97. *On the Generalized Loxodromes in the Conformally Connected Manifold.*

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In a previous paper[1], we have defined a conformal arc length σ on the curves in the conformally connected manifold and have proved the Frenet fomulae

$$(1)\qquad \begin{cases} \dfrac{d}{d\sigma}\underset{(0)}{A} = \underset{(1)}{A}, \\ \dfrac{d}{d\sigma}\underset{(1)}{A} = \lambda\underset{(0)}{A} + \underset{(2)}{A}, \\ \dfrac{d}{d\sigma}\underset{(2)}{A} = \lambda\underset{(1)}{A} + \underset{(3)}{A}, \\ \dfrac{d}{d\sigma}\underset{(3)}{A} = \underset{(0)}{A} + \overset{4}{\lambda}\underset{(4)}{A}, \\ \dfrac{d}{d\sigma}\underset{(4)}{A} = -\overset{4}{\lambda}\underset{(3)}{A} + \overset{5}{\lambda}\underset{(5)}{A}, \\ \cdots\cdots\cdots\cdots\cdots\cdots \\ \cdots\cdots\cdots\cdots\cdots\cdots \\ \dfrac{d}{d\sigma}\underset{(\infty)}{A} = -\overset{\infty}{\lambda}\underset{(n)}{A}. \end{cases}$$

The conformal arc length does not exist for the generalized circles.

The most simple curves having the conformal arc length are the ones for which we have

$$(2)\qquad \lambda = \overset{4}{\lambda} = \overset{5}{\lambda} = \cdots = \overset{n}{\lambda} = \overset{\infty}{\lambda} = 0\,.$$

We shall, first, consider the properties of these curves.

§ 1. Substituting the equations (2) in the Frenet formulae (1), we have

$$(3)\qquad \frac{d}{d\sigma}\underset{(0)}{A} = \underset{(1)}{A}, \quad \frac{d}{d\sigma}\underset{(1)}{A} = \underset{(2)}{A}, \quad \frac{d}{d\sigma}\underset{(2)}{A} = \underset{(3)}{A}, \quad \frac{d}{d\sigma}\underset{(3)}{A} = \underset{(0)}{A},$$

which shows that, if we develop the curve on the tangent conformal space at $\underset{(0)}{A}$, we shall obtain a curve lying always on a two-dimensional sphere determined by $\underset{(0)}{A}, \underset{(1)}{A}, \underset{(2)}{A}$ and $\underset{(3)}{A}$.

Considering always the development of the curve on the tangent conformal space at a fixed point of the conformally connected manifold, we can treat such curves as if they were on a two-dimensional flat conformal space.

1) K. Yano and Y. Mutô: On the conformal arc length, Proc. **17** (1941), 318–322.