The following abstracts were received of papers presented at the Symposium:

The formation of the stratospheric sulfate layer

By C. E. JUNGE, *University of Mainz, Germany*

After a brief review of the present knowledge of the stratospheric sulfate layer, several possible mechanisms of formation are discussed in detail. A direct transport of low tropospheric particles into the stratosphere by convective clouds penetrating the tropopause is not very likely because these penetrations are not high enough and because of the chemical composition of the stratospheric particles.

Another process of formation is by coagulation of smaller particles which are known to penetrate from the troposphere into the stratosphere by mixing. Estimates show that this process may be able to supply the material required to sustain the 0.15 μ particle concentrations in the stratosphere. However, a quantitative treatment was not possible in this study because of the complexity of this problem.

The most attractive process of formation is by tropospheric SO_2 which is converted to sulfate particles within the stratosphere. Analysis of this process shows that the supply of SO_2 into the stratosphere far exceeds the amount of sulfate required to maintain the aerosol layer, if reasonable assumptions are made about the vertical eddy diffusion coefficient in the stratosphere, and if SO_2 is photooxidized according to laboratory findings at room temperature. Satisfactory agreement, however, can be obtained if the oxidation rate in the stratosphere is assumed to be considerably lower than indicated by the experimental data. Since the photo-oxidation mechanism of SO_2 involves several thermal reactions, it is not unlikely that the low stratospheric temperatures result in such a decrease of the net reaction rate.

If this working hypothesis is correct, the SO_2 mixing ratio in the stratosphere should be fairly constant with altitude. It can thus be demonstrated that the study of the sulfate layer can provide useful information about the stratospheric mixing processes.

The dynamics of tropospheric aerosols

By J. E. JUNGE, *University of Mainz, Germany*

The size distribution of tropospheric aerosols is constantly modified by a variety of processes within and outside clouds. A quantitative formulation of these processes is presented. Three groups of results were obtained by calculation: variation with time of given size distributions, tropospheric global equilibrium size distribution, and the distribution of tracer material in aerosols and its modification. The calculated results are presented and compared with observations and their implications are discussed.