**PREFACE**

The thesis embodies some of the investigations carried out at the Physical Research Laboratory, Ahmedabad, during the period 1953-1956. The ionospheric section of the laboratory is maintained with financial assistance from the Council of Scientific and Industrial Research (India). The author has been working in the Section since its start.

The special observations at Ahmedabad discussed in this thesis and the relevant calculations were all made by the author. The field-strength measurements made during solar eclipse were made with the assistance of the author's colleagues and this is acknowledged in the appropriate places. Acknowledgements to sources from which additional information has been taken are given in the references.

Dr. U.D. Desai, Reader in Electronics, rendered great help in the installation of the ionospheric recorder. Thanks are also due to Mr. K.M. Kotadia who has been associated in the maintenance of the ionospheric station.

I am indebted to Professor K.R. Ramanathan for his keen interest and guidance during the investigations.

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[Counter Signed]

K.R. Ramanathan

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