

Contents of Volume I

PREFACE	vii
CONTENTS OF VOLUME II	xiii

Section 1

KINETIC THEORY

Steady-State Oscillations in a Gas	1
<i>Harold Weitzner</i>	
On the Propagation of Free Sound Waves in Rarefied Gas Dynamics	21
<i>Lawrence Sirovich and James K. Thurber</i>	
Forced Sound Propagation in Gases of Arbitrary Density	48
<i>Rodney J. Mason, Jr.</i>	
Propagation of an Initial Density Discontinuity	71
<i>George Bienkowski</i>	
Numerical Experiments in Kinetic Theory	96
<i>Donald G. Anderson and Hilliard K. Macomber</i>	
An Analysis of Some Rarefied Gas Phenomena from the Molecular Approach	112
<i>Walter J. Schaetzle</i>	
Steady Expansions at High-Speed Ratio Using the BGK Kinetic Model	125
<i>John W. Brook and Richard A. Oman</i>	

Section 2

SHOCK STRUCTURE

Exact Numerical Solution of the Complete BGK Equation for Strong Shock Waves	140
<i>M. T. Chahine and R. Narasimha</i>	

Shock-Wave Structure in Highly Rarefied Flows	161
<i>D. Battat</i>	
Molecular-Beam Approximation for a Strong-Shock-Structure Problem	182
<i>Hakuro Oguchi</i>	
Kinetic Theory of Shock Structure Using an Ellipsoidal Distribution Function	193
<i>Lowell H. Holway, Jr.</i>	
Shock-Wave Structure in a Rigid Sphere Gas	216
<i>G. A. Bird</i>	
Shock-Wave Structure in Binary Gas Mixtures with No Chemical Reaction	223
<i>Tetsuo Fujimoto</i>	
Argon Shock Structure	240
<i>Morton Camac</i>	
Density Distribution in Shock Waves Traveling in Rarefied Monatomic Gases	250
<i>F. Schultz-Grunow and A. Frohn</i>	
Electron-Beam Measurements of Shock-Wave Thickness	265
<i>David A. Russell</i>	

Section 3

TRANSITION FLOW—THEORY

Near Free Molecule Behavior of Gases with Infinite Collision Cross Section	277
<i>J. J. Smolderen</i>	
A Uniformly Valid Asymptotic Theory of Rarefied Gas Flows under Nearly Free Molecular Conditions, II	296
<i>Young-Ping Pao</i>	
The Transitional Drag on a Cylinder at Hypersonic Mach Numbers	312
<i>Marian H. Rose</i>	
Improved "First-Collision" Model Theory	326
<i>Michael Lunc</i>	
Rayleigh's Problem at Low Mach Numbers According to Kinetic Theory	332
<i>Carlo Cercignani and Franco Sernagiotto</i>	
Bimodal Two-Stream Distribution and Compressible Couette Flow	354
<i>Jurgen W. Beck</i>	

A Discrete Ordinate Technique for the Linearized Boltzmann Equation with Application to Couette Flow	370
<i>Bernard Hamel and Murray Wachman</i>	
Kinetic Theory of the Leading Edge	394
<i>Sigi Ziering, Lan-Keh Chi, and Ronald Fante</i>	
The Incipient Continuum Flow near the Leading Edge of a Flat Plate . .	416
<i>Jack Morimoto and Robert E. Street</i>	

Section 4

TRANSITION FLOW — EXPERIMENTAL

Recent Experimental and Theoretical Extensions of Nearly Free Molecular Flow	433
<i>G. J. Maslach, D. Roger Willis, S. Tang, and D. Ko</i>	
Drag Measurements in Slip and Transition Flow	444
<i>H. Coudeville, P. Trepaud, and E. A. Brun</i>	
Experimental Studies of Low-Density Effects in Hypersonic Wedge Flows	467
<i>R. J. Vidal and J. A. Bartz</i>	
An Experimental Study of Surface and Flow Field Effects in Hypersonic Low Density Flow over a Flat Plate	487
<i>J. E. Wallace and A. F. Burke</i>	
Some Exploratory Experimental Studies of Hypersonic Low Density Effects on Flat Plates and Cones	508
<i>I. E. Vas, J. McDougall, G. Koppenwallner, and S. M. Bogdonoff</i>	
Experimental Study of Low Pressure Hypersonic Flow by Using an Electron Beam Densitometer	535
<i>Isamu Wada</i>	
Experimental Investigation of Low-Density Axial Flow through Short Tapered Ducts	548
<i>T. Rogers and J. C. Williams, III</i>	
Research at the NPL on the Influence at Supersonic Speeds and Low Reynolds Numbers of Thick Laminar Boundary Layers	574
<i>E. W. E. Rogers and C. J. Berry</i>	
Investigations of the Flow Field near the Leading Edge of a Heated Flat Plate in a Mach 0.5 Air Flow	592
<i>S. A. Gordon</i>	

The Aerodynamic Drag Torque on a Rotating Sphere in the Transition Regime	611
<i>R. G. Lord and P. J. Harbour</i>	
Some Experiments on the Flow of a Rarefied Gas through a Circular Orifice	621
<i>A. K. Sreekanth</i>	

Section 5

FREE MOLECULE AND INTERNAL FLOW

Some Problems of Nose Drag Minimization for Bodies in Free Molecular Flow	630
<i>Vsevolod P. Shidlovsky</i>	
Free-Molecular Flow through Conical Tubes	641
<i>S. J. Townsend, G. N. Patterson, and S. R. M. Sinclair</i>	
Theory for the Free Molecular Impact Probe at an Angle of Attack . .	653
<i>P. C. Hughes and J. H. de Leeuw</i>	
On the Internal Flow of Rarefied Gases	677
<i>Yau Wu</i>	
SUBJECT INDEX	699