to illuminate or expand on points in the text. The author anticipates that the book could be used as a textbook for graduate classes in either engineering or applied mathematics. The reviewer believes that this purpose has indeed been achieved.

The book begins with an introduction to the Boltzmann and model equations, including the boundary conditions presented by gas surface interactions. Two chapters follow, both on solutions to selected gas slab phenomena. Chapter 4 deals with rarefied aspects of propagation phenomena and shock waves. The subsequent chapter discusses perturbation methods in more than one dimension. Important physical aspects of the role of polyatomic gases in rarefied gas dynamics, mixtures, chemistry, and radiation are discussed in Chapter 6. A complete chapter is devoted to numerical techniques for solving the Boltzmann equation. The final chapter is a discussion of evaporation and condensation phenomena.

Each of the chapters can be thought of as a review paper discussing the contribution of mathematical techniques to the understanding of selected rarefied gas dynamic physical phenomena. All are readable and quite enthralling, exhibiting the authors' exquisite insight. In fact, as a reviewer I had great difficulty in simply reviewing the book because I was enticed into reading much of it in great detail. Although limited in length, the topics chosen by the author to illustrate the applications of modern kinetic theory are excellent and are inclusive of many of the really interesting rarefied gas dynamic phenomena. I found the chapter on evaporation and condensation particularly instructive. There is extensive literature on evaporation and condensation that Prof. Cercignani distills to a readable and informative summary. Actually, the same comment can be applied to each of the chapters.

The organization of the book is such that a particular topic not explicitly chosen for discussion by the author may appear in several places. In one of my diversions from finishing this review, I was interested in thermal creep and generally thermal stress–induced flows. It turned out that important information on this particular subject appears in several chapters in the book. The index is excellent in directing the mining of this distributed information.

In summary, Carlo Cercignani has produced a unique book that may be a harbinger of the future. For those of us who would like to understand the insight available from the mathematics without going into all of the detail, this is a wonderful book. The price is right, and the book provides an immediate entrée into the important research literature in the topics that are covered. Students should find it extremely useful. I believe the book's role as a textbook may be particularly important because it will provide convenient, guided access to the extensive literature on the Boltzmann equation. As pointed out by the author, kinetic equations traceable to the Boltzmann equation are presently applied in many fields.

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Errata

Elliptic Grid Generation

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EQUATION (2) should read as follows:

$$g^{kj}\frac{\partial^2 x^{\lambda}}{\partial \xi^k \partial \xi^j} = (K_1 + K_2)n^{\lambda} \qquad (2)$$