On the Space which admits a given Continuous Transformation Group in the extended sense.

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We shall consider the space in which parallel directions along every curve are unaltered by all the transformations of a given continuous transformation group. This case we call the space which *admits the given group in the extended sense.*[1]

First, by using the notations of Lie's symbols of infinitesimal transformations, we shall obtain the conditions in which a space admits a group in the extended sense.

Next, we will examine the case when the number of the order of the group admitted by a space in the extended sense, is maximum.

Lastly, in the general space which admits a group in the extended sense, we shall obtain the relations between the covariant derivatives and the transformation-derivatives[2] for a vector field.

1. Let us consider a space V_n,[3] and let the coordinates be $x^1, \ldots, x^n$, and the coefficients of connection be L^i_{jk}. Then we can define the parallelism of vectors in V_n by the following infinitesimal transformations:[4]

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(1) When the parallelism of vectors in a space, not parallel directions, is unaltered by all the transformations of a given group, I say that the space admits the group (not in the extended sense). I have treated this case in this journal **4** (1934), 111-126.

(2) T. Sibata, this journal **4** (1934), 116-117.

(3) In this paper we shall employ certain notations due to L.P. Eisenhart, *Non-Riemannian Geometry* (1927).

(4) T. Sibata, *loc. cit.*, 112.