matrix determined in terms of the field tensor $f_{\mu\nu}$ by $F=\|f^{\mu}_{\nu}\|=\|g^{\mu\sigma}f_{\sigma\nu}\|$ where $g_{\mu\nu}$ are the components of the metric tensor which in the case of special relativity may be reduced to the form $g_{\mu\nu}=0$ for $\mu\neq\nu$, $c^{-2}g_{00}=-g_{11}=-g_{22}=-g_{33}=1$. In case F is a constant matrix, that is, its components are independent of x^{μ} or τ, the solution of (1) may be written as (2) $V=L(\tau)V_0$ where V_0 is a constant one column matrix and $L(\tau)$ is the one-parameter family of Lorentz matrices generated by the infinitesimal Lorentz matrix $1-\epsilon\lambda F$. Unpublished results of O. Veblen, J. W. Givens and the author give a complete classification of the Lorentz transformations in terms of the components of the tensor $f_{\mu\nu}$, as well as a closed expression for $L(\tau)$. The particle orbits may then be obtained by substituting (2) into the definition of V and integrating. In case f^{μ}_{ν} may be written as $f^{\mu}_{0\nu}+f^{\mu}_{1\nu}$ where $f^{\mu}_{0\nu}$ is a constant tensor and $f^{\mu}_{1\nu}$ is slowly varying, then approximations to the solution of (1) may be obtained by transforming (1) into an integral equation and using the classical Picard iteration process. (Received March 25, 1947.)

255. E. A. Trabant: *The Riemannian geometry of the symmetric top.*

The Riemannian geometry of the symmetric top with moment of inertia coefficients A, A, and B, using Euler's angles as coordinates, is developed. The following general theorem for the static space is proven. A necessary and sufficient condition in order that the static Riemannian space be an Einstein space of constant Riemannian curvature with the first covariant derivative of the Riemann symbols of the first kind equal to zero and which can be mapped conformally upon a 3-dimensional flat space is that $A=B$. (Received March 15, 1947.)

Geometry

256. H. S. M. Coxeter: *Continuity in real projective geometry.*

In the presence of the usual axioms of incidence and separation (including one which ensures the compactness of collinear points), the following nonmetrical form of Cantor's axiom of closure suffices to characterize the real projective line: *Every monotonic sequence of points has a limit.* (The words "monotonic" and "limit" are defined in terms of separation alone.) It can be deduced that every point not belonging to a given harmonic net is the limit of a sequence of points of the net, whence the fundamental theorem follows at once. The axioms of Archimedes and Dedekind are likewise deducible. (Received March 22, 1947.)

257. John DeCicco: *Characterization of Halphen's theorem on central and parallel fields of force.*

Halphen showed that if the ∞^5 trajectories of a positional field of force are all plane curves, the lines of force are all straight lines concurrent in a fixed point which may be finite or at infinity, that is, the field of force is central or parallel. The author studies the problem of determining all the positional fields of force whose trajectories are general helices. (A helix is a curve drawn on any cylinder whatever, cutting the generators at a constant angle. In particular, if the curve cuts the generators orthogonally, the curve is plane.) It is proved that if the ∞^5 trajectories of a field of force are all helices, they must be all plane curves, and the field of force is central or parallel. Another characterization was obtained by Kasner. If each trajectory of a positional field of force lies on some sphere or plane, all the trajectories are plane curves, and the field of force is central or parallel. (Received March 6, 1947.)