315. J. L. Synge: *Approximations in elasticity based on the concept of function space.*

A state of an elastic body is defined by a set of six stress components, given as functions of position throughout the body. Such a state defines a point or vector S in function space, without any implication that the equations of equilibrium or compatibility or the boundary conditions are satisfied. A metric in the function space is defined by means of the strain-energy function. If S is the solution to a problem in which surface stress is given, S' an arbitrary state satisfying the equations of equilibrium and the boundary conditions (but not the equations of compatibility), and S'' another arbitrary state satisfying the equations of compatibility (but not the equations of equilibrium or the boundary conditions), then S is situated on the intersection of a hypersphere determined by S' and a hyperplane determined by S''. The center C of this hypercircle may be regarded as the "best" approximation. Its energy-error is given through the radius R of the hypercircle, which may be calculated from the formula $R=2^{-1}|S'-S''(S'\cdot S'')/S''^2|$. The method can be extended by using a sequence of states S_1'', S_2'', $\cdots$, and may also be used when the surface displacement is given instead of the surface stress. (Received July 22, 1946.)

316. C. A. Truesdell: *On Behrbohm and Pinl's linearization of the equation of two-dimensional steady flow of a compressible adiabatic fluid.*

In a recent note Behrbohm and Pinl (Zeitschrift für angewandte Mathematik und Mechanik vol. 21 (1941) pp. 193–203) have achieved a new linearization of the potential equation of two-dimensional steady adiabatic compressible flow in generalization of the Minkowski linearization of the equation for minimal surfaces. The author shows that Behrbohm and Pinl's result is equivalent by a simple change of variable to the ordinary linearization by Legendre's transformation, that Behrbohm and Pinl's subsidiary condition on the variables is superfluous, and that hence two of their variables may be interpreted physically as components of the velocity vector. He shows that Behrbohm and Pinl's equation suggests immediately the classical solutions of Tschaplygin. He discusses the possibility of other separations of the variables, and concludes that it is unlikely that any exist. (Received July 12, 1946.)

317. Alexander Weinstein: *On the method of sources and sinks.*

This paper contains an extension of the method of sources and sinks. New types of flows are obtained by taking sources distributed on circumferences, disks and cylinders. The procedure requires a modification of several formulae given by Beltrami who failed to recognize that Stokes' stream function of a circumference is a many-valued function. (Received July 6, 1946.)

Geometry

318. L. A. Dye: *A Cremona transformation in S_3 defined by a pencil of quartic surfaces.*

An involutorial Cremona transformation in S_3 is defined by means of a pencil of quartic surfaces $|F_4|$ with γ_{11} of genus 14 and γ_5 of genus 2, $[\gamma_{11}, \gamma_5]=18$ as a base. The γ_5 lies on a quadric H which intersects $|F_4|$ in γ_5 and a system of twisted cubics $|C_3|$. The residual intersections of the bisecants of a C_3 cut from the associated F_4 are pairs of conjugate points in the involution I. The γ_5 is invariant, not fundamental,