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ON GENERALIZED FORMS OF APOSYNDESIS

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If a point set is both connected and closed it is called a continuum. The structure of a nonlocally connected continuum can be described in terms of its aposyndetic properties. In this paper various forms of continuum aposyndesis, that is, aposyndesis with respect to subcontinua, are considered. It is shown that the presence of any of these forms of aposyndesis in a compact metric continuum which is totally nonconnected im kleinen (not connected im kleinen at any point) insures nonsemi-local-connectedness on a dense open subset of the continuum and the set of weak cut points in each open subset of the continuum has cardinality at least c.[1] A weak cut point theorem for compact plane continua is established. An example is given which indicates that this result does not hold in Euclidean 3-space. Near aposyndesis, a generalization of aposyndesis, is introduced. It is shown that the presence of this property in a totally nonaposyndetic, separable, metric continuum implies the existence of uncountably many weak cut points.

DEFINITION. Let x, y, and z be distinct points of a continuum M. If every subcontinuum of M which contains x and y also contains z, then z is said to *cut M weakly* between x and y. A point z of M is said to be a *weak cut point* of M if there exist two points x and y in M such that z cuts M weakly between x and y.

DEFINITION. Let S be a subset of a continum M and let x be a point of $M - S$. If M contains a continuum H and an open set U such that $x \in U \subset H \subset M - S$, then M is said to be *aposyndetic* at x with respect to S. Note that if M is a regular Hausdorff continuum, M being aposyndetic at a point p with respect to every closed set in $M - \{p\}$ is equivalent to M being connected im kleinen at p. Let x be a point of a continuum M; if for each point y of $M - \{x\}$, M is aposyndetic at x with respect to y, then M is said to be *aposyndetic* at x.

Let S is a subset of a continuum M. If x is a point of $M - S$ and M is not aposyndetic at x with respect to S, then M is said to be *nonaposyndetic* at x with respect to S.

2. Continuum aposyndesis.

In the introduction it is pointed

[1] For a related result see [5, Th. 15]. For definitions of unfamiliar terms and phrases see [7] and [9].