SUMMARY

The preparation and properties of the B-trihalogeno-N-trialkylborazoles (halogen = chlorine or bromine), and the B-tetrahalogeno-N-tetra-t-butylborazocines (halogen = chlorine or bromine) are described, and a survey is made of previous work on their structure and preparation. The relationship between the borazoles and borazocines was studied and is discussed.

Some intermediates in the formation of the above borazoles and borazocines were prepared. The structure of these intermediates and their relationship to the borazoles and borazocines is discussed with consideration of similar compounds reported in the literature.

The preparation (in various solvents) and properties of a large number of primary alkylammonium tetrachloroborates and tetrabromoborates ($[RNH_3]^+[BX_4]^-$) are described together with a survey of previous reports of compounds containing the tetrahalogenoborate ion. The pyrolysis of these compounds to a maximum temperature of 350° was studied. The results obtained are interpreted in terms of the series of reactions thus:-

$$[RNH_3]^+[BX_4]^- \xrightarrow{-HX} RNH_2.BX_3 \xrightarrow{-HX} RNHBX_2 \xrightarrow{-HX} {}^1/_3(XBNR)_3$$

Some interactions of primary alkylamines and boron trihalides in 1:1 molecular proportions were studied, and the products obtained are discussed with consideration of mechanisms for their formation.

Finally the utility of the B-trihalogeno-N-trialkyl-borazoles as starting materials for the preparation of various other B-substituted borazoles is discussed with reference to work reported in the literature. The preparation of some B-trisaminoborazoles and hexa-alkylborazoles, and the reduction of B-trichloroborazole was studied and is discussed.