

ON EXTENDING A HOMEOMORPHISM BETWEEN TWO SUBSETS OF SPHERES*

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In two papers previously published,† the author has determined conditions under which a homeomorphism, or continuous (1-1) correspondence, between two plane point sets of a certain type can be extended to a homeomorphism between their planes. The two types of point set which have been considered are (a) a continuous curve, and (b) a closed bounded set, each component of which is a continuous curve, not more than a finite number of components being of diameter greater than any given positive number. In a recent paper,‡ Adkisson has determined, for case (a), conditions under which a homeomorphism between two subsets of spheres can be extended to a homeomorphism between the spheres. The object of this paper is to generalize Adkisson's results by proving a similar theorem for case (b). Finally it is shown how any theorem concerning the extension of a homeomorphism between plane sets yields a corresponding theorem for subsets of spheres, and conversely.

DEFINITION.§ An *E-set* is a closed proper subset of a sphere, each component of which is a continuous curve, not more than a finite number of components being of diameter greater than any given positive number.

THEOREM.|| *Let M and M' be E -sets on the spheres S and S'*

* Presented to the Society, September 13, 1935.

† H. M. Gehman, *On extending a continuous (1-1) correspondence of two plane continuous curves to a correspondence of their planes*, Transactions of this Society, vol. 28 (1926), pp. 252-265, and H. M. Gehman, *On extending a continuous (1-1) correspondence (Second paper)*, Transactions of this Society, vol. 31 (1929), pp. 241-252.

‡ V. W. Adkisson, *On extending a continuous (1-1) correspondence of continuous curves on a sphere*, Comptes Rendus des Séances de la Société des Sciences et des Lettres de Varsovie, vol. 27 (1934), pp. 5-9.

§ See Gehman, *Second paper*, p. 241. For other definitions, see papers previously cited.

|| See Gehman, *Second paper*, Theorem 2, p. 244, and paragraph 2, p. 252.