36. P. R. Halmos: *On an incompressible transformation.*

E. Hopf has introduced a very strong notion of incompressibility for one-to-one measurable transformations on a measure space and showed that a transformation is incompressible in that sense if and only if it possesses a positive finite invariant integral. Recently Hurewicz has shown that under the assumption of a much weaker notion of incompressibility a very elegant generalization of Birkhoff's ergodic theorem is valid. The purpose of this note is to point out the following two facts: (1) If a transformation does possess an invariant integral, the Hurewicz theorem can be made to follow from known results for measure preserving transformations. (This fact is not immediately obvious only because of the rather peculiar formation of the Hurewicz means.) (2) There exists a one-to-one measurable transformation on a measure space which has the weak but not the strong property of incompressibility. (This fact in addition to answering a question explicitly raised by Hopf also serves to show that Hurewicz's theorem is indeed an extension of Birkhoff's.) (Received October 16, 1944.)

Geometry

37. Felix Bernstein: *The swastika and the Sicilian triskelon from the standpoint of "higher geometry."*

From the standpoint of higher geometry as defined by Felix Klein, the swastika and the triskelon are interpreted by the crystallographic groups of the plane, which are known groups composed of translations and rotations, with an angle of rotation of $360/n$ degrees, where n is restricted to the values 2, 3, 4, 6. The known fundamental domains (F.D.) of these groups with one center of symmetry are altered here into F.D. with two centers of symmetry. The broken line of greatest length connecting the two centers is called an arm and the smallest region whose boundary consists of arms only is called a blitz according to its shape. A blitz and its images produced by the operations of the group in the case $n=4$ fill the whole plane with swastikas, in the case $n=6$ with a like set of triskelons. With the aid of a properly generalized swastika it is possible, in an analogous manner, to fill euclidean space. By certain alterations of given F.D., a proof of the Pythagorean Theorem is obtained. (Received December 1, 1944.)

38. John DeCicco: *Survey of polygenic functions.*

The author presents a general outline of the theory of the first and second deriva-