Foreword

This special issue of *Tellus* is devoted to a selection of the papers presented at the one-day Symposium on *Cloud Chemistry and Acidic Precipitation*, which was organized by the International Commission on Cloud Physics as part of the XIX General Assembly of the International Union of Geodesy and Geophysics (IUGG), held in Vancouver, Canada, in August 1987.

In the past decade there has been considerable research activity in cloud chemistry, involving laboratory experiments, field observations and theoretical and numerical modeling studies. As a consequence, our knowledge of the rôle of clouds in atmospheric chemistry has been significantly increased. However, the subject is still very much in its infancy. It is, perhaps, at a similar state in its development to that of cloud physics research in the 1940's: the door is ajar, the room beyond can be seen to be cavernous, but the features of the room are barely discernible. Even so, it is already apparent that chemical processes in clouds are so intimately connected to physical processes that the two cannot profitably be separated.

The first 6 papers in this volume are concerned with various aspects of the inter-relationships between cloud chemical and cloud microphysical processes. In the first paper, by Iribarne and Cho, basic processes are reviewed and numerical models currently in use are discussed. The next 3 papers, by Ogren et al., Seidl, and Twohy et al., are concerned with measurements and modeling of the concentrations of chemicals that are incorporated into cloud droplets of various sizes during their growth by condensation. The paper by Barth et al. presents some of the first simultaneous measurements of gas-phase and aqueous-phase concentrations of hydrogen peroxide (an important oxidant in the production of sulfate in clouds) in the atmosphere. In the final paper in this group, Chaumerliac and Rosset describe the use of a 3-dimensional mesoscale model for studying aerosol and gas scavenging by clouds.

The final 2 papers are concerned with surface measurements at mountain sites. Mohnen and Kadlecek review methods for collecting cloud water and compare cloud chemistry measurements in winter and summer at Whiteface Mountain in the northeastern United States. Saxena et al. describe similar measurements at Mt. Mitchell, North Carolina; they estimate that at this site, ionic deposition on the forest canopy due to direct cloud capture is 2 to 5 times greater than deposition due to precipitation.

Many important aspects of cloud chemistry and acidic deposition are not discussed in this short selection of papers. No doubt these will be pursued in future symposia and special journal issues.

Peter V. Hobbs
Guest Editor