thermal character. In the real domain, there are three types: (I) and (II) $X+iY = F(x \pm iy,\ p \mp iq)$, $\Theta = a\theta + h$, where h is a biharmonic function; and (III) $X = \phi$, $Y = \psi$, $\Theta = h(X,\ Y)$, where ϕ and ψ are arbitrary functions, and h is a harmonic function of $(X,\ Y)$. Within the group of contact field element transformations, there are seven types. In the real domain there are five types: (I) and (II) The Kasner extended group; (III) and (IV) $p - iq = F(X \pm iY,\ x+iy)$, $\Theta = a[\theta - 2\int(pdx+qdy)] + h(X,\ Y)$; and (V) $X = \phi$, $Y = \psi$, $\Theta = h(X,\ Y)$. Special cases are that the isogonal, the multiplicative, and the isocline trajectories of an isothermal family are always isothermal. (Received December 4, 1941.)

132. Edward Kasner and Don Mittleman: *A general theorem on the initial curvatures of dynamical trajectories.*

The theorem proved is an extension of Kasner's dynamical theorem which states that: If a particle starts from rest in any positional field of force, the initial curvature of the trajectory is one-third of the curvature of the line of force through the initial position. The generalized result is: If a particle starts from maximum rest in an acceleration field of order n, the initial curvature of the trajectory is $n!(n-1)!/(2n-1)!$ of the curvature of the line of force through the initial position. This paper will appear in the Proceedings of the National Academy of Sciences. (Received January 19, 1942.)

133. W. H. Roever: *Geometric statement of a fundamental theorem for four-dimensional orthographic axonometry.*

The theorem stated below makes possible the construction of three-dimensional models for the "picturization" of four-dimensional space in a manner analogous to that furnished by three-dimensional orthographic axonometry for the picturization of three-dimensional space on the plane. Theorem: Three conjugate diameters and the axis of revolution of an oblate spheroid may be regarded, as far as directions are concerned, as the orthographic projection on the three-dimensional space, in which the spheroid lies, of four mutually perpendicular concurrent axes of four-dimensional space. If these axes be taken as rectangular cartesian axes and the three-dimensional space of the spheroid as the picture space, then the ratios which the halves of the chosen conjugate diameters and the radius of the spheroid's focal circle bear to the spheroid's equatorial radius are the foreshortening ratios, that is, the numbers by which the scales on the axes of the four-dimensional space must be multiplied respectively in order to obtain those on the axonometric axes (that is, the three conjugate diameters and the axis of revolution of the given spheroid). (Received December 8, 1941.)

Logic and Foundations

134. A. R. Schweitzer: *On a class of ordered $(n+1)$-ads relevant to the algebra of logic.* I.

Within the frame of his geometric theory (American Journal of Mathematics, vol. 31, (1909), pp. 365–410, chap. 2, 3) the author generates complete classes of ordered $(n+1)$-ads ($n = 1, 2, 3, \cdots$) of generalized type of constituents in the algebra of logic by means of two equivalent processes: (1) Relatively to the given ordered $(n+1)$-ad $\alpha_1\alpha_2 \cdots \alpha_{n+1}$ and the ordered dyads $(\alpha_1\lambda_1), \cdots, (\alpha_{n+1}\lambda_{n+1})$ the α's are replaced by the corresponding λ's either singly or in combination yielding $2^{n+1}(n+1)$-ads. (2) Relatively to α_1, λ_1 the elements $\alpha_2\alpha_3 \cdots \alpha_{n+1}$; $\lambda_2\lambda_3 \cdots \lambda_{n+1}$ are successively