

## RESEARCH PROBLEMS

### 13. A. D. Wallace: *A problem on modular lattices.*

Denote by  $L$  a connected compactum and suppose that  $L$  is supplied with a pair  $\vee, \wedge$  of continuous lattice operations. It is known (L. W. Anderson, unpublished) that if  $L$  can be imbedded in  $R^2$  then  $L$  is distributive. It is also known (D. E. Edmondson, to appear in Proc. Amer. Math. Soc.) that  $L$  may be topologically a 3-cell and be nonmodular. If  $L$  is modular and can be imbedded in  $R^n$  it seems unlikely that  $L$  has to be distributive. If  $L$  is modular, if  $L$  can be imbedded in  $R^n$ , and if the boundary of  $L$  (relative to  $R^n$ ) is a distributive sublattice of  $L$  does  $L$  have to be distributive? It may be helpful to use the fact (L. W. Anderson, to appear in Proc. Amer. Math. Soc.) that if  $\dim L=1$  then  $L$  is a chain. (Received April 27, 1956.)

### 14. A. D. Wallace: *Topological algebraic structures.*

A space has PRF if it is compact and if each proper retract has the fixed point property. It is clear that an absolute retract or any  $n$ -sphere has PRF. Many pathological spaces have this property, for example certain indecomposable continua. If  $S$  is a topological semigroup with PRF then either  $S$  is a group or else  $K$ , the minimal ideal of  $S$ , consists of idempotents. If  $\dim S=n \geq 1$  then  $H^n(S)=0$  (any coefficients) if  $S$  also has a unit and if  $S$  is not a group. If  $n \geq 2$  is  $H^{n-1}(S)=0$  under these hypotheses? Do either of these conclusions hold if the stipulation " $S$  has a unit" is replaced by " $S=S \cdot S$ "? For references see Bull. Amer. Math. Soc. vol. 61 (1955) pp. 95-112. (Received May 28, 1956.)