THE UPPER ATMOSPHERE, BY PROF. S. K. MITRA, UNIVERSITY OF CALCUTTA (published by the Royal Asiatic Society of Bengal, Calcutta) pp. xix and 616, 308 diagrams and 5 plates.

During the last few decades considerable progress has been made in our knowledge of the physical state of the higher regions of the upper atmosphere—the part lying above the tropopause. The progress has been due to the many and various contributions

by meteorologists, by theoretical and solar physicists, by geomagneticians, by astrophysicists and by others. It is remarkable, however, that inspite of the wide interest in the subject there hardly existed a book which dealt with the upper atmosphere as a whole and in a comprehensive manner. The present volume before us has filled this long felt want. The book has also come out at an opportune moment, when flight at supersonic speed is being rapidly developed, for which accurate knowledge of the upper atmospheric data is becoming more and more important.

The book is divided into twelve chapters and the topics dealt with will be evident from the chapter headings. In the introductory chapter the various direct and indirect methods at our disposal for studying the high regions of the atmosphere are summarised. The chapters which follow deal with wind system in the upper atmosphere (Chapter II), temperature in the middle atmosphere—anomalous propagation of sound and meteoric phenomena (Chapters IIIA and IIIB), the ozonosphere (Chapter IV), Oxygen in the upper atmosphere (Chapter V), the ionosphere (Chapter VI), terrestrial magnetic variations (Chapter VII), aurora polaris (Chapter VIII), theories of magnetic storms and aurorae (Chapter IX), lights from the night sky (Chapter X), temperature in the upper atmosphere (Chapter XI) and concluding remarks in which the present state of our knowlege is summarised and some yet unsolved problems are discussed (Chapter XII). There is an appendix with eight sections. Of these the one under the caption "Spectroscopic Notes" is of particular help to those not familiar with spectroscopic terminology. There are more than 600 references to original papers and these are followed by a very full subject index and an author's index.

A perusal of the book shows how, inspite of the inaccessibility of the regions concerned, a surprisingly large amount of knowledge has been gained of the upper atmospheric regions. We now have a fairly accurate knowledge of the temperature and pressure distribution up to about 120 km. This has been obtained by the various direct and indirect methods of observation. The author regrets that when the book was written the results of V2 rocket flights were not known. It is satisfactory to note, however, these results now fully confirm the results deduced before in all the important features. Besides temperature and pressure distribution other physical properties measured are, value of the terrestrial magnetic field in Region F of the ionosphere, collision at frequencies of electrons in regions E and F, the nature of the wind systems due to atmospheric tides.

A book like this in which all the different aspects of the upper atmosphere are for the first time brought together under one head for comparative discussion is an extremely valuable publication. In presenting the accounts in a connected manner the author has brought in much originality of ideas. It should find a place in the library of every student of meteorology.

S. K. B.