45. *Extended Non-Euclidean Geometry*

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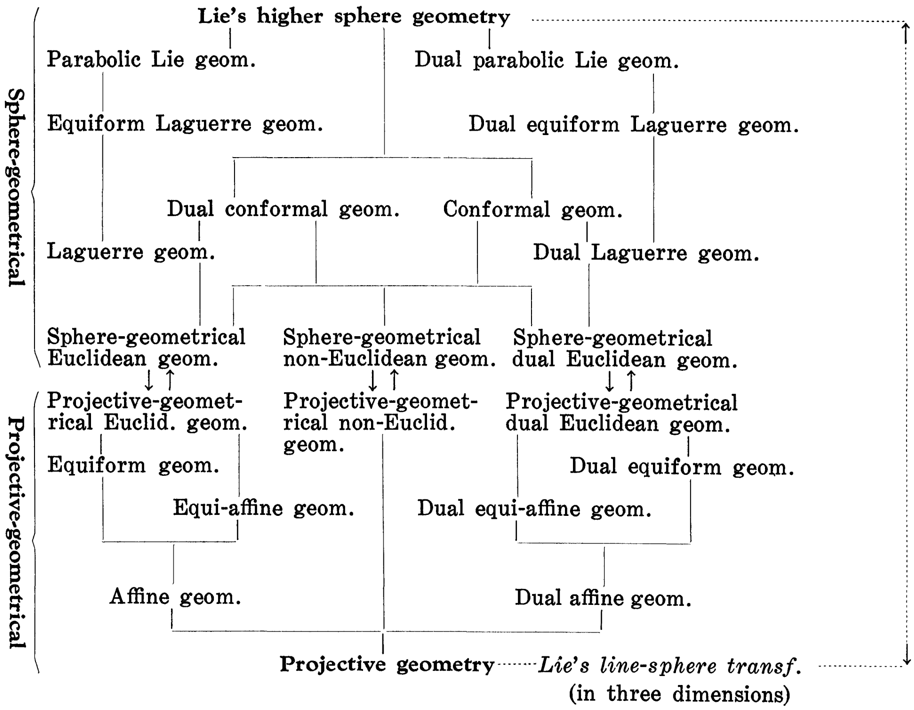
In [1–4], I have started to extend all the branches of geometry of the following table by extending the respective transformation group parameters to functions of coordinates:



In this note an *extended non-Euclidean geometry* will be established. It should be noticed that the extensions of the so-called

Cayley-Klein | Poincaré-Klein

representation are unified in it by mapping onto each other by an *extended Darboux-Liebmann transformation,* which is an extended equiform transformation [3].

The extended non-Euclidean geometry so obtained is realized in the differentiable manifolds (atlas) in the sense of S. S. Chern and C. Ehresmann.

1. Extended projective geometry. I have established [4] an *extended equi-affine group* of transformations

(1.1) $\bar{\xi}^l = a^l_m(\xi^p)\xi^m + a^l_0,\quad (|a^l_m(\xi^p)|=1,\ a^l_0=\text{const.},\ l, m, \cdots = 1, 2, \cdots, n),$