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THE SET FUNCTION R, CONTINUA AND SEMIGROUPS

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Introduction: In [6] Jones discussed the notion of aposyndetic; this notion was generalized by Davis, Stadtlander and Swingle in [1] to define the set functions $T^n(A)$: for $A \subset S$, $S-T(A)=[x|$ there exists an open set Q and a continuum W such that $x \in Q \subset W \subset S-A$]; $T^n(A)=T\{T^{n-1}(A)\}$. In [2] the same authors used these set functions to investigate properties of semigroups on continua, following to a large extent the work of Hunter in [5].

Here we are concerned with two other set functions, defined as follows: for $A, B \subset S$, $R(A,B)=[x|$ there exists an open set Q and a continuum W such that $x \cup A \subset Q \subset W \subset S-B$]; $R(A)=[x|$ there exists an open set Q and a continuum W such that $x \cup A \subset Q \subset W \neq S$]. Using the more easily discovered properties of $R(A,B)$ we show the relation of $R(A)$ to certain types of continua which contain indecomposable continua. In the second section we generalize certain of Hunter's results in [5] on the structure of semigroups on irreducible continua.

Basic set-theoretic definitions may be found in [9] and [13]. Our semigroup definitions are given by Wallace in [12]. We write M^* for the closure of M, Int(M) for the interior of M and F(M) for the boundary of M. Where S is a semigroup, we denote the minimal ideal by K and the set of idempotents of S by E. We use ϕ for the null set. By a continuum is meant a compact connected set, and S is assumed to be a Hausdorff continuum, except where otherwise noted.

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