ON THE CYCLIC CONNECTIVITY THEOREM*

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1. *Introduction.* We shall call the following theorem the *cyclic connectivity theorem.*

Every two points of a locally connected continuum having no cut point lie together on a simple closed curve in that continuum.

The demonstration for this theorem originally given by the present author† for the case of plane continua and in particular the demonstration given later by Ayres‡ for the theorem in general space are undeniably quite complicated. Indeed, the complexity of the proof of this theorem constituted a strong incentive to the author to seek and find§ a new treatment of the cyclic element theory which not only avoids using this theorem as principal point of departure as does the original one|| but also has validity in all connected, locally connected, metric, and separable spaces, and thus in spaces in which the proposition in question obviously does not hold. The same complexity was the prevailing influence motivating a development by Kuratowski and the author¶ of most of the cyclic element theory for compact locally connected continua in a simple and direct way independent of the cyclic connectivity theorem, based on a definition of *cyclic element* suggested by R. L. Moore.**

Thus it is seen that although this proposition has been almost successfully avoided in so far as the cyclic element theory is

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* Presented to the Society, February 28, 1931.

† See Proceedings of the National Academy of Sciences, vol. 13 (1927), pp. 31–38.

‡ W. L. Ayres, American Journal of Mathematics, vol. 51 (1929), pp. 577–594.

§ See Transactions of this Society, vol. 32 (1930), pp. 926–943.

|| See American Journal of Mathematics, vol. 50 (1928), pp. 167–194.

¶ C. Kuratowski et G. T. Whyburn, *Sur les éléments cycliques et leurs applications,* Fundamenta Mathematicae, vol. 16 (1930), pp. 305–331. The authors of this article describe the proof of the cyclic connectivity theorem as being "fort compliquée."

** R. L. Moore, Monatshefte für Mathematik und Physik, vol. 36 (1929), pp. 81–88.