SOME PROPERTIES OF CONTINUOUS CURVES*

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The points A and B of a continuum M are said to be separated in M by a point X of M if $M-X$ is the sum of two mutually separated sets S_1 and S_2 containing A and B respectively. The point P of a continuum M is a cut point of M if and only if the set of points $M-P$ is not connected, i.e., is the sum of two mutually separated point sets.

A continuous curve M will be said to be *cyclicly connected* provided that every two points of M lie together on some simple closed curve which is contained in M. In this paper use will be made of the following fundamental theorem.

THEOREM A. *In order that the continuous curve M should be cyclicly connected it is necessary and sufficient that M should have no cut point.*

A proof for Theorem A will be found in my paper *Cyclicly connected continuous curves*, which will appear soon.

THEOREM I. *If A and B are any two points of a continuous curve M and if K denotes the set of all those points of M which separate A from B in M, then $K+A+B$ is a closed set of points.*

PROOF. The curve M contains a simple continuous arc t from A to B. Clearly K must be a subset of t. Let P be any point of $t-(K+A+B)$. Since P does not belong to K, A and B must both belong to some connected subset† of $M-P$, and by a theorem of R. L. Moore's‡ it follows that $M-P$ contains an arc t' from A to B. On the arcs PA

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† See an abstract of a paper by R. L. Wilder, *A characterization of continuous curves by a property of their open subsets*, this Bulletin, vol. 32 (1926), pp. 217–218.

‡ *Concerning continuous curves in the plane*, Mathematische Zeitschrift, vol. 15 (1922), p. 255.