Foreword

Acid rain, ozone photochemistry, long-range transport of pollutants, greenhouse gas emissions and aerosols dominated tropospheric air pollution research in the last 30 years of the 20th century. At the start of the 21st century, acid rain is subject to planned improvement in Europe and North America, but is a growing problem in Asia. Ozone pollution is much better understood, but the problem is still with us, and desirable levels are difficult to achieve over continental Europe. The heterogeneous chemistry which is responsible for ozone depletion in the stratosphere is now reasonably well understood, but there is on-going interest in the sources and sinks of CFC (chlorofluorocarbon) replacements in troposphere. There is increasing interest in indoor air quality, and the origin and health implications of atmospheric particles. Perhaps most important on a global perspective, intensive research has not yet determined the relationship between greenhouse gases, aerosols and surface temperature. The climatic implications of these are now more urgent than ever.

In 1998 *Atmospheric Environment* began to encourage the submission of Millennial Reviews on a range of key topics. These papers assessed our knowledge at the end of the 20th century, and looked forward to the 21st century. The Millennial Reviews have been collected together as the main chapters of this book, and the authors of some of the earlier papers have supplied short up-date articles. These are included as short appendices to the main articles.

In 1995 *Atmospheric Environment* also introduced an exciting feature, the New Directions columns. These short articles were written in a journalistic style, and authors were encouraged to speculate and express controversial opinions. Initially these articles were all invited but, as the column became better known, submitted articles became the norm. These are now published at least once a month. In 1999 a selection of Future Directions columns were invited, where the authors were encouraged to look ahead to possible developments in air pollution science at the end of the 21st century. A group of recent New and Future Directions columns have been chosen for this book, to complement the Millennial Reviews. We hope that both the reviews and the thought provoking essays will stimulate the imagination of current researchers, and encourage breadth of vision in future research.

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