work of Eliassen, Smagorinsky, Phillips and Hinkelmann. Eliassen's paper, excerpted from an earlier article, considers the formulation of a prediction model for zonally averaged fields but rests on the availability of suitable expressions for effective eddy momentum and heat transfer by cyclone-scale motions, which Eliassen does not provide. Smagorinsky relates his earlier work on the theory of large-scale heat perturbations to that of orographic disturbances and finds both effects to yield qualitatively and quantitatively similar mid-tropospheric flow patterns.

The third section consists of miscellaneous studies of the general circulation and climatic change, the most important of which are probably those of Benton, Fultz, Kuo and Lorenz. Benton describes, among other things, some spectral distribution of transports of angular momentum, kinetic energy, and dry enthalpy computed for two winter months over various latitudes of the northern hemisphere. In this relatively small sample, there exists a very strong tendency toward maximum transports of all quantities by wave numbers 1, 3 and 6. Fultz describes some characteristic features of various of his experimental results similar to and possibly related to atmospheric phenomena. Perhaps the most interesting of these were and remain those relating to the annular ring experiments in which, for certain values of the Rossby number, apparent index cycle oscillations were produced, while under other conditions a tendency toward persistence of wave patterns under slowly changing conditions was clearly exhibited. Fultz calls for combined numerical and model experiments, a project which, to the reviewer's knowledge, has still not been attempted. Kuo investigates the energetics of a linear system of equations with solutions of various types and scales and shows that the quasi-horizontal cyclone-type disturbances should be dominant in atmospheric conditions. Lorenz shows that the 2 per cent conversion of radiant energy to kinetic energy by the general circulation is near the maximum possible allowed by the differential radiation conditions. H. Wexler and Fritz present somewhat speculative papers dealing with the causes of long-term climatic change.

Section IV consists of rather preliminary studies of radiative transfer by L. Kaplan and J. King, which have been largely superseded by more recent work. Finally, Section V is devoted to summaries of the comments and discussion on the papers presented. As in most such edited and author-approved versions, some of the original and spontaneous flavor of the comments has been eliminated in favor of consistency; yet this section probably contains much of the most stimulating and still-pertinent material in the book. Some of the subjects discussed which remain of current interest are: development of truncation error instability and methods of eliminating it from a numerical integration, the inadequacy of a two-parameter model, and various hypotheses of long-term climatic change.

Among important subjects of current interest not significantly mentioned in the papers or discussion are the effects of hemispheric and stratospheric (and higher) interactions. Some other of the aspects discussed have since undergone some change of emphasis. Recent model experiments by Riehl and Fultz and numerical experiments by Smagorinsky, for example, tend toward de-emphasis of the angular-momentum budget as an important controlling feature of the general circulation, it being considered to be rather a by-product of the energetics and specific boundary conditions.

It should be clear from the foregoing description that, although the long delay in publication of this book is a point against it, much of the contents is of continued interest. It should also be clear that the two titles are somewhat misleading, the first being much too general and the second, the title of the conference, specifies a constraint not noticeably present in many of the papers. —*D. K. Lilly.*

The Mechanics of Aerosols. By N. A. Fuchs. Translated by E. Lachowicz, 1958, Army Chemical Center, Maryland, 448 pp. Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., $7.50 (paperbound).

This book should be in all meteorological libraries and will be a very valuable reference on the shelves of workers specializing in air pollution and cloud microphysics. It is to be hoped that other governmental agencies follow suit in sponsoring the translation of important Russian monographs such as this one.

Fuchs' many fundamental contributions to aerosol physics are known to investigators working in that field. He has compiled in this book a very detailed compendium of a limited but quite important segment of aerosol physics. A list of chapter headings will suggest the book's scope: classification of areosols, rectilinear uniform motion of aerosol particles, rectilinear irregular motion of aerosol particles, curvilinear motion of areosol particles, Brownian movement and diffusion in aerosols, convective and turbulent diffusion in aerosols, coagulation of aerosols, and transformation of powdery substances into the aerosol stage. Mathematical and physical detail constitute the strong feature of the work. The content of many recent Russian papers, not readily accessible to most of us, is summarized in sufficient detail to make this almost a primary reference for much of that work.

Translation of entire Russian books and monographs seems far more efficacious than extensive translation of current periodicals in bringing the non-Russian-reading scientist abreast of the recent work in that country. There must be many other books such as this whose translation and publication even in the low-cost multigraphed form of this one would be of great benefit to American and British scientists.—*J. E. McDonald.*

Pflanze und Strahlung (Plant and Radiation). By Franz Sauberer and Otto Härtel. Leipzig, 1959, 268 pp., 82 figs.

This book is exactly the type of publication needed in bioclimatology. It concentrates on a narrow, well-circumscribed theme, and it is the joint production of an expert