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 It is known (L. W. Anderson, unpublished) that if L can be imbedded in R^2 then L is distributive.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 impedded 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 $S=n\geqq 1$ then $H^n(S)=0$ (any coefficients) if S also has a unit and if S is not a group. If $n\geqq 2$ 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.)