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In 1913 Study discussed the triality properties of hyperbolic 8-space. In 1925 Cartan discussed this geometric triality in the context of the automorphism groups of Lie groups of type D_4 and noted a connection with the Cayley-Graves octonions. In 1935 Moufang further connected alternative algebras with projective planes possessing many relations. We will discuss these and more general concepts of triality along with other situations where algebras are presented or explained by geometries and groups. (Received August 31, 2012)