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Before the work of Berger on the classification of compact homogeneous with positive pinching the only known examples of spaces in the title had the underlying topology of a sphere or a rank one symmetric space of compact type. Berger introduced two new spaces of dimension 7 and 13 respectively. In the early seventies the speaker introduced 3 new spaces of dimension 6, 12, and 24 as an outgrowth of his classification of even dimensional positively pinched homogeneous spaces. Also, with Aloff he introduced the first examples of an infinite number of homotopy types of simply connected homogeneous spaces in one dimension (dimension 7) each admitting positive pinching. In the ensuing years new spaces that are not homeomorphic with homogeneous spaces have been introduced by Eschenberg and Bazaikin in, respectively, dimensions 7 and 13. This lecture will touch on these subjects and more recent developments. (Received February 17, 2009)