ON CONTINUOUS CURVES IN n DIMENSIONS*

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If M_1 and M_2 are subsets of a connected point set M, the subset K of M is said to *separate* M_1 and M_2 in M if $M-K$ is the sum of two mutually separated sets containing M_1 and M_2 respectively. R. L. Moore‡ has shown that in order that a plane continuum M be a continuous curve§ it is necessary and sufficient that for every two distinct points A and B of M there should exist a subset of M which consists of a finite number of continua and which separates A and B in M. Consider the following example: Let S_i $(i=1, 2)$ be the set of all points (x, y, z) in three dimensions such that $x=(-1)^i$, $-1\leqq y\leqq 1$, $0\leqq z\leqq 1$. Let R_0 be the set of all points (x, y, z) such that $-1\leqq x\leqq 1$, $-1\leqq y\leqq 1$, $z=0$. For each integer $n>0$, let R_n be the set of all points (x, y, z) such that $-1\leqq x\leqq 1$, $-1\leqq y\leqq 1$, $z=1/n$. Let

$$M = S_1 + S_2 + \sum_{n=0}^{\infty} R_n.$$

It is easy to see that every two points of M may be separated by a single subcontinuum of M and yet M is not a continuous curve. Hence the condition given by Moore is not sufficient in order that a continuum in n dimensions $(n>2)$ be a continuous curve. In this paper we give two modifications (Theorems 2 and 4) of Moore's theorem which hold in n dimensions.

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‡ *A characterization of a continuous curve*, Fundamenta Mathematicae, vol. 7 (1925), pp. 302–307.

§ We shall use the term *continuous curve* in the sense of a point set which is closed, connected and connected im kleinen. See R. L. Moore, *Concerning simple continuous curves*, Transactions of this Society, vol. 21 (1920), p. 347.